



Anesthesiology and Reanimation Specialists' Society Congress
BALKAN STATES ANESTHESIA DAYS - VI



**ARUD
2019**

Trauma, Anesthesia and Intensive Care

3-6 April 2019

Ege University Atatürk Culture Center
İzmir, Turkey

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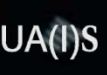
EGE BÖLGESİ SANAYİ ODASI
AEGEAN REGION CHAMBER OF INDUSTRY

organization secretariat

email: hakan@diamed98.com
Phone: +90 533 247 6627



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Anesthesiology and Reanimation Specialists' Society Congress



BOOK OF PROCEEDINGS AND ABSTRACTS

**BALKAN STATES ANESTHESIA DAYS – VI
TRAUMA, ANESTHESIA AND INTENSIVE CARE**

**İzmir, Turkey
3-6 April
2019**

Editors-in-chief

Prof. F. Feyhan Ökten, MD

Prof. Onur Özlü, MD

Coeditors:

Prof. Hülya Başar, MD

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Assoc. Prof. K. Sanem Çakar Turhan, MD

Technical editor:

Hakan Günel

Diamed Kongre Organizasyon

Ankara, Turkey

(+90 533 247 6627)

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Distinguished Colleagues

We have taken over the management of the Anesthesiology and Reanimation Specialists Society (ARUD/ARSS) for the period of 2018-2020. Balkan Anesthesia Days started to be held under Prof Meral Kanbak's valuable efforts during her ARUD/ARSS presidency and it have been held successfully in various Balkan states for the last 5 years. In these meetings, the exchange of information with our colleagues from Balkan countries and other countries as well as friendship relations have been established that contribute to the promotion of participating countries.

In 2019, ARUD/ARSS is planning to organize the sixth of Balkan Anesthesia Days on April 3-6 in İzmir Atatürk Culture Center. The subject of the meeting will be "Trauma and Anesthesia".

Trauma is one of the most important problems in our country and in the world and will continue to be.

The organisaton city Izmir is located on the west coast of Anatolia. It is the third biggest city in Turkey and it is the main port of the Aegean Region. Also, it has been enriched by many cultures both recent and ancient. The city of İzmir was an important center of commerce, art, and culture of the ancient world.

Our esteemed colleagues, I and especially, the Secretary of the Congress Prof. Dr. Onur ÖZLÜ together along with our board of directors; Prof.Dr. Ahmet COŞAR, Prof. Dr. Sumru ŞEKERCİ, Assoc. Prof.Murat SAYIN, Assoc. Dr. Prof. Dr. Nurdan BEDİRLİ and Assoc. Dr. Sanem TURHAN will have great honor and joy to welcome you.

With respect and regards.

Prof. Feyhan ÖKTEN
Congress President
President of ARUD

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	Igli Zhilla, MD PhD

All the committee members are listed in alphabetical order

SCIENTIFIC PROGRAM

03 April 2019-Wednesday

13:30-15:00	OPENING CEREMONY - I <i>Opening Speeches</i> Artificial Intelligence	Şahin ALBAYRAK, Germany
15:00-15:15	Coffee break	
15:15-16:30	PANEL 1: Introduction to Trauma	Chairs: Asuman UYSALEL, Turkey Nermin GÖĞÜŞ, Turkey Melda TÜRKOĞLU, Turkey
	From the field to the operating room-military injury	Ercan KURT, Turkey
	New concepts in triage during terror attacks	Deniz ERDEM, Turkey
	Traumatic shock	Seda Banu AKINCI, Turkey
	Burn injury	Ersel GÜLEÇ, Turkey

04 April 2019-Thursday

08:30-09:30	OPENING CEREMONY - II Vise President of the Turkish Ministry of Health Rapid sequence induction in trauma patients. Still controversial? Variety of Antartic Development of trauma centers in city hospitals	Muhammet GÜVEN, Turkey Radmilo JANKOVIC, Serbia (ESA Secretary) Burcu ÖZSOY, Turkey Osman EKİNCİ, Turkey
09:30-09:45	Coffee break	
09:45-11:00	PANEL 2: Basic informations about trauma	Chairs: Zeynep KAYHAN, Turkey Meral KANBAK, Turkey Visnja IVANCAN, Croatia
	History and epidemiology of trauma	Mirjana SHOSHOLCHEVA, Macedonia
	New concept of sedation in trauma: from field to ICU	Visnja IVANCAN, Croatia
	Pathophysiology of trauma	Sumru ŞEKERCİ, Turkey
	New concept of pain therapy in trauma patient: from field to ICU	Suna AKIN TAKMAZ, Turkey
11:00-11:15	Coffee break	
11:15-12:15	CONFERENCE	Chairs: Güner KAYA, Turkey Andrijan KARTALOV, Macedonia
	Preoperative risk and preparation of the trauma patient	Gerhard FRITSCH, Austria
12:15-13:30	Lunch	
13:30-14:30	PANEL 3: Preoperative evaluation of trauma patient	Chairs: Filiz TÜZÜNER, Turkey, Ülkü AYPAR, Turkey Hristo BOZOV, Bulgaria Osman EKİNCİ, Turkey
	Airway management in trauma: from field to ICU	Antigona HASANI, Kosovo
	Prevention and management of neurological damage	Jasmina SMAJIC, Bosnia Herzegovina
	Massive transfusion and trauma induced coagulopathy	Dilek ÜNAL, Turkey
	Effects of trauma and anesthesia on cognitive function of elderly patient	Başak Ceyda MEÇO, Turkey
14:30-14:45	Coffee break	

14:45-16:00	PANEL 4: Perioperative monitoring of trauma	Chairs: Ömer KURTİPEK, Turkey Hasib LUKAC, Montenegro Tea ZARKOVIC, Montenegro Süheyla ÜNVER, Turkey
	Hemodynamic and coagulation monitorization	Slavenka STRAUS, Bosnia i Herzegovina
	Neuromonitorization	Melih BOZKURT, Turkey
	Microbial monitoring and antibiotherapy	Nevriye SALMAN, Turkey
	Traumatic lung injury	Hülya SUNGURTEKİN, Turkey
16:00-16:15	Coffee break	
16:15-17:45	PANEL 5: Role of anesthesiologist in central nervous system traumas	Chairs: Oya ÖZATAMER, Turkey Mihal KERCI, Albania İbrahim AŞIK, Turkey Biljana KUZMANOVSKA, Macedonia
	What can the anesthesiologist do in the head trauma at crush site? Management of brain swelling in penetrating head injury.	Seval İZDEŞ, Turkey
	The role of anesthesiologist in cervical spine injuries	Canan ATALAY, Turkey
	The role of anesthesiologist in lumbosacral and pelvic trauma?	Nil KAAN, Turkey
	Early postoperative intensive care in central nervous system trauma	Fatos KATANOLLI, Kosovo
	Ventilatory strategies in head trauma patients	Snezana STANISAVLJEVIC, Serbia
05 April 2019, Friday		
07:00-08:30	The Anaesthesiologist's perspective: problems and solutions in the trauma field	Chairs: Feyhan ÖKTEN, Turkey Onur ÖZLÜ, Turkey Murat SAYIN, Turkey Nurdan BEDİRLİ, Turkey
	<i>Approach to the bleeding patient</i>	Onat BERMEDE, Turkey
	<i>Coagulation management in the trauma field</i>	Sengül ÖZMERT, Turkey
	<i>The difficult airway</i>	Süheyla KARADAĞ ERKOÇ, Turkey
	<i>CPR in the trauma field</i>	Volkan BAYTAŞ, Turkey
	<i>Vascular access in trauma</i>	Cihan ŞAHİN, Turkey
	<i>Triage in the trauma field</i>	Emine ARIK, Turkey
	<i>Management of the paediatric patient in the trauma field</i>	Nilgün ŞAHİN, Turkey
	<i>Pain management in the trauma field: Nerve blocks</i>	Şeyda Efsun ÖZGÜNAY, Turkey
	<i>Saline infusion in trauma patients: Friend or foe</i>	İlkay Baran AKKUŞ
08:30-09:45	PANEL 6: Trauma to a pediatric patient	Chairs: Orhan KANBAK, Turkey Antigona HASANI, Kosova Rudin DOMI, Albania Ahmet COŞAR, Turkey
	Anesthesia in pediatric burn injury	Ivana BUDIC, Serbia
	Anesthesia in pediatric head injury	Marijana KARISIK, Montenegro
	Anesthesia in pediatric spinal trauma	Dusica SIMIC, Serbia
	Battered child syndrome	Dilek ÖZCENGİZ, Turkey
09:45-10:00	Coffee break	
10:00-11:15	PANEL 7: Trauma in specific cases-the most important points!	Chairs: Saadet ÖZGEN, Turkey Tritan SHEHU, Albania Dejan LEKOVIC, Montenegro
	Pregnancy and trauma	Rudin DOMI, Albania
	Obesity and trauma	Esra ÖZAYAR, Turkey

	Heart and large vessel traumas Trauma in alcohol and drug addict patient	Ender GEDİK, Turkey Nuray ALTAY, Turkey
11:15-11:45	CONFERENCE Unknown side of phytotherapy	Chair: Onur ÖZLÜ, Turkey Gülendam TÜMEN, Turkey
11:45-13:00	Lunch	
13:00-14:15	CONFERENCE	Chairs: Fatma SARICAOĞLU, Turkey Ali Fuat ERDEM, Turkey Hüsnü KÜRŞAT, Turkey
	Nerve blocks that you should learn for orthopedic trauma Update on regional anesthesia for hip fracture in elderly patients	Olivier RONTES, France Philippe MARTY, France
14.15-14:30	Coffee Break	
14:30-15:45	PANEL 8: Trauma in specific cases-the most important points!	Chairs: Dusanka JANJEVIC, Serbia Dusica SIMIC, Serbia Aslı DÖNMEZ, Turkey Işıl ÖZKOÇAK TURAN, Turkey
	Maxillofacial trauma Long bone fractures and fat embolism Earthquake injuries and approach to crush injury Anesthesia in drowning and electrical injury: field, emergency service and operating room Are trauma centers effectively organised in Turkey?	Seyhan YAĞAR, Turkey Vladimir VRSAJKOV, Serbia Mahmut KALEM, Turkey Meldijana OMERBEGOVIĆ, Bosnia i Hercegovina Ceren GUNT, Turkey
15:45-16:00	Coffee Break	
16:00-17:30	PANEL 9: Trauma in the elderly patient	Chairs: Hülya BAŞAR, Turkey Çetin KAYMAK, Turkey Sanem ÇAKAR TURHAN, Turkey
	Evaluation and transport of elderly patients from the field to the operating room Hip fractures in elderly patient Polypharmacy in elders : Should we treat pain in elderly trauma patients? Elder abuse and neglect	Dilek KAZANCI, Turkey Sanem ÇAKAR TURHAN, Turkey Gülbin SEZEN, Turkey Meltem UYAR, Turkey
06. April. 2019-Saturday		
08:30- 09:15	PANEL 10: Postoperative early intensive care in trauma	Chairs: Onur ÖZLÜ, Turkey Sema TURAN, Turkey Sumru ŞEKERCİ, Turkey
09:15 - 12:00	Intensive care for blunt and penetrating abdominal trauma and abdominal compartment syndrome Ventilation management in trauma Incranial monitoring in traumatic brain injury Rational Drug Use	Ebru SALMAN, Turkey Dusanka JANJEVIC, Serbia Züleyha KAZAK BENGİSUN Feyhan ÖKTEN - Nevriye SALMAN, Turkey

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Kaykusuz Hatice¹, Güven Ayşegül¹, Ertan Batu², Turhan Çakar Sanem¹, Ökten Fatma¹
¹Ankara University, Department of Anesthesiology and Reanimation, ²Ankara University, Department of Orthopaedia and Traumatology
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Duygu Demiriz Gülmez¹, Alparslan Apan¹, Özgün Çuvaş Apan¹, Jülide Sezer¹
¹Giresun University Op.Dr.A.Ilhan Özdemir Education and Research Hospital
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 Melike Korkmaz Toker¹, Başak Altıparmak², Ali İhsan Uysal¹, Mustafa Turan², Semra Gumus DEMIRBILEK²
¹Mugla Sıtkı Kocman University Research and Training Hospital, Department of Anesthesiology and Reanimation, Mugla, Turkey, ²Mugla Sıtkı Kocman University Department of Anesthesiology and Reanimation, Mugla, Turkey
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 Seyda Ozalp¹, Sanem Çakar¹, Ramazan Akmese², Volkan Baytas¹, Feyhan Okten¹
¹Ankara University, Anesthesiology and Reanimation Department, Ankara, Turkey ²Ankara University Orthopaedics and Traumatology Department, Ankara, Turkey
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Sedat Saylan
 Karadeniz Technical University Faculty of Medicine, Department of Anaesthesiology and Reanimation, Trabzon, Turkey
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Sedat Saylan
 Karadeniz Technical University Faculty of Medicine, Department of Anaesthesiology and Reanimation, Trabzon, Turkey
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 Suleyman Demirel University Medical School, Department of Anesthesiology and Reanimation

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1Ege University Anesthesia and Reanimation Department	
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The Effect of Cerium Oxide on Erythrocyte Deformability in Desflurane Induced Rats Halil Kara ¹ , Faruk Metin Comu ² , Ayca Ozdemirkan ³ , <u>Volkan Sivgin</u> ³ , Aysegul Kucuk ⁴ , Mustafa Arslan ³	
1Yıldırım Beyazıt University, Faculty of Medicine, Department of Pharmacology, Ankara 2Kırıkkale University, Faculty of Medicine, Department of Physiology, Kırıkkale 3Gazi University, Faculty of Medicine, Department of Anesthesiology and Reanimation, Ankara 4Kutahya Health Sciences University, Faculty of Medicine, Department of Physiology, Kutahya	
ORAL PRESENTATIONS - IV	
Time: 11:00-12:00	
Hall: Hall D	
Chairs: Ali Günerli, Gülbin Sezen	
OP-069	271
Post-Thyroidectomy Tracheal Deviation and Difficult Intubation Nevriye Salman ¹ , Eda Balcı ¹ , Aslıhan Aykut ¹ , <u>Hülya Yiğitözay</u> ¹ , Sumru Şekerci ¹	
SBU Türkiye Yüksek İhtisas Training and Education Hospital	
OP-070	272
Anesthetic Practice in a Patient with Retrosternalgoiter Accompanied by Tracheal Compression and Severe Dyspnea <u>Pelin Uzun Sarıtaş</u> ¹ , Seda Özen Zunal ¹ , Aykut Sarıtaş ¹ ,	
Tepecik Training and Research Hospital	
OP-071	273
The Effect of Head Positioning on Intraoperative Optic Nerve Sheath Diameter and Postoperative Cognitive Function of Patients Undergoing Thyroidectomy Başak Altıparmak ¹ , Melike Korkmaz Tokar ² , <u>Ali İhsan Uysal</u> ² , Mustafa Turan ¹ , Semra Gümüş Demirbilek ¹	
1.Muğla Sıtkı Koçman University, Department of Anesthesiology and Reanimation, Muğla Turkey 2Muğla Sıtkı Koçman University	
OP-072	274
Relation of Anthropometric Measurements to Difficult Intubation in Obese Patients Who Will Undergo General Anesthesia Cigdem Kizilay ¹ , <u>Mehmet Cakirca</u> ¹ , Hulya Basar ¹ , Meltem Bektas ¹ , Bulent Baltacı ¹	
1Ankara Training and Research Hospital	
OP-073	275
Anesthesia Management for The Implantation of Ventricular Assist Device Implantation: Single Center Nevriye Salman ¹ , <u>Perihan Kemerci</u> ¹ , Melike Demir ¹ , Umit Karadeniz ¹ , Aysegul Ozgok ¹ , Mustafa Pac ¹	
SBU Türkiye Yüksek İhtisas Training and Education Hospital	

OP-074	276
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Does Preoperative Stroke Effect Intraoperative Hemodynamics, Near Infrared Spectroscopy (Nirs) and Postoperative Complications Patients Undergoing Carotid Endarterectomy?	
<u>Bahar Oc</u> ¹ , Funda Arun ² , Oguzhan Arun ¹ , Ates Duman ¹ , Mehmet Oc ³	
1Selcuk University, Faculty of Medicine, Department of Anesthesiology and Reanimation, 2Selcuk University, Faculty of Dentistry, Department of Pedodontics, 3Selcuk University, Faculty of Medicine, Department of Cardiovascular Surgery	
OP-075	277
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Anaesthetic Consideration for a Patient with Traumatic Carotid Artery Dissection: A Case Report	
<u>Bahar Oc</u> ¹ , Mehmet Oc ² , Oguzhan Arun ¹ , <u>Ates Duman</u> ¹ ,	
1Selcuk University, Faculty of Medicine, Department of Anesthesiology and Reanimation, 2Selcuk University, Faculty of Medicine, Department of Cardiovascular Surgery	
OP-076	278
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Our Clinic's Anesthetic Practice in Endovascular Repair of Aortic Aneurysms: Retrospective Analyzes	
Filiz Akaslan ¹ , <u>Fatma Özkan Sipahioğlu</u> ¹ , Aylin Perdi ¹ , İlker İnce ² , İbrahim Duvan ² , Asli Dönmez ¹	
1University of Health Sciences, Diskapı Yildirim Beyazıt Training and Research Hospital, Department of Anesthesiology and Reanimation, 2University of Health Sciences, Diskapı Yildirim Beyazıt Training and Research Hospital, Department of Cardiovascular Surgery, Ankara, Turkey	
OP-077	280
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The Effect of Albumin on Mortality and Morbidity As a Prognostic Factor in Geriatric Patients with Cardiovascular Surgery	
Hulya Yigitozay ¹ , <u>Nevriye Salman</u> ¹ , Sumru Sekerci ¹	
SBU Türkiye Yüksek İhtisas Training and Education Hospital	
OP-078	281
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Quadratuslumborum Type 3 Block Provides Effective Postoperative Analgesia for Hip Surgery: Case Reports	
<u>Enise Armağan Koza</u> ¹ , Ahmet Murat Yayık ¹ , Sevim Cesur ¹ , Figen Öztürk ¹	
1Regional Training and Research Hospital, Department of Anesthesiology and Reanimation, Erzurum, Turkey	
ORAL PRESENTATIONS - V	
Time: 13:30-14:45	
Hall: Hall A	
Chairs: Dilek Kazancı, Esra Özayar	
OP-022	223
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Evaluation of Pulmonary Function Tests in Obese Patients Relation to Smoking	
<u>Ayca Sultan Şahin</u> , Ziya Salihoğlu, Süreyya Özkan	
SBU Kanuni Sultan Suleyman Education and Training Hospital, Istanbul	
OP-024	224
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The Struggle for survival with hemoglobin 1.3 after Postpartum Atonia: Case Report	
<u>Ayca Sultan Sahin</u> , Ziya Salihoglu, Süreyya Özkan	
SBU Kanuni Sultan Suleyman Education and Training Hospital, Istanbul	
OP-025	225
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Comparison of Difficult Airway Prediction Tests in Diabetic Patients	
İsmail Eren Durmuş ¹ , Gaye Aydın ¹ , Yücel Karaman ¹ , <u>Pervin Sutas Bozkurt</u> ¹	
1SBU İzmir Tepecik Tepecik Education Research Hospital	
OP-027	226
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Effect of Fullerenol Nanoparticles on Erythrocyte Deformability in Rats Induced by Sevoflurane	
<u>Volkan Sivgin</u> ¹ , Aysegul Kucuk ² , Faruk Metin Comu ³ Gulferm Yalcin ¹ , Mustafa Arslan ¹	

1Gazi University Faculty of Medicine, Department of Anesthesiology and Reanimation, Ankara, Turkey
 2Kütahya Health Sciences Universty, Faculty of Medicine, Department of Physiology, Kütahya 3Kırıkkale
 University Faculty of Medicine, Department of Physiology, Kırıkkale

OP-028 **227**

Diagnosis and Treatment of Tracheo-Eusophageal Fistula in Tetraplegic- Ventilator Dependent Patient, Case Report

Fatma Özkan Sipahioğlu¹, Murat Sayın¹

1University of Health Sciences, Diskapi Yildirim Beyazit Training and Research Hospital, Department of Anesthesiology and Reanimation, Ankara, Turkey

OP-029 **229**

Evaluation of Patients with Brain Death Diagnosis and the Effect of New Regulation on the Duration of Diagnosis

Savaş Altınsoy¹

University of Health Sciences, Diskapi Yildirim Beyazit T&R Hospital, Department of Anesthesiology and Reanimation

OP-030 **230**

The efficiency of Using i-Gel During Endobronchial Ultrasonography Guided Transbronchial Needle Aspiration

Savaş Altınsoy¹, Jülide Ergil¹

University of Health Sciences, Diskapi Yildirim Beyazit T&R Hospital, Department of Anesthesiology and Reanimation, Ankara-Turkey

OP-031 **231**

The Role of SCUBE-1 in Ischemia-Reperfusion Injury in Patients with or Without Diabetes Mellitus Who Underwent Knee Replacement Surgery

Savaş Altınsoy¹, Başak Gülel¹, Derya Özkan¹, Ali Yalçındağ², I. Tuğba Hancı², Aslı Dönmez¹

1University of Health Sciences, Diskapi Yildirim Beyazit Training and Research Hospital, Department of Anesthesiology and Reanimation, Ankara-Turkey 2University of Health Sciences, Diskapi Yildirim Beyazit Training and Research Hospital, Department of Clinical Biochemistry

OP-032 **232**

The Value of Integrated Pulmonary Index Monitoring After Electroconvulsive Therapy

Demet Lafli Tunay¹

1Cukurova University Faculty of Medicine, Department of Anesthesiology and Reanimation, Adana, Turkey

OP-033 **233**

The Use of Vasoactive-Inotropic Score in Adult Patients with Septic Shock in Intensive Care

Iskender Kara¹, Mehmet Sargin², Yeşim Şerife Bayraktar¹, Hatice Eyiol², İpek Duman³ Jale Bengi Çelik¹

¹Selçuk University Faculty of Medicine, Department of Anesthesiology and Reanimation, Critical Care Medicine,

²Selçuk University Faculty of Medicine, Department of Anesthesiology and Reanimation, ³Necmettin Erbakan University, Meram Faculty of Medicine, Department of Medical Pharmacology

OP-034 **234**

Life-Threatening Event At Endoscopic Parathyroidectomy

Emel Gündüz, Bora Dinç, A.Gülbin Arıcı

Akdeniz University, Faculty of Medicine, Department of Anesthesiology and Reanimation Antalya, Turkey

ORAL PRESENTATIONS - VI**Time: 13:30-14:45****Hall: Hall D****Chairs: Ayşe Karcı, Başak Ceyda Meço**

- OP-079** **283**

Can Laryngoscopy-Assisted Technique Be an Alternative to Classic Technique for Difficult LMA Insertion?
M. Tuğba Arslan¹, M. Murat Sayın¹, Güleser Saylan²
University of Health Sciences Diskapi Yıldırım Beyazıt Training and Research Hospital, Department of Anaesthesiology
- OP-080** **284**

The Effects of General Anesthesia and Ultrasonography-Guided Interscalene Block on Pain and Oxidative Stress with The Assesment of Thiol-Disulfide Homeostasis and CRP in Patients Undergoing Shoulder Arthroscopy
Murat Öksüz¹, Süheyla Abitağaoğlu¹, Ahmet Kaciroğlu¹, Ceren Köksal¹, Özcan Erel², Almıla Şenat Aydın²
¹Fatih Sultan Mehmet Health Application and Research Center, Department of Anesthesiology and Reanimation
²Yıldırım Beyazıt University Medical Faculty, Department of Biochemistry
- OP-081** **286**

Hemodynamic Monitoring with Pulse Contour Cardiac Output (PICCO) in Trauma Patients
Alev Öztaş, Yücel Meriç, Arzu Yıldırım Ar, Süheyla Abitağaoğlu
Health Science University, Fatih Sultan Mehmet Health Application and Research Center, Intensive Care Clinic/Anesthesiology and Reanimation Clinic, İstanbul
- OP-082** **288**

Does Different Types of General Anesthesia Alter The Incidence of Myocardial Ischemia in Transurethral Resection of Prostate?
Nevzat Mehmet Mutlu¹, Murat Sakallı², Özlem Balkiz Soyal¹, Tülay Tunçer Peker¹, Deniz Erdem¹, Nermin Göğüş¹
¹Department of Anesthesiology and Reanimation, Ankara Numune Education and Research Hospital, Ankara, Turkey, ²Department of Cardiology, Özel Farabi Hospital, Konya, Turkey
- OP-083** **292**

A Rare Complication with Cevox Catheter
Halil Islamoğlu¹, Behiç Girgin², Nevriye Salman³ Umit Karadeniz⁴
Türkiye Yüksek İhtisas Training and Research Hospital
- OP-084** **293**

Iatrogenic Bile Duct İnjury and Its Management with İntensive Care Unit Process: A Single Center Experience
İbrahim Mungan¹, Büşra Tezcan¹, Bahar Aydın²
¹Turkey Advanced Specialty Education and Research Hospital, ²Mersin City Training and Research Hospital
- OP-085** **294**

The Effect of Anesthesia Type on Outcome in Endovascular Aneurysm Repair Operations
Tugba Avci, Bahadır Aytekin, B. Bogachan Akkaya, Nevriye Salman, E. Utku Unal, H. Zafer İscan
SBU Türkiye Yüksek İhtisas Training and Education Hospital
- OP-086** **295**

Applicability of Asa Classification for Elective Endovascular Infrarenal Abdominal Aneurysms
Bahadır Aytekin, Tugba Avci , H. Mehmet Ozbek, Nevriye Salman, E. Utku Unal, H. Zafer İscan
SBU Türkiye Yüksek İhtisas Training and Education Hospital
- OP-087** **296**

Does The Type of Patient Controlled Analgesia Alter Patient Anxiety in Major Abdominal Surgery?
Özlem Balkiz Soyal¹, N. Mehmet Mutlu¹, Süheyla Ünver², M. Özcan Erdemli³
¹Department of Anesthesiology and Reanimation, Ankara Numune Education and Research Hospital, Ankara

Turkey, ²Department of Anesthesiology and Reanimation, Ankara Dr Abdurrahman Yurtaslan Oncology Education and Research Hospital, Ankara Turkey, ³Department of Anesthesiology and Reanimation, Acıbadem Altunizade Hospital, İstanbul Turkey

OP-088 **298**

Analysis of Patients Fall From High in Intensive Care Unit: A Retrospective Study

Ümran Karaca¹, Derya Karasu¹, Şeyda Efsun Özgünay¹, Şermin Eminoglu¹

Bursa Yüksek İhtisas Training and Education Hospital, Department of Anesthesiology and Reanimation

OP-089 **300**

Obstetric Problems Requiring Intensive Care Unit Admission: Experience from a Tertiary Center

Gülseren Yılmaz, Ziya Salihoğlu

University of Health Science İstanbul Kanuni Sultan Süleyman Training and Research Hospital

ORAL PRESENTATIONS - VII

Time: 15:00-16:15

Hall: Hall A

Chairs: Işıl Özkoçak Turan, Abdürrahim Derbent

OP-035 **235**

Absence of The Right Internal Jugular Vein During Ultrasound-Guided Cannulation

Emine Yagli, Perihan Kemerci, Gokce Selcuk Sert, Nevriye Salman, Umit Karadeniz, Sumru Sekerci

SBU Türkiye Yüksek İhtisas Training and Education Hospital

OP-036 **236**

Retrospective Analysis of Patients Brain Death

Sermin Eminoglu, Seyda Efsun Ozgunay

University of Health Sciences Bursa Yüksek İhtisas Research and Education Hospital

OP-037 **238**

Assessment of Survival After Cardiopulmonary Arrest in a Tertiary Hospital: Preliminary Study

Sinan Yılmaz¹

Department of Anesthesiology and Reanimation, Aydın Adnan Menderes University Faculty of Medicine

OP-038 **239**

Human Albumin Infusion Recruit Hemorheology in Liver Transplant Patients

Hatice Tazegul¹, Pinar Ulker², Nur Ozen²

¹Akdeniz University, Department of Anesthesiology and ICU, ²Akdeniz University, Department of Physiology

OP-039 **240**

Anesthetic Management of a Patient with Parry-Romberg Syndrome

Pınar Nisani , Türkay Çakan, Melis Engin, Meltem Bektaş, Hülya Başar

SB Ankara Eğitim ve Araştırma Hastanesi Anesteziyoloji ve Reanimasyon Kliniği

OP-041 **241**

Anesthetic Management of a Patient with Hereditary Angioedema

Aysun Anay-Yilbas, Mohammed Sevimli, Adem Halis, Meral Kanbak

Hacettepe University, Faculty of Medicine, Department of Anaesthesiology and Reanimation, Ankara, Turkey

OP-042 **243**

The Effect of Nutrition Status on Mortality of Patients in Admission to Intensive Care: Retrospective Study

Gamze Küçükosman, Bengü Gülhan Aydın, Raşan Dilek Okyay, Hilal Ayoğlu

Zonguldak Bülent Ecevit University, Department of Anesthesiology and Reanimation, Zonguldak

- OP-043** **245**
 The Efficiency of The Use Bispectral Index Monitor in Patients with Endoscopic Retrograde Cholangiopancreatography
 Enise Oğraş¹, Bülent Baltacı², Hülya Başar³ Mehmet Çakırca⁴ Murat Kekilli⁵ Yusuf Harun İren⁶
 Health Sciences University, Ankara SUAM Anesthesiology and Reanimation Clinics and Gastroenterology Clinics
- OP-044** **246**
 A Case Report by The Central Nervous System Presentation in AIDS
 Çetin Kaymak¹, Çiğdem Ataman², Meryem Gülhan¹, Ayşe Özcan¹, Esra Yüksekaya², Serkan Dumanlı¹, Hülya Başar¹
 1Health Science University, Ankara Training and Research Hospital, Department of Anaesthesiology and Reanimation, Health Science University, 2Health Science University Ankara Training and Research Hospital, Department of Infection Disease
- OP-045** **247**
 Should We Always Delay? Gastric Ultrasound Of The Elective Baby Patient Whom No Clear Information About Breastfeeding Time
 Sibel Catalca, Gokcen Kültüroğlu, Savas Altinsoy, M. Murat Sayın, Elif Şule Özdemir
 Health Science University, Diskapi Yildirim Beyazit Training and Research Hospital
- OP-046** **248**
 The Effect of Preoperative Fluid Replacement on Intraoperative Hemodynamic Parameters in Diabetic Patients
Emel Yıldız
 Kütahya Evliya Çelebi Training and Research Hospital
- OP-047** **249**
 Perioperative Management of a Patient with a Left Ventricular Assist Device Presenting with a Femoral Neck Fracture
Sanja Konosic, Visnja Ivancan, Zeljko Colak, Mirabel Mazar, Rajka Gabelica, Mario Pavlek
 University Hospital Center Zagreb, Clinic of anesthesiology, reanimatology and intensive care
- ORAL PRESENTATIONS - VIII**
Time: 15:00-16:15
Hall: Hall D
Chairs: Nurdan Bedirli, Dilek Ünal
- OP-090** **301**
 Fatal Complication of An Opioid Intoxication: Silent foreign Body Aspiration
Gökçen Kültüroğlu, Sibel Çatalca, Murat Sayın, Gülten Utabey
 Diskapi Yildirim Beyazit Training and Research Hospital
- OP-091** **302**
 The Awareness of Patients About Anesthesia Interventions and Anesthesia Physicians in Preoperatif Period: A Qustionare
Gökçen Kültüroğlu, Sibel Çatalca, Jülide Ergil
 Diskapi Yildirim Beyazit Training and Research Hospital
- OP-092** **305**
 Sensitivity of Near Infrared Spectroscopy (NIRS) in Intracranial Hemorrhage in Orthotopic Liver Transplantation (OLT)
Behiç Girgin, Halil Islamoglu, Umit Karadeniz, Nevriye Salman, Mustafa Bindal, Bülent Yamak
 Türkiye Yüksek İhtisas Education and Research Hospital

OP-095	308
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Effect of Dexmedetomidine Infiltration on Early Wound Healing in Rats Aysel Gezer ¹ , <u>Derya Ozkan</u> ¹ , Ali Yalcindag ² , Evrim Onder Ozturk ³ ¹ University of Health Sciences Diskapi Yildirim Beyazit Training and Research Hospital Department of Anesthesiology and Reanimation, ² University of Health Sciences Diskapi Yildirim Beyazit Training and Research Hospital Department of Clinical Biochemistry, ³ University of Health Sciences Diskapi Yildirim Beyazit Training and Research Hospital Department of Clinical Pathology	
OP-096	309
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Safe Inter-Hospital Transfer for Extremely Low Birth Weight Infants Undergoing Patent Ductus Arteriosus Ligation <u>Mehmet Oc</u> ¹ , Bahar Oc ² , Oguzhan Arun ² , Ates Duman ² ¹ Selcuk University, Faculty of Medicine, Department of Cardiovascular Surgery, ² Selcuk University, Faculty of Medicine, Department of Anesthesiology and Reanimation	
OP-097	310
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Evaluation of The Relationship Between Airway Measurements with Ultrasonography and Laringoscopic View in Newborn and Infants Feyza Sever, <u>Sengül Özmert</u> University of Health Sciences Ankara Child Health and Diseases Hematology Oncology Training and Research Hospital Anaesthesiology and Reanimation Department	
OP-098	311
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Preoperative Upper Respiratory Tract Infections and Anesthesia: Turkish Pediatricians' Perspective <u>Duygu Kara</u> ¹ , Murat Capanoglu ² , Cafer Mutlu Sarikas ³ Muhammet Emin Naldan ³ Soner Sertan Kara ⁴ ¹ Adnan Menderes University, Medical Faculty, Department of Anesthesiology and Reanimation, Aydın, Turkey ² Regional Training and Research Hospital, Department of Pediatric Allergy and Immunology, Erzurum, Turkey ³ Regional Training and Research Hospital, Department of Anesthesiology and Reanimation, Erzurum, Turkey ⁴ Adnan Menderes University, Medical Faculty, Department of Pediatric Infectious Diseases, Aydın, Turkey	
OP-099	312
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Erector Spinae Plane Block in Abdominal Surgery: Pediatric Case Series <u>Çağrı Özdemir</u> , Semin Önder, Gökçen Emmez, Berrin Işık Gazi University Faculty of Medicine Department of Anesthesiology and Reanimation	
OP-100	313
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Anesthetic Management in Newborn Infants with Edwards Syndrome: Report of Three Cases <u>Oguzhan Arun</u> ¹ , Bahar Oc ¹ , Ates Duman ¹ , Mehmet Oc ² ¹ Selcuk University Faculty of Medicine Department of Anesthesiology and Reanimation, ² Selcuk University Faculty of Medicine Department of Cardiovascular Surgery	
OP-101	314
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Our Port Catheter Experience in Children's Hospital <u>Kübra Evren Sahin</u> ¹ , Ugur Karagoz ² , Timucin Sabuncu ² , ¹ Dr Behcet Uz Children's Hospital Anesthesia Department, ² Dr Behcet Uz Children's Hospital Department of Pediatric Cardiovascular Surgery	
OP-102	315
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Anesthesia Management in a Child with Moya Moya Syndrome <u>Aylin İncesu</u> , Ceren Aygün Muçuoğlu Tepecik Education and Research Hospital, Department of Anesthesiology and Reanimation	

ORAL PRESENTATIONS - IX**Time: 16:30-18:00****Hall: Hall A****Chairs: Sumru Şekerci, Nuray Altay**

- OP-048** **250**
Is Serum Lactate Concentration a Biomarker of Malignancy in Brain Tumours? Preliminary Report
Oguzhan Arun¹, Mustafa Buyukcavlak¹, Funda Arun², Bahar Oc¹
¹Selcuk University Faculty of Medicine Department of Anesthesiology and Reanimation, ²Selcuk University Faculty of Dentistry Department of Pedodontics
- OP-049** **251**
Evaluation of The Knowledge Levels of Anesthesiologists on Patients' Rights Regulation: Single Center Experience
Ergin Alaygut¹, Pervin Sutas Bozkurt²
¹Tepecik Training and Research Hospital, Anesthesiology and Reanimation Clinic, ²Istanbul University Cerrahpasa Medical Faculty, Department of Anesthesiology and Reanimation
- OP-050** **252**
A Case of Eclampsia Induced PRESS Syndrome
Mesut Öterkuş, İlksen Dönmez
Kafkas University Faculty of Medicine
- OP-051** **253**
Our Anestesthetic Experience in a Patient with Succinic Semialdehyde Dehydrogenase Enzyme Deficiency: A Rare Disorder
Ayşegül Ceylan, Mehmet Burak Eşkin, Mert Çırakman
Health Sciences University Gülhane Training and Research Hospital
- OP-052** **254**
Investigation of Postoperative Pain, Nausea and Vomiting Effects of Different Genel Anaesthesia Applications in Laparoscopic Cholecystectomy Operations
Süheyla Duman, Hale Yarkan Uysal, Gülten Sağır, Yusuf Harun İren, Hülya Başar
Ministry of Health Ankara Training and Research Hospital, Anaesthesiology and Reanimation Clinic
- OP-053** **255**
High Intraoperative Cuff Pressure Incidence due to Endotracheal Cuff Inflation Methods and Its Clinical Effects
İlkay Baran, Savaş Altınoy, Özge Yamankiliç Mumcu, Asli Dönmez
University of Health Sciences, Diskapi Yildirim Beyazit T&R Hospital, Department of Anesthesiology and Reanimation, Ankara-Turkey
- OP-054** **256**
Emergent Use of a Small Lumen Ventilator (Ventrain®) During Anesthesia Management of a Patient with Subglottic Stenosis: Case Report
Sevda Gökçe Ertürk, Elif Şule Özdemir, Dilek Ünal
University of Health Sciences Diskapi Yildirim Beyazit Training and Research Hospital
- OP-055** **257**
Esophageal Perforation Secondary to Shrapnel Shot and Its' Intensive Care Process
İbrahim Mungan¹, Büşra Tezcan¹, Bahar Aydınli²,
¹Turkey Advanced Specialty Education and Research Hospital, ²Mersin City Training and Research Hospital

OP-056 **258**
 A Bradycardia and Cardiac Arrest Following Sugammadex Application: Case Report
 Ahmet Furkan Gürel, Gülerdem Ceritoğlu, Melis Engin, Güray Alp, Çetin Kaymak, Bülent Baltacı, Hülya Başar
 Ankara Training and Research Hospital

OP-058 **259**
 Outcomes of Patients with Blunt Chest Trauma Treated in The Intensive Care Units and Possible Risk Factors Affecting Mortality
Tülay Tunçer Peker¹, Nevzat Mehmet Mutlu¹, Güzin Ceran², Özlem Balkiz Soyal², Yavuz Akçaboy³
¹Sağlık Bilimleri University, Ankara Numune Health Application and Research Hospital, Intensive Care Department ²Sağlık Bilimleri University, Ankara Numune Health Application and Research Hospital, Anesthesiology Department ³Sağlık Bilimleri University, Ankara Numune Health Application and Research Hospital, Algology Department

ORAL PRESENTATIONS - X

Time: 16:30-18:00

Hall: Hall D

Chairs: Ahmet Coşar, Reyhan Polat

OP-103 **316**
 Comparison of Making Propofol Injection From The Injection Port of Cannula Or From One Way Valve Without Needle in Preventing Pain
Esra Uyar Türkyılmaz, Nihan Aydın Güzey
 Sağlık Bilimleri University Ankara Zekai Tahir Burak Kadın Sağlığı Sağlık Uygulama ve Araştırma Merkezi

OP-104 **318**
 The Effects of Pregabalin and Adductor Canal Block on Postoperative Pain in Arthroscopic Anterior Cruciate Ligament Reconstruction
 Fatma Kavak Akelma, Ilkay Baran, Savaş Altınsoy, Derya Özkan, Julide Ergil
 University of Health Sciences, University of Health Sciences Diskapi Yıldırım Beyazıt Training and Research Hospital, Anesthesiology and Reanimation Clinique, Ankara, Turkey

OP-105 **319**
 Cerebral Infarction Presenting with Lomber Radicular Pain and Isolated Foot Drop
 Mustafa Karaoğlan, Suna Akın Takmaz,
 University of Health Sciences, Ankara Health Application and Research Center, Anesthesiology and Reanimation Clinic, Algology Department

OP-106 **320**
 A Comparison of Transversus Abdominis Plane Block and Quadratus Lumborum Block for Postoperative Pain Control Following Laparoscopic Cholecystectomy
Merve Kaçan, Handan Güleç, Berrin Koşar, Seda İlhan, Eyüp Horasanlı
 Beylikdüzü Hospital, Yıldırım Beyazıt University, Keçiören Training and Research Hospital, Yüksek İhtisas Training and Research Hospital, Yıldırım Beyazıt University

OP-107 **321**
 The Pain Management of The Traumatic Ribs Fractures with Erector Spinae Plane Block in ICU : A Case Report
Canan Gürsoy, Yağmur Kuşçu, Semra Gümüş Demirbilek
 Muğla Sıtkı Koçman University Research and Training Hospital, Anesthesiology and Reanimation Department, Intensive care unit

OP-108 **322**
 Algology Department Awareness Among Patients with Chronic Pain
 Mustafa Karaoğlan, Suna Akın Takmaz

University of Health Sciences, Ankara Health Application and Research Center, Anesthesiology and Reanimation Clinic, Algology Department

OP-109 **323**

Postoperative Analgesic Efficacy of Transverse Thoracic Muscle Plane Block After Median Sternotomy
Pelin Uzun Sarıtaş, Meltem Çakmak
 Tepecik Training and Research Hospital

OP-110 **324**

The Effect of Favorite Music on Postoperative Anxiety and Pain
Fatma Kavak Akelma, Savaş Altınsoy, Jülide Ergil
 University of Health Sciences Diskapi Yıldırım Beyazıt Training and Research Hospital, Anesthesiology and Reanimation Clinique, Ankara, Turkey

POSTER PRESENTATIONS – I

4-5 APRIL 2019

PP-001 **326**

Diffuse Axonal Injury (DAI)- Our Experiences
 Hasib Lukac, Milena Roganovic, Dejan Lekovic, Tea Zarkovic
 Clinic for Anesthesiology and reanimatology, Clinical Centre of Montenegro

PP-002 **327**

Complication of a Central Vein Catheterization in Pediatric Patient
 Seda Özen Zunal¹, Aylin Incesu¹, Pervin Sütaş Bozkurt²
¹MSU Tepecik Education and Research Hospital ²Istanbul University Cerrahpaşa Medical Faculty

PP-003 **328**

Central Venous Catheter Complication in a Case Undergoing Thoracic Surgery
 Aylin Incesu¹, Seda Özen Zunal²
¹MSU Suat Seren Thoracic Surgery Education and Research Hospital ²MSU Tepecik Education and Research Hospital

PP-004 **329**

Military Chopper Accident, Multi-Trauma, First Three Days
 Esra Adıyeke, Nurten Bakan, Nilüfer Coşkun
 Sancaktepe Şehit Prof. Dr. İlhan Varank Training and Research Hospital.

PP-005 **330**

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 Seda Özen Zunal¹, Gözde Derviş Hakim², Ayşe Pervin Sütaş Bozkurt³
¹MSU Tepecik Research and Education Hospital Anesthesiology and Reanimation ²MSU Tepecik Education and Research Hospital Gastroenterology Clinic ³Istanbul University Cerrahpaşa Medical Faculty

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¹MSU Tepecik Research and Education Hospital Anesthesiology and Reanimation ³MSU Tepecik Education and Research Hospital Gastroenterology Clinic ²Istanbul University Cerrahpaşa Medical Faculty

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 Senita BEHARIC
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	From the field to the operating room-military injury	Ercan KURT, Turkey
	New concepts in triage during terror attacks	Deniz ERDEM, Turkey
	Traumatic shock	Seda Banu AKINCI, Turkey
	Burn injury	Ersel GÜLEÇ, Turkey

NEW CONCEPTS IN TRIAGE DURING TERROR ATTACKS

Deniz Erdem, Assoc.Prof
Ankara Numune Research and Training Hospital /TURKEY

Terrorism is, to use indiscriminate violence to spread fear to achieve political, religious, ideological or financial objectives. Terrorism is not warfare, the goals are different. Terrorists want to seed a political message into our minds, murder and violence is secondary aim. Terrorist make us afraid, which makes them heard.

Firearms, Explosive and Incendiary Devices, Chemical Agents, Biological Agents and Nuclear Weapons are methods of terrorism.

Triage is a systematic categorization of the patients' condition undertaken at the scene of injury on the basis of specific criteria. Triage is a dynamic process; continuously require patients' re-evaluation.

Triage Steps:

- Set up of area needs planning
- Requires availability of medical equipment
- Patients are separated into categories and universal colors are used in color zones.

Following steps:

- Initiate treatment and continued on-going assessment
- Be organized moving patients in and out to transport sector

Triage is divided into two groups

- a. Primary group: according to states of consciousness and vital markers
- b. Secondary group: according to treatment and transfer priorities

They are tagged for sorting patients to ensure survival of most patients the allocation of resources and informing families by the most efficient method.

Four major subtypes of triage methods are used worldwide:

- Disaster triage in the field
- Communication – based triage in the field
- Routine emergency department triage
- Emergency department triage in disaster situations and in addition

In new systems there are included a fifth one which called as "Emergency Severity Index".

However; START (Simple Triage and Rapid Treatment), JumpSTART (for the pediatric patients), SALT (Sort, Assess, Lifesaving Interventions, Treatment/Transport), MUCC (Model Uniform Core Criteria) are most commonly used triage models.

Triage should be performed rapidly. Usually uses START / JumpSTART triage to determine priority and 30-60 seconds per patient. Stick the label on the upper left arm or leg. Color cards are used for this purpose. There are 4 main colors in the triage cards; red, yellow, green and black. Colors indicate the severity of injury. Emergency treatment must be labeled red. Yellow tag is delayed care. Walking patients are labeled green. Deceased or expectant patients are labeled black. Another tag is gray. Gray is for the patient that is not likely to survive even with emergent interventions.

Children are involved in mass casualty incidents. The over prioritizing of children will take valuable resources away from more seriously injured adults.

Triage systems based on adult physiology at all times do not provide accurate triage.

Incendiary and Explosive Devices cause explosion injuries. Primary effects are direct effect of pressure wave. Penetrating or non penetrating injury that results from flying debris is secondary blast injury. Whole body displacement, crush injury and toxic effects are tertiary blast injuries.

Patients with exposure (potential or real) to contaminants should be tagged as BLUE. This category will continue to stay until patient is adequately decontaminated then follow START triage system.

Weapons of Mass Destruction are categorized as CBRNE and BNICE.

CBRNE

- **C** (Chemical agents, including Toxic Industrial Chemicals (TIC) that may be used as WMD)
- **B** (Biological hazards)
- **R** (Radiological hazards)
- **N** (Nuclear hazards)
- **E** (Explosives)

BNICE

- **B** (Biological hazards)
- **N** (Nuclear)
- **I** (Incendiary)
- **C** (Chemical Agents, including Toxic Industrial Chemicals)
- **E** (Explosives)

As a result; the following steps should be applied after the terrorist attack.

- Protect yourself, choose the right protective equipment
- Collect information, inform the center
- Preserve evidence
- Start right triage
- Give your spinal immobilization decision right
- Apply routine ATLS protocol
- Early and aggressive hemorrhage control
- Decide the need for decontamination and apply
- Safe transfer / transport

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BURN INJURY

Ersel Güleç

Incidence of burn injury in United States per year;

Burn Injuries Receiving Medical Treatment: 486,000

Fire/Smoke Inhalation Deaths: 3,275

Hospitalizations Related to Burn Injury: 40,000, including 30,000 at hospital burn centers.

Local injury

The zone of coagulative necrosis is nearest to the heat source and is the area of maximal damage. Immediate, irreversible cell death occurs here.

The zone of stasis surrounds the zone of coagulation. It is characterized by sluggish tissue perfusion due to compromised microcirculation. This area is potentially salvageable but may also undergo progressive necrosis if untreated or subjected to further insult (eg infection, hypotension, oedema).

The zone of hyperemia is the most peripheral region. Tissue perfusion here is increased secondary to widespread vasodilatation via reactive inflammatory mediators released from the injured tissue.

CLASSIFICATION OF BURN DEPTH

1^o Superficial — Superficial or epidermal burns involve only the epidermal layer of skin.

2^o Partial-thickness — Partial-thickness burns involve the epidermis and portions of the dermis.

Superficial partial thickness – These burns characteristically form **blisters** within 24 hours between the epidermis and dermis.

Deep partial thickness – These burns extend into the deeper dermis and are characteristically different from superficial partial-thickness burns. Deep burns damage **hair follicles** and **glandular tissue**.

3^o Full-thickness — These burns extend through and destroy **all layers of the dermis** and often injure the underlying subcutaneous tissue.

4^o Extension to deep tissues — Fourth-degree burns are deep and potentially life-threatening injuries that extend through the skin into underlying soft tissue and can involve muscle and/or bone.

Primary Survey

Airway management

Breathing and ventilation

Circulation and cardiac status

Disability, neurologic deficit and gross deformity

Exposure (completely disrobe the patient, examine for associated injuries and maintain a warm environment)

Airway with cervical spine control

All burn patients should receive 100% oxygen (O₂) through a non-rebreathing mask on presentation. Initial compromise of the airway is almost always due to a low Glasgow Coma Score (GCS) and not the burn. Early tracheal intubation should be considered in the presence of any of the following features: stridor, hypoxaemia or hypercapnia, a GCS of ≤ 8 , deep facial burns, full-thickness neck burns and oropharyngeal oedema. Airway injury includes (1) supraglottic injury, which typically results in edema from direct thermal insult, and (2) subglottic injury with parenchymal injury due to involvement of toxic gases or soot.

Breathing and ventilation

The initial responder should auscultate bilateral breath sounds and determine respiratory rate and depth of respiration to evaluate the patient's ability to adequately ventilate and oxygenate. Circumferential burns of the trunk or neck that may impair respirations is indicated at this time as well, and treatment is the performance of a rapid bedside escharotomy.

Circulation

Blood pressure, heart rate and clinical assessment of unburned skin color are parameters utilized to assess circulatory status. Due to increased catecholamine response following a thermal injury, 100–120 heart beats per minute is considered within normal limits; a higher heart rate should raise suspicion for hypovolemia, other trauma and inadequate pain management.

Disability

Patient mental status can be easily evaluated via the Glasgow Coma Scale (GCS), which utilizes verbal, motor and eye measurements to establish a baseline mental status on trauma patients.

Exposure

Providing adequate environmental control is key for this subset of patients as they have lost their ability to thermoregulate. The patient must be completely exposed to assess for injury and to remove any contaminants that might prolong contact with chemicals or heat sources.

Secondary survey

Thorough examination for non-burn related life-threatening injuries occurs at the secondary survey and is prioritized prior to addressing thermal injury. Indicated imaging, laboratory analyses and adjunctive measures such as urethral catheters, nasogastric tubes, etc. should be completed at this time.

EXTENT OF BURN INJURY

Superficial (first-degree) burns are not included in percentage TBSA burn assessment.

The Lund-Browder chart is the most accurate method for estimating TBSA for both adults and children. Children have proportionally larger heads and smaller lower extremities, so the percentage TBSA is more accurately estimated using the Lund-Browder chart.

Rule of Nines: For adult assessment, the most expeditious method to estimate TBSA in adults is the "Rule of Nines" :

- The head represents 9 percent TBSA
- Each arm represents 9 percent TBSA
- Each leg represents 18 percent TBSA
- The anterior and posterior trunk each represent 18 percent TBSA

Palm method: Small or patchy burns can be approximated by using the surface area of the patient's palm. The palm of the patient's hand, excluding the fingers, is approximately 0.5 percent of total body surface area, and the entire palmar surface including fingers is 1 percent in children and adults.

Burn center referral criteria:

Partial-thickness burns greater than 10% of TBSA

Burns that involve the face, hands, feet, genitalia, perineum, or major joints

Third-degree burns in any age group

Electrical burns, including lightning injury

Chemical burns

Inhalation injury

Burn injury in patients with preexisting medical disorders that could complicate management, prolong recovery, or affect mortality

Any patient with burns and concomitant trauma (such as fractures) in which the burn injury poses the greatest risk for morbidity or mortality. In such cases, if the trauma poses the greater immediate risk, the patient may be stabilized initially in a trauma center before being transferred to a burn unit. Physician judgment will be necessary in such situations and should be in concert with the regional medical control plan and triage protocols.

Burned children in hospitals without qualified personnel or equipment for the care of children

Burn injury in patients who will require special social, emotional, or rehabilitative intervention

Pathophysiologic changes:

The early phase (24–48 h) of burn injury: The early phase of burn injury is characterized by decreased cardiac output and decreased blood flow to all organs. The decreased cardiac output is due to loss of intravascular volume, direct myocardial depression, increased pulmonary and systemic vascular resistance (PVR and SVR, respectively), and hemoconcentration and can lead to metabolic acidosis and venous desaturation (↓ SvO₂). Decreased urine flow results from decreased glomerular filtration and increased aldosterone and antidiuretic hormone (ADH) levels. Oxygenation and ventilation problems can occur due to inhalation injury and/or distant effects of burn on airways and lung. Compartment syndrome ensues if there is circumferential burn with no escharotomy performed to release the constriction. Compartment syndrome can also occur in abdomen, extremities, or orbits without local

or circumferential burns. Mental status can be altered because of hypoxia, inhaled toxins, and/or drugs.

At 48–72 h after burn, the hypermetabolic-hyperdynamic (flow) phase starts, characterized by increased oxygen consumption, carbon dioxide production, and cardiac output, with enhanced blood flow to all organs including skin, kidney (glomerular filtration rate), and liver, and decreased systemic vascular resistance (SVR). Increased venous oxygen saturation (\uparrow SvO₂) is related to peripheral arteriovenous shunting. The markedly decreased SVR mimics sepsis. Lungs and airways may continue to be affected because of inhalation injury. During this phase, pulmonary edema, pneumonia, and/or acute respiratory distress syndrome can be seen even in the absence of inhalation injury. Pulmonary edema can occur due to distant effects of major burn and reabsorption of edema fluid (hypervolemia). The altered mental status may be related to burn itself and/or concomitant drug therapy. Release of catabolic hormones and insulin resistance leads to muscle protein catabolism and hyperglycemia.

ANESTHETIC MANAGEMENT

Along with the standard preoperative evaluation, there are specific features of the history and physical examination, which deserve additional focus in the burned patient. These include the time and extent of burn injury, airway evaluation, presence of inhalation injury, current resuscitation regimen and patient's response, potential vascular Access sites, and tolerance to enteral feeding and/or gastric residues.

Airway Management

Airway assessment include preexisting airway abnormality, current airway injury (i.e., inhalation injury, facial edema), and signs of glottic obstruction. Mandibular mobility may reveal tightness that will make laryngoscopy challenging. Upper airway patency, mobility, or mask ventilation, fiberoptic intubation while maintaining spontaneous ventilation should be considered. Ketamine-induced sedation/ anesthesia maintains the pharyngeal muscle tone with good conditions for fiberoptic intubation.

It is essential to secure the ETT with a carefully secured tie harness to avoid unintentional extubation. Placement of a circumferential tie around the patient's head, using wire to secure the tube to a tooth, or use of arch bars can provide safe fixation.

Ventilatory strategy

The findings of the Acute Respiratory Distress Syndrome Network trial have changed ventilatory strategies and have become the standard of care for burn patients with acute lung injury. The empiric use of tidal volumes of less than equal to 6 ml/kg ideal body weight and plateau airway pressures less than 30 cm H₂O in adults are recommended. Although this concept has not been tested in burned patients, a recent report confirms the importance of maintaining low tidal volume ventilation even in the operating room.

Pharmacology

Large burns result in altered pharmacokinetic and pharmacodynamic responses to many drugs. Plasma protein loss through injured skin and further dilution of plasma proteins by resuscitation fluids decrease the concentration of albumin, an important drug-binding protein. There is an increase in volume of distribution of drugs. Clearance of these drugs may decrease during the early postburn phase as a result of decreased liver and renal blood flow. Later on clearance of these drugs may increase during the hyperdynamic phase when hepatic blood flow increases. During the

hypermetabolic state, renal blood flow and glomerular filtration rate also increase. Thus, renal clearance of some drugs increases.

In burn patients, exposure to succinylcholine can result in an exaggerated hyperkalemic response, which can induce cardiac arrest. The current recommendation is to avoid succinylcholine administration in patients 48 h after burn injury. An increased rocuronium dose of 1.2 to 1.5 mg/kg for rapid sequence induction has been recommended in patients with major burn injury.

The choice of volatile anesthetic does not appear to influence outcome in burned patients.

Propofol clearance and volume of distribution are increased in patients with major burns during the hyperdynamic phase of burn injury.

Opioid requirements are increased in burn-injured patients. Opioid tolerance makes pain management challenging throughout all phases of burn care.

Ketamine in normal patients is associated with hemodynamic stability, preserving airway patency as well as hypoxic and hypercapnic responses, and decreasing airway resistance. The addition of benzodiazepines is often recommended to reduce the incidence of dysphoria. The persistently high levels of catecholamines in patients with major burns result in desensitization and down-regulation of β -adrenoreceptors. As a result, direct myocardial depressant effects of ketamine can become manifested.

Blood Loss

The amount of blood loss during burn excision operations are in the range of 2.6 to 3.4% of the blood volume for every 1% TBSA excised. A restrictive transfusion strategy in hemodynamically stable patients without massive blood loss, with transfusion of a unit of packed red blood cells (RBCs) at a hemoglobin transfusion threshold of 7 to 8 g/dL (hematocrit approximately 21 to 24 percent). However, for patients at risk for acute coronary syndrome (ACS), we employ a higher transfusion threshold of 10 g/dL. For massive blood loss (ie, >50 percent of blood volume), a resuscitation protocol using packed red blood cells (RBCs) and Fresh Frozen Plasma (FFP) or similar plasma product transfused in a 1:1 ratio.

Intraoperative fluid management

Crystalloid administration is recommended during the initial phase of burn resuscitation; however, once the calculated crystalloid volume has been administered, many clinicians employ colloid boluses to achieve resuscitation endpoints. Intraoperative fluid administration is adjusted for the magnitude of burn excision, the depth of burn, the specific hemostatic techniques employed (eg, topical epinephrine). If the patient undergoes surgical debridement or escharotomies during the resuscitative phase, replacement of intraoperative volume losses are added to formula-guided resuscitative fluid volume for burn patients (eg, the Parkland formula).

Pain control

Pain is exacerbated by anxiety if the pain is poorly controlled with sedatives and analgesics. Pain of burns has hyperalgesic and allodynic components. Continuous administration of analgesics by itself can result in opioid-induced hyperalgesia and accentuate the need for higher opioid doses. Oral NSAIDs and acetaminophen exhibit a ceiling effect in their dose–response relationship, rendering them unsuitable for the treatment of severe burn pain. Clonidine or dexmedetomidine (α 2-adrenoceptor agonists) can be a useful adjunct in reducing pain without causing pruritus (itching) or respiratory depression.

04 April 2019-Thursday

08:30-09:30	OPENING CEREMONY - II	
	Vise President of the Turkish Ministry of Health	Muhammet GÜVEN, Turkey
	Rapid sequence induction in trauma patients. Still controversial?	Radmilo JANKOVIC, Serbia (ESA Secretary)
	Variety of Antartic	Burcu ÖZSOY, Turkey
	Development of trauma centers in city hospitals	Osman EKİNCİ, Turkey

VARIETY OF SCIENTIFIC ANTARCTIC STUDIES

Dr. Burcu Ozsoy
Istanbul Technical University (ITU)
Maritime Faculty (MF) / Polar Research Center (PolReC)
ozsoybu@itu.edu.tr

Antarctica is the coldest, driest southernmost continent and one of the few places in the world where the environment is fully protected with scientific research priority. The Antarctic Treaty was signed in Washington on 1 December 1959 by the twelve countries, as of today the total number of parties to the Treaty is 53. Treaty provide the rules which govern activities in Antarctica. Some important provisions of the Treaty to be unnderlined are “*Antarctica shall be used for peaceful purposes only (Art. I); Freedom of scientific investigation in Antarctica and cooperation shall continue (Art. II); Scientific observations and results from Antarctica shall be exchanged and made freely available (Art. III).*”

The Scientific Committee on Antarctic Research (SCAR) is an inter-disciplinary committee, was created in 1958. SCAR is an objective and independent scientific platform where active research programmes in Antarctica interested in variety of scientific disciplines discuss the outcomes of the scientific results. SCAR developed science groups including geoscience, life sciences, physical sciences and social sciences. Medical science is a small but important part of active research programmes. Areas that have been studied include aspects of cold physiology, chronobiology, psychology, microbiology, epidemiology, ultraviolet light effects, endocrine changes (including polar T3 syndrome), alterations in immune function, and telemedicine. Antarctica is also closest ground on Earth to test aspects of space exploration. This study will present the variety of scientific studies including medical science conducted in Antarctica.

04 April 2019-Thursday

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DEVELOPMENT OF TRAUMA CENTERS IN CITY HOSPITALS

The definition of trauma : The word trauma is begun to use frequently in daily life. Although the trauma is the name given to the stress increasing events, it is also used for the events that happen suddenly and unexpectedly; disrupt the daily routine; cause anxiety and panic therefore disrupt the person's process of interpretation can be defined as traumatic experiences. These events such as traffic accident and natural disasters (earthquake, flood, etc.) can be examples of trauma. What we are going to discuss here is the type of trauma that occurs with external factors, disrupts the body's integrity and functions (non-psychological).

History of approach to trauma patient: In the past, when health service delivery was not established as modern hospitals, the emergency and outpatient clinic patients were examined together and their treatments were started in the pre-treatment rooms. In the following years, the first pre-treatment units were arranged as separate centers. Since the beginning of the last century, emergency polyclinics were separated from the other polyclinics. Emergency polyclinic and quarantine (observation room) integration was established. Towards the end of the 20th century, emergency surgery and traumatology hospitals were established in some countries, including our country. Today, emergency services are planned as green, yellow and red areas and red areas serve as areas where emergency trauma patients are accepted without waiting. In central hospital - city hospitals, which are established in undeveloped centers, also has trauma patient reception units within these units. These units are including emergency service, emergency operating room, intensive care unite ,imaging instrument room, laboratories for emergency tests, resuscitation rooms, orthopedic plaster rooms, observation service and each units have active working multidisciplinary teams. In the historical development of basic and advanced life support algorithms; conversely the standardization of resuscitation guideline ,the approach to the trauma patient, its emergence and development have been differentiated from The International Liaison Committee on Resuscitation (ILCOR). J.K. Styner and his friends organized the first Advanced Trauma Life Support (ATLS) in Nebraska with Linkoln Medical Education Fund's support in 1978. Two years later, in 1980, the trauma subcommittee of the American College of Surgeons initiated the process for the ATLS course to become standardised in national and international areas. After that following researchs and courses are Advanced Trauma Care for Nurses (ATCN) prepared by the society of trauma nurses, Prehospital Trauma Lige Support (PHTLS) prepared by the National Association of Emergency Medical Technicians, and The International Trauma Life Support Course. Turkish Association of Trauma and Emergency Surgery, was founded by Cemalettin Ertekin in 1995, Istanbul and the association has been studying on such research.(1,2,3)

Trauma Centers at the present time : Trauma Centers are classified as 1st, 2nd, 3rd and 4th levels. Trauma team members and its hierarchy, trauma systems and triage methods are determined in detail.

Main Team: Traumatized patients are not treated by random physicians; treatments are provided by a competent team which is as a football team to complete each other and communicate correctly.

They should get ready to all the possible scenarios and therefore have to work continuously and dynamically to improve themselves. (4). There is a significant correlation between the completion time of the primary treatment and prognosis of the patient, and this can be achieved with team compatibility (5).

Main Team Members: Hematologist, neurosurgeon, anesthesiologist, biochemistry specialist, thoracic surgeon, anesthesia assistant, blood bank workers, plastic surgeon, general surgeon, personnel, radiologist, orthopedic surgeon, emergency medicine specialist, nurses (2 people), radiology technician, and recorder (doctor or nurse) are members of the Team. (6)

Trauma team and its hierarchy: It varies according to country, region and hospital. In case of team approach to trauma patient, 2 different approaches can be summarized; horizontal and vertical approach. In horizontal approach each member makes his / her task simultaneously, though in vertical approach each member makes his/her order one after another. Horizontal model was found to be more effective in terms of time. There is also two different type of leadership: directive or participative leadership. The directive leadership is similar to a military structuring model. Especially, it is considered to be useful for on an inexperienced team. In spite of this there are publications support that participative leadership is more suitable for experienced teams (7,8,9).

Trauma System: It is the organization that aims to provide maximum benefit to survivors by providing effective communication with health organizations, security units and fire brigades at national geographic level to deal with emergencies caused by injuries. In trauma system, injury is evaluated as a disease, first the possible effected people distribution is determined (trauma epidemic), then hospitals which have trauma center are classified and patients are referred to these hospitals. Also trained personnel, health system providers, security forces, fire brigade and other team members are trained and programmed to work together (10).

Triage: Triage application takes place in 3 steps. 1-Primary triage: Respiratory, circulatory and consciousness states of the patients or the wounded are evaluated rapidly for to perform life-saving practices as a priority 2-Secondary triage: It is aimed to apply appropriate treatments after evaluation and separation of the patients or the wounded according to the treatment requirements. 3-Tertiary triage: Re-evaluating the patients or the wounded at the end of 24 hours and completing the missing procedures also ensuring the transfer of the patients to the related clinic if they are hospitalized (11).

As a result; An emergency trauma patient, especially a patient with generalized body trauma, requires emergency intervention and evaluation without waiting. In order for this emergency intervention to be successful, all the facilities of modern medical technology should be integrated in the area with relative ease. The team should be a multidisciplinary team, who has taken the necessary training and act in accordance with the team spirit and principles. When the patient is referred to the hospital, the team should be informed to make all preparations appropriately. Nowadays, there are trauma centers and teams that serving these principles and quality in the some city hospitals in developed countries and in our country.

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04 April 2019-Thursday

09:45-11:00	PANEL 2: Basic informations about trauma	Chairs: Zeynep KAYHAN, Turkey Meral KANBAK, Turkey Visnja IVANCAN, Croatia
	History and epidemiology of trauma	Mirjana SHOSHOLCHEVA, Macedonia
	New concept of sedation in trauma: from field to ICU	Visnja IVANCAN, Croatia
	Pathophysiology of trauma	Sumru ŞEKERCİ, Turkey
	New concept of pain therapy in trauma patient: from field to ICU	Suna AKIN TAKMAZ, Turkey

PATHOPHYSIOLOGY OF TRAUMA

Prof. Sumru ŞEKERCİ, MD

1. Neuroendocrine Response
2. Immune Response
3. Metabolic Response

1. NEUROENDOCRINE RESPONSE

There are two major neuroendocrine pathways that regulate the organism's response(1).

1. Hypothalamic-Pituitary-Adrenal (HPA) Axis that releases glucocorticoid hormones
2. Sympathetic nervous system secreting catecholamines (epinephrine and norepinephrine)

1. Hypothalamic-Pituitary-Adrenal (HPA) Axis

The main mechanism of response to trauma is HPA path activation.

Almost every hormone of the HPA axis is effective on the physiological response to trauma and stress.

But growth hormone (GH), macrophage inhibitory factor (MIF), aldosterone and insulin are directly effective on inflammatory response.

Following injury, corticotropin-secreting hormone (CRH) is secreted from the paraventricular nucleus of the hypothalamus. This is partly due to cytokines produced as a result of a natural immune response to injury, directly through afferent vagal fibers with neural stimulation and emotional stimuli such as pain, fear, anxiety.

Vasopressin (ADH), Angiotensin II, Cholecystokinin, Vasoactive intestinal peptide (VIP) and catecholamines also stimulate CRH secretion in trauma patients.

CRH stimulates the secretion of adrenocorticotropin hormone (ACTH) from the anterior pituitary. The circadian rhythm of ACTH after trauma is lost. CRH and ACTH increase in many trauma patients in proportion to the severity of the trauma.

ACTH acts on the zona fasciculata of the adrenal glands to synthesize glucocorticoids.

Cortisol is the most important glucocorticoid to survive during physiological stress in human beings. The increase in post-traumatic cortisol levels causes significant anti-inflammatory effects. Cortisol may be permanently elevated due to the severity of the trauma after the normal diurnal rhythm is lost. Following normalization of the blood volume, cortisol levels decrease to normal levels.

Growth Hormone is a neurohormone with both metabolic and immunomodulatory effects. GH exerts its effects by directly binding to GH receptors and enhancing the hepatic synthesis of insulin-like growth factor (IGF) -1.

GH levels increase after trauma. GH increases protein synthesis and insulin resistance, facilitating the mobilization of fat stores. It increases plasma glucose level by preventing glucose transport and oxidation in liver and skeletal muscle. It increases the phagocytic activity of immunocytes by accelerating the production of lysosomal superoxide. It also allows the proliferation of the T cell population(2).

Macrophage inhibitory factor (MIF), a proinflammatory cytokine released from a variety of cells, such as the anterior pituitary and macrophages and T lymphocytes in the site of inflammation.

Many important functions of MIF in inflammation, innate and acquired immune responses have been described. MIF is a hormone that modulates the function of glucocorticoids and reverses their immunosuppressive effects. Findings suggest that MIF inhibits antiinflammatory activity of glucocorticoids(3).

MIF levels were higher in patients with post-traumatic mortality compared to survivors(4).

IGF-1 is an anabolic growth factor that has a positive effect on metabolic rate, intestinal mucosal function and protein loss after traumatic injury(1).

IGF-1 stimulates protein synthesis and glycogenesis in the liver; Increases glucose uptake and lipid use in adipose tissue. In the patient entering the healing process, GH is able to increase protein synthesis by means of insulin like growth factor (IGF-1). IGF-1 increases glucose uptake and protein synthesis in skeletal muscle.

Ghrelin is an appetizer secreted by the stomach.

Ghrelin supports GH secretion and plays a role in glucose homeostasis, lipid metabolism and immunity.

In a murine intestinal ischemia / reperfusion model, ghrelin administration inhibited proinflammatory cytokine release, reduced neutrophil infiltration, improved intestinal barrier dysfunction, alleviated organ damage, and positively affected survival.

Experimentally, this effect was attributed to a robust vagus nerve and intracerebroventricular injection of ghrelin was shown to be protective(5).

The effect of ghrelin is probably via the central nervous system through the cholinergic anti-inflammatory pathway.

Renin-Angiotensin-Aldosterone System (RAAS)

It is a very important system that works together with AVP (Arginine Vasopressin) to protect extracellular fluid and to restore homeostasis. Cells located in the juxtaglomerular region are baroreceptors sensitive to blood pressure changes. When the blood pressure decreases and the

sodium chloride level decreases to the juxtacagular cells, renin is secreted from these cells. Renin is also activated through ACTH, AVP, glucagon, prostaglandins, potassium, magnesium and calcium.

Renin stimulates the formation of angiotensin I from angiotensinogen. Angiotensin I is also converted to angiotensin II by an enzymatic reaction. Angiotensin II is a powerful vasoconstrictor. Potassium is lost while sodium and water are retained by the action of renin-angiotensin. The alkalosis occurs in the extracellular fluid by post-traumatic sodium retention and the elimination of potassium and hydrogen ions.

Angiotensin II

Stimulates epinephrine release from the adrenal medulla. Sympathetic activity increases. Strong vasoconstrictor effect occurs. Heart rate and myocardial contractility are increased. Blood pressure rises. Glucogenolysis and gluconeogenesis are induced. Angiotensin II increases the secretion of aldosterone hormone from the adrenal cortex, CRH (Corticotropin Releasing Hormone) release and AVP synthesis.

Aldosterone increases extracellular volume and blood pressure.

By decreasing the amount of Na⁺ in the body and decreasing renal blood flow, aldosterone is secreted by stimulating the production of angiotensin II.

Aldosterone improves potassium excretion and reabsorption of sodium, chlorine and water from the kidney tubules into the blood.

An increase of 1 mEq/L in the potassium ion concentration of the extracellular fluid increases the aldosterone secretion rate 3-fold. ACTH is the strongest stimulant of aldosterone after trauma. Aldosterone mineral receptors have been shown to have effects on cell metabolism and immunity.

Insuline, the insulin response to trauma is biphasic. Initially, increased sympathetic activity causes relative suppression in insulin secretion and hyperglycemia. Then, the amount of insulin increases.

However, severe stress is often associated with insulin resistance.

Insulin resistance contributes to hyperglycaemia by reducing glucose uptake in the liver and peripheral tissues. The catecholamines, cortisol, glucagon and GH catabolic effects, which increase in circulation following trauma, also contribute to hyperglycemia. This increase in circulating proglycemic factors, especially epinephrine, causes an increase in glycogenolysis, lipolysis and lactate production. Severe hyperglycemia is a sign of increased mortality in critically ill trauma patients. Hyperglycemia alters leukocyte function, leading to a decrease in phagocytosis, chemotaxis, adhesion and respiratory burst, and an increased risk of infection.

2. Sympathetic Nervous System: Catecholamines

Stress and tissue hypoxia caused by trauma causes the release of acetylcholine (Ach) from preganglionic sympathetic fibers by activating the sympathetic nervous system.

With the Ach signal of chromaffin cells, epinephrine (EPI) and norepinephrine (NE) are released into the circulation.

Catecholamine release prepares the organism quickly for a ask 'fight or flight' response with well-known effects on the cardiovascular and pulmonary system and metabolism.

Adrenaline and noradrenaline; increases heart rate, conduction velocity, myocardial contractility, and thus heart rate and blood pressure. As a result of the effects of both hormones on the cardiovascular system and spleen, the blood flow of the skeletal muscles increases.

Catecholamines also help to meet the need for oxygen by loosening the smooth muscles of bronchiole.

In muscle and liver glycogenolysis, lipolysis in adipose tissue, and gluconeogenesis in the liver are stimulated and the energy required by the body during the stress period is provided. These effects are also supported by increasing glucagon secretion and reducing insulin secretion.

The effect of insulin on skeletal muscle tissue is blocked and it is difficult for the glucose to be absorbed by the muscles. Hyperglycemia occurs as a net result of these effects.

Hyperglycemia contributes to the pro-inflammatory response and also to mitochondrial dysfunction.

The energy consumption of the smooth muscles of the internal organs, especially the gastrointestinal and urinary systems, is reduced.

Catecholamines increase thyroid and parathyroid hormones, renin secretion. Catecholamines are responsible for the hypermetabolic condition in the organism.

Immunomodulatory effects of catecholamines: Many effects of catecholamines on the immune system have been shown. High doses of epinephrine infusion have been shown to inhibit the production of TNF- α and increase the production of anti-inflammatory cytokine IL-10(6).

The sympathetic nervous system has direct immunomodulatory effects on resting and activated immune cells in lymphoid tissues. Norepinephrine is released by stimulation of these postganglionic nerves.

Catecholamines, and especially epinephrine, play a role in both innate pro-inflammatory cytokine regulation and adaptive Th (T helper) responses. They modulate cytokine activity together with cortisol after trauma(7).

Several immune cells, such as mononuclear cells, macrophages and granulocytes, have been shown to directly stimulate adrenergic receptors by activation of intracellular second precursors such as cyclic adenosine monophosphate (cAMP) and calcium ion flow. These second messengers regulate various immune cell functions including the release of inflammatory cytokines and chemokines.

2. IMMUNE RESPONSE

Traumatic injury activates the natural immune system to produce a systemic inflammatory response to limit damage and restore homeostasis. The degree of response to the organism is parallel to the severity of the tissue injury and the severity of the event.

1. Acute pro-inflammatory response from natural immune system recognition of foreign molecules
2. Anti-inflammatory response that will allow to modulate the pro-inflammatory response and return to homeostasis

If the trauma patient has a moderate Systemic Inflammatory Response Syndrome(SIRS), the patient will recover. Proinflammation caused by stimulation of the innate immune system may cause early organ damage. There is a third group of patients who try to survive with the Counterregulatory Anti-inflammatory Response Syndrome (CARS), which balances the anti-inflammatory response of the organism against the relatively severe SIRS response following trauma(1). CARS will cause prolonged immunosuppression and will adversely affect the patient, and in these patients organ failure will

develop in the following days. If the homeostasis can be achieved by the delicate balance between pro- and anti-inflammatory mediators after the trauma, the patient will survive.

In patients who may be discharged with early antiinflammation, immunoparasia, impaired healing and infections with low levels of organ damage, but may develop organ damage in the late period by inhibition of the adaptive immune system and apoptosis, patients may develop persistent inflammation-immunosuppression catabolism syndrome (PICS), which may lead to death.

Hazard Theory

In the early 90s, a theory was published that suggested that the immunological system was activated to protect the body from harm after trauma or infection (8). According to this theory called hazard theory, it is suggested that the immunological response is triggered by the death of certain cell types. When a healthy, undamaged cell dies apoptotically, the immune response is removed without being triggered by the environment, and if the cell lysis is caused by trauma or infection, the exiting intracellular content causes a warning of danger and initiates a natural and adaptive response. DAMPs (endogenous Damage-Associated Molecular Patterns) are generated from the damaged cell. DAMPs are similar to microbial PAMPs (Pathogen-Associated Molecular Patterns) released in sepsis(9). Both DAMPs and PAMPs activate the innate immune system.

Many post DAMPs molecules are exposed after trauma. DAMPs are recognized by Toll-Like Receptors (TLR). DAMPs molecules form reactive oxygen species (ROS) induce natural immunity by triggering TLRs (Toll-Like Receptor) (10). Excessive reactive oxygen intermediates (ROIs) in the environment cause direct oxidative damage in cellular proteins and nucleic acids and induce lipid peroxidation via disrupting the structure of cell membranes(11).

Inflammatory response has many triggers.

HMGB1 (High Mobility Group Box 1) is a nuclear protein, released from necrotic or damaged cells, attracting neutrophils and macrophages to the site of damage, increasing vascular leakage and reducing perfusion pressure in the microcirculation. It has been observed in humans that they are high in the first hour after injury (12-13).

Another endogenous trigger of inflammation is the level of succinate, an intermediate metabolite normally produced during cellular respiration, after I/R damage. Succinate is capable of inflammatory signaling. It leads to production of IL-1- β and activates immune cells. The release of local and systemic proinflammatory cytokines and phospholipids is stimulated.

Major trauma specifically stimulates non-specific cellular immunity. Non-specific cellular immunity; primarily consists of neutrophils, monocytes and natural killer (NK) cells.

The Glue Grant study showed that severe blunt trauma created a genomic storm in more than 80% of leukocytes during the first 28 days (14).

Nuytinck et al. It was demonstrated in autopsy studies that inflammation occurred in all parts of the body following major trauma(15).

Neutrophils are the cells that reach the damaged area first. Simultaneous peripheral blood leukocytosis occurs. Local neutrophil migration to the site of tissue damage is important in wound healing and protection against microorganisms.

Activated neutrophils secrete enzymes such as elastase and myeloperoxidase (MPO), accelerate the release of reactive oxygen species (hydrogen peroxide, superoxide radicals) in non-damaged tissue and damage tissue by exocytosis.

If neutrophils are stimulated and accumulation in the tissue is excessive, burnout in neutrophils is observed.

This systemic accumulation of neutrophils is important in explaining the pathogenesis of complications such as ARDS.

The second component of non-specific cellular immunity is the mononuclear phagocytosis system.

After severe injuries, circulating monocytes and tissue macrophages are sensitized and play an important role in the innate inflammatory response of microvascular endothelium.

Monocytes and macrophages are cells that are capable of phagocytosis, which produce free oxygen radicals, but have limited secretion of enzymes, but which actively synthesize cytokines. Monocytes are deactivated after major trauma. The ability of monocytes to produce cytokines is impaired after trauma. MHCII expression on monocytes is used to demonstrate the degree of suppression of immunity. After uncomplicated traumas, MHCII expression on monocytes is normalized within a week (16).

The third component of non-specific cellular immunity is NK cells. NK cell activity decreases within a few days following moderate trauma (17). After major trauma, such as heat-induced trauma, NK cell activity lasts 2-4 weeks (18).

CYTOKINES

The immune system is activated within minutes with tissue injury and ischemia/perfusion that occurs after trauma.

Pro-inflammatory cytokines are released from endothelium and monocytes in the injured area. Cytokines are the most potent mediators of the immune response. They manage the inflammatory response after trauma. They undertake very important tasks by allowing the cells to communicate with each other in the treatment of wound healing and infection. Generally, there is a strong association between the size of tissue damage and plasma cytokine levels, but it is very difficult to show such a relationship between cytokine response and mortality (17).

A. Pro-inflammatory Cytokines

- Tumor necrosis factor- α (TNF- α)
- Interleukin (IL): IL-1 (IL-1 α , IL-1 β), IL-2, IL-6, IL-8, IL-17
- Macrophage Inflammatory Protein (MIP)
- Granulocyte Macrophage-Colony Stimulating Factor (GM-CSF)
- Interferon- γ (IFN- γ)
- HMGB1
- PAF, TNRFI/TNRFII

B. Anti-inflammatory Cytokines

- IL-4, IL-10, IL-11, IL-12, IL-13,
- PGE₂
- Transforming Growth Factor β (TGF β)

If the production of cytokines is more than necessary in the immune response process, the hemodynamic and metabolic balance is impaired, and if there is excessive release, the patient gets lost. It synthesizes body anti-inflammatory cytokines to compensate for the negative effects of pro-inflammatory cytokines released during inflammation. Anti-inflammatory Cytokines: IL-4, IL-10, IL-11, IL-12, IL-13, PGE₂, transforming growth factor β (TGF β) are the most important anti-inflammatory mediators. If there is excessiveness in the construction of anti-inflammatory cytokines, this also increases the tendency for infection which can lead to immunodeficiency. The development of organ dysfunction (OD) is related to the intensity and balance between the inflammatory and counter-inflammatory responses that the trauma creates.

A. Pro-inflammatory Cytokines

Tumor necrosis factor TNF- α (cachectin)

It is the most potent cytokine released among proinflammatory cytokines. TNF- α is directly related to protein degradation, causing muscle catabolism. It provides redistribution of amino acids to be used as fuel substrate.

TNF- α increases insulin resistance. TNF- α is synthesized in monocytes, macrophages, T lymphocytes and endothelial cells. TNF- α activates the production of polymorphonuclear leukocytes (PML) in the bone marrow. Increases the production of acute-phase reactants by induction of IL-6.

PGE₂ enhances the release of platelet-activating factor (PAF), glucocorticoids and eicosanoids. Endothelin procoagulant activity and leukocyte adhesion increase.

It also improves the permeability of vascular endothelium.

Provides neovascularization of the damaged area. Collagen synthesis and fibroblast proliferation, wound healing

Accelerates bone healing by increasing osteoclast activity

Interleukin-1 (IL-1)

Shows effects through hypothalamus-pituitary. Stimulates prostaglandin release (fever, anorexia). Increases β -endorphin release, reduces pain sensation. Proteolysis in skeletal muscle.

IL-1 is one of the most important mediators of host response to invasive bacteria.

Proliferation of T lymphocytes, increases PML release.

Macrophage activation and granulocyte / macrophage colony stimulating (GM-CSF) factor increase.

TNF- α , IL-4, IL-6, IL-8 and antiinflammatory cytokine increase the production of IL-10. (B 23-25).

Wound healing. It accelerates bone healing by increasing osteoclastic activity.

There are two different forms as IL-1 α and IL-1 β .

IL-1 α : IL-1a is made and stored in healthy cells such as epithelium, endothelium and platelets.

Following trauma, they move out of the cell and bind the IL-1 receptors of the neighboring cells and transmit the signal. They function as DAMPs. by stimulating the synthesis of inflammatory mediators (chemokines, eicosanoids) and neutrophils to the trauma zone.

IL-1 β : Not available in healthy cells. A proinflammatory cytokine. IL-1b is released in inactive form from activated monocytes, macrophages or dendritic cells. Its effects are similar to TNF- α . IL-bs enhance the effects of each other in proinflammatory response and cause hemodynamic instability if they are released excessively into the environment.

Interleukin-6 (IL-6)

L-6 production is caused by TNF- α and IL-1 stimulation. It is easily detected within 1 hour following trauma. IL-6 plays an important role in the hepatic acute phase protein response with IL-1. IL-6 is a proinflammatory cytokine as well as an anti-inflammatory effect.

The increase in IL-6's blood level indicates the degree of systemic inflammatory response. It can be followed as an early precursor of the morbidity.

Interferon-gamma (IFN- γ)

IFN- γ is a strong proinflammatory cytokine against bacteria. It causes an increase in IL-1 and TNF- α activity. Activates macrophages in the circulation and tissues.

Activation of alveolar macrophages may cause acute lung inflammation after trauma.

Granulocyte / Macrophage Colony-Stimulating Factor (GM-CSF)

Delays scheduled death of macrophages and neutrophils.

It stimulates wound healing and inflammation by activation of leukocytes.

Myeloproliferation, polymorphonuclear leukocyte (PML) and increased chemotaxis of macrophages, decreased apoptosis, increase in cytokine production of macrophages.

HMGB1 (High Mobility Group Box 1)

A nuclear protein, pulls neutrophils and macrophages into the damage site, increases vascular leakage and reduces perfusion pressure in microcirculation.

It has been shown to be high in humans within 1 hour after injury.

B. Anti-inflammatory Cytokines

Interleukin-4 (IL-4)

It is synthesized by active T cells, It has a strong anti inflammatory effect.

It reduces the production of IL-1, TNF- α , IL-6 and IL-8 and superoxide and oxygen radicals.

Interleukin-10 (IL-10)

In order to compensate the immune response, inflammation must be resolved and tissue repair should be started.

IL-10 plays a major role in regulating the duration and severity of the anti-inflammatory response.

An increase in IL-10 level was associated with post-traumatic mortality.

Other Mediators Released After Trauma

Subsequent to local tissue injury, the released substances may contribute to an inflammatory event such as Endothelin-Derived Nitric Oxide EDRF / EDNO, Prostacycline (PGI₂), Thrombocyte-Activating Factor (PAF), Endothelins, Atrial Natriuretic Peptide (ANP), by activating the endothelial cell. they cause the substance to be released(1).

Endothelium-derived nitric oxide (EDNO)/

Endothelium-derived relaxing factor (EDRF)

It is a mediator with a few seconds of half-life released from the endothelium in response to ischemia and hypoxia and acetylcholine that occurs after trauma and causes cell damage. Reduces microthrombosis by vasodilation and platelet deactivation.

Prostacyclin (PGI₂)

It is a potent vasodilator and thrombocyte antiaggregant synthesized from the endothelium in response to vascular integrity and hypoxia. In systemic inflammation, PGI₂ expression is impaired and the endothelium becomes more procoagulant.

Platelet-activating factor (PAF)

It occurs by enzymatic reaction with phospholipase A₂ (PLA₂).

Aggregation of platelets and leukocytes

It increases the adherence of leukocytes, mobility, chemotaxis, invasion and reactive oxygen species (ROS)(19).

PAF enhances vascular permeability by activating neutrophils and platelets.

Increases the accumulation and activation of eosinophils.

It has been shown that, by experimentally administering PAF receptor antagonists, the effects of ischemia-reperfusion injury can be reduced(20).

Atrial natriuretic peptide (ANP):

It is a peptide that is released from many parts of the body, primarily from atrial tissue and endothelium. ANPs cause vasodilatation and fluid electrolyte excretion (diuretic, natriuretic). It strongly inhibits aldosterone and prevents reabsorption of sodium.

The endothelins

It is a powerful vasoconstrictor. Following the trauma, thrombin, IL-1, angiotensin II, arginine vasopressin (AVP), catecholamines and anoxia are secreted by vascular endothelium. The serum level of endothelin parallels the severity of trauma

3. METABOLIC RESPONSE TO TRAUMA

Metabolic changes after major trauma were first described in 1942 by Cuthbertson (21).

The body gives a hypermetabolic response to trauma characterized by tachycardia, increased oxygen use, increased respiratory rate, high body temperature, and negative nitrogen balance, ie catabolism (21). A 25% increase in metabolic rate occurs.

It is defined as SIRS (Systemic Inflammatory Response Syndrome).

Normally, 40% of the body's energy consumption is spent on the ion membrane and transport processes in the cell membrane.

An urgent energy source is needed in the organism in order to correct and maintain the deteriorated cell membrane potential due to the effect of cytokine and endotoxins after the trauma.

With the effect of hormones induced by stimulation of the adrenocortical axis, all energy sources; oil, protein and glycogen stores are rapidly converted to glucose and are presented to the needs of the organism.

The body's fat stores (triglycerides) are the most important source of energy after trauma (50% -80%).

If excessive mobilization in metabolic products cannot be compensated by adaptive mechanisms, the organism will be in a process of rapid disappearance.

Following trauma, metabolic changes in the organism occur in three consecutive stages.

1. Ebb Phase

This phase, also called early shock phase, is the first few minutes and hours following trauma (24-48 hours) (22).

It is characterized by a decrease in body temperature and oxygen consumption.

In this period, there is hypotension (shock) and hemodynamic instability due to volume loss. Adrenocortical axis-induced catecholamine and cortisol levels increases. Glycogen stores, especially hepatic, are used in the early period of Ebb phase. Increased levels of lipolized free fatty acids and glycerol are then observed.

2. Flow Phase

The struggle for existence, 'all or nothing' reaction. Catabolic response of the organism to the trauma.

The metabolic response is directed to the supply of energy and protein substrates to repair tissue damage and to protect the functions of critical organs (1). The body tries to break down fat, proteins and carbohydrate stores to meet the increased energy needs, and to meet the need for glucose by gluconeogenesis.

Amino acids, lactate, pyruvate and glycerol can be used for hepatic and renal gluconeogenesis. Consequently, a relative hyperglycemia occurs. Reactions in the flow phase are necessary for short-term survival. The catabolic phase lasts 2-3 days in moderate to severe traumas. Prolonged (2-7 weeks) or overload causes body damage.

3. Anabolic Phase

a. Early Anabolic Phase

Also known as corticoid withdrawal phase (1,22). The transition from catabolic phase to anabolic phase is related to the severity of the trauma. It can take weeks after severe trauma(22). Net nitrogen excretion begins to decrease in the early anabolic phase and the potassium-nitrogen balance is

improved (1,22). Clinically this period coincides with the onset of diuresis and oral intake. The general condition of the patient begins to improve. Early anabolic phase; from a few weeks to several months.

b. Late Anabolic Phase:

It is the last period of recovery in which the nitrogen balance has returned to normal. There is a positive nitrogen balance.

Metabolic response to trauma ended.

Changes in Posttraumatic Lipid Metabolism

The body's fat stores (triglycerides) are the most important source of energy after trauma (50% -80%). Triglyceride degradation with increased catecholamine in the flow phase; An increase in the amount of free fatty acids and glycerol occurs. The increase in free fatty acids due to lipolysis under normal conditions both inhibits glycolysis and suppresses fatty acid synthesis together with glucagon. Fatty acid synthesis in major trauma and hemorrhagic shock is insufficiently suppressed, glycolysis and proteolysis continue.

Energy resulting from fat oxidation is the most important energy source for liver cells. Hepatocytes use free fatty acids as a fuel source in case of stress.

Systemic tissues such as skeletal muscle and heart muscle can use free fatty acids entering capillary circulation as fuel by lipoprotein lipase hydrolysis in capillary endothelium (23).

Ketosis occurs when hepatic ketone production exceeds the use of extrahepatic ketone. Ketogenesis rate is inversely proportional to the severity of the trauma.

Major trauma, severe shock, and sepsis decrease ketogenesis by increasing insulin levels and by causing rapid tissue oxidation of free fatty acids (1).

Changes in Posttraumatic Carbohydrate Metabolism

Gluconeogenesis is accelerated after trauma. Endogenous glucose production shows an increase of 150% in patients with trauma.

Increased glucose synthesis is essential for the continuation of human life in critical conditions

The increase in plasma glucose levels is proportional to the severity of the trauma.

80-90% of the energy required for gluconeogenesis is obtained from fat oxidation.

Quantitatively, lactate is the most important precursor for gluconeogenesis. Lactate metabolism capacity, which is 150 grams under normal conditions, shows a significant increase in stress conditions.

Glucose is also synthesized from glycerol resulting from alanine and lipolysis (24). Post-traumatic glycogen depots are destroyed. The glycogen stores within the skeletal muscles are mobilized by activation of beta-adrenergic receptors with epinephrine.

High glucose concentrations provide the energy required for inflamed tissues and leukocytes in infected areas.

Glucose is kept away from non-priority tissues such as skeletal muscle and adipose tissue, which is also mediated by catecholamines.

There is a significant relationship between the degree of hyperglycemia and morbidity.

Changes in Posttraumatic Protein Metabolism

After trauma, systemic proteolysis is primarily mediated by glucocorticoids and daily urinary nitrogen excretion in healthy young adults rises to 30-50 g. The increase in the negative nitrogen balance can be detected early in the injury and reaches the highest value within 7 days.

The use of amino acids as a long-term fuel reserve is not possible. Excessive protein depletion is incompatible with life. Protein catabolism may be extended to 3 to 7 weeks (1).

Post-traumatic protein catabolism provides substrates for the synthesis of gluconeogenesis and acute phase proteins (1, 24).

Amino acids obtained by proteolysis in critical patients cannot be used in protein synthesis. This will result in a negative nitrogen balance (24).

After trauma, skeletal muscles were primarily consumed acutely and visceral tissues (eg liver and kidney) were shown to be relatively conserved (1).

Changes in protein catabolism and synthesis are associated with the severity and duration of injury. Small traumas cause moderate protein degradation, while protein degradation is more severe in severe traumas.

Increased cortisol, insulin resistance, hypoxia and acidosis cause early proteolysis in muscle cells (1).

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04 April 2019-Thursday

09:45-11:00	PANEL 2: Basic informations about trauma	Chairs: Zeynep KAYHAN, Turkey Meral KANBAK, Turkey Visnja IVANCAN, Croatia
	History and epidemiology of trauma	Mirjana SHOSHOLCHEVA, Macedonia
	New concept of sedation in trauma: from field to ICU	Visnja IVANCAN, Croatia
	Pathophysiology of trauma	Sumru ŞEKERCİ, Turkey
	New concept of pain therapy in trauma patient: from field to ICU	Suna AKIN TAKMAZ, Turkey

PAIN MANAGEMENT IN TRAUMA

Trauma is one of the most important health problems of our time and it has been described as a neglected epidemic of our time by the American Academy of Surgeons. Approximately 5.8 million people die each year due to trauma, and tens of million people suffer from medical services in the emergency department and the hospital (1). Pain management in trauma is often neglected because the main pathology is at the forefront. However, the need for rapid pain control following rapid recovery and stabilization of the patient is better understood in recent years. Today, pain management in trauma is an important part of the systemic approach to trauma. Trauma patients include a wide spectrum of physiologically various patient populations including healthy young athletes, vulnerable children, and frail elderly. In addition, the clinical picture in trauma patients varies from simple soft tissue injury or an isolated fracture to life-threatening multi-organ injury in relation to the severity of the trauma. The optimal management of pain is extremely difficult with additional problems such as comorbid pathologies and substance addiction. As a member of the trauma team or even as a leader, the anesthesiologist has a very important role in the stabilization of the patient and the ongoing trauma care process in the operating room or intensive care unit.

THE IMPORTANCE OF PAIN MANAGEMENT IN TRAUMA

In the trauma, the prevalence of moderate to severe pain during hospitalization (1-14 days) was found to be quite high (2), and in 58-62% of the patients after the trauma, pain was shown to last for 1-2 years (3). Although it is accepted that acute pain management should be an important part of trauma care, the literature shows that acute pain is not always treated systematically and adequately. The rate of oligoanalgesia in trauma patients was reported to be 58-61% in various publications. It has been reported that 74% of multiple trauma patients who constitute 15-20% of all traumas receive weak analgesic treatment (4), while only 30% of patients treated for acute bone fractures receive analgesic treatment (5). It has been reported that pediatric and geriatric patients are more likely to suffer from oligoanalgesia as well as patients who do not speak linguistic problems. The main causes of oligoanalgesia are the lack of awareness of problems caused by pain and the lack of awareness of the pain management principles and guidelines, avoiding opioid use due to the concern that physician opiophobia or haemodynamic and respiratory parameters cannot be closely followed, suboptimal evaluation of both pain and analgesia are the main causes of oligoanalgesia. (6).

Pain control in trauma patients in addition to being a basic human right, insufficient analgesia has been shown to increase morbidity and mortality. Untreated or inadequately treated pain adversely affects the physiological stress response to the trauma, slowing healing and prolonging hospital stay by increasing complications (7-9), decreasing functional recovery and adversely affecting quality of life. In addition to all these negative results of the treatment of inadequate pain, chronicity of pain in posttraumatic period is another important problem (10). Unfortunately, pain is reported to be chronic

in 44-86% of trauma patients. In the chronicity of pain, it has been shown that the patient's own (young age, genetic and psychological factors, low socioeconomic level etc.) or traumatic features (amputation, thoracotomy etc.) and the inadequate control of pain during the trauma process have also been shown to play a significant role. Therefore, providing adequate pain control to prevent of chronic pain is the most important risk factor that can be interchangeable within existing risk factors (11,12). It has been announced that ICD-11 will be involved in the diagnosis of posttraumatic chronic pain. For all these reasons, optimal pain management should be considered as a routine and vital part of trauma care and should be carried out with the same emphasis as other medical conditions.

PHYSIOPATOLOGY OF THE PAIN IN TRAUMA

At the time of intense tissue injury from trauma, it causes a strong and enlarged inflammatory response and activation of nociceptors. In patients with trauma, injury and acute nociceptive pain cause a series of neuroendocrine, hematological and immunological responses called stress response in the body (13). The different pathways of this response begin with the activation of the hypothalamic-pituitary adrenal axis and the sympathetic nervous system, which ends with ACTH, cortisol, catecholamines, aldosterone, arginine vasopressin and glucagon release. Increased sympathetic activity results in tachycardia, hypertension, increased myocardial oxygen demand, decreased oxygen supply in the myocardium, decreased renal and splanchnic blood flow, and a decrease in glomerular filtration rate. All of the hormonal changes cause catabolism to increase in order to meet increasing energy needs. Another change seen during the trauma stress response is haemostatic changes that cause a clotting and thrombosis susceptibility. Trauma pain can also lead to a decrease in chest wall movement and a decrease in functional residual capacity and vital capacity due to reflex diaphragmatic dysfunction, difficult to cough due to pain, accumulation of secretions and the development of atelectasis and hypoxemia and pneumonia. Immunosuppression associated with pain-induced catabolic stimulation increases the risk of infection, leading to a decrease in naturel killer cells and neutrophil phagocytic activity. It shows that untreated pain in patients with traumas may adversely affect physiological stress response and may contribute to the visualization of complications such as pulmonary dysfunction, thromboembolic phenomena, myocardial infarction, nosocomial infection and immobility. Early pain control in trauma will suppress the release of inflammatory mediators, reduce the catabolic effect of pain, improve the immune system and reduce the incidence of post-traumatic stress disorder.

PAIN ASSESSMENT IN TRAUMA

Correct assessment of pain in the management of effective pain in the trauma patient is vital. In the evaluation of pain in the trauma patient, it is recommended to use a scale to be selected in accordance with the age and cognitive status of the patient within the one-dimensional pain scales developed for the evaluation of acute pain. Some of the uni-dimensional pain scales that can be used for this purpose are:

Age < 4 yrs: Consider using an observational scale such as

Faces, Arms, Legs, Cry, Consolability (FALCC). Each domain is scored from 0-2, which results in a total score between 0-10. Zero indicating relaxed and comfortable; 1-3 = Mild discomfort; 4-6 = Moderate pain, and 7-10 = Severe discomfort/pain

Age 4-12 yrs: Consider using a self-report scale such as

Faces Pain Scale (FPS) is an illustrative scale of drawings of face expressions that is useful in children and persons who has language barriers. Children point to face that represents their pain using scores 0-6 (happy face to sad face)

Age >12 yrs: Consider using a self-report scale such as

A self-assessment scale, such as a visual analog scale (VAS), a numerical evaluation scale (NRS) or a verbal assessment scale (VRS), should be preferred.

NRS: In this scale pain rates from 0 to 10 (no pain to worst possible pain).

VAS: Patients marks the severity of pain on line.

VRS: The patient rates the pain on a Likert scale verbally, e.g. "none", "mild pain", "moderate pain", "severe pain", "very severe pain" or "worst possible pain".

Patients unable to communicate: Consider using a reliable measurement method such as Behavioral Pain Scale (BPS) or the Intensive Care Pain Observation Tool (CPOT) (14).

PAIN MANAGEMENT IN TRAUMA

Pain management in traumatized patients is considered a vital and important part of the systemic approach to trauma. A holistic approach is essential and disciplined teamwork is required for high standards of care and rehabilitation. Unfortunately, there is no comprehensive guideline for pain management in trauma by international committees. However, there are national, regional or local guidelines for trauma, especially for pre-hospital or emergency service, although they do not fully cover the trauma process (15-19). The three-step analgesic ladder therapy proposed by the World Health Organization (WHO) in 1986 (20) for the treatment of adult cancer pain has become a basis for the use of opioids in the treatment of both pre-hospital and in-patient and in-hospital moderate and severe trauma pain. However, this approach, which is not specific to emergency trauma pain, has been modified over time to trauma. Pain in the trauma is initially maximum and gradually decreases, so the three-step analgesic ladder should be used in reverse in trauma patients. In trauma patients, pain continues throughout the trauma care process, ranging from the beginning of the event to the end of the rehabilitation, with varying intensity and character. The pain caused by trauma itself or by the diagnosis and treatment is often added to this process. Generally, somatic, visceral and neuronal induced nociceptive, inflammatory and neuropathic pain components are combined. Therefore, the optimal approach to pain management in trauma is the multimodal analgesic approach designed to measure the severity of the pain and the phase of the trauma. In this context, the planning and implementation of pain therapy should be considered primarily according to the phase of the trauma. The phases of trauma can be defined as the "pre-hospital emergency phase" (trauma area and ambulance), starting with patient stabilization, continuing with surgical procedures, wound closure and intensive care period "hospitalization-acute recovery phase" and subsequent "rehabilitation phase" in which the patient is prepared for discharge until the full recovery is achieved. In all phases, non-pharmacological, pharmacological and regional treatment modalities should be included in the multimodal analgesic approach. In the trauma care process, the features that are important in terms of pain management according to the phase of the trauma are summarized below. Following the trauma, pain control should be ensured immediately after emergency resuscitative interventions until the hospital is reached. Analgesics or analgesic methods with rapid onset, easy to control, no negative effect on vital functions, analgesic effect is strong, side effect profile is acceptable, clinical diagnosis does not prevent should be preferred for pain control in pre-hospital and emergency departments. Factors such as possible hypovolemia, low cardiac output, hypoventilation or increased intracranial pressure may cause unexpected changes in the pharmacokinetics of the analgesics and their effects. It should be noted that alcohol or substance dependence may occur in patients who cannot be

cooperated. In this process, paracetamol and / or NSAIDs or weak opioids such as codeine and tramadol are the first-line analgesic drugs to be administered intravenously or orally, depending on the patient's condition, in the control of mild to moderate pain. In addition, N₂O is an effective alternative to pain control in pre-hospital phase and emergency services as an analgesic with a rapid onset and short duration (olarak 5 min analgesia). In severe pain, strong opioids should be used with simple analgesics or alone. Morphine is the gold standard opioid, but the use of other opioids, including fentanyl and oxycodone, has also increased in recent years. Opioids should be administered at frequent intervals and in small doses, and basal requirements should be determined. Hypotensive response to analgesics should be considered primarily as an indicator of hypovolemia. In this case, the use of ketamine may be preferred because of its lack of cardiovascular stability and respiratory depression. Another important option is the inhaler methoxyflurane. It has been shown that there is no risk of nephrotoxicity with short-term use of subanesthetic dose of methoxulfurane, which is abandoned due to its nephrotoxicity, in general anesthesia. In this period, peripheral nerve blocks should be used whenever possible.

In the recovery phase, for many reasons, the variable character and severity of pain occurs. In addition to trauma pain patients experience pain due to a recent surgical or other invasive procedure, or noxious stimuli caused by interventions in the intensive care unit (ICU; eg, tracheal intubation, nasogastric tubes, mechanical ventilation, routine nursing care such as repositioning). In this period, opioids are considered the gold standard analgesic, including patients being followed in the intensive care unit. The choice of opioids should be determined according to the needs of the patient (Fentanyl is preferred instead of morphine in patients with hemodynamically unstable or renal failure findings ect.). In order to reduce opioid side effects and improve the quality of analgesia, opioids should be used in combination with nonopioid analgesics and adjuvants in the multimodal approach. In addition, appropriate regional methods should be used especially in the perioperative period. In the selection of analgesic drugs and methods in patients with intensive care, altered pharmacokinetic-pharmacodynamic properties and organ dysfunctions of drugs should be considered. Regional anesthesia in the intensive care unit provides significant benefits for intensive care patients. These include reduction of stress response, better awareness and neurological evaluation, reduced risk of sedation and delirium, increased blood flow with sympathetic blockade in critical ischemia, improvement of bowel movements and splanchnic perfusion, shortening of mechanical ventilation time, and early ambulation. On the other hand, various challenges, such as the need for coagulopathy in the intensive care unit, the need for inotrop-vasopressor therapy and the presence of sepsis, give rise to a major dilemma in the application of regional methods. In the acute recovery phase of the trauma, where intensive and aggressive therapies can last for several months, the tolerance to pain is generally reduced. In this process, psychological support should be provided to all patients with analgesia, and patients should be closely monitored for posttraumatic stress disorder.

The rehabilitation phase should be considered as a process in which the patient is prepared for discharge and pain management should be planned in this direction. Pain in this process follows a dynamic course. except for physiotherapy-related episodic pains, it is expected that there will generally be a reduction in pain and consequently the need for opioids. Therefore, opioid doses should be reduced, nonopioids, especially adjuvant drugs and regional methods that do not prevent mobilization should be used more. Patients with a history of long-term opioid use or prior opioid addiction should be managed with algology and psychiatry specialists.

PAIN TREATMENT MODALITIES IN THE TRAUMA

The primary aim of pain management in trauma is to minimize pain by avoiding side effects with pharmacological, non-pharmacological and interventional methods, reducing morbidity, mortality and

hospital stay, and improving quality of life by providing early mobilization and functional recovery. For this purpose, multimodal and multidisciplinary approach including systemic opioids continue to be the first choice of treatment and regional analgesia methods should be planned. Treatment plans should be personalized taking into account the patient's medical history, current diseases and comprehensive physiological functions. In this way, the effects of techniques that may adversely affect the impaired hemodynamic or respiratory functions may be minimized and consequently, a reduction in morbidity and mortality can be achieved.

Regional Analgesia Techniques

In recent years, the role and importance of regional methods in the management of pain in trauma has been better understood by the evidence obtained from both military and non-military sources, the use of new techniques and the use of imaging equipment such as ultrasonography and increased practitioner training.

The first practices and studies of regional methods have focused on the use of neuraxial blocks in thoracic abdominal or lower extremity traumas. However, the use of neuroaxial blocks in acute trauma patients was limited due to coagulopathy associated with trauma, hypovolemia, hemodynamic instability, neurological deficit or increased intracranial pressure. In addition, post-block intensive monitoring requirement, and complications such as deep hypotension due to applied local anesthetics and late respiratory depression due to opioids also have a major disadvantage.

In recent years, peripheral nerve blocks (PNB) have been increasingly applied in both civilian and military trauma practice. In the management of trauma pain, taking into consideration the patient's immediate resuscitation or surgical priorities, regional methods can be utilized at any stage during the continuity of care from the pre-hospital emergency room to the operating room intensive care unit and service. Periferik sinir bloklarıyla opioid tüketiminde azalmayla birlikte solunum ve hemodinamik stabiliteden ödün vermeden etkili bir analjezi sağlanabilir. In the literature, successful interscalen, femoral, fasian iliaca and sciatic nerve block applications in trauma or ambulance have been reported by pre-hospital emergency aid teams in France (21-23). In addition to France, trauma systems created by different countries provide paramedic or nurses with special training to perform PSB techniques in pre-hospital period (24,25). In emergency services, effective pain control can be achieved with PSB application, while the duration of emergency room stay and monitorization time can be decreased and patient safety can be increased. It is possible to provide analgesia in the early period following airway management and resuscitation, to position the patient for spinal or epidural anesthesia, to achieve anesthesia alone or to reduce the consumption of general anesthetic or systemic analgesic with perioperative PSB. In addition, continuous PNB may be applied for burns and wounds requiring repeated debridement or dressing or for postoperative analgesia. In this way, the need for additional sedation or general anesthesia is eliminated for the procedures required for perioperative intensive care and service. Other benefits include less opioid intake with reduced opioid-related side effects and sedation, permitting better assessment of mental status changes and acute surgical conditions, reduction in the incidence and severity of chronic posttraumatic pain syndromes, better surgical outcomes with immobilization of delicate neurovascular repairs, and greater tolerance of aggressive physical therapy. There is a wide variety of PNB options available for ultrasound guidance for thorax, abdomen, pelvis and extremities. In trauma patients, block techniques are not different from elective patients, but some specific features and important features specific to trauma patients are available.

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04 April 2019-Thursday

13:30-14:30	PANEL 3: Preoperative evaluation of trauma patient	Chairs: Filiz TÜZÜNER, Turkey, Ülkü AYPAR, Turkey Hristo BOZOV, Bulgaria Osman EKİNCİ, Turkey
	Airway management in trauma: from field to ICU	Antigona HASANI, Kosovo
	Prevention and management of neurological damage	Jasmina SMAJIC, Bosnia Herzegovina
	Massive transfusion and trauma induced coagulopathy	Dilek ÜNAL, Turkey
	Effects of trauma and anesthesia on cognitive function of elderly patient	Başak Ceyda MEÇO, Turkey

AIRWAY MANAGEMENT IN TRAUMA: from field to ICU**ANTIGONA HASANI****Associated Professor of Anesthesiology and Reanimation****Chief of Department Anesthesiology and Reanimation, Faculty of Medicine, University of Prishtina, KOSOVO**

The ABC's approach during trauma resuscitation, which means secure the airway, provide the breathing and then take care for circulation, are nowadays a topic of debate. During trauma resuscitation the airway management has many challenges and the successful endotracheal intubation is depended on providers ability and the need for a safe and executable plan. But, does early definitive trauma airway management save lives, and could we "stay and play" or "scoop and run"? The answers for this question are not simple and raise *pros* and *contras*.

There is evidence to support the argument that advanced airway management can be performed in the prehospital setting without delaying transfer to a trauma center. When performed by skilled emergency medical services providers, advanced airway management is associated with a significant decrease in mortality. In the hospital setting, delayed intubation is associated with increased mortality in non critically injured trauma patients.

On the other hand, there is a growing body of evidence that prehospital advanced airway management may increase mortality for trauma patients in some circumstances. The laryngoscope on the hands of non-experienced person could be harmful. However, lifesaving oxygenation could realize with bag-mask ventilation, with supraglottic airway devices and sometimes.

The ABC priorities of trauma resuscitation may be: stop the bleeding, maintain perfusion and oxygenate.

Difficult intubations are very common in trauma patients. The situations when we couldn't ventilate and couldn't intubate are depended on localization of trauma. The life threatening situations are mostly present during neck and lower airway trauma.

Airway management strategies for the care of the patient with trauma are reviewed, with specific considerations for those with traumatic brain injury, suspected c-spine injury, the contaminated airway, the agitated trauma patient, maxillofacial trauma, and the traumatized airway.

Trauma resuscitation is a complex and dynamic process that requires a high-performing team to optimize patient outcomes.

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NEUROLOGICAL DAMAGE IN TRAUMA

*Asst Prof Jasmina Smajic, MD, PhD,
Clinic for Anaesthesiology and Reanimatology,
University Clinical Center Tuzla,
University of Tuzla, Bosnia and Herzegovina*

Traumatic brain injury (TBI) is sudden damage to the brain caused by a blow or jolt to the head. Common causes include car or motorcycle crashes, falls, sports injuries, and assaults. Injuries can range from mild concussions to severe permanent brain damage. While treatment for mild TBI may include rest and medication, severe TBI may require intensive care and life-saving surgery.¹

TBI is an injury to the brain caused by a blow or jolt to the head from blunt or penetrating trauma. The injury that occurs at the moment of impact is known as the primary injury. Primary injuries can involve a specific lobe of the brain or can involve the entire brain. Sometimes the skull may be fractured, but not always. During the impact of an accident, the brain crashes back and forth inside the skull causing bruising, bleeding, and tearing of nerve fibers. After the initial impact occurs, the brain undergoes a delayed trauma – it swells – pushing itself against the skull and reducing the flow of oxygen-rich blood. This is called secondary injury, which is often more damaging than the primary injury.¹

Classification

Primary and secondary injuries

- Primary injury: Induced by mechanical force and occurs at the moment of injury; the 2 main mechanisms that cause primary injury are contact (eg, an object striking the head or the brain striking the inside of the skull) and acceleration-deceleration
- Secondary injury: Not mechanically induced; it may be delayed from the moment of impact, and it may superimpose injury on a brain already affected by a mechanical injury

Focal and diffuse injuries

These injuries are commonly found together; they are defined as follows:

- Focal injury: Includes scalp injury, skull fracture, and surface contusions; generally caused by contact

- Diffuse injury: Includes diffuse axonal injury (DAI), hypoxic-ischemic damage, meningitis, and vascular injury; usually caused by acceleration-deceleration forces

According to the severity and mechanism of injury:

- Mild: person is awake; eyes open. Symptoms can include confusion, disorientation, memory loss, headache, and brief loss of consciousness.
- Moderate: person is lethargic; eyes open to stimulation. Loss of consciousness lasting 20 minutes to 6 hours. Some brain swelling or bleeding causing sleepiness, but still arousable.
- Severe: person is unconscious; eyes do not open, even with stimulation. Loss of consciousness lasting more than 6 hours.²

Measures of severity

- Glasgow Coma Scale (GCS): A 3- to 15-point scale used to assess a patient's level of consciousness and neurologic functioning ; scoring is based on best motor response, best verbal response, and eye opening (eg, eyes open to pain, open to command)³
- Duration of loss of consciousness: Classified as mild (mental status change or loss of consciousness [LOC] < 30 min), moderate (mental status change or LOC 30 min to 6 hr), or severe (mental status change or LOC >6 hr)
- Posttraumatic amnesia (PTA): The time elapsed from injury to the moment when patients can demonstrate continuous memory of what is happening around them ⁴

Table 1. Severity of traumatic brain injury

	GCS	PTA	LOC
Mild	13–15	<1 day	0–30 minutes
Moderate	9–12	>1 to <7 days	>30 min to <24 hours
Severe	3–8	>7 days	>24 hours

Pathological features

By its pathological features lesions can be extra-axial, (occurring within the skull but outside of the brain) or intra-axial (occurring within the brain tissue). Damage from TBI can be focal or diffuse, confined to specific areas or distributed in a more general manner, respectively. However, it is common for both types of injury to exist in a given case.⁵ Diffuse injury manifests with little apparent damage in neuroimaging studies, but lesions can be seen with microscopy techniques post-mortem, and in the early 2000s, researchers discovered that diffusion tensor imaging (DTI), a way of processing MRI images that shows white matter tracts, was an effective tool for displaying the extent of diffuse axonal injury. Focal injuries often produce symptoms related to the functions of the damaged area.⁶ One type of focal injury, cerebral laceration, occurs when the tissue is cut or torn. Such tearing is common in orbitofrontal cortex in particular, because of bony protrusions on the interior skull ridge above the eyes. In a similar injury, cerebral contusion (bruising of brain tissue), blood is mixed among tissue. In contrast, intracranial hemorrhage involves bleeding that is not mixed with tissue. Hematomas, also

focal lesions, are collections of blood in or around the brain that can result from hemorrhage. [Intracerebral hemorrhage](#), with bleeding in the brain tissue itself, is an intra-axial lesion. Extra-axial lesions include [epidural hematoma](#), [subdural hematoma](#), [subarachnoid hemorrhage](#), and [intraventricular hemorrhage](#). Epidural hematoma involves bleeding into the area between the skull and the [dura mater](#), the outermost of the three [membranes](#) surrounding the brain. In subdural hematoma, bleeding occurs between the dura and the [arachnoid mater](#). Subarachnoid hemorrhage involves bleeding into the space between the arachnoid membrane and the [pia mater](#). Intraventricular hemorrhage occurs when there is bleeding in the [ventricles](#).⁷

Symptoms

Symptoms are dependent on the type of TBI (diffuse or focal) and the part of the brain that is affected. Unconsciousness tends to last longer for people with injuries on the left side of the brain than for those with injuries on the right. Symptoms are also dependent on the injury's severity. With mild TBI, the patient may remain conscious or may lose consciousness for a few seconds or minutes. Other symptoms of mild TBI include headache, vomiting, nausea, lack of [motor coordination](#), dizziness, difficulty balancing, lightheadedness, blurred vision or tired eyes, [ringing in the ears](#), bad taste in the mouth, fatigue or lethargy, and changes in sleep patterns. Cognitive and emotional symptoms include behavioral or mood changes, confusion, and trouble with memory, concentration, attention, or thinking. Mild TBI symptoms may also be present in moderate and severe injuries.⁸

A person with a moderate or severe TBI may have a headache that does not go away, repeated vomiting or nausea, convulsions, an inability to awaken, [dilation](#) of one or both pupils, slurred speech, [aphasia](#) (word-finding difficulties), [dysarthria](#) (muscle weakness that causes disordered speech), weakness or numbness in the limbs, loss of coordination, confusion, restlessness, or agitation. Common long-term symptoms of moderate to severe TBI are changes in appropriate social behavior, deficits in social judgment, and cognitive changes, especially problems with sustained attention, processing speed, and executive functioning. [Alexithymia](#), a deficiency in identifying, understanding, processing, and describing emotions occurs in 60.9% of individuals with TBI. Cognitive and social deficits have long-term consequences for the daily lives of people with moderate to severe TBI, but can be improved with appropriate rehabilitation.

When the pressure within the skull ([intracranial pressure](#), abbreviated ICP) rises too high, it can be deadly. Signs of increased ICP include decreasing [level of consciousness](#), paralysis or weakness on one side of the body, and a [blown pupil](#), one that fails to [constrict in response to light](#) or is slow to do so. [Cushing's triad](#), a [slow heart rate](#) with [high blood pressure](#) and [respiratory depression](#) is a classic manifestation of significantly raised ICP. [Anisocoria](#), unequal pupil size, is another sign of serious TBI. [Abnormal posturing](#), a characteristic positioning of the limbs caused by severe diffuse injury or high ICP, is an ominous sign.

Diagnosis

Diagnosis is suspected based on lesion circumstances and clinical evidence, most prominently a [neurological examination](#). The preferred radiologic test in the emergency setting is [computed tomography](#) (CT): it is quick, accurate, and widely available. Follow-up CT scans may be performed later to determine whether the injury has progressed. [Magnetic resonance imaging](#) (MRI) can show more detail than CT, and can add information about expected outcome in the long term. It is more useful than CT for detecting injury characteristics such as diffuse axonal injury in the longer term. However, MRI is not used in the emergency setting for reasons including its relative inefficacy in detecting bleeds and fractures, its lengthy acquisition of images, the inaccessibility of the patient in the machine, and its incompatibility with metal items used in emergency care. Other techniques may

be used to confirm a particular diagnosis. [X-rays](#) are still used for head trauma, but evidence suggests they are not useful; head injuries are either so mild that they do not need imaging or severe enough to merit the more accurate CT. [Angiography](#) may be used to detect blood vessel pathology when risk factors such as penetrating head trauma are involved. [Functional imaging](#) can measure cerebral blood flow or metabolism, inferring neuronal activity in specific regions and potentially helping to predict outcome. [Electroencephalography](#) and [transcranial doppler](#) may also be used.¹⁰

Treatment

Care of a TBI patient should begin at the site of the injury, with an aim to secure the patients' airway and maintain adequate ventilation and circulation. Patients with moderate or severe TBI should be transferred to a tertiary care center with neurosurgical facilities as soon as possible. Outcomes in TBI patients have been found to be influenced by transport methods, the duration of transit and whether the responding team is led by a physician or a paramedic. The primary management goals are the prevention of hypoxia and hypotension, because even a single episode of hypotension has been found to be associated with a doubling of mortality and an elevated risk of morbidity.¹¹

Airway Control and Ventilation

Several studies have shown a correlation between hypoxemia and poor outcomes. Although airway control may be our primary concern in these patients, studies have reported poorer outcomes for TBI patients who were intubated at the site of trauma.¹² Intubation by inexperienced providers showed a four-fold increase in death and a significantly higher risk of worse functional outcomes when compared to patients whose airway was secured in the emergency department. In 2013, Sobuwa et al.¹³ suggested that basic airway care performed well in a prehospital setting may be significantly better than prehospital intubation that is performed poorly. Patients with TBI have up to a 5% to 6% incidence of an unstable cervical spine injury. Therefore, all attempts at intubation should include in-line neck stabilization to reduce the chance of worsening a neurological injury until radiological clearance is obtained. Anesthetic drugs that allow for rapid control of the airway while avoiding an increase in intracranial pressure (ICP) and providing hemodynamic stability are preferred. Propofol and thiopental are the most commonly used drugs, but they may cause hypotension. Etomidate has advantages in terms of cardiovascular stability, but the possibility of adrenal suppression exists. Ketamine is popular in trauma patients and recent evidence suggests that its effect on ICP may be limited.¹⁴ For rapid sequence intubation, succinylcholine or rocuronium may be used. Although succinylcholine may produce a small increase in ICP, this has to date not proven to be clinically significant. Ventilation of patients with severe TBI aims to maintain PCO₂ within a normal range of 34–38 mmHg. Hypoventilation should be avoided, as increased PCO₂ levels may lead to cerebral hyperemia with an increase in blood volume and ICP. Hyperventilation, on the other hand, results in an increased risk of vasoconstriction and increased tissue hypoxia, especially in the penumbra zone, so it is best avoided. Hyperventilation up to a PaCO₂ of 25 mmHg for the purpose of reducing ICP is still accepted in the BTF Guidelines from 2016 for a brief period of time. Volume-guaranteed modes of ventilation may be a rational choice in these patients to minimize variations in PaCO₂. Fraction of inspired oxygen (FiO₂) settings on a ventilator should be adjusted to achieve a PaO₂ of ~90 mmHg, which can oxygenate the penumbra zone. High PaO₂ should be avoided, considering the risk of hyperoxic cerebral vasoconstriction and hyperoxic lung injury. PEEP of 5–10 cmH₂O may be administered to prevent atelectasis and has been proven to be safe in these patients.¹⁵

Evidence from recent trials indicates that although early tracheostomy may not be associated with a reduction in ventilator-associated pneumonia rates, ventilator/intensive care unit (ICU) days are reduced. Consequently, the BTF (Brain Trauma Foundation) has recommended that early

tracheostomy should be performed to reduce ventilation days when the overall benefit outweighs the complications associated with the procedure.^{16,17}

Blood Pressure and Cerebral Perfusion Pressure (CPP)

Initially, the recommendation was to keep CPP above 70 mmHg with vasopressors if needed. However, a subsequent study showed that outcomes were better with a relatively lower CPP, possibly because of a reduced incidence of Acute respiratory distress syndrome secondary to reduced vasopressor usage.¹⁸

The 4th edition of the BTF guidelines recommend:

- Maintaining SBP at ≥ 100 mmHg for patients 50 to 69 years old or at ≥ 110 mmHg or above for patients 15 to 49 or over 70 years old to decrease mortality and improve outcomes (Level III);
- The recommended target CPP value for survival and favorable outcomes is between 60 and 70 mmHg. Whether 60 or 70 mmHg is the minimum optimal CPP threshold is unclear and may depend upon the patient's autoregulatory status (Level IIB);
- Avoiding aggressive attempts to maintain CPP above 70 mmHg with fluids and pressors may be considered because of the risk of adult respiratory failure (Level III).

Fluid Management

In a hypotensive TBI patient, hypovolemia resulting from extracranial hemorrhage should be first ruled out. Even in the absence of extracranial hemorrhage, hypovolemia can still develop by trans-capillary leakage. Crystalloids are usually poor volume expanders, as ~ 70 – 80% reaches the interstitial space within 20 minutes of infusion, contributing to general systemic tissue edema. With a disrupted blood brain barrier (BBB), significant passive distribution into the brain interstitium may occur, leading to increased brain edema and increased ICP, especially if hypotonic solutions are used. Saline is the most common crystalloid used in TBI patients, but Ringer's lactate is an alternative. Infusion of large volumes of normal saline results in adverse hyperchloremic metabolic acidosis that is detrimental in TBI. Balanced crystalloid solutions may be a good alternative. Colloids appear to provide no further benefit, and the SAFE trial found increased mortality in patients receiving albumin compared to saline. TBI is associated with acute kidney injury in many patients (9–23%) and often presents with consecutive higher mortality. Colloids are also found to be associated with increased chances of acute kidney injury and increased use of renal replacement therapy in critical ill patients. Evidence seems to suggest that it is the volume of fluid infused, rather than the choice of fluid itself, that plays an important role in outcomes following TBI.¹⁹

Sedation and Analgesia

Reducing stress and the adrenocortical response is an important component of TBI management. Even unconscious TBI patients may have increased blood pressure and ICP resulting from this stress response. Sedative agents can reduce metabolic stress on acutely injured brain tissue by decreasing cerebral metabolism and consumption of oxygen in a dose-dependent manner that, in turn, decreases CBF and leads to a reduction in ICP.²⁰

The latest BTF recommendations regarding the use of sedatives and analgesics are as follows:

- Administration of barbiturates to induce burst suppression as prophylaxis against intracranial hypertension is not recommended (Level IIB);

- High dose barbiturates are recommended to control ICP refractory to maximum standard surgical and medical treatments while ensuring hemodynamic stability;
- Although propofol may be used for ICP control, it is not recommended for improvements in mortality or six-month outcomes.

ICP Monitoring and Management

Patients with elevated ICP have been shown to have worse outcomes and are at a higher risk of mortality.²¹ The indications of ICP monitoring in TBI from the latest edition of the BTF guidelines are as follows:

- Management of severe TBI patients based on ICP monitoring may reduce in hospital and two-week post-injury mortality;
- The guidelines no longer include a recommendation regarding patients that should be chosen for monitoring because of insufficient high quality evidence
- Clinical judgement should be used to initiate intracranial monitoring in patients who are at a high risk of clinical deterioration.

Updated BTF guidelines state that ICP monitoring is a level IIB recommendation, and recommend treatment of ICP > 22 mmHg to reduce mortality. The management of increased ICP includes standardized strategies that use a “staircase approach” with an escalating treatment intensity. Invasive monitoring using the external ventricular drain (EVD) technique, in which a catheter is placed into one of the ventricles through a burr hole, is considered to be the gold standard of ICP monitoring.

Osmotherapy

Osmotherapy with mannitol has been used since the 1960s as the main treatment for raised ICP and remains a component of TBI management guidelines. Hypertonic saline has become an alternative during the last 20 years, but controversy remains regarding which solution is the best agent and regarding the best method of administration. Mannitol increases CBF by plasma expansion, decreasing the blood viscosity via deformed erythrocytes, and promoting osmotic diuresis. Hypertonic saline promotes the flux of water across the BBB and improved blood flow by expanding the plasma volume. Because of limited evidence, the recommendations of the 3rd edition of the BTF guidelines were as follows: “Mannitol (0.25–1 gm/kg) is effective for the control of elevated ICP while avoiding hypotension (Level II).”²²

Anticonvulsant Therapy

Subsequent to TBI, convulsive activity results in increased ICP and altered oxygen supply to the injured brain. To prevent secondary brain injury, many studies have attempted to study the benefit of seizure prophylaxis. The current BTF Guidelines recommend treatment with anticonvulsants within 7 days of injury. No randomized controlled studies have been performed till date to prove that one antiepileptic drug is better than another in this setting.²³

Temperature Management

In clinical practice, even mild hyperthermia has been associated with poorer outcomes and longer ICU stays, as it may lead to increased edema and inflammation. Conversely, cooling may be neuroprotective and has been seen to improve outcomes following global brain hypoxia. However, the traumatized brain suffers from compromised circulation and hypoxia in the penumbra zone, making it hypersensitive to the adrenergic stress induced by the brain injury itself, which may get aggravated

active hypothermia.²⁴ The recommendation from the BTF is that early (< 2.5 h), short term (48 h) prophylactic hypothermia is not recommended to improve outcomes (Level IIB).

Glycemic Control

After TBI there is a marked catecholamine surge, with cortisol release and glucose intolerance leading to significant hyperglycemia. Anaerobic metabolism of glucose and resulting acidosis in the brain may lead to neuronal dysfunction and cerebral edema. Impaired cerebrovascular regulation following TBI has also been implicated as a reason for poor outcome because of hyperglycemia. Glucose-containing fluids should be avoided and blood sugar monitored to maintain levels between 4–8 mmol/L.²⁵

Decompressive Craniectomy

Decompressive craniectomy is a surgical procedure that involves removal of a large section of the skull. Craniectomy reduces ICP by giving extra space to the swollen brain, and it may quickly prevent brainstem herniation. The latest BTF guidelines recommend a large frontotemporoparietal decompressive craniectomy, as opposed to a smaller one, to target reduced mortality and better neurological outcomes (Level IIA recommendation).¹⁷

Nutrition

Early nutritional support is associated with better outcomes and enteral feeding has been found to be beneficial. The BTF recommends basal caloric replacement by at least the fifth day, and at most by the seventh day post-injury. Transgastric jejunal feeding may also reduce the risk of ventilator associated pneumonia. Patients with severe TBI have gastric feeding intolerance, which may be attributed to dysfunctional gastric emptying secondary to increased ICP and the use of opiates. Prokinetic agents, such as metoclopramide, may improve feeding tolerance.

The BTF recommends the replacement of 140% and 100% of the resting metabolic expenditure in non-paralyzed and paralyzed patients, respectively; however, lower caloric intake may also be beneficial.¹⁷

Antibiotic Therapy

Since TBI patients are more likely to receive invasive monitoring and therapeutic treatments, including mechanical ventilation, they are also more likely to be at increased risk for the development of infections. Sources of potential infections need to be identified and appropriate therapy should be instituted. Most studies cited by the BTF guidelines that evaluated prophylactic antibiotic coverage in patients with TBI have shown little significant differences in infection rates. There is limited available data to support the use of antibiotic prophylaxis in TBI, especially as data suggests that such therapy may predispose these patients to more severe infections. However, evidence for antibiotic therapy following penetrating TBI is robust, and therapy should be maintained for at least 7–14 days.

Other Considerations

Patients with TBI are at significant risk of experiencing thromboembolic events. Options for prevention include mechanical (graduated compression stockings or intermittent pneumatic compression), pharmacological (low-dose or low-molecular-weight heparin) prophylaxis, or a combination of both. Pharmacological thromboprophylaxis is usually initiated 48–72 h after neurosurgical intervention and in the absence of other contraindications. Additional care includes peptic ulcer prophylaxis, physiotherapy, and full hygienic care. The importance of both high quality perioperative intensive care and rehabilitation therapy in these patients cannot be overstated. Proper physiotherapy and postdischarge care in this patient population has been found to be an independent predictor of mortality and morbidity.²⁶

CONCLUSION

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04 April 2019-Thursday

13:30-14:30	PANEL 3: Preoperative evaluation of trauma patient	Chairs: Filiz TÜZÜNER, Turkey, Ülkü AYPAR, Turkey Hristo BOZOV, Bulgaria Osman EKİNCİ, Turkey
	Airway management in trauma: from field to ICU	Antigona HASANI, Kosovo
	Prevention and management of neurological damage	Jasmina SMAJIC, Bosnia Herzegovina
	Massive transfusion and trauma induced coagulopathy	Dilek ÜNAL, Turkey
	Effects of trauma and anesthesia on cognitive function of elderly patient	Başak Ceyda MEÇO, Turkey

TRAUMA INDUCED COAGULOPATHY AND MASSIVE TRANSFUSION*Dr. Dilek Ünal*

Trauma is the leading cause of death in the first 4th decades of life and 40% of these deaths are related to preventable uncontrolled blood loss.

Massive transfusion usually is defined as the transfusion of more than 10 units of packed red blood cells (RBCs) within 24 h or a corresponding blood loss of more than 1- to 1.5-fold of the body's entire blood volume.

Coagulopathy is reported in half of the patients with massive bleeding, the incidence increases up to 87% if the patient is evaluated with viscoelastic testing. Thus it is safe to say massive hemorrhage is coagulopathy and when there is coagulopathy present the mortality increases 5 fold.

Definite blood transfusion algorithms and optimal coagulation management strategies are lacking.

The pathophysiology and monitoring of coagulopathy, the hemostatic transfusion approach with formula based transfusion and massive hemorrhage protocols, whole blood transfusion and pharmacologic treatment of coagulopathy are presented here.

In the past coagulopathy had been considered to develop after aggressive fluid resuscitation and dilution of coagulation factors. Recently, it has been recognised that before receiving aggressive fluid resuscitation, 25-30% of trauma victims have already altered coagulation parameters.

This condition is now referred as "Acute traumatic coagulopathy" or "Trauma induced coagulopathy TIC" and encompasses both iatrogenic coagulopathy and traumatic coagulopathy.

Tissue damage along with massive bleeding and consequent hypoperfusion after major trauma triggers a complex pathophysiological pathway and derange the haemostatic system.

Tissue hypoxia and high thrombin generation causes an upregulation of thrombomodulin (TM) and protein C activation. Activated protein C (APC) inactivates factor (F) Va and FVIIIa and depletes fibrinogen. The release of tissue plasminogen activator (tPA) from the endothelium causes fibrinolysis. Inhibition of plasminogen activator inhibitor-1 (PAI-1) increases fibrinolysis. Endothelial activation is important during this process, markers of endothelial activation (soluble-TM and syndecan-1) are elevated. The severity of TIC is correlated with the severity of trauma. Tissue hypoperfusion and

catecholamine stimulation after injury may result in glycocalyx degradation and contribute to coagulopathy. The role of APC is debated after recent reports. Isolated blunt traumatic brain injury (TBI) or pulmonary contusion are sufficient to cause coagulopathy in the absence of hypoperfusion. In TBI there is limited blood loss and hypoperfusion, brain thromboplastin release and platelet dysfunction are thought to be the reason of TIC. Systemic release of thrombin-rich microparticles may cause a coagulopathic state similar to disseminated intravascular coagulation. Elevated circulating endothelial-, erythrocyte-, and leukocyte-derived microparticles have been identified in the plasma of injured patients. Increased circulating microparticles were also found in patients with TBI. Platelets are also adversely affected by injury, platelet dysfunction plays an essential role in TIC. Concomitant acidosis, hypothermia and genetic influences worsen the situation.

The presence of TIC should be considered in all trauma patients, especially when the reason is high-energy trauma.

Several models that attempt to predict the need for MT have been developed, however these scoring systems concentrate on bleeding related to trauma rather than TIC.

Traditionally the prothrombin time (PT) and activated partial thromboplastin time (APTT) are used in TIC diagnosis. These tests are poor predictors of TIC as there is a long turnaround time needed, studied only in plasma at 37 degree temperature, and covers only the initiation of coagulation, while the coagulation process involves whole blood, there is acidosis and hypothermia present and after initiation it continues with clot formation fibrinolysis and hyperfibrinolysis in TIC. The role of fibrinogen in TIC pathogenesis is fundamental, to date plasma fibrinogen levels are quantified with Clauss Fibrinogen and Prothrombin Time Derived Fibrinogen. The major limitation of these tests is the time delay to result availability, which can be greater than 60 min.

As opposed to standard laboratory tests (SLT), point of care coagulation testing (POC) or viscoelastic hemostatic assays (VHA) cover the whole coagulation cascade, are studied in whole blood and provide information on fibrinolysis and hyperfibrinolysis in a short time period, are more sensitive to detect TIC compared to SLT and can guide targeted therapies. Thromboelastography (TEG) and rotational thromboelastometry (ROTEM) are the most used devices. A Cochrane Review reported that although the quality of studies were low and the majority of trials were in cardiac surgical patients there is an expanding evidence base that VHA guided transfusion strategies can improve morbidity in bleeding patients.

The multicentre, prospective randomised controlled iTACTIC Trial (NCT:02593877) investigating the use of VHA in traumatic haemorrhage is ongoing.

Damage control resuscitation (DCR) is a treatment approach that aims at first restoring physiology and anatomy thereafter. DCR involves early control of bleeding, permissive hypotension, controlled administration of crystalloids to avoid hemodilution and administration of blood products to ensure coagulation as well as sufficient oxygenation and intravascular volume. Early administration of blood products is a mainstay of DCR.

After establishing blood component separation, hospitals were supplied with blood components, and the utilisation of WB decreased. Resuscitation of hemorrhage diverted from WB transfusion to RBC transfusion and crystalloid infusions, until documentation of the coagulopathy of trauma. Current transfusion practice consists of transfusion of RBC, FFP and platelets with the same ratio to simulate whole blood. However reconstituted blood is not equal to WB and is anemic, thrombocytopenic and coagulopathic.

Although it has been shown that WB transfusion decreased mortality during war injuries, no superiority has been shown in civilian trauma and this practice carries the risk of transfusion reactions and infection, new researches and fast safe screening tests are needed.

In recent years, the transfusion of all components of blood products with a 1 : 1 : 1 ratio of plasma to red blood cell (RBC) to platelets has been proposed in cases of massive bleeding and MT. This strategy aims at early correction of TIC and is called hemostatic transfusion.

Massive hemorrhage protocols are activated by a clinician in response to massive hemorrhage. Transfusion of RBCs, plasma, and platelets simulating WB may decrease the effects of TIC and hypovolemia. Studies demonstrated a survival advantage of increased plasma: red cell ratio in patients receiving massive transfusion after trauma. In hemorrhaging trauma patients every minute both from patients' admission to MHP activation and arrival of blood products is associated with a 5% increase of mortality. Increased survival is associated with timely delivery of blood components and focused management of bleeding.

However evidence supporting the 1:1:1 ratio or any ideal blood component ratio is lacking.

The Pragmatic, Randomized Optimal Platelet and Plasma Ratios (PROPPR) trial is the largest randomized prospective controlled study in this field: trauma victims were randomized to receive platelets, FFP and RBC in either 1:1:1 or 1:1:2 ratio and concluded that there was no mortality difference between groups although the 1:1:1 group achieved earlier hemostasis.

Latest evidence show that despite not ideal, having a MHP has better outcomes than not having one. To date it is recommended that ratio based resuscitation should be accompanied or replaced with the individualized and goal directed use of coagulation factor concentrates, antifibrinolytic agents based on POC coagulation testing or other laboratory assessment.

This approach is called Pharmacologic treatment or Early goal directed coagulation management. The sources of coagulation factors and fibrinogen are FFP, cryoprecipitate, fibrinogen concentrates, prothrombin complex concentrates and FXII concentrates.

Fresh frozen plasma, contains all coagulation factors; the fibrinogen (FBN) concentration is approximately 2 g/L; 1 U FFP with 100% factor activity, increases factor activity by 2-3%; to increase the F II - VII - IX - X levels, 20-30 ml/ kg FFP transfusion is needed. This amount of FFP transfusion is associated with complications such as anemia, thrombocytopenia volume overload, TRALI and TACO, besides thawing FFP is time consuming and the amount of coagulation factors are not standardized. However, FFP transfusion is more than coagulation factor replacement recent in vitro studies demonstrated that FFP may restore the glycocalyx layer of the endothelium.

Cryoprecipitate, contains F I - FXIII - FVIII and vWF; FBN concentration is 8-16 g/L; in order to increase the fibrinogen concentration 1 g/L, 30 mL/kg cryoprecipitate is needed (10 U). Cryoprecipitate has the same limitation as FFP, there is a wide variability in its transfusion and it is often delayed. The CRYOSTAT study, demonstrated that the early administration of cryoprecipitate as part of a MHP is feasible in trauma patients. In this study 85% of patients in the Cryo group received cryoprecipitate within 90 min, fibrinogen levels were higher throughout active bleeding. The CRYOSTAT-2 study is ongoing.

Fibrinogen concentrate is produced from pooled human plasma; the FBN concentration is standardised; can be reconstituted quickly with sterile water and infusion volumes are low, allowing for rapid administration; Fibrinogen is the first procoagulant factor to decline, dropping to a critical level of 1.5-2 g/L. A number of retrospective and prospective clinical studies have stated that standard protocol driven transfusion ratios were ineffective in maintaining fibrinogen levels and the addition of fibrinogen was required as well as high dose plasma transfusion does not correct TIC and coagulation parameters only improve with plasma, cryoprecipitate and platelet transfusion with a combined high fibrinogen load. On the contrary the EFIT-1 trial did not demonstrate benefit from early administration of FBN. The initial dose of FBN is 25-50 mg/kg in case of hypofibrinogenemia or functional fibrinogen deficiency (FIBTEM A10 7-10 mm), to maintain FBN concentration above 1.5-2 g/L.

Prothrombin complex concentrate (PCC) contains vitamin K dependent factors (factors II, VII, IX, and X) and (proteins C,S) and heparin. The factor concentration is 25 fold as that of FFP. It is mainly used in oral anticoagulant reversal and congenital factor deficiency and recently in non-warfarin coagulopathy and direct anticoagulant related bleeding as well as non-medication coagulopathy.

Factor XIII is responsible of cloth stabilisation, the concentratin is depleted during blood loss and fluid resuscitation, 1000 mL colloid resuscitation may decrease FXIII activity by 60%. During ongoing blood loss especially if fibrinogen concentration is normal, FXIII should be replaced.

Advantages in using these factor concentrates are avoiding fluid overload, obtaining adequate levels of coagulation factors faster than those with plasma, and decreasing transfusion-associated complications. Concerns related to factor concentrates are risk of thromboembolic events and increased cost.

Tranexamic acid (TXA) is a lysine analog, which binds to the lysine-binding area of plasminogen and decreases its activation. The efficacy has been shown in the CRASH-2 trial. Patients with bleeding were treated either with a 1 gr bolus TXA followed by 1 g in 8 hours or placebo. Mortality and transfusion requirements were reduced in the TXA arm compared to placebo.

During massive hemorrhage platelets should be transfused to keep the platelet count above 50.000 mm³.

To conclude, better identification of the physiopathology TIC can provide the development of effective goal directed pharmacological therapies; hemostatic transfusion based on formula driven transfusion with high FFP ratios is not proven effective and the optimal ratio of RBC:FFP: platelets are not known, whole blood transfusion in civilian trauma setting is also not proven effective. Massive hemorrhage protocols provide increased survival.

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04 April 2019-Thursday

13:30-14:30	PANEL 3: Preoperative evaluation of trauma patient	Chairs: Filiz TÜZÜNER, Turkey, Ülkü AYPAR, Turkey Hristo BOZOV, Bulgaria Osman EKİNCİ, Turkey
	Airway management in trauma: from field to ICU	Antigona HASANI, Kosovo
	Prevention and management of neurological damage	Jasmina SMAJIC, Bosnia Herzegovina
	Massive transfusion and trauma induced coagulopathy	Dilek ÜNAL, Turkey
	Effects of trauma and anesthesia on cognitive function of elderly patient	Başak Ceyda MEÇO, Turkey

EFFECTS OF TRAUMA AND ANESTHESIA ON COGNITIVE FUNCTION OF ELDERLY PATIENT

During the recent years the definition of old age has changed with the increased life expectation of humans. In this context, regardless of the chronological age, frailty has arisen as a new concept, to describe a problematic clinical condition with different clinical problems, in some elderly. Furthermore, with this rise of life expectancy, this frail population is more and more becoming a concern for medical staff. The management of these patients is very challenging for the anesthesiologist, with several different aspects and risks.

Perioperative cognitive dysfunction is one of the important parameters to monitor and manage during the perioperative period. This clinical condition is, usually under diagnosed and overlooked during the early postoperative period, and can cause several problems during the long-term postoperative period.

Accordingly, age became the most prominent risk factor for the development of postoperative cognitive dysfunction. Also, stress exposure such as trauma, anesthesia and surgery can cause long-term changes in cognition. It is important to understand the potential risk factors and to control them accurately (neuroinflammation, hemodynamic instability, ect). A good perioperative evaluation and preparation is as important as the perioperative follow up and management. Also the early postoperative management is an important concern for a good long-term result.

It is very important to keep in mind the challenge of elderly trauma patients in regard to the perioperative management, with all different aspects and concerns.

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14:45-16:00	PANEL 4: Perioperative monitoring of trauma	Chairs: Ömer KURTİPEK, Turkey Hasib LUKAC, Montenegro Tea ZARKOVIC, Montenegro Süheyla ÜNVER, Turkey
	Hemodynamic and coagulation monitorization	Slavenka STRAUS, Bosnia i Herzegovina
	Neuromonitorization	Melih BOZKURT, Turkey
	Microbial monitoring and antibiotherapy	Nevriye SALMAN, Turkey
	Traumatic lung injury	Hülya SUNGURTEKİN, Turkey

MICROBIAL MONITORING AND ANTIBIOTHERAPY

Assoc. Prof. Nevriye SALMAN, MD
ANKARA SEHIR HOSPITAL,

Department of Anesthesiology and Reanimation, Ankara, Turkey

Trauma is a complex disease that involves direct injury to tissues as well as systemic disturbances that may alter and affect the entire body. (1). Trauma is the leading cause of death for individuals up to the age of 45 years and the third leading cause of death overall for every age group. Globally, trauma is responsible for more than 5 million deaths per year. (2). In addition, in 2010 approximately 10% people of 52.8 million the cause of mortality was also calculated as trauma (3). In the studies conducted by the World Health Organization (WHO), trauma was reported to will be in 2020 the first cause of deaths in the 15-44 age group years and the third cause of death in all age groups (4).

Infection and sepsis tendency increases after trauma with bacterial contamination, impaired host defects and invasive surgical procedures (5,6). To prevent this, used therapy is not actually 'prophylactic antibiotics'; 'presumptive antibiotics' should be named because of contamination already existing (7).

1. Penetrating abdominal trauma

In the penetrating abdominal trauma, the most commonly Enterobacteriaceae (especially E. coli E. enterobacter cloacae sikklebsiella) is isolated in the aerobic cultures (8). As gram-positive pathogens enterococcus faecalis and s. aureus 1-10 and bacteroides are common pathogens 1-8,10. In addition E. coli and bacteroides after colonic injuries, E. cloacae and klebsiella after stomach or small bowel injuries are more common as pathogen (8).

In penetrating abdominal trauma, effect of presumptive antibiotic should cover enterobacteriaceae, p. aureus and anaerobic bacteria ± enterococcus (9,11). Ampicillin sulbactam offers single-agent coverage of the target pathogens, it should be avoided if E. coli resistance is greater than 10% to 20% based on local antibiograms (11). Similarly, cefoxitin should generally be avoided in the setting of poor local Bacteroides fragilis group susceptibility (12,13). Cefazolin and metronidazole is the most commonly used antibiotic combination. (But aminoglycoside and clindamycin can be used if cephalosporin allergy is (11))

2. Open Extremity Fractures

Open Extremity Fractures associated with high morbidity and mortality and also there is a risk of serious infection (14). Crush injuries are the most common cause of open fractures, followed by falls

and road traffic accidents (15). The degree of fracture according to Gustilo classification also determines the risk of infection (16).

Expanded Version of the Gustilo Classification System of Open Fractures ^a					
Feature	Fracture Type				
	I	II	IIIA	IIIB	IIIC
Wound size, cm	<1	>1	>1	>1	>1
Energy	Low	Moderate	High	High	High
Contamination	Minimal	Moderate	Severe	Severe	Severe
Deep soft tissue damage	Minimal	Moderate	Severe	Severe	Severe
Fracture comminution	Minimal	Moderate	Severe/segmental fractures	Severe/segmental fractures	Severe/segmental fractures
Periosteal stripping	No	No	Yes	Yes	Yes
Local coverage	Adequate	Adequate	Adequate	Inadequate	Adequate
Neurovascular injury	No	No	No	No	Yes
Infection rate	0%-2%	2%-7%	7%	10%-50%	25%-50%

Gram-positive skin flora such as *S. aureus* and *Streptococcus* species are the most common pathogens causing infection after open extremity fractures. Gram-negative bacteria including *Enterobacteriaceae* and *Pseudomonas* species are more likely to be isolated in Type III fractures because of a higher degree of contamination, as well as the greater degree of tissue injury (43%) (17).

Practice Management Guidelines for presumptive antibiotic use in open fractures developed by Eastern Association for the Surgery of Trauma (EAST) (14):

-Systemic antibiotic coverage directed at gram-positive organisms should be initiated as soon as possible after injury.

-Additional gram-negative coverage should be added for type III fractures.

-High-dose penicillin should be added in the presence of fecal or potential clostridial contamination (e.g., farm-related injuries).

-Fluoroquinolones offer no advantage compared with cephalosporin/ aminoglycoside regimens. Moreover, these agents may have a detrimental effect on fracture healing and may result in higher infection rates in type III open fractures.

3. Penetrating Brain Injury

Penetrating brain injury is often caused by traffic accidents, violence and suicide in civil society. These are typically the result of accidents, violence, or suicide attempts. Infections resulting from penetrating brain injuries are more common in military injuries than in the civilian population, with an incidence of 4% to 11% and 1% to 5% respectively, when treated with presumptive antibiotics. Combat-related penetrating brain injury, gram-positive bacteria were isolated in 70% of cases, and the predominant organisms were *S. aureus* and coagulase-negative staphylococci whereas gram-negative organism (*Acinetobacter*) infection is rare (18). Anaerobic bacteria were not isolated in brain injuries (18). However, anaerobic bacteria may become pathogens of concern if the penetrating injury reaches the sinuses or oropharynx as they are local flora at these sites.

The use of presumptive antibiotics in penetrating brain injuries has not been investigated. However, a single dose of pre-operative antibiotherapy is supported by the Clinical Practice Guidelines for

Antimicrobial Prophylaxis in Surgery (19). For this purpose ampicillin-sulbactam is frequently used. However, if there is resistance ceftriaxone and metronidazole/moxifloxacin can be used if allergy (20).

4. Facial, Sinus, and Skull Fractures

Facial, sinus and skull fractures vary from bacterial contamination according to the proximity of oral cavity or nasal passages. Facial and sinus fractures are often contamination. Infection with gram-positive (*S. Aureus*, streptococcus species, micrococcus species, corynebacterium species and propionibacterium species) and gram-negative anaerobic organisms (bacteroides species, prphyromonas species, prevotella species and fusobacterium species) occurs in generally. Cefazolin and metronidazole or ampicillin-sulbactam is the first choice agents in these fractures (20).

5. Thoracic trauma

Routine presumptive antibiotic use to reduce the incidence of empyema and pneumonia in thoracic trauma for traumatic hemopneumothorax is controversial; however, there is insufficient published evidence to support any recommendation either for or against this practice (21).

Conclusion

Presumptive treatment in trauma injuries represents a unique role for antibiotic therapy. At the same time the emergent nature of trauma injuries leads to many challenges with regard to antimicrobial therapy, particularly involving dosing and timing of antibiotics and the limited data indicating optimal duration for presumptive treatment.

Antibiotic selection should be based on the most likely pathogens and prevailing susceptibility patterns. In addition, balancing the benefits associated with presumptive antibiotic therapy with the risks associated with unnecessary antibiotic use is a challenge best met by limiting the antibiotic use to the minimum duration

Despite multiple interventions to improve antibiotic prophylaxis, overall adherence did not improve. Most interventions were directed at the point of administration in the operating room; future implementation strategies should focus on the perioperative setting. Future efforts will be targeted at improving dissemination and implementation strategies and measuring related metrics.

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14:45-16:00	PANEL 4: Perioperative monitoring of trauma	Chairs: Ömer KURTİPEK, Turkey Hasib LUKAC, Montenegro Tea ZARKOVIC, Montenegro Süheyla ÜNVER, Turkey
	Hemodynamic and coagulation monitorization	Slavenka STRAUS, Bosnia i Herzegovina
	Neuromonitorization	Melih BOZKURT, Turkey
	Microbial monitoring and antibiotherapy	Nevriye SALMAN, Turkey
	Traumatic lung injury	Hülya SUNGURTEKİN, Turkey

TRAUMATIC LUNG INJURY***Prof Dr Hülya Sungurtekin***

Mortality is high in the thoracic trauma patients. The American Society of Surgeons estimates that it is associated with 16,000 deaths per year (10% death). This constitutes 25% of all trauma deaths. The major cause of death from 1 to 45 years of age (half of all deaths in the 13 -32 age range, 80% of young deaths) and if considered to be the most important cause of death before the age of 75 is a very important clinical situation. Only two thirds of the patients can reach the hospital alive. Most patients who reach the hospital (90% of blunt injury and 70-85% of penetrating thoracic injury) are treated with most simple procedures without requiring surgical intervention.

In a series of 22613 trauma cases of Huber et al., pulmonary contusion was present in approximately half of the cases (10864, 48%). In this series, pneumothorax (8878, 39%), rib fracture (7794, 35%), hemothorax (6223, 28%), flail chest (3681, 16%) and lung laceration (2644, 12%) are common injuries after thoracic trauma was reported.

Tracheobronchial injury: Clinical symptoms depend on the site of the damage and its severity. 87% subcutaneous emphysema, 17-70% pneumothorax, Hamman's sign (synchronous cracking tone in precordial auscultation), 59-100% dyspnoea, tachypnea and 74% hemoptysis were seen. Sound changes ranging from hoarseness to aphonia, laryngeal fractures, laryngotracheal separation, vocal cord injury, and recurrent laryngeal nerve damage may occur.

ASA has an algorithm that emphasizes spontaneous ventilation, if possible, above all. The critical tool for evaluating the injury and controlling the airway is fiberoptic bronchoscopy. In most cases, the aim is to place the cuff of the endotracheal tube beyond injury, or at least to protect it from positive pressure ventilation.

Treatment of tracheobronchial injuries is usually recommended as conservatively. The majority of the literature focused on iatrogenic injury of the membranous part of the trachea. These injuries are becoming increasingly common. In a recent series, half of the injuries are caused by these iatrogenic injuries.

Pulmonary Contusion: Lung contusion is a clinical condition that complicates 65% of blunt chest trauma patients who are admitted for surgery. A recent review examining the long-term sequelae found that 70% of patients experienced a deficiency in respiratory function and a loss of physical function after 6 months of injury. Clinical findings include tachypnea, hypoxia, hypercarbia, wheezing, and sometimes hemoptysis. X-rays and even CT findings may be behind the clinical picture. Chest X-

ray is difficult to diagnose pulmonary contusion; While only half of them were detected on the first chest radiography, 92% of lung contusions could be seen 24 hours after trauma. The first 24 hours of X-ray enlargement of the chest contusions in the chest is usually a sign of poor prognosis. Lung ultrasound can help with rapid diagnosis, especially as the extended focused evaluation with ultrasound (EFAST) for trauma develops. In pathology, the loss of vascular integrity in the alveolar capillary membrane can be seen as intraparenchymal and alveolar bleeding and edema. Surfactant production decreases and shunt increases. As with ARDS, the lungs functionally shrink by the filling of alveoli with blood and edema. Pain can lead to difficulty in breathing and progressive atelectasis. Pulmonary contusion can lead to real ARDS. The studies continue that the lung damage itself is inflammatory and also localized inflammatory response can lead to ARDS. The inflammatory response in the lung can lead to delayed immunosuppression, which increases the susceptibility of patients to an infectious challenge. Steroids cannot be recommended.

The treatment of pulmonary contusion is primarily supportive: it is important to quickly evaluate additional oxygen, air, and respiration with standard trauma protocols. Based on the current literature, it is difficult to make specific, evidence-based recommendations. There is no single level I evidence-based recommendation in the guidelines for pulmonary contusion in the East Trauma Surgery Association (EAST). Level II recommendations include supportive care, such as optimal ventilation management (with epidurals, if possible), avoiding mandatory ventilation, and aggressive resuscitation. The primary role of anesthesiologists in lung contusion outside the operating room would be to assist in pain management. In the operating room, management will focus around fluid and ventilator management. It is appropriate to use lung protective strategies developed and accepted in ARDS patients. The alveolar opening and atelectasis with alveolar hyperinflation further aggravates the alveolar inflammatory process. Initial resuscitation is important. However, in the application of fluids, the extravascular lung fluid must be very careful not to increase. The best monitoring for fluid management is still under investigation. Dynamic assessments seem to be better than static measurements of CVP and PCWP to estimate the liquid response (improvement in cardiac output) in numerous new clinical trials.

Selective intubation is useful in cases of unilateral pulmonary contusion and / or massive intratracheal bleeding. Endobronchial blocker may be used. Blockers protect the lungs from bleeding. Double lumen tube can be used for single lung ventilation. Lung isolation can be used to protect the patient from intact lung lung contamination.

Fiberoptic bronchoscopy may be required in the following cases:

- Major airway aspiration
- • Check airline integrity
- • Lung isolation
- • Separation of the lung during surgery

Aggressive pulmonary washing, meticulous fluid management, pain control (multimodal analgesia techniques) are the cornerstones of treatment. The use of NPPV can be used in cases of pulmonary contusion and hypoxemia. Secondary damage should be avoided in the application of mechanical ventilation. Peak and plateau pressures should be limited in patients with pulmonary contusion and excessive ventilation should be avoided. Pressure controlled ventilation decreases the peak airway pressure and can prevent barotrauma. Pulmonary contusion, if other pulmonary complications do not develop, usually begin to return within two to three days. In appropriate cases, hypercapnia and

alveolar opening maneuvers may be necessary. In less than 2% of patients with blunt thoracic trauma, wedge resection is required, which includes pulmonary parenchyma repair or resection thoracotomy and repair. Pulmonary contusion can often be associated with a rib fracture. Long-term FRC abnormalities and deterioration in oxygenation may remain after pulmonary contusion.

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16:15-17:45	PANEL 5: Role of anesthesiologist in central nervous system traumas	Chairs: Oya ÖZATAMER, Turkey Mihal KERCI, Albania İbrahim AŞIK, Turkey Biljana KUZMANOVSKA, Macedonia
	What can the anesthesiologist do in the head trauma at crush site? Management of brain swelling in penetrating head injury.	Seval İZDEŞ, Turkey
	The role of anesthesiologist in cervical spine injuries	Canan ATALAY, Turkey
	The role of anesthesiologist in lumbosacral and pelvic trauma?	Nil KAAN, Turkey
	Early postoperative intensive care in central nervous system trauma	Fatos KATANOLLI, Kosovo
	Ventilatory strategies in head trauma patients	Snezana STANISAVLJEVIC, Serbia

CERVICAL SPINE INJURY

***Prof Dr Canan ATALAY,
Atatürk University, Medical faculty,
Anesthesiology and Reanimation
ERZURUM /TURKEY***

Cervical spine injury (CSI) is seen in 0.9% to 3% of blunt trauma patients, on average 1.8% (1). Acute cervical spinal cord injury (CSCI) may cause significant morbidity and mortality. Anesthesiologists can prevent or minimize secondary injury to the nervous system. Time from injury to treatment is important. The duration of treatment may indicate the potential for complications requiring anesthetic management. An initial assessment of the airway, respiration and circulation should always be done before the evaluation of the spine. CSCI patients should be monitored in the intensive care unit and hemodynamic instability and respiratory failure should be managed. Keeping the mean arterial blood pressure (MAP) at 85 to 90 mmHg can improve spinal perfusion. Patients with CSCI above C3-5 usually require respiratory care. Radiographic images are commonly used to evaluate CSI and SCI. BT is ideal for visualization of most fractures. Magnetic resonance imaging (MRI) is ideal for detecting edema, bleeding and ligament injuries. MRI may be required in patients whose clinical signs cannot be explained by plain film or CT. Spinal immobilization is widely recommended for CSCI patients.

The primary purpose of managing the airway in a CSCI patient is to minimize neck movement while fixing the airway quickly and efficiently. Direct laryngoscopy induces the largest movement at the cranial cervical junction, causing moderate movement in the C1 to C2 joints. Manual in-line immobilization (MILI) is recommended as an airway intervention standard in patients with known or suspected cervical injury. Although MILI increases the laryngoscopic grade in some patients, it increases the failure rate of successful intubations within the first 30 seconds (2). Video laryngoscopy is an alternative to conventional direct laryngoscopy. When faced with CSI patients in stable situations (breathing spontaneously with stable vital signs), most anesthesiologists opt to perform awake fiberoptic bronchoscope intubation (3). However, this technique requires adequate training and time for intubation and is difficult to perform in the presence of blood, vomiting, secretion or impaired anatomy. In emergencies, most anesthesiologists rely on direct laryngoscopy with the MILI for CSI patients.

Care should be taken during induction with propofol, benzodiazepines or barbiturates, as these drugs may cause severe hypotension in hypovolemia patients. Between three days and nine months following CSCI, patients should avoid using muscle relaxants such as succinylcholine as it may trigger fatal hyperkalemia. Stimulation of airway tissue can lead to deep bradycardia, hypotension and cardiac arrest (4). Intraoperative neurophysiological monitoring is useful in assessing impairment of spinal cord function; thus, it makes it possible to correct the risk factors such as the patient's position (neck position and shoulder position), hypotension, hypothermia and surgery-related factors. Somatosensory evoked potential (SSEP) is the most widely used form of monitoring in spinal surgery. SSEP directly monitors the dorsal column-medial lemniscus pathway, but does not directly monitor the cortical spinal cord. When monitoring SSEPs, a balanced anesthetic with a total volatile anesthetic or low concentrations of volatile anesthetic may be preferred (5). Motor evoked potential (MEP) directly monitor the corticospinal pathway. While monitoring motor evoked potentials, a total intravenous technique is recommended (6).

Bradycardia: In the period after the acute injury, 64-77% of patients experienced bradycardia with CSCI, especially those with high cervical (C1-5) lesions. Bradycardia peaks four days after injury and may remain in acute CSI patients for two weeks, during which a positive sinus rhythm drug or pacemaker may be required (7). Atropine is effective in increasing heart rate. Some procedures such as oropharyngeal suction and endotracheal intubation can increase vagal tone and cause cardiac arrest. Therefore, these should be done with atropine in the case of bradycardia.

Acute blood loss leads to hypotension requiring fluid management. Optimal fluid therapy for SCI patients is unknown. Since it can exacerbate spinal cord swelling, 5% dextrose in water and 0.45% normal saline made from hypotonic crystalloid should not be used. Systemic hypotension often occurs after bleeding and neurogenic shock. Neurogenic shock caused by loss of central supraspinal sympathetic control and vasodilatation may cause hypotension and insufficient tissue perfusion (8). Systemic hypotension lowers the perfusion pressure of the spinal cord and contributes to secondary neurological injury. Inotropic, chronotropic and vasoconstrictive agents should be used to maintain blood pressure. Thus, dopamine, norepinephrine or epinephrine with α 1- and β 1-agonist properties are acceptable options. Phenylephrine works as an α 1-receptor agonist with minimal effects that may lead to reflex bradycardia. The use of dobutamine in the treatment of SCI is limited due to its effect on vasodilation and possible reflex due to the risk of bradycardia (9).

Patients undergoing general anesthesia for one- or two-level decompression in the prone position are routinely extubated at the end of the procedure. Patients undergoing an operation lasting more than four hours in the prone position are evaluated after lying on their back at the end of the procedure. If there is significant facial edema, extubation may be delayed, even for a short time in the operating room. The patient is positioned with the head raised to 30 degrees to ensure that the edema is withdrawn. When the patient is extubated, if there is significant edema, we extubate through a tube changer. Patients undergoing prone position with a certain blood loss (> 2000 mL); large volume resuscitation with crystalloid, colloid and blood products; Those who have undergone anterior back spine surgery will remain intubated and receive postoperative care in the ICU. The risk of thromboembolic complications is very high in these patients. Therefore, active prophylaxis is recommended using a combination of low molecular weight heparin and a rotating bed, elastic or pneumatic compression stockings or electrical stimulation (10). Patients will increase the caloric requirement after SCI. Therefore, appropriate nutritional support should be provided. For patients undergoing major spine surgery, the pain may be severe and a multimodal approach to pain control may be required (11,12).

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04 April 2019-Thursday

16:15-17:45	PANEL 5: Role of anesthesiologist in central nervous system traumas	Chairs: Oya ÖZATAMER, Turkey Mihal KERCI, Albania İbrahim AŞIK, Turkey Biljana KUZMANOVSKA, Macedonia
	What can the anesthesiologist do in the head trauma at crush site? Management of brain swelling in penetrating head injury.	Seval İZDEŞ, Turkey
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	Ventilatory strategies in head trauma patients	Snezana STANISAVLJEVIC, Serbia

THE ROLE OF THE ANESTHESIOLOGIST IN LUMBOSACRAL AND PELVIC TRAUMAS

Prof. Dr. M. Nil Kaan

*Aydın Adnan Menderes University Medical Faculty Anesthesiology and Reanimation
Department, Aydın, TURKEY*

Lumbosacral and pelvic injuries may involve a wide clinical spectrum, from mild to severe life-threatening injuries, depending on the severity and site of the trauma and the damage caused by it.

Pelvic injuries caused by high-severity trauma such as motorcycle or other vehicle accidents, incidents involving pedestrians or falling from heights, are frequently accompanied by abdominal organ (liver, bowel, rectum, bladder and ureter) injuries and trauma to the spinal cord, chest or head.

Pelvic injuries constitute approximately 10% of injuries arising from blunt traumas. General mortality in pelvic fractures ranges between 5% and 16%, but rises to 50% if hypotension is present on arrival and 30% in the presence of open fracture. Pelvic bleeding is responsible for half of deaths associated with pelvic fractures, and 80-90% of bleeding arises from the presacral, lumbar venous plexus.

Various classification schemes have been proposed for pelvic ring insults. The Young-Burgess includes the injury mechanism and the direction of the relevant force (Figure 1). Bleeding-related hemodynamic disturbance may occur in 20% of unstable pelvic fractures (AIII, BII, BIII, and C). Damage to inferior level lumbar and sacral nerve roots or isolated peripheral nerve damage may occur in lumbosacral and pelvic traumas. The Denis classification is employed for sacrum fractures and is important due to the risk of neurological injury. In this classification the sacrum is divided into three zones. The risk of neurological injury is 6% in zone I, 28% in zone II, and 57% in zone III, the central zone I (Figure 2). Intestinal, bladder or sexual function impairment may arise. The bulbocavernosus reflex test must be performed for L5 and S1 nerve roots in particular, and the needle test for anal sensation.

Unstable Pelvic Fracture Management

If pelvic fracture is suspected in a traumatic patient the priority must be to determine the urgency of the condition. Bleeding must be suspected if systolic blood pressure <90 mmHg and HR > 120 /min despite fluid and blood replacement, together with unstable pelvic fracture. If clinical examination findings, ultrasound directed toward intra- and retroperitoneal bleeding (focused abdominal sonography for trauma: FAST) and/or diagnostic peritoneal aspiration are positive, then pelvic

bandage, external stabilization, angiographic embolization and, if available, [Resuscitative Endovascular Balloon Occlusion of the Aorta](#) (REBOA) can be applied, depending on the urgency of the findings. An emergency diagnosis and therapeutic approach chart for unstable pelvic fractures is given below (Figure 3).

THE ROLE OF THE ANESTHESIOLOGIST IN LUMBOSACRAL AND PELVIC TRAUMAS

Orthopedic repair and stabilization are generally applied in the early period, considering also the patient's clinical condition and the nature of the fracture, in lumbosacral and pelvic traumas in the absence of life-threatening danger. General anesthesia is applied in the majority of these operations performed under partially elective conditions. It is important in these operations under elective conditions for the anesthetist to know whether the lumbar and sacral nerves are damaged and whether nerve monitoring such as SSEP is required in the intraoperative period.

Critical conditions for the anesthetist are the perioperative management of hemorrhagic patients with severe hemodynamic compromise.

Diagnostic and therapeutic interventions following the initial evaluation of patients with life-threatening lumbosacral and/or pelvic traumas in the emergency department may require a multidisciplinary approach. The emergency department team may require urgent consultations with the orthopedic, urology, general surgery or anesthesia departments. The anesthetist physician ensures airway control, fluid and blood replacement, invasive hemodynamic monitoring, analgesia and sedation during angiographic embolization and REBOA procedures in the emergency and radiology departments.

These patients are taken for emergency surgery for external and internal fixation and laparotomy and preperitoneal packing. General anesthesia is employed. The anesthetist has to manage the following problems in these patients with hemodynamic compromise due to severe bleeding:

1. Hemodynamics: EKG, invasive arterial blood pressure, central venous pressure and, if possible urine output must be monitored. Systolic blood pressure must be maintained at 90 mmHg and hemoglobin levels at 9 gr/dl. Four to six units of blood must be prepared. Cell saver can be used.

2. Coagulopathy: Erythrocyte suspension, fresh frozen plasma and platelet infusion at a 1:1:1 ratio is recommended. Tranexamic acid (1 g and 1 g in 24 h), prothrombin complex concentrate, Fc VIIa, and cryoprecipitate can be given. Thromboelastographic or viscoelastic tests should be used, depending on the data, if possible.

3. Acidosis: Lactic acidosis may cause a significant decrease in platelet and coagulation factor activity. Base deficit must be corrected.

4. Hypothermia: Esophageal or rectal temperature must be maintained at 36 - 37 C.

5. Infection: Antibiotics must be administered in the presence of rectal and intestinal injury-related contamination.

6. Postoperative analgesia: Gabapentin and pregabalin can be used in the intraoperative period and morphine and paracetamol postoperatively.

Prophylaxis must be applied in the event of a high risk of postoperative deep vein thrombosis (35-60%) and pulmonary embolism (05-2%).

Chronic pain (25%) and sexual dysfunction (40%) may develop in the long term.

General body trauma will usually accompany lumbosacral and pelvic trauma patients taken for surgery under emergency conditions due to hemorrhage. The anesthesiologist may have to administer general anesthesia and seek to maintain hemodynamic stability without being able to perform a full preoperative assessment.

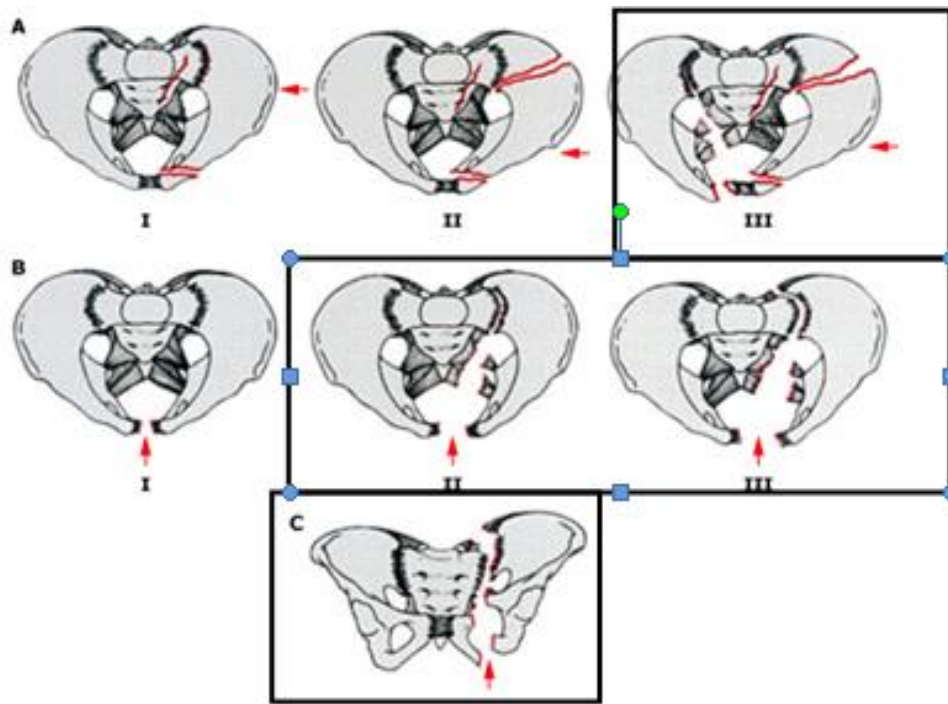


Figure 1: The Young-Burgess classification in pelvic fractures: A, Lateral compression injury, B: Anteroposterior injury; C: Vertical tear/shear. Unstable pelvic fractures: AIII, BII, BIII, C

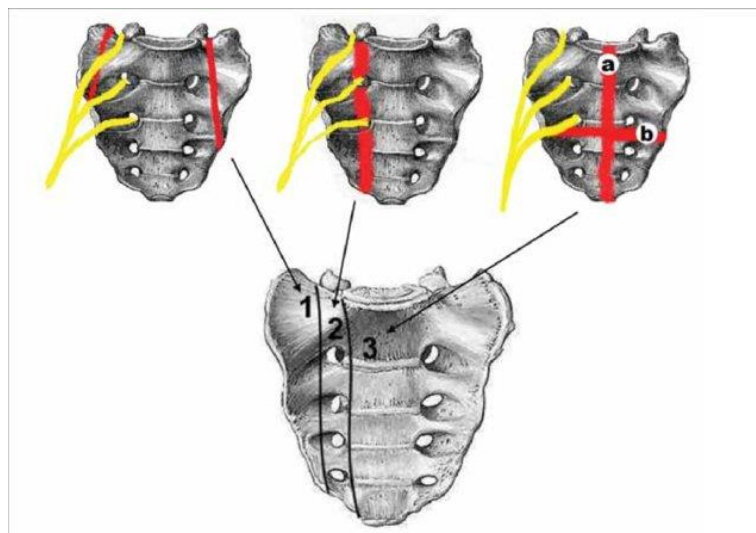
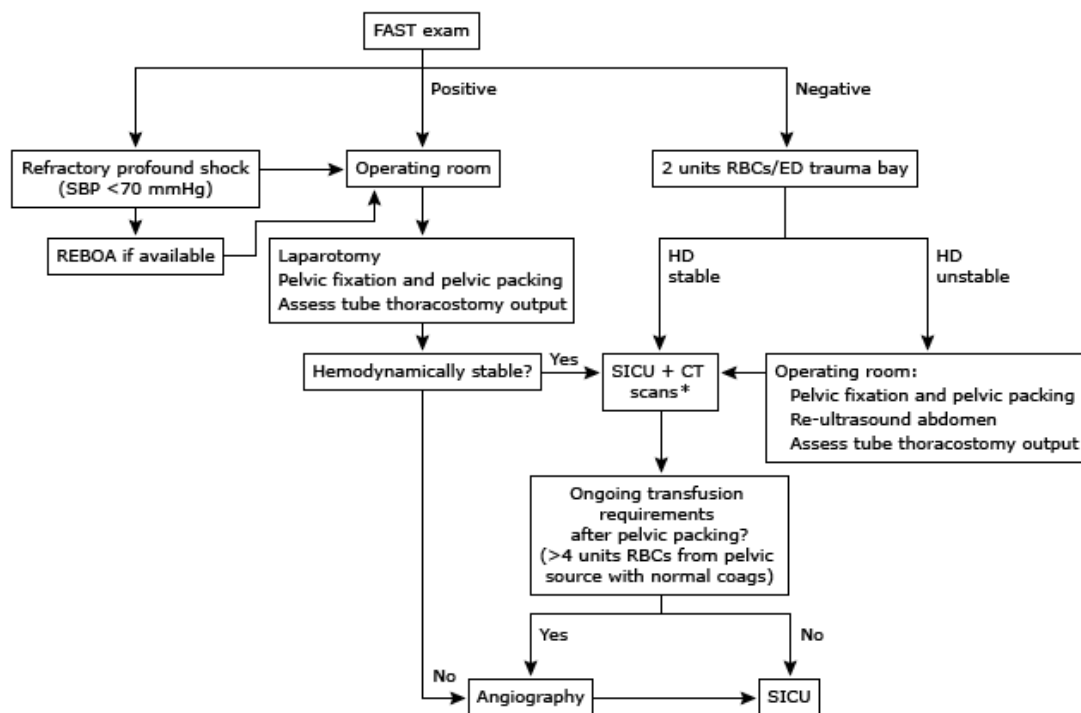


Figure 2: The Denis classification in sacral fractures



1. Resuscitate with 2 L crystalloid.
2. Measure base deficit.
3. Rule out thoracic bleeding source (portable chest radiograph).
4. Stabilize pelvis (sheet).
5. If immediate RBC transfusion required, consider operative pelvic packing.
6. Transfuse, FFP:RBC (1:2); platelets:RBC (1:5).
7. Perform TEG.
8. Notify: trauma surgeon, orthopedic surgeon, blood bank, operating room, interventional radiology.

FAST: focused abdominal sonography for trauma; SBP: systolic blood pressure; RBC: red blood cells; ED: emergency department; REBOA: resuscitative endovascular balloon; HD: hemodynamically; SICU: surgical intensive care unit; CT: computed tomography; FFP: fresh frozen plasma; TEG: thromboelastography.

* Normalize coagulation status, abdominal CT scan if no laparotomy done.

Figure 3: Unstable Pelvic Fracture Management

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04 April 2019-Thursday

16:15-17:45	PANEL 5: Role of anesthesiologist in central nervous system traumas	Chairs: Oya ÖZATAMER, Turkey Mihal KERCI, Albania İbrahim AŞIK, Turkey Biljana KUZMANOVSKA, Macedonia
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EARLY POSTOPERATIVE INTENSIVE CARE IN CENTRAL NERVOUS SYSTEM TRAUMA

Fatos Katanolli, MD

Introduction: Traumatic Brain Injury (TBI) is one of the leading causes of death for individuals between the ages 1 and 45. Every 2 seconds in TBI worldwide.

TBI consists of two types of injuries: **primary** brain injury and **secondary** brain injury.

Treatment consists on mitigating the effects of primary brain injury, and prevention of the secondary brain injury.

Treatment consists of prehospital and emergency medicine treatment, surgical treatment and intensive care treatment of traumatic brain injury.

The role of early postoperative intensive care of TBI is to continue the treatment of primary injury, and to prevent development of secondary brain injury, and is strongly recommended to be in compliance with the guidelines for the management of severe TBI. Management consists of general medical measures and specific therapeutic measures, monitoring and compliance with recommended thresholds in order to reduce the rates of mortality and morbidity.

Of a critical importance is monitoring of intracranial pressure (ICP), cerebral perfusion pressure (CPP) as key indices to track the possibility of brain swelling or development of infarctions. Therapeutic measures to contain these values within a physiological range are medical (osmotic therapy, ventilator therapies, blood pressure, anti-seizure drugs) and surgical (craniotomy decompression), as well as the impact of these measures in mortality, ICU days, vegetative state, severe and moderate disability as well as on good functional outcomes.

04 April 2019-Thursday

16:15-17:45	PANEL 5: Role of anesthesiologist in central nervous system traumas	Chairs: Oya ÖZATAMER, Turkey Mihal KERCI, Albania İbrahim AŞIK, Turkey Biljana KUZMANOVSKA, Macedonia
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VENTILATORY STRATEGIES IN HEAD TRAUMA PATIENT*Snežana Stanisavljević*

Traumatic brain injury (TBI) is defined as an alteration in brain function or other evidence of brain pathology caused by external force. TBI is the most common cause of death under the age of 40 year. Severe TBI is diagnosed in the patient that has Glasgow Coma Scale (GCS) less than 9, after full resuscitation.

Central goals in head trauma, according to the Brain Trauma Foundation Guidelines, are prevention of hypoxic secondary insults through the maintained of an adequate cerebral perfusion pressure and cerebral oxygen delivery. Major issue is management of intracranial pressure (ICP), cerebral blood flow (CBF), and avoidance of secondary brain injury through the prevention of hypercarbia, hypoxemia and hypotension.

Mechanical ventilation is required in the majority of patients with severe traumatic brain injuries in order to control carbon dioxide (CO₂) clearance, improve oxygen delivery, and facilitate resuscitation and injury management.

Conventional models of mechanical ventilation (assist/control AC, synchronized intermittent mandatory ventilations SIMV, pressure controlled ventilation PCV, airway pressure release ventilation-APRV or bilevel ventilation BIPAP) can be used in order to maintain low normocapnia and adequate oxygenation.

In the patient with the isolated severe brain injury, acute lung injury (ALI)/ acute respiratory distress syndrome ARDS occurs in 20-45% causing prolonged hospitalisation and higher mortality. It should be considered whether the selected mode of mechanical ventilation is being used to manage patient with isolated TBI or patient with ALI/ARDS, or to prevent ALI/ARDS.

Ventilatory strategies in these circumstances are challenging, because they can be in conflict. Therapeutic manoeuvres that improve oxygenation can have adverse effect on injured brain.

Non conventional models of mechanical ventilation of the lungs can be used in head trauma as salvage strategies (prone position, recruitment, high frequency oscillatory ventilation-HFOV, extracorporeal membrane CO₂ removal-ECCO₂R, extracorporeal membrane oxygenation-ECMO). Because of limited

available evidence, these models of mechanical ventilation should be considered individually with monitoring of ICP and/or CBF.

Manipulating with CO₂ by mechanical ventilation of lungs, we can strongly modulate CBF and ICP and directly have impact on outcome of TBI. TBI patients are special group in intensive care to which protective lung ventilation have to be adapted.

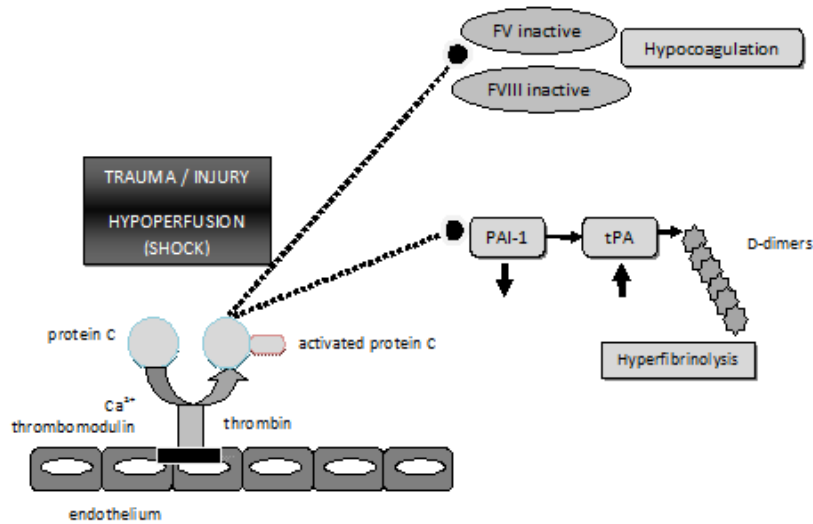
05 April 2019, Friday

07:00-08:30	The Anaesthesiologist's perspective: problems and solutions in the trauma field	Chairs: Feyhan ÖKTEN, Turkey Onur ÖZLÜ, Turkey Murat SAYIN, Turkey Nurdan BEDİRLİ, Turkey
	<i>Approach to the bleeding patient</i>	Onat BERMEDE, Turkey
	<i>Coagulation management in the trauma field</i>	Sengül ÖZMERT, Turkey
	<i>The difficult airway</i>	Süheyla KARADAĞ ERKOÇ, Turkey
	<i>CPR in the trauma field</i>	Volkan BAYTAŞ, Turkey
	<i>Vascular access in trauma</i>	Cihan ŞAHİN, Turkey
	<i>Triage in the trauma field</i>	Emine ARIK, Turkey
	<i>Management of the paediatric patient in the trauma field</i>	Nilgün ŞAHİN, Turkey
	<i>Pain management in the trauma field: Nerve blocks</i>	Şeyda Efsun ÖZGÜNAY, Turkey
	<i>Saline infusion in trauma patients: Friend or foe</i>	İlkay Baran AKKUŞ

COAGULATION MANAGEMENT IN THE TRAUMA FIELD

Sengül Özmert
Department of Anaesthesiology,
Ankara Children's Haematology Oncology Training and Research Hospital,
Ankara, Turkey

Trauma is one of the leading causes of death among people under the age of 40 (1). Uncontrolled hemorrhage and exsanguination is responsible for more than 50% of deaths in the first 48 hours after hospitalization based upon trauma (2). Trauma is the most important cause of disability and death in pediatric population (3). Worldwide annual trauma-related death rate is more than 5.8 million and is expected to exceed 8 million by 2020 (4,5). Approximately one third of patients with hemorrhagic trauma show signs of coagulopathy when hospitalized and are called acute traumatic coagulopathy (ATC). These patients show a significant increase in the need for a higher transfusion requirement, multiple organ failure, longer ICU or hospital stay, and death compared to patients who suffer from similar trauma without coagulopathy (6). The occurrence of early acute coagulopathy in trauma is multifactorial; including shock due to bleeding, formation of thrombin-thrombomodulin complex due to tissue injury, activation of anticoagulants and fibrinolytic pathways (Fig. 1)(7). The severity of coagulation disorder is affected by environmental and therapeutic factors that cause or contribute to acidemia, hypothermia, dilution, hypoperfusion and coagulation factor consumption (8). In addition, age, genetics, comorbidities, inflammation and drug therapy (especially oral anticoagulants), fluid treatment applied before arrival to hospital and presence of traumatic brain injury (there will be tendency to coagulation abnormalities) also affect the severity of coagulation disorder (Fig. 2) . (9) Early diagnose of acute traumatic coagulopathy and early & aggressively treatment can fix coagulopathy, control bleeding, reduce blood product use, and make the outcome better in severely injured patients (7). For this reason, knowing mechanisms and consequences of the coagulopathy that follows the trauma is important for the prevention and treatment of coagulopathy.



Figur

Figure 1

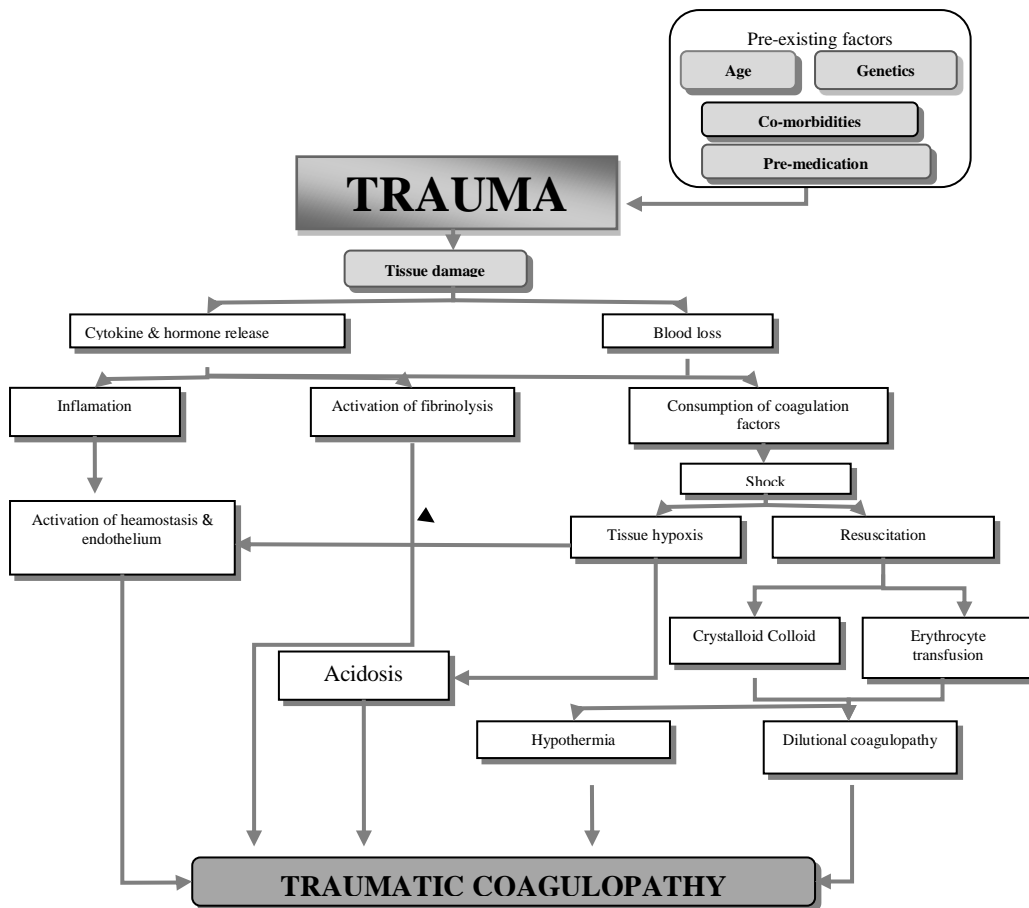


Figure 2

In pediatric patients as a special group, there is no solid evidence for the use of tranexamic acid when a serious trauma develops, but current expert view suggests the use of it (10). The most commonly used plasma in hospitals is fresh frozen plasma (FFP). It takes time to dissolve this product and transport it to the trauma resuscitation unit. The French Military Health Service has developed French

lyophilised plasma (FLYP). This product is as effective as FFP to improve thrombin and clot formation.(11) The preparation for FLYP is short (<6 min.) (12), it can be stored at room temperature for 2 years (13) and it is allowed to be used in civilians (14) Fibrinogen is found in FFP and cryoprecipitate, but the best source of fibrinogen is fibrinogen concentrate. (15) Fibrinogen concentrates are easy to use in the field like French lyophilised plasma. It can be obtained quickly and stored at room temperature. The benefits of fibrinogen supplementation in pre-hospital settings have not yet been established without laboratory tests. Nonetheless, studies are ongoing (16). In patients with hemorrhagic shock who cannot be transported rapidly, its use is supported when considering the balance of profit (17). Prothrombin complex concentrates (PCC) rapidly reverse the effect of vitamin K antagonists. However, storing the concentrate at 4 ° C limits its use in the field. In pre-hospital settings, the only reported cases involve antagonisation of prior vitamin- K anticoagulant therapy. (18,19).

In the European guideline on management of major bleeding and coagulopathy following trauma that published by Rossaint et al in 2016; (9)

- It is recommended to decrease the time between injury and bleeding control (1A) by transporting serious trauma patient directly to a proper trauma center (1B).
- It is recommended to use an auxiliary tourniquet to stop life-threatening bleeding because of open extremity injuries (1B).
- Avoidance of hypoxemia (1A) and providing normoventilation (1B) are recommended. Hyperventilation is recommended in the presence of cerebral herniation. (2C)
- It is recommended to monitorize early and recurrent coagulation by either traditionally measuring routine PT, PTT, platelet number and fibrinogen levels or using viscoelastic methods (1C).
- In the absence of traumatic brain injury (TBI), it is recommended to keep the systolic blood pressure at 80-90 mmHg until major bleeding is stopped (1C). In the presence of severe TBI (GCS ≤8), it is recommended to maintain the mean arterial pressure ≥80 mmHg (1C)
- It is recommended to use the limited volume strategy (restrictive fluid therapy) to obtain target blood pressure until the bleeding is controlled (1B).
- In the presence of life-threatening hypotension, it is recommended to administer vasopressors in addition to fluids to maintain target arterial pressure (1C).
- It is recommended to use an inotropic agent in the presence of myocardial dysfunction (1C).
- Use of isotonic crystalloid solutions for initial resuscitation (1A) and avoiding over use of a 0.9% NaCl solution (2C) in hypotensive trauma patients, and avoiding hypotonic fluids such as Ringer's lactate in patients with severe head injury (1C) are recommended. Furthermore, Restrict the use of colloids are recommended due to adverse effects on hemostasis (2C) .
- Target Hb is 7 - 9 g / dl (1C).
- It is recommended to reduce heat loss and provide heating of hypothermic patients to maintain normothermia (1C)
- Serum lactate and base deficits should be used to monitorization of severe bleeding and shock diagnosis (sensitive test) (1B)

- In patients with massive hemorrhage, either plasma-ES (Erythrocyte suspension) ratio should be at least 1: 2(1B) or ES and fibrinogen concentrate should be used according to Hb level (1C).
- Giving intravenous tranexamic acid 1g / 10min as soon as possible and 1g infusion in the next 8 hours (1A) and applying the first dose of tranexamic acid on the way of hospital (2C) are recommended for the patients who have hemorrhage and severe hemorrhage risks. In general, it is recommended to administer tranexamic acid to patients within the first 3 hours following trauma (1B).
- It is recommended to early use prothrombin complex concentrate (PCC) for the immediate reversal of vitamin K-dependent oral anticoagulants (1A)
- If a factor-based strategy is used, if presence of functional fibrinogen deficiency in viscoelastic tests or less than 1.5-2.0 g/l fibrinogen level is accompanied by a severe bleeding; treatment with fibrinogen concentrate or cryoprecipitate is recommended (1C) (The initial recommended fibrinogen supplement is 3-4 g. This is equivalent to 15–20 of single cryoprecipitate). For repetitive treatment doses measuring fibrinogen level in plasma or viscoelastic monitoring is recommended (2C)

Conclusion: Massive bleeding and coagulopathy can be prevented by early intervention and multidisciplinary approach. Volume restriction, early use of blood products, vasoactive agents, tranexamic acid, infusion of factor extracts, provision of permissive hypotension, prevention of hypothermia, prevention of acidosis and optimal tissue oxygenation are important.

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THE DIFFICULT AIRWAY IN THE TRAUMA PATIENT

Airway management is a critical component of resuscitation of the trauma patient. Airway injuries (maxillofacial, neck, and laryngeal) can complicate the airway management of trauma patients. The airway may be compressed and obstructed by tissue disruption, edema, and hematoma. Hypoxemia, hypocapnia, and hypotension associated with poor outcomes during the peri-intubation period. These physiologic abnormalities must be considered and addressed prior to intubation.

Airway assessment should be made for mask ventilation, tracheal intubation, and a surgical airway. The mnemonic LEMON is a helpful tool for assessing the potential for a difficult intubation and several of its components are particularly relevant in trauma (e.g., facial or neck injury). High LEMON scores have been shown to be associated with a greater likelihood of difficult intubation (1). However, airway evaluation in patients requiring emergency tracheal intubation after trauma is often based on clinical examination.

Awake intubation is recommended for management of anticipated difficult airway if the patient is cooperative, stable and can maintain spontaneous ventilation, airway patency and adequate O₂ saturation. However, trauma patients are at higher risk for pulmonary aspiration associated with traumatic brain injury, alcohol intoxication, drug overdose, trauma-induced reduction or absence of gastrointestinal motility. Rapid sequence induction (RSI) is the most common approach for airway management in trauma. RSI should be achieved with administration of an induction agent, paralysis and oxygenation. The application of cricoid pressure (CP) for RSI is controversial, with some evidence suggesting it may make various aspects of airway management more challenging. Excessive pressure may worsen the laryngeal view and make intubation more difficult. Manual in-line stabilization (MILS) of the cervical spine during intubation is recommended in patients with suspected cervical injury. However, MILS may worsen laryngoscopic view, causing the person intubating to apply greater pressure, or result in longer time or failure to secure the airway.

Maxillofacial trauma neck, and laryngotracheal trauma can result in life-threatening airway and hemorrhage problems and lead to significant ocular, nasal, and jaw dysfunction. Because anticipated difficulty in patients with facial trauma may involve challenges with intubation, mask ventilation, and

possibly supraglottic airway rescue, preservation of spontaneous respiration during attempts to secure the airway should be considered. These patients may be best served when feasible by an “awake” approach with a laryngoscope or flexible intubating endoscope (FIE) or in selected cases a primary front of neck airway (FONA) (2).

Management of the difficult airway in the trauma patient requires experienced physicians, the preparation equipment and an executable plan. The primary goal in the airway management of the trauma patient is to maintain adequate oxygenation, ventilation, and airway protection. Adequate oxygenation and prevention of aspiration are essential to improving outcomes.

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CPR IN THE TRAUMA FIELD

Dr. Volkan BAYTAŞ
Ankara Üniversitesi Tıp Fakültesi Anesteziyoloji ve Reanimasyon AD

Traumatic cardiac arrest (TCA) carries high mortality. The response to TCA is time-critical and success depends on a well-established chain of survival, including advanced prehospital and specialized trauma centre care. Immediate resuscitative efforts in TCA focus on simultaneous treatment of reversible causes, which takes priority over chest compressions.

The diagnosis of traumatic cardiac arrest is made clinically. The patient presents with agonal or absent spontaneous respiration and absence of a central pulse.

There are no reliable predictors of survival for traumatic cardiac arrest. A large systematic review reported an overall survival rate of %3.3 in blunt and %3.7 in penetrating trauma.

Emphasis on rapid treatment of all reversible pathology is the basis of treatment guidelines. All algorithms attempt to rapidly address reversible causes of TCA in the prehospital and in-hospital phases of care.

Chest compressions are the standart of care in patients with cardiac arrest. In cardiac arrest caused by hypovolemia, cardiac tamponade or tension pneumothorax, chest compressions are unlikely to be as effective as in normovolaemic cardiac arrest. Chest compressions take a lower priority than the immediate treatment of reversible causes. In an out-of hospital setting, only essential life saving interventions should be performed on scene followed by rapid transfer to the nearest appropriate hospital.

Uncontrolled haemorrhage is the cause of traumatic cardiac arrest in %48 of all TCA. The main principle is to achieve 'haemostasis without delay', usually with surgical or radiological intervention.

Hypoxaemia due to airway obstruction and traumatic asphyxia has been reported as cause of TCA in %13 of all cases. Effective airway management and ventilation can reverse hypoxic cardiac arrest. Tracheal intubation in trauma patients is a difficult procedure with a high failure rate if carried out by less experienced care providers. Use basic airway manoeuvres and supraglottic airways.

Thirteen percent of all cases of TCA are caused by tension pneumothorax.

Cardiac tamponade is the underlying cause of approximately %10 of cardiac arrest in trauma. Where there is TCA and penetrating trauma to chest or epigastrium, immediate resuscitative thoracotomy can be life saving.

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VENOUS ACCESS IN TRAUMA

Essential for three reasons:

1. Administration of drugs
2. Administration of i.v. fluids
3. Measurement and monitoring of cardiac parameters

PERIPHERAL INTRAVENOUS LINES

Advanced Trauma Life Support(ATLS) protocol recommend;

- In most injured patients, two large peripheral I.V. line (14-16 gauge) are sufficient to provide adequate initial treatment and volume replacement.
- In rare cases of greater trauma and in unclear cases this might be insufficient and several IV lines or central line are needed.

Based on Poiseuille's law;

$$Q = \frac{Pr^4}{8nL}$$

Q: Flow

r: Radius of the catheter

P: Driving pressure through the catheter

n: Viscosity of the solution

L: Length of i.v. tubing

◆ Doubling the internal diameter of the venous cannula increase the flow through the catheter 16 fold.

Most suitable veins;

-Wrist

- Antecubital fossa in the arm
- Dorsum of the hand
- Saphenous in the leg

Verify by checking for backflow of blood !!

CAUTIONS

- Avoid extremities with fractures
- Never place an IV cannula in extremities injured by crush or burn
- In patients with injuries below diaphragm at least one IV line should be placed in a tributary of the SVC (IVC disrupted?)
- Patients with upper thoracic injuries IV line should be placed in the lower extremity.(SVC disrupted?)

CENTRAL VENOUS ACCESS

Peripheral percutaneous IV access is difficult or impossible;

- Hypovolemia
- Venous collapse
- Edema
- Obesity
- Scar tissue
- History of IV drug abuse
- Burns

SUBCLAVIAN CATHETERIZATION

COMPLICATIONS :

Pneumothorax:Most common complication.

- More likely to occur on the left side because the left pleural dome is anatomically higher.
- Patients with pulmonary contusions or a pneumothorax in the contralateral hemithorax; A simple pneumothorax may result in respiratory compromise

Hemothorax: May result from laceration of the subclavian vein or subclavian artery.

Arrhythmia: May occur during line placement when the catheter or wire contacts the endocardium of the atrium or ventricle.

Thrombosis or thrombophlebitis: A kinked, knotted or malpositioned catheter in the superior vena cava may lead to thrombosis.

Venous air embolism

Brachial plexus or phrenic nerve injury

Thoracic duct injury: Left side catheterization

Infections

INTERNAL JUGULAR VEIN CATHETERIZATION

- Cervical trauma is a relative contraindication
- Carotid artery puncture
- Other complications are similar to complications of subclavian catheterization

FEMORAL VEIN CATHETERIZATION

- Easier placement and less risk of complications.
- Bowel perforation can occur in patients with femoral hernia.

-Deep vein thrombosis

-Arterial or neurologic injury

-Infection

-Abdominal compartment syndrome: Extravascular infusion

-Septic arthritis: Penetration of the hip

VENOUS CUTOFFS

Where percutaneous peripheral or central access is either contraindicated or impossible to achieve

Most favored sites;

- Cephalic vein
- Basilic vein
- Median antecubital vein
- Greater saphenous vein
 - These veins can accept large catheters, allowing rapid infusion.
 - Strict aseptic technique should be used

Complications;

- Cutaneous nerve injury: Most common
- Infection: Especially in prolonged use
- Cellulitis
- Venous thrombosis
- Phlebitis , Hematoma

INTRAOSSEOUS CATHETERS

- ATLS recommends that after 2 unsuccessful percutaneous attempts;

- Younger than 6 years of age: Intraosseous infusion
- Older than 6 years of age: Central venous infusion

Most successful younger than 2 because the cortical bone is softer

- **Locations of choice;**

- Proximal ve distal tibia
- Distal femur
- Sternum
- Clavicle
- Humerus

When using the proximal tibial plateau (Uninjured) ,the needle should be placed 2 to 3 cm below to the level of the tibial tuberosity.(sterile technique)

- **Complications;**

- Infection (Cellulitis and osteomyelitis)
- Subcutaneous or subperiosteal infiltration
- Pressure necrosis of the skin
- Physeal plate injury
- Hematoma

Intraosseous devices;

- 1) Standard intraosseous needle used for bone marrow
 - 2) Bone injection gun with spring mechanism (BIG)
 - 3) Tool connected to the drill mechanism
- BIG and drill device superior to standard needle

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TRIAGE IN THE TRAUMA FIELD

The word “triage” originates from the French verb “trier” and it includes the notions of sorting out, arraying, choosing and classifying(1). In case of an incidence where there is numerous ill and injured people, the rapid choosing and coding of those to prioritize who will be treated and transferred in the scene of accident and in the healthcare organization is called triage.

History

Triage is firstly used in history in military field by the military surgeon of Napoleon, Dominique Jean Larrey. The number of deaths in the battle field had significantly decreased after Larrey’s idea of transferring quickly the injured soldiers to field hospitals with applying triage.

During World War 1, the usage of chemical gases and emergence of machine guns resulted with the increase in injured people’s number which forced the paramedics to use triage techniques. In World War 2, the coming into use of the antibiotics, the development of surgery techniques and the rapid transport to hospitals with the development of triage has reduced death rates significantly.

During Vietnam War, with the further development of the triage system and with helicopter evacuation, the time it takes for the patients to meet with the treatment has significantly decreased(2).

The triage know-how in the military field has been started to be used in civilian life. The application of triage in emergency service by Weinerman and his friends was first published in 1965(3).

In case of disasters where the goal is to maximize the benefits while ensuring the minimum loss in patient management, true triage is the most important factor(4). In case of a disaster or a mass accident where there are numerous patients and injured people, the triage responsible has to make fast decisions and designate which ill or injured people should meet with immediate aid.

- Generally, the most educated or the most experienced personnel in the first team who reach the scene of accident is responsible from the triage.
- Triage is more about the quality of the instant reply of the system when compared with the number of the ill or injured people. Scene of accident and the hospital facilities may vary.
- The application of triage can differ with the extent of disaster’s and emergency situation’s effect, number of the injured people, present medical structure, opportunities of recovery, transfer and surgery.

- The triage responsible is the emergency health services' ear and eye in the scene of the accident. Effective triage requires coordination between the site and local hospitals, and medical and non-medical organizations in the disaster area.
- A basic concept of triage aims to save the greatest number of injured people by using available resources efficiently.
- After the triage is applied to all patients or wounded at the scene of accident, if there is no shortage of personnel at the scene and if the assistance is provided in emergency care, the process of triage is repeated back from the beginning.
- Triage evaluation follows the sequence of respiration, circulation, consciousness and determine the immediate and priority patients or casualties according to this evaluation.

The operation of triage is arranged according to a coding system:

Red code: The emergency group of people who have serious disease or injury. These patients should be quickly transferred and receive emergency treatment with highest priority.

Yellow code: The waiting period is a bit longer when compared with the red code patients. If yellow coded patients' transfers don't take place on time, the survival ratio drops off.

Green code: Green-coded people are patients who can walk, who don't feel the necessity of immediate care, patients with open conscience. Some of those people can be considered to help the rescuing team.

Black code: Deceased or patients with a very low chance of survival even if they receive a treatment. In cases of disaster, even if these patients haven't died yet they are classified as black coded. They are not given any health service or given emergency aid as the last ones in the row.

In mass events' disaster triage, a moral and ethical viewpoint is needed for the medical providers. To deal with these situations, triage systems have been developed and implemented worldwide. The purpose of such systems, protocols and algorithms is to provide the best possible opportunity for all sufferers to survive. Simple triage and rapid treatment (START) is the most widely used triage system which is developed in the 1980s.

In the START method, the triage officer first summons the wounded with a megaphone or strong tone at the scene and send those who can walk to a safe area and encodes these patients in green. In the second stage, the injured people are evaluated in their position.

-**Respiration** is evaluated by look-listen-feel method. Is there any spontaneous respiration? Has breath started with the appropriate maneuver? If our answer is no; head-neck position is re-evaluated. If breathing has started, red code is given and black code is given if breathing has not returned. If the answer is yes; respiration number is checked. If the number of breaths is below 30, circulation control is started. If the respiratory rate is over 30, red code is given.

- **Circulation** evaluation is determined by radial pulse or capillary backfill test. In the capillary refill test, the nail tips of the patient are briefly pressed and released. If the whiteness after the pressing turns to pink within 2 seconds, the state of consciousness is evaluated. If the conversion is over 2 seconds, bleeding is checked and red code is given.

-**Consciousness** assessment is done by command system. If the patient responds to simple commands logically, they are marked in yellow. If they don't respond to simple commands, they are marked as red coded(2).

Triage Card

The decision of determining the wounded person who will be addressed firstly at the scene of the incident, which application and how this application will be carried out is given by the triage officer. For this purpose, the injured person who has been given triage must be marked with the appropriate colored triage cards.

The airway should be kept open in trauma, bleeding should be controlled as much as possible, stabilization should be done in cervical injuries and in major fractures using the cervical collar and trauma board. The patient's airway status, state of consciousness, respiratory and pulse conditions, injury zones should be recorded as much as possible on the cards.

There are three main reasons why triage is beneficial in cases of disaster:

- 1) Separates those who need fast medical care to save life or limbs.
- 2) Reduces the urgent burden on medical facilities and organizations by separating minor injuries.
- 3) Ensures that the distribution of patients between the existing hospitals is fair and realistic, and that the burden on each hospital is kept almost at "non-disaster" levels.

Problems in Triage

- In cases of disaster where triage cannot be carried out correctly as it should be, the injured people who approach to the nearest or most familiar hospital can cause to over-capacity in emergency service and also chaos.
- Most of the injured come to the emergency room on foot, by taxi or by their own private vehicle. The number of wounded brought by ambulance is very low compared to the number of all wounded people.
- The majority of those who apply for medical assistance to the emergency department will cause an unnecessary usage of hospital resources that are for serious patients.
- The non-traceability of the patient after releasement due to lack of keeping true and adequate recordings is also an important problem.

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MANAGEMENT OF THE PAEDIATRIC PATIENT IN THE TRAUMA FIELD***Nilgün ŞAHİN***

Trauma is the biggest cause of death for children under 18 in USA (<http://www.cdc.gov/nchs/fastats/children.htm>, 1). Every year 1 of 4 children living in USA and applying to the emergency services applies to the hospital due to an injury requiring medical treatment (1, 3). The hemodynamics of children can progress stable until 25-30% blood loss. Thus whether their extremities are cold and the perfusion should be cared for.

Blunt trauma is the most frequent trauma in children patients and it causes multiple organ injuries in child body (3). The experience of the health professionals in child trauma is less compared to adults (1, 2). Trauma patients are divided into 3 with the advanced trauma life support (ATLS) program. Accordingly, death can occur in 3 stages (3, 4):

- The death can occur in the first minutes. There is nothing to do in this case.
- Death in golden hour. Fast assessment and treatment can prevent death. Golden hour is the most important time frame in trauma. The oxygen given in this period, the ventilation and liquid support can prevent organ damages (20). The transfer of the child to the trauma center is conducted in this time frame. The survival of the children directed to a pediatric trauma center is higher than the ones who are sent to a center where adults are also accepted (21).
- In the later stage the death may occur days or even weeks later connected to infection, and organ failure that are advanced period complications.

Injury degree – Multiple trauma is defined with distinct injuries in two or more body regions. Localized trauma covers only one anatomic region of the body (for example, head and neck, chest and back, abdomen, extremities). Sometimes the injury degree can be clear and in others this cannot be observed easily and the clinical table can develop in time.

Injury type – Expected injuries change due to their occurrence as the result of blunt trauma (e.g. Falling, motorized vehicle accident) or penetrating trauma (for example firearm, stabbing, cut due to explosion). Severity assessment shall dictate the starting method and tendency (3, 5). High risk trauma mechanism stipulates the instable patients and patients with high possibility of instability and together with the vital signs and physical findings, it is used to direct the transportation decrees before hospital.

First Assessment

As in adults, the purpose of the primary trauma management in children is to assess the injuries quickly, to determine the management priorities and to provide critical interventions. The first assessment starts at the trauma site, it is performed within couple of minutes by the team leader and it has effects in decreasing mortality. In order to reach these goals, to emphasize the importance of the fast application of the procedures and the importance of the emergency needs continuously, a systematic and logical approach is needed in accordance with the ATLS principles as given in an extended format below (3):

- fast first assessment
- Resuscitation of the vital functions (for example, airway, breathing, circulation, mental status)
- First resuscitation
- more comprehensive secondary assessment
- resuscitation when needed and follow up after resuscitation
- Use of secondary assessment contributions
- advance level treatment start

The approach in the severely injured children is based on two fundamental principles:

- Assessment and management are performed simultaneously in the first assessment. Any defined physiological threat against life should be treated fast before passing to the assessment of the next priority field.
- In case the patient gets worse in any way during the assessment the first assessment should be repeated and before continuing the care of the patient all problems that are newly determined should be handled (3, 6).

Clinicians are including the ATLS guidelines in the management of the pediatric trauma patient however it should be understood that this only provides a general structure. In fact, especially when more than one clinician is included, many steps are typically realized simultaneously.

Organization of the medical intervention around the pediatric trauma team concept may provide more timely identification of the injuries and the faster treatment with improved results (7). American heart foundation, in its 2010 evaluation, had changed the ABC of the resuscitation in children and made it into CAB and recommended pulse control first (22).

Primary assessment (3):

- A. Airway control and protection of cervical vertebra
- B. Breathing control and ventilation
- C. Circulation control and bleeding check
- D. Muscle strength and neurological check
- E. Taking the environment under control

During the primary assessment, abiding by all the global rules, the environment control should be promptly established, the intervention of the health personnel should be provided via protecting them.

In trauma site the team leader facilitates the intervention to the patient with an efficient communication.

At the acceptance of the patient the clinicians should monitor properly, the vital signs (pulse, breathing, oxygen saturation, blood pressure, temperature) should be read and oxygen should be provided. Based on the age of the patient the pediatric vital findings should be assessed in comparison with a ready reference of normal values of that age.

In clinic environment, especially when more than one clinician is involved, simultaneously more than one step is performed. In small children it is hard to determine some findings based on physical findings (for example cardiac tamponade) and others may develop in time. For example, a patient with symmetrical breathing noises at the beginning while taking positive survey ventilation and requires secondary thoracostomy tube, at the middle of second survey, he/she may become cyanotic due to stress pneumothorax.

A. Airway control and protection of cervical vertebra

Assessment of the airway: hypoxia is the most frequent and important reason of cardiac arrest in child patients (8). The physician performing the first intervention should assess in a very quick way the openness of the airway, whether there is a foreign object in the mouth or pharynx, whether there is a mandibular, or face bone fracture or a trachea, larynx tear (4).

Protection of the airway: in children with head, neck, spine traumas, the cervical movement should absolutely be restricted. For the cervical region, in small children smelling position, and in newborns and babies neutral position should be given. Thus cervical vertebra position shall be protected. The cases where cervical protection is required:

- Potential cervical injuries (in or out of vehicle traffic accidents, falling from heights etc.)
- Tendency for cervical trauma (Down syndrome, past cervical surgery etc.)
- Having neck pain
- Poisoning
- Neurological instability.

For protection of the cervical vertebra cervical stabilizer is used. In cases where endotracheal intubation is needed, not to create trauma when the stabilizer is removed, manual cervical protection should be performed (9).

If breathing is not sufficient, in order to provide openness of the airway and to prevent hypoxia the certain maneuvers should be performed:

- Raising the chin
- Secretion aspiration
- Airway placement
- Endotracheal intubation; especially in the children with intracranial pressure increase, to prevent the pressure increase the child should be given reaction with the proper drugs.
- Laryngeal mask airway placement
- Cricothyrotomy can be applied (4,10).

B. Breathing control and ventilation

Breathing control: breathing assessment is performed via neck and thorax examination. The breathing speed, depth, paradoxical or abnormal breathing movements, abnormal view in trachea and chest are examined (4). External oxygen should be given to the patient with spontaneous breathing after examination. For the patient without sufficient breathing ventilation with mask should be provided. If there is pneumothorax, hemothorax it should immediately be discharged and a chest tube should be placed. The patient's breathing monitoring should be performed via the oxygen and carbon dioxide measurements in blood gas.

C. Circulation control and bleeding check

Circulation assessment: hypovolemia is the most common shock cause in child patients (3, 9). In compensated shock the circulation is tried to be continued with tachycardia and vasoconstriction. Tachycardia is generally the first shock indicator in children. Usually in children, the blood pressure can be maintained up to 45% volume loss (3, 4). Thus the child patients with hypothermia and tachycardia should be accepted as in shock (3, 4). Other shock indicators are slowing down of capillary filling, pulse pressure decreasing under 20 mmHg, extremities becoming cold, consciousness blurring, pain response decrease (3,4).

Bleeding check: in external bleedings pressure should be applied from outside. If manual compression cannot be applied the pressure should be applied on the closest artery to the region. If the bleeding cannot be taken under control with pressure then tourniquet should be performed on the region (3, 11). If it is on the scalp then it can be taken under control with a large suture in the shape of eight or via using stapler or Raney clips (3, 11). In suspicious pelvic traumas the rectum and perineum should be examined carefully. Then the pelvic stabilization should be provided (3).

Persistent bleeding: Despite having many treatment methods for internal and external bleeding in adults, the data for children are limited.

- External bleeding. Use of fibrin leak proof dusts, wound dressings with chitosan are used frequently in military, but information on civilian use is limited (3).
- Internal bleeding. It is known that antifibrinolytics, especially aminocaproic acid, tranexamic acid derivatives decrease bleeding during surgical applications (3). Especially, giving tranexamic acid in the first 3 hours is associated with a decrease in rate of mortality based on bleeding (3, 12). However, application in late period (after 3 hours) increases the death risk (3, 12). Yet, further studies are required on children (3).
- Establishing vascular access: Generally, a large vascular access on upper extremity is preferred. In newborn and infants 22-22G, for children 18-20G catheters are preferred. If vascular access cannot be established, fast liquid resuscitation should be provided via intraosseous way. For central venous intervention, femoral vein is preferred as it is easy to access and its complications are minimal (3, 4, 6).
- Liquid supply: After blunt trauma, if the patient is compensated 20ml/kg/15min ringer lactate or isotonic NaCl can be given fast. If hypotension is not regulated 40-60 ml/kg liquid resuscitation can be done (3).
- Blood transfusion: In the patient whose hypotension cannot be regulated, if no healing is observed despite giving crystalloid, 10-20 ml/kg erythrocytes in the blood type of the patient or in O Rh(-) should be given by warming (3, 4). Fresh frozen plasma, thrombocytes and factor

like other products increase survival in massive bleedings after fast erythrocyte supply and in coagulopathies. In children with very severe bleeding, there are views that the massive transfusion protocol application decreases mortality (13). In massive blood protocol 50-55 ml/kg for newborns and infants, and 40-45 ml/kg blood for children can be given.

- Controlled hypotension: Especially in stab wounds, it is beneficial until the bleeding is taken under control (3). Thus, vasospasm and thrombus formation is permitted in the region with bleeding. Aggressive liquid resuscitation may cause dilution of coagulation factors, disruption of factor activities due to hypothermia and increase of blood pressure and increase of bleeding (3, 4). However in blunt trauma, especially in head trauma, it should be noted that it may cause harm to the patient (2, 3).
- Use of vasoactive drugs: It is not very appropriate for the patients in shock.

Hypotension despite the proper liquid treatment is the indication of disruption of pumping function of the heart or development of cardiac tamponade. The Beck triad, indicator of cardiac tamponade is observed as

- Increased venous pressure (increase in neck venous distension),
- Persistent hypotension
- Heart sounds coming from deep.

Existence of hypovolemia and pneumothorax together with tamponade can be a cause for cardiac activity without pulse (4). It can be easily diagnosed with an emergency ultrasound. Also while performing ultrasonography, the circulation can be fixed via performing discharge with pericardiosynthesis. Later on a surgical intervention should be performed to identify the bleeding focus.

D. Neurological assessment

In this primary assessment the pupil response and the brainstem reflexes should be checked. Having anisocoria in pupil diameters indicates the intracranial pressure increase. In order to decrease the intracranial pressure measures should be taken. For fast neurological assessment Glasgow Coma Scale (GCS) can be used. In children with GCS below 8, resuscitation shall be required. In these children, in case of insufficient ventilation, emergency endotracheal intubation and controlled mechanical ventilation is needed. If intracranial pressure increase finding is present then hyperventilation cannot be performed. As hyperventilation shall decrease the cerebral blood flow it may cause cerebral ischemia (14).

In children with increasing intracranial pressure, in order to decrease the pressure 0.5-1 g/kg mannitol or 1-3 mEq/kg hypertonic NaCl (3%) should be given. Especially in hypovolemic patients as hypertonic NaCl does not increase hypovolemia it can be preferred more (14).

E. Taking the environment under control

The environment should be warmed, the liquids administered should be warm, the child should be covered with warm blankets, thus complications due to hypothermia should be prevented (4, 6). During the first assessment, the child should be strip naked and the multiple traumas should be detected; this is important from hastening treatment. In spinal injuries, rectal injuries, the patient can be turned on his/her side while protected cervical vertebra. Hard stretchers should be used for short time frames and it is be cared for not developing pressure sores.

Gastric tube/ nasogastric probe placement: Major trauma is generally results in gastroparesis and distinct stomach expansion. In order to decrease aspiration risk, for stomach decompression an orogastric or nasogastric tube should be placed. Placement of a gastric tube can also be helpful in endotracheal intubation. In cribriform plate cracked patients, when the radiographic diagnosis is made or it is suspected in the basis of nose bleeding, fluid leak from nose or motion of chin bleeding it is contraindicated. In this environment orogstric way is preferred.

Laboratory Tests:

- Hemogram: In hematocrit trauma patients, it is accepted as one of the basic assessment criteria (15). Value being under 30% may indicate intraabdominal injury in blunt traumas. Looking at periodic hematocrit values rather than single value can indicate continues bleeding.
- Blood sugar: In confused patients hypoglycemia should be considered.
- Liver enzyme levels: Heaving AST>200 IU/L, ALT>125 IU/L supports blunt intraabdominal injury (16).
- Urine analysis: Groshematuria indicates severe urinary tract and kidney trauma. In TIT, having >50 erythrocytes indicates intraabdominal injury.
- Blood gas: we can detect hypoxemia, metabolic acidosis detection, decreased perfusion.
- PTZ, APTT, INR
- Serum electrolytes, kidney function tests, lipase and amylase values should be checked for (15,16).

Radiologic Imaging:

- Two way lung graphy can show pneumothorax, hemothorax, aorta dissection, pulmonary contusion, pneumomediastinum, rib crack and/or hemopericardium. Additionally, it helps imaging the endotracheal and gastric tube placement.
- Cervical vertebra side x-ray provides diagnosis of the cervical vertebra trauma in the rate of 80% however image being normal does not exclude cervical trauma (4).
- Single way pelvic graphy is beneficial especially in severe pelvic blunt trauma. In patients where decision cannot be made regarding the pelvic fracture, if the fracture is detected early pelvic fixation can be provided.
- Fast abdominal ultrasonography is assessment of 4 regions of abdomen quickly with ultrasound. In this assessment pelvis and subscaphoid region, lungs and heart is assessed. It is recommended as it may hasten surgical intervention without waiting tomography (10, 17).
- For all traumas, in order to achieve fast results from single action and to make a diagnosis it should be made.

Secondary Assessment:

After the general condition of the child is stabilized, it is systematic reassessment of the child. It covers a comprehensive anamnesis and physical examination. In anamnesis the allergies, the drugs used, the medical history, pregnancy status, when last food intake occurred, the factors causing the trauma are inquired (4).

Physical examination:

- Head-neck: laceration on scalp, bleeding, break on head bones are evaluated regarding hematoma. Eye: pupil size should be assessed regarding conjunctival bleeding, fundus bleeding should be assessed regarding periorbital bleeding. Ear: whether blood, BOS is coming from ear canal should be checked, retroauricular hematoma and BOS coming from ear canal should indicate base fracture. Maxillofacial assessment: mouth, nose cribriform fractures, soft tissue traumas should be assessed regarding hematoma. Cervical vertebra: it should be assessed regarding spine, large vein and trachea injuries. Also assessment for esophagus rupture, pneumothorax, emphysema should be done.

Chest: Chest examination is repeated as in first assessment. Crepitations, sensitivity presence, heart and lung auscultation should be checked. It should not be forgotten that children can have heart and lung contusion without skeletal trauma (4, 14).

- Abdomen: abdomen distension, ecchymosis, whether intestinal sounds are present, sensitivity should be assessed. In abdominal examination the safety belt finding (spasm along the abdomen) indicated gastrointestinal system trauma.

- Perineum: Perineum examination is important for identification of contusions, hematomas, lacerations or urethral bleeding (in men). In instable patients bleeding injury control can be done via rectal examination (18).

- Musculoskeletal system: the deformities in extremities, hematoma should be examined regarding contusion finding with palpation. If pathology is detected split brace application should be made.

- Pelvis: It should be assessed regarding iliac wings, pubis, labium, hematoma scrotum, ecchymosis. In unconscious patients, detection of mobility with positive pressure on iliac crest indicates pelvic fracture (4). In pelvis fractures, in order not to increase bleeding, pelvis should be stabilized and the patient should not be moved.

- Neurological examination: Besides motor and sensual functions, a short but comprehensive neurological assessment including the reassessment of the consciousness level of the patient and pupil reflexes given to light should be made. If any spinal cord injuries are suspected, the patient should be kept immobile via using cervical spine immobilization devices.

Laparoscopy: In patients who are stable hemodynamically, if intraabdominal trauma is suspected it can be made with diagnostic/therapeutic purposes (19).

After the patient is stabilized, in open wounds, in children with open fractures IV antibiotics should be given, tetanus immunization and pain control should be made.

After patient is stabilized, he/she should be directed to the trauma surgeons specialist in pediatrics field as soon as possible.

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05 April 2019, Friday

07:00-08:30	The Anaesthesiologist's perspective: problems and solutions in the trauma field	Chairs: Feyhan ÖKTEN, Turkey Onur ÖZLÜ, Turkey Murat SAYIN, Turkey Nurdan BEDİRLİ, Turkey
	<i>Approach to the bleeding patient</i>	Onat BERMEDE, Turkey
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	<i>Management of the paediatric patient in the trauma field</i>	Nilgün ŞAHİN, Turkey
	<i>Pain management in the trauma field: Nerve blocks</i>	Şeyda Efsun ÖZGÜNAY, Turkey
	<i>Saline infusion in trauma patients: Friend or foe</i>	İlkay Baran AKKUŞ

PAIN MANAGEMENT IN TRAUMA FIELD: NERVE BLOCKS*Seyda Efsun Ozgunay**SBU Bursa Yuksek Ihtisas Research and Training Hospital, Bursa, Turkey***Introduction**

Therapeutic nerve blocks can reduce incidences of morbidity and mortality in trauma cases. Regional analgesia is very effective for pain management in acute trauma. Peripheral nerve blocks (PNB) used in conditions of multiple comorbidity do not entail complications of the airways and the haemodynamic response as in the use of general anaesthesia (GA). Pain reduction in the traumatised area by PNB can enable the reduction of adversities in the long term such as chronic pain, causalgia and post traumatic stress disorder.

Single nerve block procedures have been used successfully by emergency physicians and anaesthetists in traumas, the military action and in transport. Use of continuous catheter techniques for regional anaesthesia (RA) in military personnel has provided long term analgesia after wounding and during transport.

Discussion

In cases of acute trauma application of PNB by experienced healthcare staff is a means of easy and safe method for analgesia with reduced side effects. In procedures of digital implantation or conditions of peripheral ischaemia PNB reduces vasospasms and increases vascular flow by decreasing catecholamine release under continual sympathetic blockage.

While enabling pre-hospital early analgesia, sedation and the reduction the need for analgesia and facilitating the transport to hospital, factors such as the necessity of experience in patient selection and timely applications, and local anaesthetic toxicity (LAT) constitute limitations.

Approach for elbow block at the antecubital area involve blockage of the median, radial and the forearm medial and lateral cutaneous nerves; and, posteromedially the blockage of the ulnar nerve. Blockage can be achieved at the wrist level.

Use of ultrasonography in the hospital emergency services together with safe and easy procedures have increased the approach to RA. Interscalene block for shoulder dislocation, infraclavicular and

supraclavicular blocks for upper extremity interventions, intercostal block for chest tube placement for pneumothorax, and femoral block for lower extremity interventions are examples to increasing applications on minor cases at hospital emergency services.

Femoral nerve block has been shown to be a safe and easy to perform technique that causes minimal delays in transport. The femoral nerve is one of the major branches of the lumbar plexus. Femoral Nerve Block (FNB) is used for analgesia in the thigh, femur, knee and the lower part of the leg.

The nerve can be reached at the iliac crease. Femoral nerve catheterisation helps protect the lung function in patients waiting for surgery and reduces the need for opioid use and has been used increasingly in hip fractures.

Pre-hospital use of fascia iliaca compartment block (FICB) in femoral fractures without the necessity of special skill and equipment is effective in reducing pain. The injection point for fascia iliaca block (FIB) is 1 cm below the line between the pubic tubercle and the anterior-superior iliac spine; and 30-40 ml of local anaesthetic can be injected until seeing its lateral-medial spread. FIB is used for analgesia of the anterior thigh and the knee and can be considered as an alternative to FNB or the lumbar plexus blockage. Both the FIB and the FNB provide excellent anaesthesia of the middle and distal femur.

Posterior popliteal fossa sciatic nerve block involves the blockage of the sciatic nerve and the tibial and peroneal nerves which form its branches. It is frequently combined with the safenous and the femoral nerve blockage. Given the difficulty of placing the trauma patient in the prone position, the lateral popliteal approach is recommended by placing the trauma patient in the supine position.

Ankle block is suitable for surgery on the plantar surface, the dorsum and the digits of the foot, but it can be discomforting by requiring multiple injections. It is used for distal lower extremity procedures.

Conclusion

Use of the RA techniques is increasingly used for prehospital and emergency room pain management. Extremity blocks are often easy to perform even without ultrasound aid or nerve stimulation. Next to facilitating the perioperative analgesia and rehabilitation, PNB techniques appear to be advantageous in reducing the parenteral drug use and complications met in the trauma incident and during patient transport. Training the trauma teams for the prehospital period and the application of the treatment protocols should improve patient comfort, and decrease the incidences of complications and morbidity.

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05 April 2019, Friday

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SALINE INFUSION IN TRAUMA PATIENTS: FRIEND OR FOE

İlkay Baran Akkuş

Traumatic injury contributes to about one in ten mortalities, resulting in the annual worldwide death of more than 5.8 million people.

The goals of fluid resuscitation in trauma patients are improve hemodynamic indices, increase perfusion pressure, and prevent organ failure by hypoperfusion until hemorrhage is controlled. Fluid replacement is still the key element in early trauma resuscitation; however, the ideal resuscitation fluid in trauma patients is still controversial.

In trauma management Fluid resuscitation should be individualized according to patient , with factors such as the type of bleeding (controlled / not controlled), mechanism of trauma (blunt, penetrating), severity of injury, access to volume resources, the time of application of fluid(pre-hospital, pre-surgery, intensive care) and the response of the patient to the fluid.

Recently, there have been some dramatic changes in active hemorrhage management.

Damage control resuscitation consists of a bundle of interventions and strategies for resuscitation of the massively hemorrhaging patient aimed at restoring the physiologic derangements observed in trauma patients. These strategies are permissive hypotension, restriction of crystalloid infusions, and delivery of blood products in ratios resembling whole blood. These approaches supplement the principles of DCS whereby the team actively rewarms the patient, corrects their coagulopathy, and rapidly controls surgical bleeding. Conceptually, DCR can be thought of as the preemptive treatment of the lethal triad of acidosis, hypothermia, and coagulopathy.

Crystalloid-based resuscitation has been shown to worsen the lethal triad. The detrimental effects of excessive crystalloid administration have been known for many decades. Data from both animal and human studies show that massive intravenous fluid therapy prior to hemorrhage control leads to increased bleeding.

The potentially detrimental effects of early and aggressive volume replacement including

(1) dilution and hypothermia disrupting the coagulation cascade, (2) volume overload causing lung injury and abdominal compartment syndrome, and (3) increase in blood and hydrostatic pressure to disrupting wound healing and further blood loss were recognized, and ended up with the introduction of the damage control resuscitation (DCR) concept.

There is also increasing evidence that early aggressive resuscitation of hemorrhagic shock with predominately saline-based regimens may be associated with cardiac dysfunction, abdominal compartment syndrome, harmful inflammation, acute respiratory distress syndrome, multiple organ dysfunction syndrome and increased mortality. Limiting crystalloid infusions prevent dilutional coagulopathy, avoids potentiation of an already robust inflammatory response, and decreases the risk of later acute lung injury.

Large volume 0.9% saline resuscitation leads to acidosis from dilution of serum bicarbonate through replacement of lost plasma with non bicarbonate containing solutions. Serum chloride levels in the body range from 97 to 107 mEq/L. Chloride and bicarbonate ions reciprocally adjust up and down. This type of hyperchloremia potentially leads to a non anion gap metabolic acidosis and acute kidney injury when infused approximately 6 to 10 L within a 24-hour period.

In trauma patients, hyperchloremic metabolic acidosis compounds metabolic acidosis from injury associated with shock and potentially worsening outcomes. Hyperchloremic complications begin with a serum chloride level greater than 110 mEq/L. In addition to acidosis, hyperchloremia appears to have a negative impact on renal blood flow. Chloride partially regulates renal vascular resistance. Renal vasoconstriction inhibits the release of renin and angiotensin II. High chloride concentrations cause renal vasoconstriction, decreased glomerular filtration rate, prolonged time to first micturition, and decreased urine output leading to devastating renal complications requiring renal replacement therapy.

Recent guidelines recommend restricted use of saline solutions. The German guideline on the treatment of patients with severe/multiple injuries recommends that isotonic normal saline (0.9% NaCl) must not be administered for trauma patients with high level of evidence and the European guideline on management of major bleeding and coagulopathy following trauma also recommends the same with GRADE 2C evidence.

Lactate ringer provides better buffer for metabolic acidosis, Disadvantages; Increases endothelial dysfunction and neutrophil activation with increase in cellular damage.

In conclusion, the use of crystalloid should be limited in trauma patients and permissive hypotension should be allowed in appropriate patients. Crystalloid fluids can contribute to coagulopathy by causing dilution of coagulation factors and hypothermia in large volumes. In the early stages of trauma, the use of isotonic saline is still the first option. The use of isotonic saline in large volumes should be limited because of interstitial edema, acute lung injury, intraabdominal compartment syndrome, hyperchloremic metabolic acidosis. Fluid resuscitation in trauma management should be individualized according to the patient, including the type of bleeding, the mechanism of the trauma, the severity of the injury, access to volume resources, the time of administration of the fluid, and the patient's response to the fluid.

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05 April 2019, Friday

08:30-09:45	PANEL 6: Trauma to a pediatric patient	Chairs: Orhan KANBAK, Turkey Antigona HASANI, Kosova Rudin DOMI, Albania Ahmet COŞAR, Turkey
	Anesthesia in pediatric burn injury	Ivana BUDIC, Serbia
	Anesthesia in pediatric head injury	Marijana KARISIK, Montenegro
	Anesthesia in pediatric spinal trauma	Dušica SIMIĆ, Serbia
	Battered child syndrome	Dilek ÖZCENGİZ, Turkey

ANESTHESIA IN PEDIATRIC BURN INJURIES

Budic I¹, Marjanovic V¹, Jankovic R¹, Stevic M², Milenovic M³, Simic D²

¹ Department of Anesthesiology and Emergency Medicine, Medical Faculty, University of Nis; Clinic for Anesthesiology and Intensive Care, Clinical Centre Nis, Serbia

² Department of Surgery and Anesthesiology, Medical Faculty, University of Belgrade; University Children's Hospital, Belgrade, Serbia

³ Department of Surgery and Anesthesiology, Medical Faculty, University of Belgrade; Center for Anesthesiology and Resuscitation, Emergency Center, Clinical Center of Serbia, Belgrade

Summary

The anesthesiologist plays a crucial role in the management of the pediatric patient with burns. Indeed, the anesthesiologist will be involved in the provision of analgesia, sedation, and anesthesia to the patient at multiple stages. In the initial, assessment of the child's burn and resuscitation should be made. New treatment modalities and revised fluid management are available and are being effectively used in hospitals and burn centers. The ideal anesthetic technique for burn surgery has yet to be described. Selection of specific agents depends on airway status, patient pathophysiology and provider preference. Burn injured patients have altered pharmacokinetics and pharmacodynamics. Combining traditional principles of resuscitation with new approaches such as treatment of hypermetabolic response can optimize burn care and improve outcome for burn-injured children.

Key words: resuscitation, anesthesia, intensive care, burns, children

Introduction

In children, the majority of burns are from thermal injuries, either from contact with hot liquids or vapors, fires, or direct contact with hot surfaces. Electrical burns usually cause tissue destruction by direct thermal damage and associated injuries. For chemical burns, the degree of injury depends on the chemical, its concentration, and the duration of exposure. The severity of burn injury is characterized by the depth of the burn, the total body surface area (TBSA) that is involved, the location of burn injury, and the presence or absence of inhalation injury. In neonates, a smaller TBSA is

necessary for a severe burn due to the immaturity of the organ systems and the subsequent difficulty in maintaining homeostasis.

These children provide several anesthetic challenges, such as difficult airways, difficult vascular access, fluid and electrolyte imbalances, altered temperature regulation, sepsis, cardiovascular instability, and increased requirements of muscle relaxants and opioids.¹

Improved outcomes can be attributed to specialized burn centres, advances in resuscitation, protocolized and specialized critical care, improved coverage of wounds and treatment of infections, better treatments for inhalation injury, and the burn-induced hypermetabolic response.²

Prognostic scoring systems in burns

Burn surgeons and pediatric intensivists have independently developed scoring systems for their patient populations, primarily the Pediatric Risk of Mortality (PRISM) score (pediatric intensivists) and the Abbreviated Burn Severity Index (ABSI) (burn intensivists). Each of these systems has advantages, but it is unclear which system is most accurate in evaluating children with burns. The PRISM score is a highly-detailed severity of disease scoring system utilizing 14 variables including vital signs and lab values, which are collected over the first 24 h after admission. The PRISM may be assessed with capillary blood gases. It is widely utilized in the pediatric literature, being accurate and less cumbersome than other available scoring systems. Although the level of detail included in PRISM may improve its predictive value, it also leads to a necessary 24 h delay in calculation and may require unit conversion from what is supplied by the local laboratory. Perhaps the greatest potential issue for burns is that PRISM does not account for skin loss, the largest source of morbidity and mortality in burned children. As such, it has not been validated or widely used by burn intensivists. In stark contrast, the ABSI score is calculated from five variables (sex, age in years, inhalation injury, full thickness burn, total body surface area burned) that can be rapidly assessed at the time of admission, which eases calculation and allows for immediate prediction of mortality. The ABSI does not distinguish between infants and older children as the PRISM score does, though the two populations have disparate outcomes for the same size of burn. Although the ABSI is familiar to burn intensivists, it is not commonly used in the pediatric critical care setting.³

Pathophysiology of burns

The skin serves as a barrier to protect the host from infection and to prevent heat and fluid losses. The destruction of this protective barrier by a major burn injury leads to infection and to altered heat and fluid regulation. Severe burn injury also causes the release of local and systemic mediators of inflammation. Local mediators, which include prostaglandins, leukotrienes, and bradykinin, nitric oxide, histamine, and oxygen free radicals, cause localized and systemic capillary leak with resultant edema. Systemic mediators, which include interleukin (IL) 1, IL-6, IL-8, IL-10, and tumor necrosis factor α (TNF- α) cause a systemic inflammatory response almost immediately following burn injury.¹

Burn injury causes pathophysiologic changes to occur in all organ systems, and these changes can be divided into the acute phase, which resolves within 24–48 h, and the hypermetabolic or late phase. This milieu of pro-inflammatory cytokines leads to the release of stress hormones that create a hypermetabolic state, which begins 3–5 days postinjury.

Patient outcome and survival are directly related to the quality of the complex care that burn patients receive. Three key aspects of care exist. First, initial care at the scene, prehospital care, and the early hospital phase: adequate and timely response, assessment of the burns, resuscitation, and admission to a burn centre, escharotomies or fasciotomies, resuscitation, and treatment of inhalation injury.

Second, after hospital phase: wound care including burn surgeries, infection control, maintenance of organ function, and attenuation of hyper metabolism. Third, long-term phase: persistent hyper metabolism, reconstruction, and rehabilitation. Four interrelated aspects seem to be crucial for survival: burn shock and resuscitation, inhalation injury, wound closure, and burn hypermetabolism. Pain control is also an important aspect of burn care that affects burn outcomes and quality of life at all stages.²

Underhill and Blalock were among the first to describe the extensive loss of fluids in the burned patient. After this, the appropriate resuscitation of the acutely burned patient, including the amount and type of fluid given, was debated in the literature.⁴

Fluid management in major burn injuries

Many formulas have been studied, and all have the same goal of maintenance of organ perfusion during burn shock with restoration of intravascular volume. The most commonly used formula is the Parkland formula, which provides the total volume of crystalloid to be given over the first 24 h (4 mL/kg bodyweight/% TBSA burned). However, recent data suggest that the Parkland formula provides incorrect estimates of fluid requirements in patients with large and deeper burns, inhalation injury, delays in resuscitation, alcohol or drug use, and electrical injury, resulting in inadequate and inappropriate resuscitation. The catastrophic events associated with underresuscitation include multiple organ failure and death. Children were also excluded as the fluid resuscitation as well as the endpoint of resuscitation (urine output of at least 1 ml/kg/hr) for children differs from adults, and conclusions made for adults may not apply to children.

Several reports have documented that modern burn patients receive far more resuscitation fluid than predicted by the Parkland formula—a phenomenon termed “fluid creep.”⁵ Cancio et al.⁶ noted that clinicians were less likely to reduce fluid infusions in the face of increased (>50 ml/h) urine output than they were to increase fluids in the face of inadequate (<30 ml/h) output. Over-resuscitation in burn patients has been proposed as the cause of complications such as increased need for mechanical ventilation and resultant ventilator associated pneumonia, increased ICU stay, and abdominal compartment syndrome. With this in mind, it is easy to see that any excessive fluid given in the early post-burn period would increase capillary hydrostatic pressure and further reduce oncotic pressure, both contributing to a cycle of accelerated capillary leakage which requires ever greater amounts of crystalloid to satisfy. Depletion of plasma proteins alone can mimic burn edema, and infusions of albumin or dextran can almost completely prevent edema in unburned tissues.

Hemodynamic monitoring in burn shock resuscitation

One of the greatest challenges in resuscitation is monitoring whether the procedure is adequate and effective. The traditional endpoints of urine output (0.5–1 mL/kg bodyweight/h), mean arterial pressure (>65 mm Hg), normal base excess, and lactate concentrations are not always accurate and can be misleading. However, no better physiological markers exist that enable adequate resuscitation, and therefore, these parameters remain the gold standard. New attempts to improve and individualise resuscitation include use of thermal dilution catheters (PiCCO) and computer-assessed closed loop resuscitation. These technologies hold promise but have not been fully established in the clinic.²

Fluid resuscitation: crystalloids or colloids

Scientific literature addresses not only the amount of fluid used in resuscitation, but also the type of fluid. The best known formulae are: Evans, Brooke, modified Brooke, Monafu, Parkland and modified Parkland. None of the proposed formulae fulfills all the requirements. It is for this reason that, over

time, many formulae have been proposed and different centres use different calculations; i.e., in the UK, Muir and Barclay's formula is the most widely used. The main controversy in fluid resuscitation focuses on the administration of protein-based colloids: whether to provide or not, which solutions to use, and when to begin.⁷ Administration of large volumes of crystalloid during burn resuscitation decreases plasma protein concentration and further promotes extravascular egress of fluid and edema formation. Replenishment of plasma protein using colloids (either with albumin or plasma) would theoretically mitigate this effect. As a result, early formulas developed by Evans and by surgeons at the US Army Burn Center contained significant amounts of colloid in their calculations.⁸

The time at which the protein leakage stops has been described differently in the literature. Carvajal, as reported by Cocks et al.⁹ found that albumin extravasation stops 8 h after injury. According to Demling¹⁰, capillary leakage of protein ceases significantly about 12 h following the burn. Colloid is typically given at 24 hours postburn, but in a patient with a difficult resuscitation (receiving much larger volumes than anticipated) colloid was often given as early as 8 hours postburn. Many burns centres have now moved to using formulas where crystalloid is given for the first 8-12 hours, when capillary leak may be most pronounced, followed by colloid administration thereafter. Radioisotope experiments by Baxter and Pruitt et al have demonstrated that plasma expansion during the first 24h was independent of the type of fluid given, whether crystalloid or colloid.⁸

Inhalation injury

Another key component of early burn care is maintenance of adequate oxygenation and treatment of inhalation injury. A marked proportion of fire related deaths are not attributable to burn injury, but to the toxic effects of airborne combustion byproducts. Clinical signs of inhalation injury vary, but inhalation injury can be suspected when the patient has been exposed to smoke in an enclosed area and has physical findings of burns on the face, singed nasal vibrissae, bronchorrhoea, sooty sputum, and wheezing or rales. The best practice to diagnose inhalation injury is bronchoscopy. Once inhalation injury is diagnosed, treatment of the injury should start immediately. Patients with inhalation injury should not be prophylactically intubated, nor should they receive prophylactic antibiotics. Standard care protocols for inhalation injury include bronchodilators (salbutamol), nebulised heparin, nebulised acetylcysteine, and for extreme mucosal oedema, racemic adrenaline.

It is important to identify pediatric patients who may require definitive airway management early, as securing the airway becomes increasingly challenging with the development of oedema.¹¹

Airway management

Securing the airway in a pediatric burn patient is challenging. Within the first 24 h after burn injury, succinylcholine is safe to use without the risk of lethal hyperkalemia. Previously, the standard practice in pediatric patients was to place uncuffed endotracheal tubes to prevent mucosal damage. However, recent evidence suggests that low pressure high volume cuffed endotracheal tubes should be used since patients may have decreased compliance and may require high ventilatory pressures that can cause leaks around uncuffed tubes. In the acute phase, patients may have facial and airway edema that distorts the normal anatomy as well as limited neck mobility and mouth opening. All patients with face, neck, or upper chest injuries should be approached as potential difficult airways.

Anesthetic considerations for acute burn procedures

The management of pediatric burn patients provides challenges for the anesthesiologist. These patients are often critically ill with hemodynamic and respiratory compromise; however, operative management should not be delayed since early wound excision and coverage with skin substitutes,

within 72–168 h, improves mortality and decreases hospital stay in pediatric patients with acute burn without inhalation injury. The only drawback is the greater volume of blood loss.

Preoperative assessment and management

The preoperative assessment of a burn patient begins with an evaluation of the type and severity of burn injury and any associated injuries. Some patients with minor burns (TBSA <10%) typically do not require formal resuscitation, whereas those with major burns (TBSA >30%) develop the systemic physiologic changes described above and require resuscitation. Significant co-existing medical illness may merit more aggressive treatment and resuscitation even with minor burns. The patient's current physiologic state is determined by assessing the patient's current hemodynamics and / or pressor requirements, pulmonary compliance, ventilator set-tings, volume status, and urine output. The physical exam should include a thorough airway evaluation as many of these patients have distorted anatomy and are potential difficult intubations. Laboratory studies including complete blood count, electrolytes, coagulation studies, and BUN / creatinine should be noted. Special emphasis should be placed on correcting any acid–base disturbances. These patients have high metabolic demands; therefore, perioperative nutrition should be continued as long as possible. While some evidence shows that preoperative fasting of nasogastric feeds for <2 h may not increase aspiration risk, there is limited data on the safety and efficacy of this practice. Burn patients can develop gastric stasis, which increases their aspiration risk. Naso-jejunal enteral feeds are an alternative to nasogastric feeds to minimize the risk of aspiration. Continuing naso-jejunal feeds perioperatively does not appear to increase the risk of aspiration. While parenteral nutrition can be continued perioperatively in lieu of enteral nutrition; this practice is not without risk since parenteral nutrition is associated with increased mortality and altered gut physiology. During the preoperative assessment, attention should be paid to any fear, anxiety, and pain that the child may have. Appropriate premedication should be given as indicated prior to transport to the operating room.¹

Monitoring

Large thorax burns may necessitate creative, non-standard surface electrode placement for EKG monitoring. Esophageal EKG monitoring is another option. Peripheral pulse oximetry may be unreliable with extensive burn injury, hypoperfusion, or hypothermia. Alternative sites of probe placement include the ear lobe, buccal mucosa, tongue, and esophagus. Invasive blood pressure monitoring is advantageous if the extremities are injured or if large fluid shifts or blood loss are expected. Temperature should be monitored given the propensity for heat loss. Invasive central venous pressure monitoring along with urine output measurements may provide insight into the patient's volume status; however, these measurements may not be useful especially in the setting of intra-abdominal hypertension or abdominal compartment syndrome.

Induction and maintenance

An inhalational or an intravenous induction can be performed depending on the patient's current physiologic condition. During the initial burn shock phase, decreased circulatory blood volume, cardiac output and tissue perfusion lead to reductions in renal and hepatic blood flow, which prolongs the rate of drug distribution and onset of clinical effects. Lower doses of agents are typically required because of prolonged duration of action and slower rates of renal clearance. During the subsequent hypermetabolic phase, high blood flow to the liver and kidneys, decreased plasma albumin, and an increased level of α -1-acid glycoprotein result in altered protein binding and increased renal clearance. Anesthetic requirements are generally increased including minimal alveolar concentration for volatile anesthetics, and the duration of action is decreased requiring frequent redosing of agents.

Balanced general anesthesia consisting of an opioid, muscle relaxant, and volatile agent is the most common anesthetic technique used for burn excision and grafting. Propofol and thiopental have been used successfully for induction, though they should be carefully titrated to minimize dose dependent cardiac and respiratory depression. Etomidate is an effective induction agent because of its stable hemodynamic profile and is considered a good choice for burned patients who may not tolerate changes in heart or cardiac output. However, the use of etomidate in septic patients is controversial because of adrenocortical suppression following a single bolus dose and likewise may not be the best choice of induction agent for immunocompromised burn patients. Ketamine offers many advantages for induction and maintenance of anesthesia for burn-injured patients and is routinely used for burn-related procedures. Ketamine may be particularly useful for the induction of hypovolemic patients due to sympathomimetic effects that cause dose-dependant increases in arterial blood pressure and heart rate. Increased systemic vascular resistance may be advantageous during burn surgery, as it reduces heat and blood loss from burned skin compared with vasodilatation caused by virtually all other anesthetic agents. Ketamine offers additional benefits of airway reflex preservation, dissociative anesthesia, and potent analgesia. Minimal increases in heart rate observed after ketamine is administered to hypermetabolic patients may result from preexisting elevated levels of catecholamines that result in a decrease in the number of receptors and a down-regulation of receptor affinity.¹²

Maintenance is achieved with potent inhalational agents, a nitrous-narcotic technique, or a total intravenous anesthetic. Patients that are in the acute phase of their injury may be too hemodynamically unstable to tolerate the potent inhalational agents; therefore, a nitrous-narcotic technique with or without ketamine supplementation might be preferred. After 48–72 h, burn injury induces an up-regulation of extrajunctional nicotinic acetylcholine receptors in the muscle membrane, which leads to hyperkalemia from succinylcholine as well as resistance to nondepolarizing muscle relaxants. Burn patients are shown to have higher requirements for thiopental up to a year postinjury. Burn patients also have an increased requirement for opioids due to both pharmacokinetic changes and to development of tolerance. Because of the pharmacologic changes with burn injury, all drugs should be titrated to clinical effect.¹

Intraoperative fluid losses

Large fluid losses occur during major burn surgeries due to insensible evaporative losses from the burn wounds and blood loss from excised wounds and donor sites. There is limited data to approximate the amount of blood loss during excision and grafting procedures. Expected blood loss increases each day postinjury as the wound becomes more hyperemic. Blood loss is greater for tangential excisions as compared with fascial excisions and is approximated as 4 ml/cm² and 1.5 ml/cm², respectively. Blood loss also increases in infected wounds. Frequent hematocrit and hemoglobin measurements are necessary to best determine blood loss for each individual patient. An approximation of anticipated blood loss can be made based on the surgical procedure and the TBSA to be excised. Intraoperative fluid losses can be replaced with crystalloid or colloid solutions. Depending on the patient's preoperative hemoglobin concentration, the anticipated blood loss, and the lowest tolerable hemoglobin concentration, an appropriate number of red cell units can be cross-matched.

Temperature regulation

Pediatric burn patients are at great risk for intraoperative heat loss due to the lack of an intact skin layer and due to their high surface area to volume ratio. Hypothermia increases metabolic heat production, which diverts metabolic energy from other areas such as wound healing. Therefore, one must take care to prevent intraoperative heat loss in these patients.

Postoperative management

A detailed handover from theatre staff to ward personnel is vital for good patient care. Good pain control after surgery is non-negotiable. At this time, volume losses are ongoing from the blood and serum oozing from the operative sites. Hemodynamic monitoring and observation of blood loss is essential. Children are often cold after theatre and need to be actively warmed. Feeding and drinking should be re-introduced as soon as possible, and nausea and vomiting aggressively managed.¹³

Pain management

Burn pain is a combination of background pain, procedure related pain, and postoperative pain. Background pain, which is proportional to the size of the thermal injury, must be adequately controlled before procedural pain and postoperative pain can be addressed. Background pain is typically controlled with opioids. These patients do develop tolerance to opioids; therefore, the doses should be reassessed frequently and should be titrated to patient comfort. In order to minimize the escalation of opioid doses patients other agents, such as acetaminophen, ketamine, or alpha-2 agonist, such as clonidine, can be used as analgesic adjuncts. Using of alpha-2 agonist to prevent withdrawal of narcotics and benzodiazepines in ICU patients also has been documented. Nonsteroidal anti-inflammatory drugs are also useful analgesic adjuncts; however, they carry the risk of renal tubular dysfunction. Burn pain can have a depressive effect and /or associated anxiety, which can be treated with anti-depressants and benzodiazepines, respectively. Background pain should be adequately controlled in order to have effective control of procedural pain. Procedure related pain is controlled with additional boluses of opioids, benzodiazepines, and /or ketamine.

Regional anesthesia

Regional anesthesia techniques, epidural and peripheral nerve blocks, can provide postoperative pain control. There is limited data on the efficacy of epidural block in pediatric burn patients. Similarly, there is limited data on the use of peripheral nerve blocks for postoperative pain control in this population.

While regional anesthesia techniques offer benefits for pain control, it may be difficult to find sites for regional anesthesia that are free from burn injury in the setting a severe acute burns.

Treatment of hypermetabolic response

A key cause of poor outcomes after burn injury is the hypermetabolic response, which is associated with severe alterations in glucose, lipid, and aminoacid metabolism. Hypermetabolism leads to severe catabolism, which is associated with protein breakdown (razlaganje) in muscle and in organs, leading to multiple organ dysfunction. Therefore, hypermetabolism, organ function, and consequently survival, seem to be closely linked. The burn induced hypermetabolic response that occurs in the ebb phase (48 h after burn) and flow phase (>96–144 h after burn) is profound, extremely complex, and most likely induced by stress and inflammation. Treatment options for hipermetabolism include pharmacological and non-pharmacological strategies. The main goal of nutritional support is to provide an adequate energy supply and the nutrients necessary to maintain organ function and survival. Early wound excision and closure have been the biggest advances in burn care in the past few decades. Early excision and grafting has substantially reduced basal energy expenditure, mortality, and costs. The higher the room temperature the lower the metabolic demand. Providing patients with burns with physical therapy is a crucial yet easy intervention that can ameliorate metabolic disruptions and prevent contractures of the burn wound. Drugs are used as an adjunct for the treatment of various aspects of the hypermetabolic response. In the past two decades, several agents have been tested; some are more effective and promising than others (e.g. propranolol, insulin).²

Conclusion

Major burn injury remains a significant cause of morbidity and mortality in pediatric patients. There are insufficient data to support a treatment standard treatment at this time. The ultimate goal of intensive burn care is to keep the patient alive, an outcome that is dependent on coverage of burn wounds, maintenance of organ function, control of infection and sepsis, and alleviation of hyper metabolism. Critical adverse events in burns anaesthesia and surgery are common, and mainly relate to the airway and haemodynamic compromise. One of the major determinants for survival of severely burned patients is appropriate fluid resuscitation.

In 1973, Gordon Bush, a pediatric anesthesiologist, said: "Apart from all else, a humane, friendly, gentle and encouraging approach is essential in dealing with a burned child. The burns of today are the suffering of tomorrow and the scars of a lifetime".

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05 April 2019, Friday

08:30-09:45	PANEL 6: Trauma to a pediatric patient	Chairs: Orhan KANBAK, Turkey Antigona HASANI, Kosova Rudin DOMI, Albania Ahmet COŞAR, Turkey
	Anesthesia in pediatric burn injury	Ivana BUDIC, Serbia
	Anesthesia in pediatric head injury	Marijana KARISIK, Montenegro
	Anesthesia in pediatric spinal trauma	Dušica SIMIĆ, Serbia
	Battered child syndrome	Dilek ÖZCENGİZ, Turkey

Objective: To describe the optimal anesthetic management of patients with brain injury, with emphasis on the

Abstract

ANESTHESIA IN PEDIATRIC HEAD INJURY

Marijana Karišik, MD
Department of Anesthesia
Institute for children diseases
Clinical Center of Montenegro
Podgorica - Montenegro
Montenegro Airway Management Study Group Task Force - Coordinator
Europien Airway Management Society, Council Member

Traumatic head injury in children is frequently followed by other traumatic injuries of internal organs, lungs, limbs, or the spinal cord and represents the leading cause of serious morbidity and mortality around the world.

Many children who survived severe traumatic brain injury are left with significant cognitive, physical, behavioral and emotional damage.

Pediatric anesthesiologists are involved in preoperative management (resuscitation and stabilization in the emergency department, anesthesia for imaging), perioperative management and intensive care management of patients with traumatic head injury. Immediate control of the airway management, cervical spine, breathing and circulation are the most important initial interventions.

While severity of primary injury is the major factor in determining the outcome, avoiding hypotension, hypoxemia, hypo/hypercarbia, hypo/hyperglycemia, fever and raising intra-cranial pressure (ICP) during the perioperative period, can reduce the impact of secondary brain injury.

Neuroprotective anesthetic management supports oxygen delivery to the brain, affects cerebral perfusion positively, preventing cerebral ischemia and thus improving the outcome.

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SPINAL INJURY IN PEDIATRIC PATIENTS

***Dušica Simić^{1,2}, Ana Vljaković¹, Ivana Budić^{3,4}, Miodrag Milenović^{1,2},
Siniša Dučić^{1,2}, Marija Stević^{1,2}***

1University Children's Hospital, Belgrade, Serbia

2Medical Faculty, University of Belgrade, Serbia

3Clinical centre, Niš

4 Medical Faculty, University of Niš, Serbia

***Correspondance information: Dušica Simić, University Children's Hospital, Tiršova 10,
11000 Belgrade, Serbia. Tel.: +381 (0)64 12 13 819; +381 (0)11 20 60 649;
Email: ducicasimic2@gmail.com***

ABSTRACT

The leading causes of death in the childhood worldwide are injuries and violence. Spinal cord injury is potentially crippling injury which usually results in severe and permanent disability, but it is relatively rare before the age of 15 years and account for a low proportion of all childhood injuries. The most common level of the spinal injury in the childhood under the age of 8 years is upper cervical region, while in the older children it is thoracolumbar level. Cervical spine clearance in the very young child is exceptionally challenging.

It is of great importance to thoughtfully note the differences between developing child's spinal cord and normal adult spinal cord. Anatomical differences with adults along with the flexibility and elasticity of the pediatric spine, makes these injuries a biomechanically separate entity. Management depends upon the age, severity, level of injury and degree of neurological deficit. The medical, emotional and economic impact can be immense throughout the lifespan of the injured children, if not treated at time.

It appears that functional recovery is faster and better in pediatrics population. Sustaining a spinal cord injury alters every aspect of a person's life significantly and irreversibly.

Keywords: pediatric, injury, spinal, trauma, neurological damage

INTRODUCTION

Trauma is the leading cause of death in children worldwide, responsible for about 950 000 deaths per year in children under the age of 18 years (1, 2). Globally, more than 95% of all injury deaths in children

happen in low-income and middle-income countries and for about 40% in developed countries (2). Head injury is the most affected body region in pediatric trauma (3). Pediatric patients with trauma represent unique challenges to front-line care providers (4).

Pediatric spinal cord injury (SCI) can be life threatening, but it is a relatively rare occurrence before the age of 15 years and accounts for only 1%–10% of all reported spinal injuries (5, 6). Spinal trauma in children is quite different than in adults due to anatomic, physiologic and metabolic factors that leads to injury patterns, clinical presentation, imaging analysis, management principles, response to deformation and outcome (4, 7). The mechanism of injury is different to those in adults due to higher center of gravitation, unproportionally larger head compared with body size, multiple vertebral ossification centers and increased laxity in spinal structures (8). Characteristic injuries occurring in the childhood are occipito-atlantal or atlanto-axial dislocation, atlanto-axial rotary subluxation, spinal cord injury without radiological abnormality (SCIWORA) and multiple thoracic compressions (7).

The first 24 hours following the injury is associated with the highest incidence of complications (9). The neurological recovery rate in the pediatric population appears to be better than in adult population, but still there are no studies comparing adults and children in terms of recovery and it is therefore difficult to distinctly establish if neurological recovery is significantly better in children (5).

When SCI occurs in children, because of the lack of effective therapy for restoring neurological function below the level of injury and increase long-term survival, the lifetime medical costs are exorbitant, for a single patient it can be as high as \$3 million (10, 11).

EPIDEMIOLOGY

The incidence of SCI in pediatric population increases rapidly with age (5). More than 30% of injuries occur between the ages of 17 and 23 and 53% occurring between the ages of 16 and 30 (5). In polytraumatized pediatric patients spinal injuries are relatively rare (12). The 60% of the cervical spine injuries in children may be associated with head injury (13). Level of the spinal cord injury correlates with the age of the patient; in children younger than 8 years injuries mostly happen to the upper cervical spine, while thoracolumbar junctional injuries are most common in the older children (7, 14). Traumas of lower cervical cord are equal in both groups (7). Spine injuries are uncommon in the pediatric population, with the incidence of 1-2% of all injuries in the childhood (15). Up to 60 to 80% of pediatric vertebral injuries occur within the cervical spine, while in adulthood, of all spinal injuries only 30-40% occurs in cervical region (6, 14, 15, 16). The incidence of SCI in the thoracolumbar spine in children is between and 5.4% to 34% (17). Male to female ratio in pediatric injuries varies with the age groups, which may reflect gender differences in injury prone activities in the different ages.

In pediatric patients with cervical spine trauma the mortality rate ranges from 16% to 18% (14).

Spinal trauma has permanent neurologic deficit in up to 60% and mortality as high as 40% (18).

UNIQUE CHARACTERISTICS OF THE PEDIATRIC PATIENT

The most important pediatric differences compared to adults are anatomical, radiologic and increased elasticity. Pediatric pattern of injury to that of adults has been held to occur around the age of 8–9 years, while some authors maintain that the trend to an adult pattern of injury does not start until 10–11 years and does not equal that of the adult until late adolescence (19).

Uniqueness of the growing spine is the fact that ossifying cartilages are present and these ossification centers are joined by synchondrosis which may be misguided for fracture. Atlas vertebra develops from three ossification centers and these ossification centers appear at 1 year and fuse by 7 years. Axis

develops from four ossification centers. The odontoid is separated from the body by a cartilaginous physis which is positioned below the level of the C1/C2 facet joints and it is usually mistaken for a fracture until they fuse, at the age of 5–7 years. The rest of the cervical and the thoracolumbar vertebrae follow a similar pattern with one ossification center for the body and one each for the posterior arches and lateral masses, which unite in the midline between 2–4 years age and the neurocentral synchondrosis closes at 3–6 years (7).

The ligamentous structures are more flexible in young children compared to adults (19). As a result of flexibility there is a lower frequency of SCI when compared to adults and it is more likely to see SCI in young children without an associated bony fracture (19). Young children are more prone to flexion and extension injuries due to greater head to body ratio and consequently a higher center of gravity what results in relatively greater torque and acceleration forces applied to unformed neck musculature and relatively more lax and elastic ligaments and joint capsules (20). Additionally, in young children, the fulcrum of cervical motion is much higher and lies at C2/3, what differs from the adolescent and adult fulcrum at C5/6 level. Children are predisposed to subluxation and translational movements of cervical vertebral bodies due to more horizontally orientated articulating facet joints. This translational movement is aggravated further by the normal anterior wedging of the superior aspects of the vertebral bodies in children (20). Due to increased flexibility and due to greater head in relation to body size cervical injuries are most common in this age group (19). Trauma in thoracolumbar region in children usually presents with multiple levels of fractures of the endplate, with the superior endplate being more often (7).

CAUSES AND MECHANISMS OF INJURY

The most common cause of SCI in the childhood is motor vehicle collisions, followed by violence and sports (21). Toward the causes of injury, there seem to be two distinct causes affecting younger children and adolescents (5). Younger children were usually injured in motor vehicle accidents whereas adolescents were commonly injured during sport activities (5). Unique causes of SCI in the childhood are traumatic injuries as consequences of lap belt injuries, child abuse and birth injuries and non-traumatic injuries such as instability of the upper cervical spine seen in Down syndrome, spinal stenosis seen in skeletal dysplasia and inflammatory conditions such as juvenile rheumatoid arthritis (21).

Significantly less force leads to injury of children's spine cord than in injuring an adult and pathophysiology varies noticeably in children compared to adults. Three primary forces that lead to spinal injury are: longitudinal compression, hinging and shearing forces (22). Longitudinal compression forces compress the vertebrae against one another and are typically seen in falls from height, when we see vertebral body fractures. Hinging forces the patient experiences in whiplash, from bending over seat belts and when the body is exposed to sudden direction changes. Repercussion of this force is usually transverse fracture. And the third one is shearing force which is combination of longitudinal and hinging forces, and it is typically seen when patient is twisted/thrown in a sporting accident or when is struck by a car.

Lap-belt injuries and the seat-belt syndrome are seen usually in children involved in motor vehicle accidents due to their thinner and less muscular abdominal wall. The seatbelt syndrome is characterized by abdominal wall ecchymosis, intra-abdominal organ injuries and vertebral fractures with SCI. In evaluation children involved in motor vehicle crash with any of the components of the seatbelt syndrome, it is necessary to search for associated injuries to avoid the catastrophic consequences. The most common intra-abdominal injuries are hollow viscus injuries followed by vertebral column and spinal cord injuries (23).

There is growing scientific evidence suggesting that exists an association between occult spinal injury and abusive head trauma known as shaken baby syndrome, maybe it is because of the larger use of spinal MRI nowadays (24). Involvement of the cervical spine among children with abusive head trauma happens due to flexion and hyperextension injury during shaking. Children with suspected child abuse often took a long time to arrive in the hospital from the injury event (median 8 hours) (24).

Birth spinal cord injuries are rare condition and the incidence is approximately 1 per 60000 births (25). The most common birth injury level is upper cervical spine followed by cervicothoracic level. Spinal birth trauma may occur in context of difficult delivery characterized by excess traction, rotation and hyperextension (26). The mortality rate in spinal birth injury is extremely high (25).

PATHOPHYSIOLOGY

The tissue damage is due to primary and secondary events. Primary injuries occurs at the time of traumatic insult and may include tearing, lacerations, punctures and compressions, while secondary injuries develop over hours to days as a result of complex inflammatory process, bleeding, ischemia and swelling (27). Furthermore, secondary spinal cord deterioration has the tendency to worsen during the first moments after the primary injury, and accordingly treatment during this “window” of time has the possibility to prevent or reduce further neurological damage. Insufficiently knowledge about the exact time of many secondary mechanisms and therefore the exact time for the therapeutic window in which is optimal to treat many of these processes is still unknown (11).

SCI are considered either as complete or incomplete (28). Complete injuries results in total loss of motor and sensory function bellow the level of injury and incomplete injuries results in some degree of motor and sensory preservation below the level of injury. The distinction may not be possible to make until spinal shock has resolved because in spinal shock all reflexes may be lost below the level of injury. Spinal shock is defined as a condition of transient physiologic, rather than anatomic, reflex depression of spinal cord function below the level of spinal cord injury and usually lasts for days or weeks after the injury and the average duration is 3 to 4 weeks (29). During the spinal shock patient appear completely paralyzed, but may show significant recovery after the initial phase have resolved.

CLINICAL EVALUATION

The full extent of the SCI may not be completely understood immediately after the trauma, but may be revealed with a comprehensive medical evaluation and diagnostic testing.

The clinical examination in children can be difficult due to lack of adequate verbal skills, or when patient is present in setting of polytrauma, or have altered mental status. Spinal trauma should be highly suspected in the presence of a high-risk mechanism of injury and abnormal neck or neurological examination, even if the radiographic evaluations are without any sign of trauma (5). Signs and symptoms of acute SCI appears below the level of injury in form of flaccid paralysis, loss of spinal reflexes, loss of sensation, loss of sweating and loss of sphincter tone, bowel and bladder dysfunction (30).

The basis of standard trauma protocols in the initial management of acute spinal trauma includes plain X-rays and computed tomography (CT). These imaging modalities can identify most fractures but it is limited in showing ligamentous injuries, and cannot identify soft tissues to the same degree as magnetic resonance imaging (MRI) (31). The NEXUS (National Emergency X-Radiography Utilization Study) is based on 5 low-risk criteria that allow physicians to avoid X-ray evaluation in the assessment of cervical spine in children less than 18 years (25). These five low-risk criteria were the absence of: midline cervical tenderness, evidence of intoxication, altered level of alertness, focal neurological

deficit and other painful distraction injuries. If any of the five criteria were met the child was considered as high-risk for SCI. When cervical spine radiographs were obtained a minimum of 3 views (antero-posterior, lateral and odontoid) need to be obtained. Open mouth view of the odontoid does not seem to be helpful in children less than 5 years (25).

SCIWORA is a unique pattern of SCI described exclusively in children due to the difference between elasticity of the spinal column and the neural elements (19, 25). It is defined as objective signs of acute traumatic spinal cord injury in the absence of notable findings of static and dynamic flexion/extension films, CT imaging, and X-ray or CT myelography, also excluding injuries from penetrating trauma, obstetric complications and electrical shock (30). SCIWORA is more common in children up to 8 years and it represents up to 35% of SCI before the age of 17 years, usually following serious trauma (20, 32).

INITIAL MANAGEMENT

Acute SCI is a medical emergency. If there is any doubt of injury to the spinal cord, emergent medical attention is absolutely necessary on the scene of the accident injury. The primary goal of pre-hospital management of patients with potential spinal cord injury is to prevent additional injury. The primary trauma survey places special emphasis on the airway, breathing, and circulation (ABCs of resuscitation). When immobilization is necessary for children transport, than the type of immobilization should take into account the child's age and physical maturity. An ideal spinal immobilization of pediatric trauma patients appears to be ensured by a combination of spinal board, rigid collar and tape, but these immobilization techniques may negatively affect the child's respiratory function (25). Immobilization of the child's cervical spine in neutral position is desired. Thoracic elevation or an occipital recess is recommended in children <8 ages to achieve a more neutral position. High frequency of multiple-site injury highlights the need for stabilization of the total spine, not just the cervical (33).

The management of pediatric cervical spine has traditionally been conservative, only unstable injuries have been treated operatively (34). The Spinal Trauma Study Group identified the first 24 hours after the injury as the most promising time window during which decompression may afford neuroprotection, but unfortunately to date surgical guideline that rigorously explores the merits of early versus late surgical decompression for SCI doesn't exist (35).

Review of the available literature doesn't give any evidence to support the use of neuroprotective assessments including hypothermia and steroids (5). Methylprednisolone was considered most controversial because there are very different opinions about the use in SCI (11). The current evidence for steroid use in adults is very weak (5). Certain evidence suggesting that children treated with corticosteroids had worse outcomes and harmful side effect is more consistent than any suggestion of clinical benefit (36, 37). On the other hand as recommended on the basis of the National Acute Spinal Cord Injury Studies (NASCIS-2 and NASCIS-3), high-dose methylprednisolone is the only effective neuroprotective agent tested in controlled multicenter clinical trials (11). Many centers worldwide still use methylprednisolone probably despite lack of clear evidence of its efficacy and to avoid legal repercussions (38). It is important to note that methylprednisolone is not recommended for use in acute SCI according to the Food and Drug Administration (39). If the decision is made to administer steroids, than high dose of Methylprednisolone should be given within eight hours of injury, but only with previously proven non-penetrating spinal trauma (11).

Increased risk of developing deep venous thrombosis (DVT) exists in patients with SCI due to neurologic dysfunction, immobilization and hypercoagulability (35, 40). Disagreements about the optimal type and timing of prophylaxis still exist, even though the existing guidelines on anticoagulation prophylaxis are rather extensive (35).

LONG-TERM OUTCOMES

Life-long follow-up is necessary to prevent and detect complications. The healthcare team educates the family after hospitalization how to best care for their child at home focusing on maximizing resting child's capabilities. Studies have shown that SCI has a definite negative impact on quality of life (QoL) across a range of dimensions, such as physical, social and emotional functioning, mental health, vitality and pain (41). As a consequence of pediatric related SCI and relatively long life span children are at risk of SCI-related complications for a longer duration than those with adult-onset SCI (42).

Life expectancy after SCI is significantly reduced due to complications like neurogenic bladder, urinary tract infections, pneumonia, septicemia, cardiac diseases, pressure ulcers, syringomyelia, scoliosis and neuropathic pain (42, 43, 44). For those injured as children, the life expectancy may be lower, 50–83% of normal. Scoliosis development following SCI in children is a common entity especially when the neurological insult occurs before their adolescent growth ends (5). Neuropathic pain and spasticity are multifactorial and complex consequences after SCI (45).

Adults with SCI in the childhood were less likely to live or drive independently or be married compared to the general population, but the employment rate for adults with pediatric-onset SCI is much higher than employment rates reported among individuals who gained spinal trauma in the adulthood (46).

CONCLUSION

Spinal trauma in the childhood is a devastating and life-altering injury. It is of great importance to remember that all trauma patients require spinal clearance. An understanding of the unique nature and growth potential of the immature skeleton is of paramount importance in treating a child with a suspected cervical spine injury. Although SCI is rare in pediatric population, the physiologic, psychosocial and economic impact is far reaching, but nevertheless many children are able to lead meaningful and productive lives.

It is also very significant to note that disabled child requires a focus on maximizing his/her capabilities at home and in the community with positive reinforcement and promoting independence. And never forget, when a child is injured, the whole family is injured too.

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05 April 2019, Friday

10:00-11:15	PANEL 7: Trauma in specific cases-the most important points!	Chairs: Saadet ÖZGEN, Turkey Tritan SHEHU, Albania Dejan LEKOVIC, Montenegro
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	Trauma in alcohol and drug addict patient	Nuray ALTAY, Turkey

OBESITY AND TRAUMA

Dr. Esra OZAYAR

Kecioren Training and Research Hospital, Ankara

While the number of obese patients increasing in the world more trauma patients with obesity are likely to be triaged to the hospitals. The practitioners should be better prepared to manage this population. Large adipose tissue negatively affects each phases of the resuscitation such as airway management, respiratory mechanics, monitoring and support, circulatory monitoring and optimization (1). Comorbidities in obese population are; hypertension, diabetes, history of stroke, increased risk of cancer and respiratory problems. These can increase morbidity and mortality independently or in association with other conditions (1). Studies have shown the relation between the obesity and severity of the injury, hospital length of stay (LOS), intensive care unit (ICU) admission, higher infection rates, increased ventilation days, the pattern of the injury and the rate of complications and mortality. Management of obese patients following trauma needs attention in terms of airway management, circulation, breathing and disability.

Trauma is one of the important cause of death for all ages. Head, chest and abdominal trauma are the main causes of the traumatic death. Anterior abdominal fat content plays a protecting role in abdominal blunt and penetrating injuries which leads lower rates of liver and head injuries (2). A study reveals fewer head injuries but more chest and lower extremity injuries in obese patients (3). Mortality rate among the obese population from trauma is 8 times higher than non obese population.

CHALLENGES IN MANAGEMENT OF OBESE TRAUMA PATIENTS

AIRWAY AND RESPIRATORY SYSTEM

Airway management in obese patients is challenging due to short thick neck, limited extension, fat accumulation in the pharyngeal region and loss of landmarks. Pharyngeal fat tissue may lead pharyngeal wall collapse during airway management. Obesity and obstructive sleep apnea (OSA) are the risk factors which may lead airway obstruction while the patients are lying flat. Factors predicting the difficult airway include, Mallampati score, limited mouth opening, reduced cervical mobility, upper lip bite test, obstructive sleep apnea syndrome (OSAS), increased neck circumference. Due to fat mass surrounding the thorax the restrictive lung pattern impairs the ventilatory function in obese population.

Challenges & Considerations of management of the obese patient airway and respiratory system are as follows;

-Reverse Trendelenburg position to improve pulmonary function

- 2 person for effective bag mask ventilation
- Oxygen saturation should be monitored closely
- Ramp position with the elevation of the head of the bed (patient should be positioned by targeting the alignment of the external auditory meatus and the sternal notch in the horizontal axis)
- Move all skin folds during intubation
- Immobilization of the c-spine if the c-collar is not an option
- Gastric tube insertion to avoid aspiration
- Difficult airway management equipments containing fiberoptic bronchoscope and videolaryngoscope should be available
- Early cricothyrotomy or tracheotomy option should be kept in mind in case of an unsuccessful intubation maneuvers
- Sedation or premedication may lead airway obstruction and hypoxia
- Preparation to intubation should include effective preoxygenation to increase safe apnea time during laryngoscopy procedure. (Safe apnea period is shorter in obese population due to reduction of functional reserve capacity (FRC) 10 cm H₂O during preoxygenation reduces atelectasis and increases the safe apnea time. Preoxygenation by high flow nasal cannula is another option which allows oxygen delivery during apnea period)
- Fat accumulation in the diaphragm and intercostal muscles leads reduction in effective gas exchange
- In supine position work of breath increases
- Calculations for ventilatory settings should be based on ideal body weight to avoid barotrauma and volutrauma
- Increased intrathoracic pressure due to increased intraabdominal pressure leads decreased thoracic and pulmonary compliance

CIRCULATION

Obese patients have increased blood volume, stroke volume, cardiac output and left ventricular volume leading ventricular hypertrophy and decreased compliance. IV access may be challenging due to adiposity and skin folds.

Challenges&Considerations

- Excessive fat tissue causes difficulty to palpate pulses
- Loss of landmarks of carotid and femoral pulses
- Usage of ultrasound may be helpful for line placement or central catheter insertion.
- Higher blood volume and cardiac output causes ventricular hypertrophy and decreased compliance
- Non- aggressive fluid resuscitation
- Close hemodynamic monitorization of fluid resuscitation
- Atrial dilatation may cause arrhythmias and sudden death

- Due to loss of landmarks treatment of pericardial tamponade may be challenging

CRITICAL CARE

-Obese trauma patients often admit to ICU with hypoxemia, multiple fractures, respiratory distress. Studies revealed that morbidly obese patients with traumatic injury have higher multiorgan failure rates and four fold longer hospital stay (4,5).

-Adult respiratory distress syndrome rates are higher in obese trauma patients with respiratory distress comparing to non- obese patients.

-Feeding tube insertion needs caution

-Early mobilization decreases mortality and morbidity in ICU

-Monitorization of creatinine kinase levels, renal function and rhabdomyolysis is important

-Decubitus ulcer and wound complication rates are higher

-Weight based tromboprophylaxis (LMWH)

OTHER ISSUES

-Because of large surface area obese patients are at risk of hypothermia

-Hypothermia leads coagulopathy

-Skin folds management may lead skin tears as obese patients are prone to skin tears during cloth removal

-Skin folds examination for fungal infections, wounds and retained objects is important

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HEART AND LARGE VESSEL TRAUMAS

Ender Gedik, MD, FICS, EDIC.

Dep. of Anesthesiology, Dep. of Critical Care, Başkent University, Faculty of Medicine, Ankara, Turkey.

Chest trauma is the second most common cause of mortality after head trauma and accounts for about 25% of traumatic deaths. Immediate deaths are usually due to massive injury of the heart, great vessels, or lungs. Multisystem injuries such as head, face, spine, abdomen, and extremities frequently coexist in patients.

Initial assessment includes mechanism of injury, history and physical exam, and resuscitation of vital functions. In the operating room, priorities include definitive airway management, monitoring of hemodynamics, support of vital signs and organ perfusion, a high suspicion for associated injuries, measurement of pertinent laboratory values, provision of general anesthesia, and treatment of injuries.

Hemorrhagic shock is treated with warmed fluid resuscitation using rapid infusion devices and large-bore intravenous access. If the patient does not respond to fluid and blood resuscitation, blood pressure support should be considered with vasopressors and inotropes. Other diagnoses should be investigated including blunt cardiac injury, and cardiac tamponade.

Chest trauma can be classified as penetrating or blunt. Penetrating wounds of the chest, such as gunshot and stab wounds, can directly injure any or all structures in the trajectory of the missile or weapon, causing cardiac injury, and great vessel injury. Gunshot and shrapnel wounds cause both direct injury to structures encountered by the weapon and secondary injury due to the blunt trauma-like shock wave created by the missile. Blunt forces applied to the chest wall cause injury by rapid deceleration, direct impact, and compression. Rapid deceleration is the usual force involved in high-speed motor vehicle collisions and falls from a height.

Penetrating cardiac injuries are usually caused by gunshot wounds (63%), stab wounds (36%), and rarely by shotgun wounds and ice picks. Beck’s triad—muffled heart tones, jugular venous distention, and hypotension—describes the classical presentation of a patient with pericardial tamponade. Kussmaul’s sign, described as jugular venous distention upon inspiration, is another classic sign attributed to pericardial tamponade. The clinical presentation of penetrating cardiac injuries may range from complete hemodynamic instability to cardiopulmonary arrest. Patients who lose between

40% and 50% of intravascular blood volume develop cardiopulmonary arrest. The most unique presentation of a penetrating cardiac injury is pericardial tamponade.

With severe blunt trauma, the heart and great vessels are most often disrupted at one of four “ anchor points” : the aortic root, the posterior left atrium, the cavo-atrial junction in the right atrium, and the proximal descending thoracic aorta. The key point is emergent operation with excellent anesthesia team support.

Indications for emergent operative interventions are;

- Cardiac tamponade
- Acute deterioration or cardiac arrest in the trauma center
- Penetrating truncal trauma
- Vascular injury at the thoracic outlet
- Great vessel laceration
- Mediastinal traverse of a penetrating object

Ventricular injuries are more common than atrial injuries. Distribution of penetrating cardiac injuries in one study were: Right ventricle 43%, left ventricle 34%, right atrium 16%, left atrium 7%. Myocardial cell damage produces electrical instability, which may result in supraventricular or ventricular arrhythmias. Other clinical manifestations are impaired cardiac function, elevated troponin and right heart failure. Echocardiography is critical for accurate diagnosis.

Cardiac tamponade in the trauma environment is usually due to a rapidly expanded pericardial effusion after blunt or penetrating trauma. Rapid accumulation of fluid in the pericardial space, particularly following penetrating cardiac trauma or aortic injury, can result in cardiac tamponade and hypotension. As little as 60 to 100 mL of blood in the pericardial sac can produce tamponade physiology. Diagnosis can be made by echocardiography. If hemodynamic compromise is occurring, then a decision should be made to proceed to the operating room for a pericardial window to relieve the tamponade followed by careful inspection of the heart for a source of continued bleeding. Depending on severity, wounds of the heart may be reparable without the use of cardiopulmonary bypass (CPB). If CPB is required for more complex repair preparations for systemic heparinization and a full cardiac team including perfusionist will be necessary.

Gunshot wounds of the heart have several unique considerations with respect to anesthetic management. The potential exists for transmediastinal injury including the great vessels and the esophagus. Traumatic esophageal perforation may be worsened with TEE. Placement of a TEE probe may therefore be contraindicated.

Emergency department thoracotomy is a drastic, dramatic, and potentially life-saving procedure. With thoracotomy, the goal is to relieve cardiac tamponade, support cardiac function with direct cardiac compression and/or cross-clamping of the aorta to improve coronary perfusion, evacuate air embolism, and perform internal defibrillation when indicated. The injury that is likely to be most amenable to thoracotomy is tamponade.

Traumatic aortic injury can occur following blunt or penetrating trauma. Injuries to the aorta can include a tear or outright rupture. Aortic disruptions typically occur at the attachment site of the ligamentum arteriosum in the proximal descending aorta. These often cause immediate

exsanguination and mortality is high. If the tear is incomplete, the adventitia or parietal pleura contains the rupture with development of a pseudoaneurysm or intramural hematoma. Surgery is always recommended for type III and IV and often done for type II injuries as well. Blunt aortic injuries are typically associated with multisystem trauma, including brain, spine, abdominal, pelvis and extremity injuries.

Anesthesia goals include:

- Accurate control of blood pressure and heart rate to alleviate shearing forces on the aortic wall.
- Smooth induction with blunted sympathetic response when securing the airway.
- Adequate beta-blockade and blood pressure control with short-acting agents such as esmolol.
- Maintaining a target heart rate of < 100 beats/minute and systolic blood pressure < 120 mmHg to minimize aortic disruption, while at the same time preserving an adequate perfusion pressure to other organs like the brain and spinal cord.

For cardiac and large vessel traumas anesthesiologists, surgeons and other team members with the ability to recognize these important injuries and the skill to perform the necessary procedures can save lives.

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TRAUMA IN ALCOHOL AND DRUG ADDICT PATIENT

Assoc. Prof. Nuray Altay, MD

Harran University Medical Faculty Department of Anesthesiology and Reanimation

- Trauma continues to be the number one cause of death for children and young adults. Adult trauma patients are known to have higher rates of alcohol and other drug (AOD) use when compared to other hospitalized patients. Adolescent trauma patients have been shown to have higher risk of AOD use when compared to adolescents presenting with other medical conditions, and AOD use may be as high as 25%.
- The question of whether the use of psychoactive drugs other than alcohol is related to injury events has gained greater attention recently in the literature , particularly influenced by the fact that many jurisdictions in the world are now decriminalizing or even legalizing the recreational use of drugs such as cannabis. Cannabis use has been reportedly increasing in emergency facilities, but data on fatal injuries and the effects of acute substance use on these deaths are still scant.
- Injuries, both intentional and unintentional provoked by the acute exposure to physical trauma, compose a major portion of the burden of disease and health care costs. Although there seems to be a strong association between the acute combined use of substances (the so-called synergistic effect) and injuries, studies continue to demonstrate that alcohol plays a bigger role among road traffic and violence-related injuries compared to use of any other drug. Substance use is one of the main individual factors contributing to injuries, with findings here showing that one in every two decedents were found to be under the influence of at least one substance before an injury death.
- Intentional and unintentional injuries are influenced by a multitude of contributing factors, both at the individual-level (e.g. risk-taking behavior, substance use, etc.) and at the community-level (e.g. permeated violence, availability of safety strategies, etc.) that together shape each individual's risk of injuries . Substance use is one of the main individual factors contributing to injuries. Very little data on substance use, particularly for drugs other than alcohol, are available for monitoring systems on injury deaths among low- to middle-income countries. The findings presented indicate that alcohol is the lead substance consumed before a fatal injury event, followed by cocaine and cannabis. Poly-drug use is also frequent, especially the combination of alcohol with illicit drugs.

- Moreover, road traffic deaths have a stronger association with alcohol use compared to other causes of death, while other drug use seems to be more related to intentional injuries (homicides and suicides). Patients with gunshot wounds and or evidence of hanging were found to have the highest rate of positive AOD results, but these were not statistically different when compared with rates seen in patients with other injury mechanisms. When injury mechanism was divided into violent versus non-violent mechanisms, patients with violent injury mechanisms (36.8%) were more likely to be positive for AOD use than those with non-violent injury mechanisms 15.6%
- International studies report that 5% – 60% of pregnant women engage in alcohol consumption at some time during pregnancy. It is estimated that 0.5% – 2% of all pregnant women undergo surgery and anesthesia at some time during pregnancy. As documented by numerous studies, binge alcohol consumption with sharp peaks for blood alcohol concentration (BAC) above 80 mg/dL produces the most negative effects on the fetus, including development of fetal alcohol syndrome and fetal alcohol spectrum disorders (FASD).

Anesthetic management

- Anesthetic management in patients under alcohol and/or drug addiction represents additional challenges. Alcohol interacts with a variety of commonly used anesthetics, and modifies their effect on key physiological characteristics, including cardiac and neuronal function. An alcohol-related injury was defined as self-reported drinking of any amount within six hours prior to the injury. It likely over-represents the alcohol-relatedness of the event, since a relatively small amount of alcohol consumed early in the six-hour period might have little to do with occurrence or causation of the injury. Additionally, the validity of patient self-reports may be a concern. Under-reporting of drinking could potentially occur for drivers with traffic injuries, but over-reporting by those injured in violence-related events could also potentially occur.
- Perioperative management of opioid-dependent patients begins with the preoperative administration of their daily maintenance or baseline opioid dose before induction of general, spinal or regional anaesthesia. Patients should be instructed to take their usual dose of an oral opioid on the morning of surgery. All opioid analgesics should be strictly avoided with NSAIDs, paracetamol, ketamine forming the main stay of non-opioid analgesics. Regional anaesthesia is always preferred if indicated . If opioid-based anaesthetic management is planned, naltrexone should be discontinued at least 24–72 hours prior to surgery. As the requirement of opioid analgesia may be greater, shorter-acting opioids analgesics, such as fentanyl, remifentanyl, sufentanyl, are preferred. Nerve blocks and local infiltration can be additive. Postoperatively non-opioid-based analgesics should be given.
- We should have an emphatic and holistic approach towards drug addict patients for a proper management strategy. The anaesthesiologist plays a key role, both in opioid addict patient analgesic dose requirement maintenance therapy and the withdrawal symptoms. Multimodal analgesia is a cornerstone in managing these patients in the perioperative period. Although challenging, with a clear management strategy, patients with known and unknown alcohol and drug abuse can be safely and effectively managed in the perioperative period.

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05 April 2019, Friday**11:15-11:45 CONFERENCE****Chair: Onur ÖZLÜ, Turkey**

Unknown side of phytotherapy

Gülendam TÜMEN, Turkey

THE INVISIBLE FACE OF PHYTOTHERAPY

Prof.Dr.Gülendam Tümen**Balıkesir University Faculty of Science and Arts Department of Biology**

Introduction

Since the existence of earth, human being used the plants for protection or treatment against diseases beside food. In the past, for the purpose of treatment plants, leaves, roots, fruits, such as above-ground and subsoil parts are used. After 18th century, the effects of medicinal plants were determined with the rapid development of chemistry. Various active substances such as morphine, atropine, digoxin, vincristine and galanthamine were used in treatment. Over time, these natural compounds have been modeled on certain synthetic drugs such as aspirin.

Synthetic drugs have long been a part of human life and have been used extensively. However in recent years, with the 'return to nature' and 'quality life' has started to be consumed with herbal products. The number of known flowering plant species on the earth is estimated to be about 500 000-750.000. Considering that the number of species in the Amazon forests cannot be determined precisely, this number is claimed to be 1,000 000. It is estimated that up to 70,000 of the medical plant species used for medical purposes. It was found to be suitable to prepare 21,000 plant species by the World Health Circle. At present, 2,000 in the world and 500 medicines in Western Europe are traded. Treating diseases by using medicinal plants is more common in societies in Far East countries. In recent years, the use of medicinal plants in western societies has also increased. These practices, often called 'alternative medicine' or 'complementary medicine', have led to an ever-growing market in herbal medicinal product trade. The size of world medicinal and aromatic plant trade increased from \$ 50 billion in 2000 to \$ 180 billion in 2016 (FAO 2017).

According to World Health Organization data, 75-80% of the world population is still using herbal products in the treatment of diseases, especially in less developed countries.

Herbal products

"100% herbal"

"Completely natural"

"No side effects"

In herbal solution to your problems "

selling with slogans is a serious risk for public health. There are some issues to be considered in the treatment of herbal or therapeutic products with herbs. If we list these issues;

1.Yapısal ve kimyasal farklar

1. Structural and chemical differences

In plant systematics; The species in a genus can be very similar to each other in terms of botany. Non-experts can confuse them. for example; *Matricaria chamomilla* L. (May chamomile) and *Tanacetum parthenium* L. (Gümüüşdüğme) species can be easily mixed. Therefore

2. Identification and collection of the species to be used
3. Diagnosis should be made by experts
4. the chemical content of close species should not be excluded.
5. The chemical composition of the species should be selected for the most suitable phytotherapy.
6. It should be collected at the right time, knowing that the time of each medicine plant is different.
7. Development conditions; The climate, rainfall, soil structure and time of gathering of the geography they grow affect the chemical structure of plants. Chemical compositions vary and reveals chemotypes
8. Production Method; When preparing an herbal product, a scientific and possibly an international method should be chosen. Standardized extracts must be used and stability tests of the product should be carried out.
9. Environmental factors; Environmental pollution is an important problem.

In the tests carried out, in the medicinal plants collected from the high-traffic roads where more pollution is generated, heavy metals, especially lead, are much higher than the desired rates. Pesticides used against pests are found in the vicinity of planting areas pesticide residues.

10. Storage conditions; To prepare herbal products, the plants collected must be dried quickly and correctly, and enzymatic transformations should be prevented. Their active components may deteriorate or become harmful substances. The storage conditions of the collected plants should be carefully created, and aflatoxins (Mycotoxins) can occur in the plants left in humid environments.

Considering all these points, the products prepared from medicinal plants are neither vegetable-free ürün nor den herbal is unhelpful ”.

Busse, Quality, efficacy and safety of a product that only features "Medical" features will be said.

In order for a herbal product to be used in pharmacotherapy, it is absolutely necessary to prepare from an effective and standardized extract, to determine its

stability, and to detect toxicological data besides pharmacological and clinical findings.

On the other hand, if we look at the problems experienced in our country about the marketing of medicinal plants; In our country, raw drugs, tablets, capsules are sold in a pharmaceutical form or as tea.

A large portion of these products are sold in transfers, vegetable product sales points or internet sales sites, and a small portion can be delivered to the public through pharmacies.

In Turkey, except those adopted in the form of medicines, the Ministry of Health to evaluate or any indication of Agriculture and Rural Affairs Ministry allowing packaging of herbal products (which diseases to be good) information can not take place. However, there are many indications on the websites of the manufacturers or vendors and the brochures they distribute.

When this information is examined, it is seen that they are incomplete or inaccurate.

- Effective parts of the plant
- In pharmacies in Europe
- sold in health food stores in Turkey
- and, when the Ministry of Health in Europe has approved,
- approved by the Ministry of Agriculture and Rural Affairs in Turkey are the key differences between Europe and Turkey.

these products in Turkey "Food Support" are consumed with the idea that it is considered to be harmless and food.

It is clear that the free and sufficient control of most of the crops can pose a threat to society.

In newspapers, books and brochures about herbal products, exaggerated and inaccurate information is found without scientific foundations, and most of the time, wrong information is given to the public with suggestions without considering the most important issues.

In the use of medicinal plants, we can answer the question of what are the important points to consider.

Medicinal plants also have therapeutic effects such as drugs sold in the pharmacy,

- overdose,
- duration of use,
- use during pregnancy,
- issues such as interaction with other drugs should always be considered.
- If the patient using the diabetes medication uses the extract of the ginseng plant as a performance enhancer, he may experience hypoglycemia (the fasting blood sugar may be too low).
- If the patient using blood pressure lowering medication consumes too much dandelion to clean his liver, there is a risk of hypotension.
- Warfarin (used as blood thinner) has a synergistic interaction with many plants. For example, if the patient uses warfarin and Ginseng extract besides the patient, subcutaneous bleeding starts.
- Mate tea produces overdose muscle spasms and rhythm disturbances in the heart
- When the sage is consumed around 15 g a day, excessive fever, chills and convulsions occur. Increases estrogen levels. Triggers breast cancer

As a result;

Plants should never be used without consulting the specialist.

Information should be obtained from the correct sources, such as books written by experts of the subject, and so on.

Keep away from random sites on the internet, the right information from scientific sites should be reached.

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05 April 2019, Friday

13:00-14:15	CONFERENCE	Chairs: Fatma SARICAOĞLU, Turkey Ali Fuat ERDEM, Turkey Hüsnü KÜRŞAT, Turkey
	Nerve blocks that you should learn for orthopedic trauma	Olivier RONTES, France
	Update on regional anesthesia for hip fracture in elderly patients	Philippe MARTY, France

WHY SHOULD WE USE REGIONAL ANESTHESIA IN TRAUMA

Introduction:

In the acute phase of traumatology, an ideal method for pain relief is one that is safe, reliable, provides predictable and lasting analgesia, and does not interfere with hemodynamics nor with respiratory function.

Multimodal analgesia can result in improved analgesia, both during the acute phase and during ongoing care.¹ Opioids are effective for pain management but present some side-effects (e.g. respiratory depression, somnolence, nausea, vomiting, and pruritus) that limit their use in emergency setting.² Localized and regional pain can be treated effectively by local, regional, or neuraxial analgesia.

Regional blocks provide high quality of pain relief when compared with intravenous opioids or oral analgesics.³

They can be used for analgesia or surgical anesthesia, making them an ideal choice in a patient with full stomach⁴, hemodynamic instability⁵ or other injuries, such as unstable cervical spine, that make general anesthesia risky.

Regional analgesia can either benefit a patient in the emergency department or in the prehospital setting if patients are selected appropriately and a correct technique is chosen.

This text will expose different situations in traumatology that specially benefit from regional anesthesia but also pitfalls to avoid.

Trauma types that specially benefit from regional anesthesia

Chest trauma:

Multiple rib fractures are associated with severe pain, leading to atelectasis and alteration of pulmonary function. Numerous studies have shown that thoracic epidurals with local anesthetic and/or opioid combinations provide improved pulmonary function and reduce pulmonary complications.⁶ Paravertebral block (PVB) can also be proposed in patients with unilateral multiple rib fractures for prevention of critical pneumonia due to sufficient pain relief to facilitate coughing up.⁷ PVB improves significantly diaphragmatic motility in patient with multiples rib fractures, particularly during forced inspiration.⁸ It is a simple and effective method of providing continuous pain relief.

Phantom Limb Pain

Although common, phantom limb pain (PLP), a neuropathic pain, is difficult to prevent and treat since the exact underlying mechanism for the development of this phenomenon remains unknown.⁹ While

none have been proven, a variety of theories behind PLP have been proposed and, in fact, multiple mechanisms are likely involved including central, spinal, and peripheral components.^{10,11}

Regional anesthesia has been proposed to prevent phantom limb pain and appears to be promising. Despite the lack of data, regional anesthesia should be considered for all amputations.^{12,13}

Distal revascularization

Vasospasm may be devastating, causing irreversible damage to the replanted limb.

A vasodilatory effect due to sympathicolysis has been described after regional anesthesia and might be interesting in this setting. Plexus block produces an enhancement of tissue oxygen saturation and peripheral blood flow.¹⁴ Blocking the stellate ganglion decreases the sensitivity of the sympathetic system to develop vasospasm due to intrinsic or extrinsic causes. It might provide baseline security for avoiding and reversing ongoing vasospasm.¹⁵ Continuous brachial plexus blockade is effective in improving vascular flow and perfusion, reducing vasospasm, and providing sympathetic blockade as well as managing postoperative pain. Regional anesthesia should be considered whenever vascular anastomosis is performed.^{16 17}

Issues regarding regional anesthesia in traumatology

Neurologic assessment

Neural damage should always be considered in traumatology. For example, in gunshot wounds and blast injuries to the upper limbs, radial nerve injury is often associated with humerus fracture.¹⁸ This neural damage might be confusing as local anesthetics could also be responsible for neural toxicity.¹⁹

A neurologic assessment should always be performed before regional anesthesia and this information should clearly appear in patient's file.

Diaphragmatic paralysis associated with interscalene block

Interscalene block (ISB) provides excellent analgesia minimizing the side-effects of opioids and is considered as the gold standard in the management of shoulder and upper arm pain.²⁰ However, it may eventually be associated with side effects as blockade of vagus nerve, recurrent laryngeal nerve and even pleural effusion.^{21,22} The main pitfall of ISB appears to be hemidiaphragmatic paralysis caused by the block of the phrenic nerve.^{23,24} If occurrence of phrenic nerve block after ISB is a well-known side effect, its impact on patient outcome might be challenging in case of chest trauma.

Pneumothorax

Pneumothorax is a classic complication of supraclavicular brachial plexus block.²⁵ It may also occur after interscalene, and after infraclavicular approaches.²⁶ The incidence also depends on the experience of the physician. Symptoms can be delayed in presentation and must be kept in mind whenever there is chest discomfort 6–12 hours after the block. Use of ultrasound may help decrease the risk of pneumothorax from brachial plexus blockade.²⁷

This risk of pneumothorax should always be considered specially in patients with contralateral chest trauma.

Compartmental Syndrome

Compartmental syndrome may occur anywhere that the muscles are enclosed by fascia. Common sites after trauma are the lower leg and forearm. Increased pressure within the compartment compromises the circulation and function of tissues. As one of the primary presenting symptoms of compartmental

syndrome is pain, many trauma surgeons and anesthesiologists worry that regional anesthesia will mask the symptoms of early compartmental syndrome after trauma and after major extremity surgery.²⁸ Others believe that the ischemic pain of compartmental syndrome breaks through an analgesic peripheral nerve block.^{29,30} Nonetheless, the potential for losing a limb in a patient because of delayed intervention deters many of us from doing these blocks in the traumatized patient. Diagnosing compartmental syndrome requires a high index of suspicion, performance of serial examinations, and careful documentation of changes over time. Prophylactic fasciotomies, delayed closure, and measurement of compartmental pressure should hopefully allow this excellent modality of analgesic intervention to be made more available to trauma patients.

Infection

Continuous nerve blockade using catheters is a well-known procedure to prolong analgesia duration. In the setting of traumatology and emergency, physician should pay attention to the infectious risk. Bacterial colonization of indwelling catheters is frequent and known to occur as early as the first 48 hours.³¹

Initial single shot regional anesthesia might be suitable in case of trauma specially if regional anesthesia is performed in the setting of pre-hospital care. Adjuvants (specially dexamethasone) should be considered to extend duration of analgesia whatever the route of administration (perineural or intravenous).³²

Perineural catheter can be proposed in case of persistent pain but immediate catheter removal, catheter culture, and imaging are recommended in case of suspected infection.

Coagulopathy

Patients may develop coagulopathy due to massive transfusion and/or multisystem organ failure, making neuraxial and deep blocks unsafe. In case of severe trauma, superficial blocks should always be considered as compression might stop bleeding in case of vessels injury. Ultrasound guidance is a helpful tool to minimize needle repositioning and vessels damage.

Conclusion

Regional anesthesia is the best procedure for immediate, reliable pain relief.

This procedure should be considered in all trauma patients to avoid side-effects of opioids but also in chest trauma or distal revascularization to improve outcome.

Despite some limitations to keep in mind in the setting of traumatology, regional anesthesia remains the gold standard for analgesia.

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HOW TO PERFORM REGIONAL ANESTHESIA IN TRAUMA

Regional anesthesia in trauma remains the best way to provide a safe, reliable and efficient pain relief. Different approaches are classically described to perform a regional anesthesia in the setting of trauma.

Interscalene Brachial Plexus Block (ISB)

Interscalene block provides the most reliable anesthesia and analgesia for injuries around the shoulder and upper arm.¹ However, physician should pay attention to specific issues in the setting of ISB in trauma.

First, shoulder's injuries are often associated with neural damage of the brachial plexus on account of their proximity. Pain and bandages may compromise a detailed neurologic examination prior to the block. If there has been any underlying neural compromise (trauma or otherwise), additional nerve injuries during initiation of the block may result in a "double-crush syndrome"², causing new or worsening neurologic symptoms postoperatively. Injuries and surgeries around the shoulder have been documented to result in neurologic deficits in 1–67 percent of patients.³ Thus, it is important that patients are aware of the risk of preexisting neurologic injury due to trauma/surgery. Alternate approaches to the brachial plexus in the interscalene area, such as the posterior approach of Pippa et al. or the modification of Boezaart et al., may have to be utilized in certain patients.

Secondly, ISB is associated with up to 100 percent incidence of diaphragm paresis.^{4,5} This is due to the spread of local anesthetics to the phrenic nerve. One has to be careful not to initiate an ISB in the presence of contralateral diaphragm weakness, pneumothorax, or lung injury. Contralateral diaphragm weakness might be difficult to evaluate in the emergency scenario. The use of

cardiothoracic ultrasound appears to be an attractive diagnostic tool and allows early diagnosis of pneumothorax and lung injury.⁶

Others issues have to be considered before ISB in trauma. For optimal block performance, one needs to rotate the neck to the contralateral side, which may not be possible in patients with neck trauma or cervical spine injury. Fractured clavicle may also distort the anatomy in this area making traditional techniques more difficult to use. Accidental intravascular injection or epidural/intrathecal spread may be particularly undesirable in a hemodynamically unstable patient.⁷

Brachial Plexus Blocks Around the Clavicle

Supraclavicular block

Supraclavicular block can be used for injuries of the shoulder and below. The supraclavicular approach is feared by many because of the potential risk of pneumothorax. In a series of 1,001 supraclavicular blocks performed by both residents and consultants, Franco and Vieira reported no pneumothorax or any other major complications, and the success rate was 97.2 percent.⁸ Use of ultrasound adds a margin of safety. If the patient already has a drained pneumothorax on the ipsilateral side, the risk with this block is not exaggerated. If the patient has contralateral chest injury, we recommend use of ultrasound for initiating this block.

Supraclavicular block is also associated with complete hemidiaphragmatic paralysis in approximately one-third of patients.⁹

Even if this risk is lower than ISB, it remains high and this block should be avoided in case of contralateral lung injury.

Infraclavicular block

The infraclavicular block is particularly convenient in trauma as it requires minimal or no movement of the injured arm. The risk of pneumothorax is significantly less with this approach. The infraclavicular approach is quite useful in the trauma patient, especially with cervical spine injury, as it can be performed with the head and neck in the neutral position. The risk of respiratory function impairment is low with this block as spread of local anesthetics to the phrenic nerve is unlikely. A recent study reported a 3% risk of complete hemidiaphragmatic paralysis associated with ultrasound guided infraclavicular block.⁹

Axillary Brachial Plexus Block

Ultrasound guided axillary brachial plexus block is an attractive option for hand and forearm trauma. Because the artery is in a compressible location, use of this block is particularly attractive in a patient with coagulopathy. This block may be difficult in the presence of vascular injury in the axillary area. The need of abducting the arm and manipulating its position is to consider before performance of this block. This may not be possible in certain trauma instances. Of all the approaches to the brachial plexus discussed above, the chances of incomplete block are the highest with the axillary approach because of dividing septae in the axillary sheath that may prevent spread of local anesthetic to all the branches of the plexus¹⁰, as well as failure to anesthetize the musculocutaneous nerve that lies outside the sheath in this location. Ultrasonography again contributes to improved success with this approach, as individual nerves can be target blocked for adequate analgesia.¹¹ Continuous axillary blocks, though used in the past by many pain physicians for ongoing analgesia, may be associated with higher failure rates, catheter infections, and kinking and have been largely replaced by other techniques.

Wrist Blocks

Radial, median, and ulnar nerves can be blocked at the wrist either to supplement an incomplete block or for distal hand surgeries requiring individual nerve blocks only. Often, these techniques can be used to provide analgesia following internal fixation of digits and soft tissue injuries. Again, these blocks can be done elegantly using ultrasonography with minimal local anesthetic.

Femoral nerve block

Indications for femoral block include analgesia for femoral fractures and knee injuries. This block is reliable and easy to teach and learn. It provides excellent analgesia for patients with femoral fractures. Femoral nerve lies lateral to the femoral artery, above psoas muscle and under the lata and iliac fascia. This block should likely be performed at the level of the common femoral artery as it divides in many branches at a lower level.

Physician should pay attention to the lateral femoral circumflex artery before injection of local anesthetics.

Sciatic nerve block

This block can be done at various levels of the sciatic nerve either anteriorly or posteriorly. It provides analgesia of the posterior compartment of thigh and most of the lower leg. Labatt's classic approach, midway between the sacral hiatus and greater trochanter, lends itself both for single-injection blocks as well as for continuous catheter techniques. The main pitfall of the sciatic block in the setting of trauma is that it often requires prone position. Mobilization of trauma patients might be difficult. The anterior approach has been suggested to avoid this pitfall. It allows one to perform sciatic nerve block in supine position in patients who cannot be positioned on the side with flexion of hip and knee. However, this approach might be challenging and the success rate of the anterior approach is relatively low. A possible explanation is the inaccessibility of sciatic nerve from the anterior approach in a high percentage of patients. In this approach, the landmarks may be difficult to palpate, and there is potential for injuring the femoral nerve as the needle is advanced toward the sciatic nerve.

Conclusion:

Regional anesthesia can be a very useful tool in the setting of trauma as it provides the most reliable pain relief. However, we should keep in mind some specific issues regarding each block.

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UPDATE ON REGIONAL ANESTHESIA FOR HIP FRACTURE IN ELDERLY PATIENTS

*Dr Olivier RONTES
Médipôle Garonne Toulouse France*

10 Important points

- 1- In France, 55 000 patients have a hip fracture every year.
- 2- The population concerned is elderly, fragile and poly-pathological. It's an emergency.
- 3- The first objective is to reduce the morbi-mortality.
- 4- The hip innervation is depending on the lumbar plexus (femoral nerve and obturator nerve) for the anterior side, and sacral plexus (sciatic nerve) for the posterior side.
- 5- Spinal anesthesia is a proven technic, specially in elderly patient. The strategy to reduce side effect, goes through the use of vasopressive drugs, fight against hypo-volemia and reduction of local anesthetic dose injected.
- 6- Femoral nerve block is not sufficient for a perfect analgesia. The association with the obturator nerve block induce a better analgesia and reduce the opioïd use.
- 7- Several approaches technics of the lumbar plexus have been proposed, but the place of each must be found.
- 8- Sciatic nerve lesion is frequent after hip surgery. Sciatic nerve block must be reserved at patient with a favorable risk-benefict ratio.
- 9- The result of surgical infiltration on analgesia and opioïd consumption are contrasted.
- 10- Early mobilisation of the patient is a global process and is not delayed by peripheral nerve block or surgical infiltration.

1. Epidemiology

Hip prosthesis is one of the five most frequent surgeries. 150 000 patients are operated each year in France, and more than 1 million people live with a hip prosthesis. In the US, this surgery increased by 50% between 1990 to 2002, and the projected increase between 2005 and 2030 is 173%[1]. This is attributed to the aging of the population and hip fracture is concerning elderly patient. 55 000 patients each year in France, and 300 000 in the USA for a total cost estimated at 5.4 billions \$ per year[2].

Hip fracture is an emergency, and the mortality is high (27% at 1 year) and worsens with age (50% at 90 years old) [3]. The risk factors are, age, male sex, use of psychotropic drugs. The surgical treatment must be done during the 48 first hours to reduce the mortality [4].

2. Hip innervation[5, 6]

Hip innervation is depending on lumbar plexus and sacral plexus.

Lumbar plexus :

Bone : Lumbar plexus performs innervation of a part of the femoral neck and head, both by femoral nerve and obturator nerve. It also innervates the anterior part of the articular capsule and numbers of periarticular ligaments (ilioinguinal ligament, pubo-femoral ligament, ilio-femoral ligament).

Muscle : Lumbar plexus acts mainly on the flexor muscles, adductors and internal rotators of the hip and extensors of the knee through spinal nerves (psoas muscle), femoral nerve (sartorius muscle, right muscle, iliac muscle, pectinus muscle) and obturator nerve (pectineus muscle, external obturator muscle).

Cutaneous : External branch of the abdominal-genital nerve innervates the postero-external part of the buttock and the femoro-cutaneous nerve the anterior and lateral aspect of the hip.

Sacral plexus :

Bone : Sacral plexus realizes innervation of the acetabulum and a part of the posterior face of the femoral head and neck. It also innervates the posterior part of the articular capsule as well as periarticular ligaments (ischio-femoral ligament, transverse ligament of acetabulum, ligament of the head of the femur).

Muscle : Sacral plexus innervates the extensor muscles of the hip through the spinal nerves (upper and lower twin muscle, internal obturator muscle, femoral square muscle), upper and lower gluteal nerves (gluteus minor and gluteus maximus muscle, fascia-latta tensor), and piriformis nerve (piriformis muscle).

Cutaneous : Posterior cutaneous nerve of the thigh innervates infero-internal part of the buttock.

3. Regional anesthesia technics

Anesthesia techniques for hip surgery are shared between general anesthesia (GA) and regional anesthesia (RA) mainly represented by spinal anesthesia (SA). In United Kingdom, 45% of femoral neck fractures are performed under GA, 35% under spinal anesthesia, 47% of patients benefit from a femoral nerve block [7].

a- Spinal anesthesia

Spinal anesthesia (SA) is a popular technic for hip surgery.

Lowest morbidity and mortality compared to GA is debated [8], and is not found in trauma surgery of the upper femoral extremity [9, 10].

Arterial hypotension, induced by vasodilatation of sympathomimetic block, is common in SA, specially for elderly [11] and is the most deleterious element. Hypovolemia treatment and prophylactic administration of vasopressors (phenylephrine) [12], reduce incidence, intensity and duration of hypotensive periods.

Other strategies have been described to limit the hemodynamic consequences of SA.

Use of low doses of LA, and lateralization of SA seem to be effective [13]. However, decrease in LA doses [14] has two limitations:

- risk of failure (up to 20%) by lack of sensory level extension or by early block lifting [15, 16].
- bilateralisation of the local anesthetic (up to 48%) [15].

In addition, SA with bupivacaine has, even at low dosage, a high heterogeneity of the sensitivo-motor block duration [16], making random the leng of stay in the recovery room and the patient empowerment.

In subjects with cardiovascular system diseases, the most relevant technique could be the titrated SA. A catheter is inserted in the intrathecal space, and small doses of LA are injected until the desired level of anesthesia is achieved [17]. Juelsgaard et al. showed the superiority of titrated SA compared to GA and regular SA in terms of hemodynamic side effects in coronary patient [18, 19]. This technique is to be reserved for elderly patients because of the high risk of post dural puncture headache in young subjects.

Finally, the use of short-acting LA, such as prilocaine, could be interesting for efficient teams, mastering well the operating time. This LA presents a high predictibility of the level, the intensity, and the duration of the sensitivo-motor block [20]. However, no study has yet studied this LA in this indication.

b- Peripheral nerve block (PNB)

Peripheral nerve block has fallen out of favor for hip surgery because of its partial effectiveness and because of the competition with surgical infiltration, which is considered more effective.

Several points must be underlined:

- The hip joint is innervated by the lumbar plexus and the sacral plexus. Femoral nerve can not therefore supports alone a complete analgesia.
- The majority of peripheral nerve block studies concerned femoral nerve block only. They are either old or retrospective and use "blind" puncture techniques or neurostimulation.
- Finally, no study directly compares surgical infiltration with a well conducted regional anesthesia, according to current technics.

b-1: Lumbar plexus block

Lumbar plexus provides innervation of the anterior aspect of the joint, flexor and adductor muscles of the hip, through the femoral nerve and obturator nerve. In addition, the skin of the lateral face is innervated by the lateral cutaneous nerve of the thigh, branch of the lumbar plexus.

Also, the management of postoperative analgesia by a PNB can be conceived by ensuring the block of all these nerves, not just the femoral nerve.

A meta-analysis following 1422 patients with femoral neck fracture found a reduction in postoperative pain and opioid use with association of femoral nerve block, obturator nerve block and lateral cutaneous nerve of the thigh block [21]. These blocks, associated with intraoperative sedation, have been successfully used as an anesthetic technique on 472 Intermediate Hip Prosthesis series [22]. Finally, a recent study on cadaver shows a diffusion of LA on the obturator canal when it's injected on the posterior side of the pectineus muscle, and therefore leads an infiltration of all hip joint branches [23]. The association of a femoral nerve block and an obturator nerve block seems interesting for the management of postoperative pain after THA.

Another approach is to perform a diffusion block (fascia iliaca block), hoping a diffusion of LA to all lumbar plexus branches. A cadaver study found a constant infiltration of the femoral nerve and very frequent (83%) of the lateral cutaneous nerve of the thigh [24]. Infiltration on the obturator nerve is more random. This block still allows a decrease in the risk of post-operative confusion in the elderly, which passes from 23.8% to 10.78% for patients who have benefited of this block. These episodes of confusion are less intense and shorter in the PNB group [21, 25].

In this context, new posterior approaches to the lumbar plexus have been proposed using the ultrasound guidance technic, the quadratus lumborum blocks (QLB) [26].

The quadratus lumborum muscle (QLM) is the main ultrasound reference point, which constitutes a "bridge" between the muscles of the abdominal wall (transverse muscle, internal oblique muscle, external oblique muscle) and the paravertebral muscles (psoas muscle and erector spinae muscle). An abdominal ultrasound probe is positioned above the iliac crest next to the posterior axillary line and is then translated in the cephalic direction to the L3 or L4 level.

Three techniques are currently proposed:

- **Quadratus lumborum block 1:** LA injection is performed laterally to the transverse muscle, on the external face of the quadratus lumborum muscle.
- **Quadratus lumborum block 2:** The injection is performed between the posterior side of the quadratus lumborum muscle and the inner side of the oblique muscles and external latissimus dorsi muscle.
- **Quadratus lumborum block 3:** The injection is performed between the quadratus lumborum muscle and the psoas muscle next to L4.

QLB 3 has been used successfully for THA analgesia by some teams [27, 28] and appears to be the most appropriate approach for hip surgery. However, the use of QLB in hip surgery is very recent and relies solely on case reports. We must therefore remain cautious about this technique, which requires to be studied in order to find a place in the therapeutic strategy [29].

b-2: Sacral plexus block

The sacral plexus ensures the innervation of the acetabulum, the posterior side of the hip joint and all its extensor muscles. It seems interesting to perform a sciatic nerve block in addition to a lumbar plexus block to have a perfect analgesia. This was also used as an anesthetic technique about fifteen years ago [30].

However, the risk benefit ratio must be taken into account. Indeed, the risk of a sciatic nerve injury during hip surgery is known and relatively common (1 to 3%). The incidence of these lesions is greater in case of dislocation of THA, femoral neck fracture. Their mechanism is polymorphic: stretching, hematoma, traction, direct lesion [31].

The benefit of a sciatic nerve block in terms of postoperative analgesia is not demonstrated with respect to well-done balanced analgesia.

In this context, the realisation of a sacral plexus block near the surgical area should be cautious and perhaps reserved for patients in whom SA and GA should be avoided [32].

c- Surgical Infiltrations

Surgical infiltrations have been of great interest since 2008 and the description of the technique by Kerr [33], who proposes the infiltration of a large volume of local anesthetic, associated with ketorolac and adrenaline. The infiltration is divided into 3 injections of equivalent volume (50 to 70 ml). The first one around the acetabulum, articular capsule, gluteal and adductor muscles. The second injection in the external rotator muscles and in fascia lata tensor. And the third one in the subcutaneous tissue.

Many authors have modified the technic, either at the level or technic of infiltration or using different drugs (LA and adjuvants). Thus, publications on infiltration is marked by a very great heterogeneity of practices, which makes comparisons difficult and probably explains the contrasting results.

Indeed, some meta-analyzes found a significant decrease in early postoperative pain at rest and mobilization as well as a decrease in morphine consumption; but this effect is no longer and not found at H + 24 [34]. Other meta-analyzes found no difference in efficacy on postoperative pain between infiltration and multimodal analgesia.

In addition to postoperative analgesia, surgeons have promoted this technique to mobilize patients early. In fact, patient mobilization comes from "pro-active" care of all the team, and in this context, PNB does not delayed it [35, 36].

Finally, what choice to make between infiltration and BNP?

The answer is difficult for several reasons:

- There is no prospective study comparing surgical infiltration and PNB. A meta-analysis comparing indirectly the two techniques does not find any difference. It appears that the addition of morphine improves the quality of the infiltration, and that the realization of a proximal plexus block is better than a femoral nerve block [37].
- The studies concerning surgical infiltration are marked by a very great heterogeneity as well as on infiltration technic, as on the solution injected and the population studied.
- The combination of a femoral nerve block and an obturator nerve block with posterior surgical infiltration could be the right solution.

Conclusion

In total, it is currently impossible to decide between the different RA technics.

SA is a proven technic, well studied for trauma surgery and the elderly. The hemodynamic consequences may be limited by the use of low-dose of LA or even SA titration, lateralization, and preventive use of vasoconstrictors.

A better understanding of hip joint innervation allows us to modify our point of view regarding PNB. An obturator nerve block should be systematically associated with a femoral nerve block to improve postoperative analgesia management.

Sciatic nerve block should be reserved for a few special cases in which SA and GA are contraindicated.

Finally, surgical infiltration is far from the miracle solution that has been presented to us. The heterogeneity of infiltration technic and drug used makes comparison difficult with other analgesia methods. However, surgical infiltration should not be opposed to PNB, which may be complementary (nerve blocks of the lumbar plexus and posterior infiltration).

Further studies are needed to determine the good place of each technic in the therapeutic strategy.

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05 April 2019, Friday

14:30-15:45	PANEL 8: Trauma in specific cases-the most important points!	Chairs: Dusanka JANJEVIC, Serbia Dusica SIMIC, Serbia Aslı DÖNMEZ, Turkey Işıl ÖZKOÇAK TURAN, Turkey
	Maxillofacial trauma	Seyhan YAĞAR, Turkey
	Long bone fractures and fat embolism	Vladimir VRSAJKOV, Serbia
	Earthquake injuries and approach to crush injury	Mahmut KALEM, Turkey
	Anesthesia in drowning and electrical injury: field, emergency service and operating room	Meldijana OMERBEGOVIĆ, Bosnia i Herzegovina
	Are trauma centers effectively organised in Turkey?	Ceren GUNT, Turkey

LONG BONE FRACTURE AND FAT EMBOLISM**Vladimir Vrsajkov MD PhD*****Clinic of anesthesia,intensive care and pain therapy******Clinical centre of Vojvodina******Novi Sad, Serbia***

Definition: Presence of circulating fat globules in circulation and pulmonary parenchyma represent fat embolism. Fat embolism syndrome (FES) is the clinical manifestation of fat embolism More than 95% of patients with fat embolism had orthopedic trauma. Long bone fractures and orthopedic surgery disrupt intramedullary fat in 95% of cases but only a minority of patients develops clinical symptoms.

Epidemiology: National Hospital Discharge Survey found an FES incidence of 0.17% in patients with isolated or multiple orthopedic fractures ,but other studies reported higher trauma incidence of 1–2% The incidence is higher in bilateral femoral fractures (4.8%–7.5%), and following intra-medullary nail fixation (up to 11%). Eriksson found fat emboli in the pulmonary circulation of 82% of trauma patients and 88% of patients who received cardiopulmonary resuscitation. These findings point out that number of subclinical cases is underestimate. Transient hypoxemia may represents often case of subclinical FES.

Pathophysiology: Mechanical and biochemical theory are the most popular theories which are trying to explain this syndrom.Mechanical theory introduced by Gaus 1924 emphasize increase in intramedullary pressure which forces fat cells into the circulation where they cause direct obstruction of the pulmonary capillaries or enter arterial circulation via a patent foramen ovale or directly through the pulmonary capillary bad.Result of this aggregation is ventilation-perfusion mismatch, low oxygen saturation and dispnea. Biochemical theory introduced by Lehmann and Moore 1927 point out the role of free fatty acids and glycerol, released by fat emboli trapped in small capillaries and inflammatory rersponse to trauma.This inflammatory cascade results in localized endothelial injury, permeability edema and hemorrhage. Regardless of the initial drive final result is diffuse alveolar wall damage manifest as acute respiratory distress syndrome ARDS.

Clinical presentation: Multisystem dysfunction typically appear 12-72h after the initial insult. Classic triad of symptoms are hypoxemia, neurological deficit and petechiae. Hypoxemia affects 75-96% of patients, with clear differences in the magnitude and duration. Neurological defects are following respiratory pathology. Confusion, lethargy or restlessness are the most common. Petechial rash (50%) is transit and classically located in conjunctivae, head, neck, axillae or upper thorax. Other possible symptoms are thrombocytopenia and anaemia.

Diagnosis: To diagnose FES can be very challenging. Recommendation is combination of the classic clinical symptoms, predisposing insult and supportive imaging. Chest X-ray can't differentiate bilateral patchy infiltrates between trauma and fat embolism. Patients with long bone fracture and hypoxemia can also have normal chest X-ray. Chest CT will show diffuse areas of vascular congestion and pulmonary edema. This is not enough for final diagnosis. For clinician a brain MRI can be a definitive solution. In cases of probable fat embolism finding of a star-field pattern of diffuse, hyperintense lesions represents a final prove. Obvious limitations of this imaging limits its use in early trauma. Some data recommend bronchoalveolar lavage (BAL) for clear diagnosis of FES. Bronchoalveolar lavage with 30% of alveolar cells staining for neutral fat indicate FES. This method is also invasive and time dependent which seriously limits its use. If the patient has 2 major or 1 major and 4 minor clinical criteria proposed by Gurd and Wilson proper diagnosis of FES can be made. Major criteria are 1. Axillary or subconjunctival petechiae 2. Hypoxaemia $PaO_2 < 60$ mm Hg, $FIO_2 = 0.4$ 3. Central nervous system depression disproportionate to hypoxaemia. Minor criteria are tachycardia more than 110 beats per minute, pyrexia more than $38.5^\circ C$, fat globules present in urine, changes in renal function (reduced urine output), drop in haemoglobin values (more than 20% of the value upon admission), drop in haematocrit values, drop in platelet values (more than 50% of the value upon admission), fat globules present in the sputum.

Prevention and treatment: Prophylactic corticosteroids after long bone fractures is still controversial. Several small studies show reduced risk of FES by 78% and reduced hypoxemia without difference in mortality. After prolonged immobilisation reported incidence of FES goes to 22% Because early surgical fixation (within 24h) lower the risk of fat embolism this represents a corner stone of therapy. In the case of developing symptoms of FES clinician first choice is hemodynamic (blood pressure and fluids) and respiratory system (supplemental oxygen or mechanical ventilation) maintenance. For patient with signs of neurological deficit crucial are frequent neurological examinations and ICP monitoring (cerebral edema).

05 April 2019, Friday

14:30-15:45	PANEL 8: Trauma in specific cases-the most important points!	Chairs: Dusanka JANJEVIC, Serbia Dusica SIMIC, Serbia Aslı DÖNMEZ, Turkey Işıl ÖZKOÇAK TURAN, Turkey
	Maxillofacial trauma	Seyhan YAĞAR, Turkey
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	Earthquake injuries and approach to crush injury	Mahmut KALEM, Turkey
	Anesthesia in drowning and electrical injury: field, emergency service and operating room	Meldijana OMERBEGOVIC, Bosnia i Herzegovina
	Are trauma centers effectively organised in Turkey?	Ceren GUNT, Turkey

EARTHQUAKE INJURIES AND APPROACH TO CRUSH INJURY

The typical crush injury of a limb is the closed crush suffered by casualties crushed under masonry (earthquake victims) and vehicles or victims lying unconscious without movement for many hours (mechanical muscle-crush injury – MMCI)

The systemic causes of morbidity and death in MMCI are hypovolemia (dehydration), hyperkalemia, hypocalcemia, metabolic acidosis, and acute myoglobinuric renal failure. This series of events begins with dehydration and is followed by the dangers of the reperfusion of the crushed tissues of the limb.

The local causes of morbidity and mortality are the acute muscle-crush compartment syndrome complicated by overwhelming sepsis, often after fasciotomy, and gas gangrene in neglected open crush wounds.

The diagnosis is usually obvious if the history is known and the limb is inspected. Swelling appears rapidly, causing an acute compartment syndrome, and the limb can become turgid and brawny within hours without obstruction to the distal circulation. The crushed skin is bruised and discolored but remains intact. Pain develops gradually and may become excruciating.

Management

a. General

An orthopedic surgeon should have knowledge of the fluid requirements which are indicated in the early, emergency situation. In order to counter both the life-threatening hyperkalemia and hypocalcemia and to prevent myoglobinemia from causing acute renal failure, massive fluid transfusion and alkalinization of the urine must be instituted as early as possible.

b. Local

Open MMCI

When the skin is torn, laying open the MMCI, the treatment is the same as for any severe, open wound: radical debridement, repeated as often as necessary (performed under general anesthesia whenever possible); the opening of fascia and extension of the wound in order to remove all dead tissues and achieve adequate drainage is frequently necessary. Prophylactic intravenous antibiotics are commenced immediately. If the sepsis fails to respond to aggressive treatment, amputation proximal enough to be performed through healthy muscle is indicated as a lifesaving measure.

Closed MMCI: Acute Mechanical Muscle- Crush Compartment Syndrome

The classical management of an acute compartment syndrome has recently been reviewed. This classical treatment is not relevant to a closed MMCI, because in MMCI at least part of the muscle in the compartment is already dead. By converting the closed crushed limb segment into an open wound, profuse bleeding may occur, aggravating coagulopathy and complicating dialysis for myoglobinuric acute renal failure. Also, life- or limb-threatening sepsis now becomes a risk. Excision of necrotic muscle is inevitably incomplete and must be repeated, often several times, under general anesthesia. The only indication for fasciotomy is when the distal pulse is absent and when both direct local major arterial injury and systemic hypotension have been excluded. Orthopedic treatment should be primarily conservative. Joints are splinted in a functional position, while active and passive movements are encouraged as soon as pain allows. Finally, ischemic muscle contractures and paralysis caused by the destruction of muscle are corrected by late reconstructive surgery.

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ANAESTHESIA IN DROWNING AND ELECTRICAL INJURY: FIELD, EMERGENCY SERVICE AND OPERATING ROOM

Meldijana Omerbegović

Among the various environmental situations and accidents that may lead to severe traumatic injuries with wide spectrum of pathophysiological changes and serious outcomes drowning and electrical injuries encompass challenging scenarios and necessitate particularly meticulous and prompt approach in resuscitation and management from the very place of the accident to the clinical settings.

Management of the patients after drowning

Drowning as the process of experiencing respiratory impairment and subsequent pathophysiological alterations from submersion/immersion in liquid is the third leading cause of unintentional injury death worldwide according to data from World Health Organization(1) and almost half a million lethal outcomes worldwide(2).

Pathophysiology

The process of drowning with airway submergence under a fluid medium and subsequent aspiration lead to numerous pathophysiological changes mostly on the respiratory system in terms of developing pulmonary oedema, decreased compliance, and severe hypoxia with effects on all organ systems. Prolonged cerebral hypoxia with most severe consequences is proportional to the duration of submersion and the time of initiation of effective resuscitation and oxygenation (2).

Hypoxemia and acidosis that lead to multiorgan alterations are the most contributing factors to morbidity and mortality in drowning. Impairment of central nervous system may occur due to hypoxemia during the submersion or as a result of cardiovascular instability and respiratory disarrangements with prolonged tissue hypoxia.

After releasing of laryngospasm triggered by liquid in the airway and aspiration of the liquid in the lower respiratory tract with consequent hypoxemia and hypercapnia with all effects on cardiac function with electrical instability, cardiac arrest and central nervous systemic ischemia.

Significant electrolyte changes in blood develop after aspiration of greater quantities of water.

There are some situations when individuals maintain laryngospasm till the cardiac arrest and they do not aspirate liquid. Aspiration of as little as 1-3 mL/kg of fluid leads to significantly impaired gas exchange. Injury to other systems is largely secondary to hypoxia and ischemic acidosis.

Aspiration of both salt and fresh water lead to situation of washing out surfactant and resultant noncardiogenic pulmonary oedema and acute respiratory distress syndrome with marked ventilation/perfusion mismatching (3).

Hypoxemia and hypothermia lead to cardiovascular dysfunction with different forms of arrhythmias that include sinus tachycardia, sinus bradycardia and atrial fibrillation. Patients with congenital QT syndrome type 1 are at particular risk of developing fatal ventricular arrhythmias (4).

Drowning may result in an acute cardiac arrest, which emanates from hypoxemia that precedes the development of ischemia. This scenario results from initial cessation of gas exchange followed by worsening hypoxia and eventual cardiac arrest(5).

Hypovolemia may ensue after fluid shifts caused by increased capillary permeability, with severe hypotension during and after the initial resuscitation time when the process of rewarming is accompanied by vasodilatation. It is of paramount importance to keep awareness of the presence of hypothermia due to prolonged submersion period.

There are many factors that may result in myocardial dysfunction like ventricular dysrhythmias, pulseless electrical activity and asystole related to hypoxemia, hypothermia, acidosis, abnormal electrolyte concentrations.

There have been described sudden, severe cardiovascular collapse in relatively healthy subjects after brief, witnessed immersion what has been associated with the underlying conduction alterations (6).

Tissue hypoxia affects central nervous system causing neuronal damage with development of cerebral oedema and increase of intracranial pressure. The degree of CNS injury remains the major determinant of subsequent survival and long-term morbidity in cases of drowning. Primary brain injury is associated with tissue hypoxia and ischemia. In the case of short period of hypoxia and ischemia and the victim is very young child, who can rapidly achieve core hypothermia these primary injuries may stay limited with a good recovery outcome with minimal neurologic sequelae. On the contrary, if the submersion is associated with prolonged hypoxia there is high risk for development of primary and secondary brain injuries with poor outcome despite all measures of resuscitation. One of results of acute cerebral hypoxia may be the seizures although they may be the events that lead to loss of consciousness and cause of submersion, too (7).

Additional central nervous system damages may result from accidental head or spinal cord injury.

In the situations of prolonged hypoxia, acidosis, rhabdomyolysis, the clinical scenario may result in multiorgan system deterioration with development of hepatic and renal failure and disseminated intravascular coagulation with subsequent high risk of poor outcome.

Resuscitation measures at the scene

The most important and essential factors for survival and good outcome after drowning imply timely rescue from the water, instantaneous initiation of aggressive supportive measures in terms of the patency of airway, securing airway by intubation, maintaining cardiovascular and respiratory function and optimization of tissue oxygenation (2).

The period of hypoxia/hypoxemia is initially limited to the duration of hypopnea or apnoea and may resolve with initial rescue efforts.

It is important to emphasize that rescue breathing should be performed while the individual is still in the water but only trained individuals should attempt in water resuscitation, otherwise the patient

should be taken out of water, with prompt assessment of airway, breathing circulation and initiation of immediate uninterrupted cardiopulmonary resuscitation along with cervical spine precautions if trauma was possible. Endotracheal intubation and positive end-expiratory pressure with mechanical ventilation should be considered in any patient with altered consciousness, poor respiratory function and circulatory disturbances. Transportation to medical centre could be organized after initial stabilization of cardiovascular and respiratory functions. It is important to emphasize that bystanders should always assume that there is possibility to salvage. Supplemental oxygen should be administered as soon as available.

Resuscitation measures at Emergency Department

The process of resuscitation continues in Emergency department by maintaining of cardiovascular stability and respiratory support to decrease hypoxia and metabolic derangements with continuous monitoring of vital parameters and diagnostic imaging and laboratory tests.

Endotracheal intubation and mechanical ventilator support may be the best way to provide adequate oxygenation in a patient unable to maintain a PO_2 of greater than 60-70 mm Hg (>80 mm Hg in children) on 100% oxygen by facemask. Hypotension should be avoided and treated.

Maintaining mild hypothermia (32-34°C) may be beneficial in first 12-24 hours in comatose patients(8,9).

Neurologic complications should be promptly treated along with tight control of glycaemia and blood electrolyte concentrations and acid base abnormalities.

Resuscitation measures in ICU

Intensive care unit is a place for continuation of previous measures of resuscitation and maintenance of cardiovascular and respiratory stability in order to maintain adequate oxygenation and tissue perfusion aiming at minimizing sequelae of the episodes of hypoxia on different organ systems.

There are numerous measures that can be provided in ICU to maintain adequate oxygenation in the patients who survived submersion like administration of ventilation modes with use of positive end expiratory pressure which can provide distending pressures to improve volume of gas at the end of exhalation, minimize atelectasis or alveolar collapse, decrease intrapulmonary shunting and improve arterial oxygenation.

Extracorporeal membrane oxygenation could be beneficial in some patients who had no benefit of conventional or high frequency ventilation and persistent hypothermia. Acid base disturbances should be treated adequately, while in some cases hyponatremia and hypernatremia have been described after ingestion of large quantities of water. In the situation of volume depletion rapid volume expansion could be necessary along with inotropic support. Infusions of vasopressor may be beneficial in management of myocardial dysfunction and altered peripheral vascular resistance. Treatment is focused at normalization of blood pressure, maintaining organ perfusion, and facilitating gas exchange and maintenance of normal glycaemia.

Among the other measures bronchoscopy is of great importance, while the use of surfactant therapy has been reported in some patients of severe respiratory failure(10).

Performance of neuromonitoring is achieved by frequent neurologic examinations, while continuous electroencephalography may be important in assessment of subclinical seizures.

Passive rewarming is appropriate for the cases of mild hypothermia, but moderate and severe hypothermia necessitate active external and internal rewarming.

Therapeutic hypothermia has been shown to have some beneficial effects according to extrapolation from studies with adults experiencing witnessed out-of-hospital cardiac arrest⁽⁹²⁾. Current recommendations are in favour of maintaining core temperature 32-34°C for 12-72 hours (11). Therapeutic hypothermia may improve oxygen supply to ischemic brain areas, decrease cerebral metabolic demand, and lower increased intracranial pressure(12). During resuscitation, attempts should be made to raise the body temperature of hypothermic patients by one of rewarming methods.

Treatment in ICU is focused at normalization of blood pressure, maintaining organ perfusion, and facilitating gas exchange and maintenance of normal glycaemia, allowing restoration of the homeostasis and recovery of the patients after episodes of hypoxia of different duration and under different circumstance. In the situations of less severe submersion patients may display mild to moderately severe hypoxemia that can be corrected with supplemental oxygen if no complications develop. Great number of patients who were admitted to emergency department with altered mental status may recover without neurological deficit, while the patients with more severe alterations of consciousness may have severe neurologic deficit (13).

In the situations when operative procedures have to be performed in patients after submersion that could be performed after stabilization of the general condition of the patients in the terms of stabilization of respiratory function with assured oxygenation, restoration of cardiac function and optimized electrolyte and acid base homeostasis and maintained end-organ perfusion.

Management of patients with electrical injury

While the electrical injury from the natural surrounding in the form of the lightning has been affecting humans since ancient times, electrical injury from man-made electrical power sources has appeared as an important jeopardy from the beginning of last century. According to data in some countries the incidence of electrical injuries is about three thousands per year with high number of lethal outcome, while up to forty percent of serious electrical injuries are fatal(14).

There is a bimodal peak incidence of electrical injuries in children highest in toddlers and adolescents, while most electrical injuries in adults occur at work being the fourth leading cause of work-related traumatic death (15).

According to data from the United States the incidence of the electrical injury is in range of three to four to percent of all burn –related injuries with high mortality rate up to 40%(16).The importance of the problem and need for developing preventive measures has been also emphasized by data from other countries and regions (17).

Pathophysiology

Main pathophysiological changes in the electricity-induced injury comprise direct tissue damage after alteration of cell membrane resting potential and eliciting muscle tetany, massive tissue destruction after conversion of electrical energy into thermal energy and trauma after mechanical injury from falls or violent muscle contractions.

Factors that determine the severity of injury include the magnitude of energy of the current, type of current, current pathway resistance of the tissues and the duration of the contact. Systemic effects are usually dependent of the magnitude of the energy delivered. There is a classification that voltage

above a thousand volts produce high voltage injury with greater morbidity and mortality while the lower voltage is associated with the term of low voltage injuries.

Regarding the type of current alternate current is much more dangerous in regard to direct current, as the possibility of eliciting of muscle tetany and increasing the duration of contact may lead to respiratory arrest. Repetitiveness of alternate current increase the chances of delivery the current to myocardium during the vulnerable period of cardiac cycle and possibly precipitate ventricular fibrillation. On the other hand direct current results in single violent muscle contraction which may throw away the victim from the source of electricity. Lightning is a unidirectional huge current that lasts for 1/10 to 1/1000 of a second, but voltage range is over 10 million volts.

The most important difference between lightning and high-voltage electrical injuries is the duration of exposure to the current. Resistance of the body is quite variable depending on the fluid and electrolyte content in different tissues. While nerve tissue, blood vessels, muscles and mucous membranes presents with the lowest resistance, bone is the tissue most resistant to the flow of current. Skin which is of intermediate resistance is the most important and primary resistor but also with variations of the resistance from about thousand ohms for humid skin to several thousand ohms for dry calloused skin.

The current pathway is of great importance as different tissues may be traversed. There is greater possibility for lethal outcome if the current passes through the head and thorax, with greater incidence of fatal arrhythmia, direct cardiac damage or respiratory arrest in transthoracic pathway and greater incidence of direct brain injury, seizure, respiratory arrest and palsy in transcranial pathway.

Thermal tissue injury due to electrical current flow may result in tissue oedema and there is possibility for development of compartment syndrome in any body compartment, but the lower extremities are the most commonly involved.

The current intensity will have a probable effect in the body, determined by the factors discussed above. There may be individual variation on the energy dose for a specific effect. Less energy is generally required in children, who have more water content and thin skin and, hence, better conductivity and less resistance, and in patients under moist conditions.

Numerous factors involved at the moment of electrical injury produce a wide spectrum of symptoms and signs from a tingling sensation to extensive and serious tissue damage and in the most difficult conditions to instantaneous lethal outcome. Since the external resistance of the skin is highly variable electric current may be transmitted to deeper structure damaging the deep structures of bones, muscles, vessels and nerves without extensive injury of the skin.

In most cases the main symptom of an electrical injury is a skin burn. While the high-voltage injuries may cause massive internal burns, coagulation necrosis, oedema and compartment syndrome, injuries from the lightning are usually superficial surface burns(18).

The effects of electrical current on the heart may be direct necrosis of myocardium and cardiac dysrhythmias that may range from benign to lethal. Asystole is usually caused by high voltage or direct current, while alternate current causes ventricular fibrillation, the most common fatal arrhythmia in the patients when the current makes a path from one hand to the other hand. The most common changes on electrocardiogram include sinus tachycardia, nonspecific ST- and T-wave changes, blocks of conductivity, and prolongation of the QT interval(19).

Electrical injury may result in the damage of central and peripheral nervous system with changes of the state of consciousness, weakness or paralysis, respiratory depression and later cognitive disturbance(20). Keraunoparalysis with temporary paralysis is specific for lightening (21).

Of particular interest is that the most common electrical injury in small children is mouth burn, with all possible consequences in terms of facial deformities and functional problems associated with teeth and jaw growth in later period. In the situations when current traverses close to eyes there is a high risk of developing cataract in the early post-injury period or even years later.

Systemic effects of electrical injury that lead to secondary hypovolemia, may cause acute renal failure while rhabdomyolysis from massive muscle necrosis may induce renal function deterioration.

Great number of patients who survived lightning may have damage of eardrums. Autonomic dysfunction may be presented as dilated and asymmetric pupils. Specific for electrical injury the "locking-on" phenomenon indicates a refractory state of neuromuscular stimulation with tetanic muscle contractions that prolongs the duration of the contact with the source of electricity.

In the scenario of electrical burn injuries bone fractures of upper limbs and vertebrae may result from severe muscle contractions or after falls and mechanical injuries.

It is of great importance that electrically injured extremity may not show external signs of injury.

Resuscitation measures at the scene of injury

First steps at the scene of electrical injury imply separation the patient from the electrical current in a safe way. Patients with electrical injury should be evaluated according to the protocol for trauma patients that include assessing airway, breathing, cardiovascular function, assessing skin, neurologic function, musculoskeletal function. Primary measures of resuscitation comprise of airway patency, breathing, circulation, and immobilization of the spine.

Prolonged cardiopulmonary resuscitation should be administered in the victims of electrical injury regardless of the initial rhythm (22). Thorough inspection of the whole body and high index of suspicion for possible deep structures injuries even in the presence of relatively small skin burns and damages. Placement of intravenous cannula, cardiac monitoring, and measurement of oxygen saturation should be started as soon as possible during the primary survey, with special emphasis on fluid replacement in the initial resuscitation. Similarly to simple thermal injury electrical injuries cause massive fluid shifts along with extensive tissue damage and acidosis with significant effects on haemodynamics. Monitoring of diuresis is very important in the assessment of renal function.

Resuscitation measures in the emergency room

Initial primary survey and primary measures of resuscitation may be extended with better possibilities of diagnostic imaging and monitoring. Maintenance of cardiovascular and respiratory stability by means of mechanical ventilation in the patients with altered consciousness, and administration of crystalloids and balancing the acid-base homeostasis are essential.

While maintaining fluid resuscitation the approach is aimed to prevention of acute kidney injury caused by possible myoglobinuria or in the cases of major crush injuries. Initial fluid resuscitation should aim for diuresis greater than 100 ml /h and 1.5 to 2.0 ml/kg/h for young children, with measurement of electrolyte concentrations every two to four hours. Indicated lab studies include complete blood cell count, serum electrolyte levels, liver function tests, BUN, creatinine levels, and urinalysis with urine for myoglobin. Diagnostic imaging include cervical spine, chest, and pelvis radiographs on any victim who was previously unconscious and appropriate extremity images in the presence of extremity injuries, recording of ECG readings in all patients and arterial blood gases. In the situations of severe electrical injuries when surgery is required it is necessary to perform blood typing or cross matching, and assessment of coagulation parameters (23).

Resuscitation measures in the operating room

Surgical treatment

There is high risk of development of myofascial compartment syndrome in patients after electrical injury and early recognition and decompression are of paramount importance. Patients may experience unrelenting pain, paraesthesia, hypoesthesia or decreased motor function, and there should be emphasized that loss of peripheral pulses is a late sign of compartment syndrome. Vascular thrombosis and skin and muscle necrosis limit the possibilities of manipulations of local tissue for reconstruction.

The optimal approach to management of these wounds has evolved to initial debridement, decompression and extensive debridement with skin coverage aiming at preserving vital structures. There should be emphasized that a relatively small burn may hide large tissue destruction and any sign of impaired circulation or swelling should be thoroughly inspected so that the decision on fasciotomy could be promptly elaborated and prevent further derangements of the damaged tissue.

Operative procedures may be performed after stabilization of the general condition of the patients in the terms of reversal of shock, stabilization of respiratory function with assured oxygenation, restoration of circulating volume and maintenance of end-organ perfusion. In the situations when those goals cannot be accomplished bedside fasciotomy may be performed.

Induction of anaesthesia and maintenance of balanced anaesthesia according to the protocols for burned and traumatized patients with administration of adequate analgesia, sedation and relaxation and maintaining stability of the patient.

Resuscitation will continue in the intensive care unit after surgical procedures with administration of respiratory support, monitoring and support of cardiovascular function, sedation, fluids, analgesia, monitoring renal function and nutritional support.

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ARE TRAUMA CENTERS EFFECTIVELY ORGANIZED IN TURKEY?

Trauma which is the leading cause of death under 45 years, is a public health issue. Regionalized trauma systems, used increasingly across the world, are consisted of a great number of trauma units which are under the control of a major trauma center. In Turkey, 112-emergency service stations and the doctors at the emergency departments of the hospitals are the frontline responders to trauma patients. As reported by Republic of Turkish Ministry Health Statistics Yearbook published in 2017, trauma patients are not classified as a distinct group but recorded as belonging the group of injury and intoxication along with road accidents. According to these statistical data, mortality rate of the group of injury and intoxication is %4.5. In the country, there are 30836 units of 112-emergency stations, one ambulance for 16418 people, total caseload including trauma patients is 8136. Despite the fact that there have been ongoing improvements in last decade, trauma system in Turkey is not as organized as it should be. Records of national data with regard to type and mechanism of trauma, demographic features, pre-hospital information, in-hospital information, mortality and morbidity, need new regulations on 112-emergency services and emergency departments at hospitals by taking sociocultural and geographic features into consideration while establishing preventive strategies for trauma, ascertaining the utilization and sharing of essential financial resources.

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	Evaluation and transport of elderly patients from the field to the operating room	Dilek KAZANCI, Turkey
	Hip fractures in elderly patient	Sanem ÇAKAR TURHAN, Turkey
	Polypharmacy in elders : Should we treat pain in elderly trauma patients?	Gülbin SEZEN, Turkey
	Elder abuse and neglect	Meltem UYAR, Turkey

HIP FRACTURES IN ELDERLY PATIENTS***K. Sanem Cakar Turhan, MD******Ankara University Medical School, Department of Anesthesiology and ICU***

The increased average age and life expectancy of the population lead to an increased prevalence of hip fractures. By 2030, elderly is expected to be up to 20% of US population. Each year approximately 280000 hip fractures are diagnosed and treated in United States and this number is thought to be 500000 by the year 2040 (1).

Hip fractures are among the common emergencies in geriatric population and requires immediate hospitalization. More than 90% of the individuals with hip fractures are aged above 65 and are usually precipitated predominantly by falls. Recent studies show that the average individual over 65 years falls at least once a year, and roughly 1 out of every 4 of these individuals succumb to their injuries just 12 months following surgical treatment (1).

Hip fractures are associated with an increased risk of mortality and morbidity. Obtaining a detailed medical, social, and functional history is the basis of preoperative assessment. Initial preoperative assessment is important to help identify the presence of preexisting comorbidities, which can have an important impact on the course of treatment (1). The prevalence of malnutrition is very high in older people and identification and management of malnutrition during preoperative period could be associated with a better functional recovery following hip fractures. (2). Preoperative delirium and preexisting dementia are frequent and may be present in more than 50% and 30% of patients with hip fracture, respectively. Delirium is a known postoperative complication occurring in 4% to 65% of all geriatric hip fractures. Postoperative delirium has been associated with sequelae of poorer outcomes, increased length of hospital stay, costs, and mortality (3). Identification of all these factors is important for better postoperative outcome. Immediate and adequate intervention which typically begins at the emergency department have shown to decrease mortality by reducing cardiopulmonary and venous thromboembolic complications that often accompany hip surgeries. A generally accepted approach in hip fractures is surgical management within 48 hours of admission. Delaying surgical management of hip fractures has been linked to decreased functional outcomes and increased mortality rates. Time, rather than technique, appears to be a recurring factor that can impact the long-term survival of these patients.

Therefore initial preoperative assessment presents a window of opportunity where possible interventions can be made in an effort to reduce the delay of surgery, minimize postsurgical complications, and ultimately improve mortality rate among patients with hip fracture (1).

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POLYPHARMACY IN ELDERLY: SHOULD WE TREAT PAIN IN ELDERLY TRAUMA PATIENTS?

Gülbin SEZEN,
Department of Anesthesiology and Reanimation, University of Duzce, Turkey

What is polypharmacy?

The use of multiple medicines, commonly referred to as *polypharmacy* is common in the older population with multimorbidity, as one or more medicines may be used to treat each condition¹. There is large heterogeneity in the definition of polypharmacy; ranging from numerical counts only, numerical counts for a given duration of therapy or setting or descriptive, which included terms such as minor, moderate, major and excessive polypharmacy. The most commonly used term was polypharmacy which was defined as five or more medications. Studies have suggested a shift towards adopting the term 'appropriate polypharmacy' in order to differentiate between the prescribing of 'many' and 'too many' drugs instead of a simple numerical count of medications, which is of limited value in practice².

The proportion of older patients with polypharmacy varied, by a factor of 2.4, between general practices after accounting for differences in the patient and practice population³. The prevalence of medication use increased with age across the seventh decade, with the greatest increase seen in the volume of cardiovascular prescriptions, particularly in those prescribed between two to four cardiological medications¹. When addressing polypharmacy, we usually think about prescription medication. However, we must consider the number of over-the-counter drugs and herbal supplements that patients use.

Why polypharmacy is important in elderly population?

Polypharmacy is associated with adverse outcomes including mortality, falls, adverse drug reactions, increased length of stay in hospital and readmission to hospital soon after discharge³⁻⁵. The risk of adverse effects and harm increases with increasing numbers of medications⁶. Older patients are at even greater risk of adverse effects due to decreased renal and hepatic function, lower lean body mass, reduced hearing, vision, cognition and mobility⁷. Also, the risk is compounded by the increased number of drugs. Polypharmacy increases the risk of potential drug-drug interactions as well as the risk of sustaining a hip fracture, especially specific drugs associated with falls such as central nervous system active drugs⁸. Additional contributing factors include miscommunication or misunderstanding physician orders as a result of cognitive dysfunction, and mistaking drugs because of similarity in shape or colour, both of which can arise more often in older age groups⁹.

Multimorbidity and polypharmacy generally will increase the risk of adverse drug reaction (ADR). ADR will be difficult to avoid having to consider the treatment of patients with possible inappropriate prescribing and potential risk in the elderly. Another reason, pharmacokinetic properties may change in elderly patients so that the dose needs to be adjusted to avoid the incidence of drug side effects. The prevalence of polypharmacy, inappropriate prescriptions and ADR interlinked, therefore, should be assessed to adjust the drug is needed, so that a given drug needs to pay attention to patient safety in elderly patients. The improvement in the quality of the prescription, the selection of the appropriate doses, avoids drug-drug interactions (DDIs), can reduce adverse drug events (ADEs)¹⁰.

There are many different resources, from literature reviews, food and drug administration reports, and clinical care guidelines which can be used to assist in identifying high risk medications in older people. One of the most well-known is the American Geriatrics Society's Beers Criteria (2019 update). A list of medications whose use is deemed potentially inappropriate in older people, where harm is thought to commonly outweigh the benefit. The Beers Criteria are not meant to be punitive, in other words, it is not that the medications listed are never to be used; it is however meant to flag medications we should avoid when other safer alternatives exist, and to closely monitor when the use of one of these higher risk medications is required¹¹.

The STOPP (Screening Tool of Older Persons' Prescriptions) and START (Screening Tool to Alert to Right Treatment) criteria were designed and validated as criteria to help prevent the use of potentially inappropriate medicines and prescribing errors, as well as to reduce ADRs and ADEs. The criteria were developed in 2008 and updated in 2015¹² to the STOPP/START Criteria, the top 10 STOPP Criteria include: 1. Long term benzodiazepine use, 2. Duplicate prescriptions for the same drug class, 3. Proton pump inhibitor use in peptic ulcer disease at full dose for >8 weeks, 4. NSAIDs in patients with moderate to severe hypertension, 5. Long term use of opioids as first line for mild to moderate pain, 6. Aspirin use without adequate cardiovascular risks, 7. Warfarin and NSAID use together, 8. Betablocker use in patients with chronic obstructive pulmonary disease (COPD), 9. Prolonged use of first generation antihistamines, 10. NSAID use in patients with chronic kidney disease (CKD)¹³.

Is pain important in elderly trauma patient?

It is clear that pain results from most traumatic injuries, yet very little attention has been given to the assessment and management of pain in older trauma patients. Effectively assessing and managing pain in older adults is difficult. First, older adults are more likely to have chronic pain conditions before the traumatic injury, such as degenerative joint disease, neuropathy, nerve impingements, or osteoporotic fractures. They may be taking opioids or nonsteroidal anti-inflammatory drugs to control these painful conditions, which may lead to atypical tolerance for pain and pain medication compared with their younger counterparts. Second, health care providers may have biased or inaccurate attitudes about pain in older adults, assuming pain is just part of old age. On the other hand, providers know that aggressive pharmaceutical treatment of pain is difficult and potentially risky in patients with medical comorbidities or hemodynamic instability. Third, older adult patients may not understand the language or process of standard assessment instruments and therefore cannot or do not communicate their pain effectively to health care providers¹⁴.

The treatment of pain in older adults is important not only to achieve an immediate reduction in suffering but also because untreated pain may impact long term health outcomes. Persistent pain in older adults is associated with decreased quality of life, impaired function, poor sleep, decreased balance, increased falls, and mortality, perhaps mediated through increased stress or pain's effect on function. However, effective management of acute pain is associated with reduced persistent pain and improved function at 6 months in older patients following orthopedic surgery, suggesting that treating

acute pain in emergency department patients has the potential to improve long term outcomes. Because of the negative effects of pain in older adults and the potential to reduce persistent pain by treating acute pain, the effective management of acute pain in this population is an important priority. Additionally, lack of pain control can lead to delirium, decreased mobility, and inhibit deep breathing. These can cause changes in level of consciousness, pneumonia, pressure ulcers, and functional decline¹⁴.

In the Quattromani's study, patients who sustained blunt trauma and were older than 65 years were less likely to receive pain medication and had to wait longer to receive it. However, elderly patients who received pain medication were administered equivalent weight-adjusted morphine doses as their younger counterparts. Cautious management by starting slow and titrating narcotics may account for some of observations in their study, such as time delay in administrations. Interestingly, even though in this study demonstrated equivalent morphine dosing when opioids were administered, both geriatric and younger counterparts were undertreated in traditional weight-based dosing of 0.1 mg/kg¹⁵.

In a cohort of 211 older adults who presented to the emergency department (ED) after a motor vehicle collision (MVC), 26% had continued moderate or severe collision-related pain at 6 months. Patients with persistent pain were more likely to report functional decline, reduced self-rated health, and a change in living situation to obtain additional help¹⁶.

How to evaluate pain in elderly patient ?

The assessment and treatment of pain in the geriatric population can be challenging for multiple reasons. The more obvious reasons include their tendency to have more comorbidities and multiple medications, and the age-related changes in pharmacokinetics with pain medications¹⁷⁻¹⁸. Other less obvious reasons may include subtle cognitive impairments, a tendency to under-report or minimize pain, or even lack of documentation of their pain by medical personnel¹⁹⁻²⁰.

Although self-report remains the gold standard for the assessment of pain in all cognitively intact older adults, mild or moderate cognitive impairment can make pain assessment unreliable, whereas severe impairment can make it almost impossible to get an accurate assessment. There is no evidence that older adults with dementia have less pain, but they currently receive less analgesia. One should assume that patients with dementia experience at least as much pain as others with similar painful stimuli. Observational scales and surrogate reports should be used if self-report is not available or not reliable²¹. The inadequate management of pain for people with cognitive impairment is because of their tendency not to report pain and the failure of staff to assess pain. It is argued that staff attempts to assess pain are further hindered by the unavailability of appropriate assessment measures for use in patients with cognitive impairment²². Chibnall and Tait studied four available tests to assess pain in cognitively impaired and found that the use of the 21-point box scale is both a reliable and valid indicator of pain intensity in older hospitalized patients, including those with mild-to-moderate and severe cognitive impairment. The 21-point box scale consists of 21 numbers, ranging from 0 to 100, in multiples of 5. Using this scale, individuals were asked to place an 'X' in the box that best represented pain intensity; no verbal response was asked or required²³.

It is not uncommon for critically ill patients to be unable to communicate verbally, whether the cause is physiological or iatrogenic. Several scales are available for the nurse to use in assessing pain levels in these patients. The Wong-Baker FACES Pain Rating Scale provides pictures of 6 faces, with facial expressions ranging from a happy face (no hurt) to a sad face where the individual is crying (hurts worst). The Abbey Pain Scale can be used to measure pain in patients diagnosed with dementia and

unable to speak. The nurse observes for behaviors like vocalization (groaning and crying), non verbal body language, facial cues (frowning), and physiological changes (vital signs) ²⁴.

However, the effect of cognitive deficits in older adults has been shown not to interfere with the validity of the Verbal Numeric Rating Scale (VNS) as compared with younger adults. The VNS is one of the more commonly used pain scales, with pain being rated by the patient on a scale from 0 to 10 with 0 being “no pain” and 10 being “the worst pain imaginable.” This is the preferred method of pain assessment in many EDs ²⁵.

In the event of acute pain, it is recommended to carefully assess patient based on OPQRST. OPQRST stands for Onset of the event, Provocation or palliation, Quality of the pain, Region and radiation, Severity, and Time (history). In addition to documentation of OPQRST, the patients’ subjective assessment of their pain should be recorded in their medical chart (SOAP note) since there are misconceptions and culturally determined beliefs about pain. Age 65 and older should be assessed every 4 hours at minimum. This change in nursing documentation would help to gain a tighter control on pain for these patients who are typically poor reporters of pain. It also would pick out the patient who’s pain is not controlled leading the RN to recognize that this patient’s pain regimen may need to be changed ²⁶.

What are the treatment options for pain in elderly trauma patient?

Opioids:

Although opioid management in younger patients is very effective, elderly patients tolerate lower dosages of opioids. Starting doses of opioids for opioid-naïve, frail, and older adults with moderate to severe pain should be morphine as low as 1–2 mg intravenously or subcutaneously every 15–30 min, or hydromorphone 0.1–0.2 mg intravenously or subcutaneously every 15–30 min until the pain is controlled. Coanalgesics such as acetaminophen, anticonvulsants, and antidepressants should be considered as adjuvants ²⁷.

Age-related changes in metabolism can cause varying levels of increased sensitivity to opioids in elderly patients, which can lead to altered mental status or respiratory depression ²⁸.

The weak opioids including co-codamol, codeine and dihydrocodeine may elicit adverse effects such as cognitive decline and constipation. Although tramadol’s GI effects are lesser than other weak opioids, potential to precipitate delirium and reduced seizure threshold if creatinine clearance lower than 30 mL/min. According to AGS 2019 Beers Criteria, tramadol should be used with caution because of the risk of SIDH and hyponatremia. Use of meperidine should be avoided, oral analgesic not effective in dosages commonly used; may have higher risk of neurotoxicity, including delirium, than other opioids; safer alternatives available (AGS 2019 Beers Criteria, strong recommendations, moderate evidence) ¹¹.

Nonopioids:

Paracetamol was recommended as the first-line treatment by the AGS for treating mild pain in older adults ²². Intravenous paracetamol can be effective for trauma patients, however, like most medications close attention needs to be paid to the dosing schedule in the elderly. Liukas et al. found that if a standard dose of 1 g of paracetamol is given to all adults irrespective of age and sex, patients aged 80–90 years old will have 70% larger plasma concentration to paracetamol than young adults ³⁰. Also, paracetamol is less effective for treating inflammatory conditions. Furthermore, the presence of liver failure is considered as an absolute contraindication for administration of paracetamol. A strong recommendation of the AGS, although supported by only moderate evidence, is adherence to maximum daily dosage limitations for paracetamol: less than 4 g/day from all sources ^{22,27}.

NSAIDs, especially the oral formulations, pose a much greater risk for causing adverse events such as gastrointestinal bleeding, renal failure, and cardiovascular events within older adult populations. Overall high-quality evidence indicates that in older individuals, both nonselective NSAIDs and selective cyclooxygenase-2 inhibitors should only be considered in carefully selected individuals^{11,22}.

Lidocaine patches: conflicting data exist on the efficacy of lidocaine patches in rib fracture patients. Thus, no recommendation can be made on the basis of the available studies³¹.

Ketamine:

Subdissociative dose ketamine (0.3 mg/kg IV) provided better pain relief at 5 to 15 minutes and comparable analgesic efficacy at 20 and 30 minutes in comparison with IV morphine (0.1 mg/kg) in patients with acute abdominal, flank, and back pain. However, there were higher rates of minor side effects at 5 and 15 minutes³³⁻³⁴. Subsequent case series using short infusions of low-dose ketamine (0.3 mg/kg over 10 minutes) demonstrated significantly less side effects (6%) with effective analgesia (87%) compared with bolus dosing³⁵⁻³⁶.

Delirium and hallucinations are feared side effects with utilization of ketamine therapy. Delirium is common in older patients admitted to an ICU, with previous work suggesting a 10% increase in the incidence for every year over the age of 50-years. Significant risk factors for the development of delirium are influenced by clinical treatment decisions including opioid utilization, restraint use, sedation, and an altered sleep cycle³⁷.

Sedative medications:

Sedative medication such as benzodiazepine in patients who are not intubated should be used with caution. The combination of these medications with analgesic drugs can cause significant respiratory decompensation or worsen delirium. In general, mind-altering medications, such as benzodiazepines, should be minimized or not used in this population. Agitated patients should be evaluated for hypoxia, hypoventilation, and shock, before administration of any sedatives^{11,38}.

Regional Anesthesia:

Established and theoretical indications for regional anesthesia (RA) being a competent and safe technique in the elderly and cognitively impaired patients includes profiles from such methods currently being performed in traditional Operating Rooms and Emergency Rooms for both diagnostic and therapeutic interventions. Additionally more and more centers are sending patients, even polypharmacy elderly patients, home with continuous peripheral nerve catheters for prolonged benefits of pain management from RA³⁹⁻⁴¹.

The different analgesic modalities, which provide different postoperative analgesic levels (and varying side effects), may result in a varying incidence of postoperative cognitive influence or level of cognitive dysfunction. This implication is important for RA techniques because analgesic regimens of local anesthetics were shown to provide superior pain control over systemic opioids and also reduces systemic side effects of opioids that have been associated with the occurrence of postoperative cognitive dysfunction (POCD)⁴²⁻⁴³.

Epidural Anesthesia:

Many consider epidural analgesia to be the ideal choice for pain control in the elderly trauma patients with rib fractures. Epidural analgesia produces optimal pain control and can improve mechanical ventilation and pulmonary toilet⁴⁴⁻⁴⁵. There is an associated increase in maximal inspiratory pressure and vital capacity with epidural analgesia⁴⁶⁻⁴⁷.

The Eastern Association for the Surgery of Trauma published last guideline in 2016 for the treatment of pain in persons who have sustained blunt thoracic trauma. Epidural anesthesia was recommended as the firstline treatment for those with severe blunt thoracic trauma, and for patients older than 65 years with more than four rib fractures ⁴⁸. Significant decreases in mortality and pulmonary complications were found with the use of epidural analgesia compared with parenteral analgesia (45). There studied epidural analgesia in trauma patients older than 60 years who had rib fractures. When comparing the parenteral analgesia group with the epidural analgesia group, mortality decreased from 16% to 4%, instances of pneumonia decreased from 19% to 8%, and occurrences of adult respiratory distress syndrome decreased from 14% to 6%. A study by Bulger et al confirmed the potential life-saving attributes of epidural analgesia. Bulger et al found that when comparing elderly patients with rib fractures who did not receive epidural analgesia with those who did, the mortality rate decreased from 25% to 11% ⁴⁹.

Periferic Nerve Block:

Management of elderly orthopedic trauma patients in the ER can involve many regional anesthetic options. In shoulder and upper extremity injuries, an interscalene, supraclavicular, infraclavicular, axillary, and individual nerve blocks could be effective interventions associated with low risk of complications for older patients ⁴³.

Lumbar plexus block, fascia iliaca compartment block and femoral nerve block have been used successfully in elderly hip fracture patients. Hip fractures are one of the most common injuries with the elderly in a traumatic fall and one of the most common orthopedic trauma injuries associated with poor outcomes in the elderly population. Other lower extremity injuries such as ankle fractures can be effectively managed with a distal sciatic nerve block in addition to a femoral/saphenous block ⁴³.

Paravertebral Block:

In patients in whom epidural placement is considered unsafe, paravertebral block would be the technique of choice. Even though epidural analgesia is considered as the gold standard for management of rib fracture pain, it is limited by its narrow applicability to rib fracture patients and related side-effects. Many trauma patients, for multiple reasons such as cervical neck fractures, lumbar–thoracic spine fractures, and altered mental status are not candidates for an epidural placement. Currently in a perioperative setting placement of epidural catheter in an intubated and anesthetized patient is not recommended because of the suboptimal neurological evaluation. Paravertebral anesthesia has been shown to provide effective pain relief in patients with multiple rib fractures. Evidence supports the concept that paravertebral block is as effective as epidural blocks for perioperative pain management without many of the side-effects of epidural analgesia (50). Pulmonary complications, urinary retention, nausea, vomiting, and hypotension are less common with paravertebral block as compared to epidurals ^{43, 51}.

Other interventional approaches include interpleural catheters and intercostal nerve blocks. Intercostal block is associated with suboptimal pain control in rib fracture patients. The presence of a chest drain may lead to loss of local anesthetic ²⁷.

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05 April 2019, Friday

16:00-17:30	PANEL 9: Trauma in the elderly patient	Chairs: Hülya BAŞAR, Turkey Çetin KAYMAK, Turkey Sanem ÇAKAR TURHAN, Turkey
	Evaluation and transport of elderly patients from the field to the operating room	Dilek KAZANCI, Turkey
	Hip fractures in elderly patient	Sanem ÇAKAR TURHAN, Turkey
	Polypharmacy in elders : Should we treat pain in elderly trauma patients?	Gülbin SEZEN, Turkey
	Elder abuse and neglect	Meltem UYAR, Turkey

ELDER ABUSE AND NEGLECT

Prof.Dr Meltem Uyar
Ege University Medical Faculty Algology Department

Elder abuse is the mistreatment or neglect of an elderly person, usually by a relative or other caregiver. At greatest risk are the frail and/or isolated. Elder abuse may include physical violence, threats of assault, verbal abuse, financial exploitation, physical or emotional neglect, or sexual abuse. Elder abuse is the mistreatment or neglect of an elderly person, usually by a relative or other caregiver. At greatest risk are the frail and/or isolated. Elder abuse may include physical violence, threats of assault, verbal abuse, financial exploitation, physical or emotional neglect, or sexual abuse.

Physical The use of physical force that may cause pain or injury (Older persons may be more physically or psychologically vulnerable)

Signs Include: Black eyes, welts, burns, broken bones, bruises (esp. neck or groin), withdrawal easily startled/agitation

Sexual Non-consensual sexual contact of any kind, as well as sexual contact with any older person who is unable to give consent.

Includes: Physical acts, exposure to pornography, forced voyeurism, forcing elder to undress

Psychological/Emotional The willful infliction of mental or emotional anguish or pain through either verbal or non- verbal acts.

Includes: Threats and Intimidation, Isolation, Verbal Abuse, Deprivation of Basic Needs or Affection.

Psychological/Emotional Indicators Physical unexplained significant weight fluctuation, stress-related conditions

Behavioral disrupted sleep, depression/confusion covers in abusers presence, emotionally upset/agitated withdrawn/unresponsive

Financial/Material Exploitation The act or process whereby an individual illegally or improperly uses an older person's resources, including property, funds, and/or other assets. Financial Abuse Will be Addressed by Second Assistant Paul Machado

The National Center on Elder Abuse (NCEA) broadly defines and places elder abuse into three categories: **Domestic Abuse, Institutional Abuse, Self-Neglect or Self Abuse**

Neglect

The refusal or failure of an individual to fulfill any part of his or her duties or obligations to an older person, including failing to provide an older person with necessities such as food, shelter, personal safety, clothing, medicine, and needed care. Neglect may also include the failure of a person who has financial responsibilities to provide care such as paying for needed home care services or the failure of an in-home paid care provider to deliver needed care.

Self neglect or abuse refers to the fact that individuals may threaten their own health or safety by failing to provide for their own basic daily needs. This may result when an individual is cognitively impaired or when an individual has a chronic illness that leads to the person being physically not capable of providing for his or her own needs. It is important to recognize that individuals who are mentally competent and physically capable may also neglect themselves.

Self-Neglect or Self Abuse -Indicators Bedsores, dehydration and malnutrition, unsafe or unsanitary living conditions, allowing an Alzheimer's patient to wander unsupervised, Increased medical complications due to lack of/improper medication or care

Prevention Identify the risk factors:

avoid isolation, stay social/active – volunteer, see friends, avoid living with a person with a history of abuse or violence beware of family members with financial motivations or with substance abuse issues consider respite services to relieve caregivers, have friends and relatives remain involved and observant, Consider Counseling, Communicate, Have relatives and friends visit at various times of the day – unannounced

Warning Signs : abuser often speaks for elder, abuser isolates elder, abuser controls mail, visits and phone calls, elder appears helpless, confused, hesitant to speak freely, elder has insufficient food and basic necessities, elder exhibits poor hygiene, untreated medical conditions, visible injuries, change in sleep, appetite or behavior

06. April. 2019-Saturday

08:30- 09:15	PANEL 10: Postoperative early intensive care in trauma	Chairs: Onur ÖZLÜ, Turkey Sema TURAN, Turkey Sumru ŞEKERCİ, Turkey
	Intensive care for blunt and penetrating abdominal trauma and abdominal compartment syndrome	Ebru SALMAN, Turkey
	Ventilation management in trauma	Dusanka JANJEVIC, Serbia
	Incranial monitoring in traumatic brain injury	Züleyha KAZAK BENGİSUN

INTENSIVE CARE FOR BLUNT AND PENETRATING ABDOMINAL TRAUMA AND ABDOMINAL COMPARTMENT SYNDROME

Incidence rates of intra-abdominal hypertension (IAH) and Abdominal Compartment Syndrome (ACS) upon admission to the ICU are reported to be around 27.7% and 2.7%, respectively. The prevalence of ACS is between 4.2% - 14% in patients admitted to the ICU after trauma and in general ICU's 1%. (1) Intraabdominal hypertension is graded in World Society of Abdominal Compartment Syndrome (WSACS) guideline as grade I IAP:12-15 mmHg, grade II: 16-20 mmHg, grade III: 21-25mmHg, grade IV >25 mmHg and ACS is defined as sustained IAP > 20 mmHg (with or without an APP < 60 mmHg) that is associated with new organ failure/dysfunction. Improvement in abdominal wall compliance, evacuation of intraluminal contents, intraabdominal space occupying lesions, optimization of fluid administration and systemic/regional perfusion are the cornerstones of prevention of ACS. (2) Decompressive laparotomy is proposed for treating deranged physiology, when no other perceived option exist. Open abdomen is a non-anatomic and non-physiologic state requiring temporary abdominal closure when skin and fascia not being closed after laparotomy. Indications are based on mainly anatomic, physiologic and logistic reasons. The most common indications are abdominal compartment syndrome, damage control surgery and intraabdominal sepsis, which may overlap each other. OA is a continuum, composed of physiologic optimization, temporary abdominal closure and delayed abdominal closure. Right timing, effective surgery, collaboration of anesthesia and surgical teams in perioperative setting and following OA patients in permanence with discipline are the key points in this life saving strategy. OA patients shuttle back and forth between intensive care and operation theatre.

Prevention of acidosis, hypothermia and coagulopathy are mortal triad in damage control resuscitation. Besides this, endothelial glycocalix, crystalloid infusion and persistent sepsis make the damage uncontrolled, triggering acute traumatic coagulopathy. Hemostatic resuscitation with balanced blood products, minimalization of crystalloids, correction of hyperfibrinolysis, permissive hypotension and damage control surgery are strategies in reducing mortality and secondary ACS in damage control management. (3) OA as part of damage control resuscitation, and as a relief of ACS is a treatment option that bring along certain complications and challenges for anesthesiologists and intensivists. Increased IAP is also a symptom of intestinal injury.

Negative pressure systems (NPS) and dynamic abdominal closure systems (ABRA) are current approaches in temporary abdominal closure in OA. Kubiak et al demonstrated in a porcine sepsis and ischemia reperfusion model that application of peritoneal NPS decreased lung, kidney, liver and intestinal pathology. As a mechanism, this inflammatory ascites and toxic mesenteric lymph enters the circulation and cephalad to lung causing ARDS. Removal of inflamed peritoneal ascites diminished end organ damage. (4) NPS has effects on wound healing as well. By affecting angiogenesis, extracellular matrix remodelling a better granulation tissue is also provided. Decreased intestinal edema, negative fluid balance and prevention of heat loss are other key points in multifactorial

mechanisms of NPS. NPS is part of source control together with effective surgery and antibiotherapy. Thus effective source control may play an important role in antibiotic deescalation. Procalcitonin, SOFA, CRP and clinic of patient as a whole should be used to tailor antibiotic therapy.

Dynamic abdominal closure system (ABRA) by providing dynamic traction prevents fascial retraction. Its sequential use in conjunction with NPS decreases mortality and provides better primary fascial closure in OA patients. This system in intensive care in rehabilitation of OA patients provides better patient compliance, facilitates spontaneous respiration and ironically may help to provide necessary IAP increase in physiologic activities like coughing and straining.

In anesthesia of OA patient pharmacodynamic and pharmacokinetic properties should be taken into consideration. Drugs should be used with titration with lower doses. Depending on the stage of OA and after regression of sepsis, sedation with short acting agents may be chosen.

APACHEE, SOFA, SAPS, MODS, ISS and OA and peritonitis scoring systems, Björck, Menheim peritonitis index score and fascial defect can be used in management of severe complicated OA patients. Lung protective ventilation strategies should be maintained in all steps including perioperative periods. After laparotomy in ACS mechanical ventilation adjustments must be done accordingly. In addition to standard ICU care, the patient with OA will require tight fluid control. Significant amount of potassium, magnesium, phosphorus and calcium should be taken into account. Early nutrition for OA patients without intestinal injury will require additional protein supplement. Multimodal analgesia methods should be applied to OA patients with minimal sedation. (5) Intensivists's role is crucial for providing physiologic environment for minimizing OA duration. Abdominal closure should be done as soon as possible.

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INTRACRANIAL MONITORING IN TRAUMATIC BRAIN INJURY

Traumatic brain injury (TBI) is a leading cause of death and disability. Many survivors live with significant disabilities, resulting in major socioeconomic burden as well.

The systematic discussion of intracranial pressure (ICP) and its determinants dates back to the work of Scottish anatomist Monro and a compatriot surgeon, Kellie, at the turn of the 18th century. Their model for ICP, the Monro–Kellie doctrine, which was later refined by American neurosurgeon, Harvey Cushing, details the basic principles that govern ICP.

Principally, the volume of the intracranial cavity is constant under normal conditions, and, therefore, the maintenance of a steady ICP depends on the volume of its contents. The intracranial contents include brain tissue, blood and cerebrospinal fluid (CSF). As brain tissue is incompressible, steady ICP requires balancing the in- and outflow of the fluid components; namely, there must be a balance between the inflow of arterial blood and the outflow of venous blood from the head, as well as between the rate of CSF production and drainage. Elevated ICP can therefore result from any mechanism that increases the volume of any of the three components.

The maintenance of ICP within its physiologic boundaries is of critical importance to prevent brain injury. Elevated ICP-related injury occurs primarily via one of two mechanisms: (1) cerebral ischemia and (2) brain herniation. Cerebral blood flow (CBF) is tightly linked to cerebral perfusion pressure (CPP), which is governed by both mean arterial pressure (MAP) and ICP through the following relationship, $CPP = MAP - ICP$. Accordingly, as ICP increases, MAP is increased, primarily through a rise in cardiac output, in order to maintain a steady CPP. In the presence of elevated ICP beyond the ability for compensation through elevation of MAP, CPP will be compromised and cerebral ischemia may follow. While under the Monro–Kellie hypothesis, the intracranial space is a constant, enclosed space, the brain and intracranial CSF continue, of course, through the foramen magnum at the base of the skull to become the brainstem, spinal column, and the CSF-filled spinal canal. When ICP is sufficiently elevated, the pressure differential between the intracranial cavity and the spinal canal can cause the downward motion of brain tissue (i.e., herniation), which can compress vital brainstem structures, and subsequently lead to severe neurological outcomes including death.

Instead, TBI care focuses on the early identification and removal of mass lesions and on the detection, prevention, and management of secondary brain insults that adversely affect outcome (e.g., hypotension, hypoxia, seizures, elevated intracranial pressure). TBI is a heterogeneous disease in cause, pathology, severity, and prognosis. Consequently, TBI care depends in large part on careful and repeated assessment of clinical and laboratory findings, imaging studies, and bedside physiological data.

ICP and CPP guided therapy is central to neurocritical care for TBI patients. ICP monitoring is a fundamental strategy in neurocritical care for TBI and is used routinely to guide medical and surgical intervention. Though well-supported by retrospective and prospective studies there is no level I evidence for outcome benefit from treatment guided by ICP monitoring. Recent consensus guidelines from the Brain Trauma Foundation specify a critical ICP threshold of 22 mmHg below which ICP should be maintained, based on evidence that ICP above this value best predicts mortality and severe morbidity.

As some variability in ICP is expected even under physiologic conditions, there are intrinsic compensatory mechanisms to maintain a stable mean ICP. Foremost among these is that ability to modify the brain venous blood pool. Additionally, there is an ability, albeit limited, of some CSF to expand further out of the intracranial space and into the spinal canal. This compensatory reserve is finite and is dependent on the compliance of the system. When the reserve is depleted, small elevations in volume will lead to potentially dangerous sustained elevations in ICP. Alongside these mechanisms to attenuate changes in ICP, cerebrovascular autoregulation functions to maintain the necessary CPP in the face of ICP changes by way of altering cerebral arteriolar resistance. Autoregulation, however, is only effective between a CPP of 50–150 mmHg, below and above which hypoperfusion and cerebral edema may ensue, respectively.

The first instance of ICP monitoring using an EVD-based manometric system was described by Adson and Lillie in their landmark 1927 paper. Since that time, the indication for ICP monitoring has expanded, and, currently, the most common neurological and neurosurgical pathologies that require ICP monitoring include TBI, SAH, and hydrocephalus.

The Guidelines for the Management of Severe TBI recommend an ICP monitor in TBI patients at risk for intracranial hypertension, i.e., patients in coma (Glasgow Coma Scale [GCS] <8) and an abnormal admission head CT scan. This includes a mass lesion(s), hematoma or contusion, swelling (edema), midline shift, and compressed basal cisterns, particularly the perimesencephalic cisterns. However, up to 50% of patients who subsequently develop increased ICP may have a normal admission head CT scan. In these patients, an ICP monitor is recommended if two or more of the following are present at admission: age >40 years, unilateral or bilateral motor posturing, or episodes of systolic blood pressure (BP) <90 mmHg.

The indications for an ICP monitor remain debated in several circumstances, including (a) comatose patients with an initial normal CT scan or only minimal findings, e.g., traumatic SAH, diffuse axonal injury, bifrontal contusions in the noncomatose patient; and following surgery such as a decompressive craniectomy or evacuation of a mass lesion. These topics were addressed in a recent consensus conference on ICP with the following conclusions.

First, invasive ICP monitoring is not recommended in comatose patients with an initial normal CT scan or only minor changes, e.g., small petechiae, particularly if the scan is obtained early after injury. These patients should undergo a follow-up CT scan, particularly if there is neurologic worsening, and receive an ICP monitor if there is disease progression on the CT scan. Second, an ICP monitor is indicated when the CT shows evidence of brain swelling, e.g., compressed or absent basal cisterns. Third, an ICP monitor may be considered in patients with large bifrontal contusions independent of the neurological condition. Fourth, an ICP monitor is recommended when sedation interruption to check neurological function may be dangerous, e.g., respiratory failure. Similarly an ICP monitor is useful when the neurological examination is not reliable, e.g., maxillofacial trauma or spinal cord injury. Fifth, elevated ICP may occur after a decompressive craniectomy performed in a delayed fashion for intracranial hypertension refractory to medical management. ICP monitoring is recommended in these patients.

Finally, intracranial hypertension is common in patients who undergo a craniotomy for a mass lesion, particularly an acute subdural hematoma, and when present, intracranial hypertension aggravates outcome. Consequently an ICP monitor is recommended after a craniotomy particularly when there are other associated factors, e.g., hypoxia, hypotension, pupil abnormalities, midline shift >5 mm, brain swelling at surgery, and when patients may require other surgeries for extracranial injuries.

Methods for ICP monitoring can be divided into invasive and non-invasive approaches. Invasive methods include fluid-based systems and implantable micro-transducers. Of the invasive methods, ICP monitoring using an EVD is considered as the gold standard, not only for its accuracy but also because it additionally serves a therapeutic purpose by allowing CSF drainage.

EVDs allow for fluid-based monitoring as the pressure in the catheter equilibrates with the intraventricular pressure. This pressure transmits into an external saline-filled tube through a strain-gauge transducer from which the pressure measurement is made. The insertion of an EVD may be difficult in patients with inherently small ventricles size or those with ventricular compression attributable to advanced brain swelling.

ICP can also be measured using implantable microtransducers such as strain gauge devices, pneumatic sensors and fiber-optic sensors. In strain gauge devices, ICP changes cause the diaphragm to bend, leading to changes in the electrical resistance that are used to calculate ICP. Pneumatic sensors have a balloon in the distal end of the probe, where pressure exerted on the balloon is equal to the pressure of the surrounding tissue. Pneumatic sensors have also been used to measure intracranial compliance. In fiber-optic sensors, changes in ICP move a displaceable mirror at the tip of the sensor, altering the intensity of the light reflected back along the fiber optic cable. Most micro-transducers probes tips are placed intraparenchymally, but these can also be placed in the intraventricular, subarachnoid, subdural or epidural compartment. Advantages of implantable microtransducers are lower infection rates and risks of hemorrhage compared to EVD. However, these are more expensive and, with the exception of pneumatic sensors, generally cannot be recalibrated once in situ, which can affect the precision of ICP measurements. Generally, micro-transducers are used in situations where EVD placement is not successful or when clinicians judge that CSF drainage is not likely to be necessary.

In the neuro-critical setting, transcranial Doppler (TCD) is most commonly used as a tool to monitor changes in CBF in the setting of subarachnoid hemorrhage-associated vasospasm. A number of models using TCD-derived data have shown correlation with invasively-measured ICP; these models have used measurements of flow velocity (FV) in the middle cerebral artery, arterial blood pressure and pulsatility index (PI).

When the optic nerve exits the intracranial space into the orbit, it is still surrounded by the dural sheath. As such, the subarachnoid space surrounding the nerve is contiguous with the intracranial subarachnoid space. Elevation in ICP can transmit through the CSF in the subarachnoid space, leading dilatation of the optic nerve sheath, which can be detected using transocular ultrasonography.

There are a variety of gross anatomic changes associated with elevated ICP that can be detected using computed tomography and magnetic resonance imaging.

In summary, even though there is no level I evidence to support the use of a generic ICP threshold, it is clear that ICP remains important to and a foundation of sTBI care. In particular, research using ICP as part of MMM and investigation of the relationship between pressure, volume, blood flow, and metabolism has improved our understanding of sTBI pathophysiology. This has opened the door on

new therapies for ICP. Today numeric ICP values should no longer be considered a target but rather be regarded as an indicator of targetable pathophysiology. As such, optimal ICP management requires integration of ICP data with MMM, including the clinical examination, clinical imaging, and other physiologic parameters to provide individualized and pathophysiology specific care.

ORAL PRESENTATIONS

OP-001

PELVIC FRACTURE IN MULTIPLE TRAUMA: RETROSPECTIVE EVALUATION OF 50 PATIENTS

Kaykusuz Hatice¹, Guven Ayşegül¹, Ertan Batu², Turhan Çakar Sanem¹, Ökten Fatma¹

1:Ankara Üniversitesi Anesteziyoloji ve Reanimasyon Ana Bilim Dalı,

2:Ankara Üniversitesi Ortopedi ve Travmatoloji Ana Bilim Dalı

Introduction/purpose: Pelvic fractures are of serious importance in terms of surgery and anesthesia. It is associated with high mortality and morbidity especially in the elderly. It is mostly caused by falling and traffic accidents. The aim of this study was to retrospectively analyze the patients with pelvic fractures in the orthopedic operating room.

Materials and method: 50 patient files were retrospectively reviewed.

Findings: The mean age of these patients was 47.5(16-79 years). 8% of these patients had only coccyx fracture, 8% had only vertebral fractures and 84% had pelvic fractures with multi-trauma patients. 50% of the traumas were fall, 34% were in-vehicle traffic accidents, 10% were non-vehicle traffic accidents, 2% were occupational accidents and 4% were suicides.

4 patients had coccyx excision, 5 had stabilization, 35 had open reduction-internal fixation (ARIF), 3 had prosthesis, 1 had closed reduction and 1 patient had both stabilization and ARIF procedure.

Average operation time was calculated as 3 hours and 30.6 minutes. Mean intraoperative blood volumes were 0.76 units of erythrocyte suspension (ES) and 0.7 units of fresh frozen plasma (FFP). General anesthesia was preferred in 86% of the patients and regional anesthesia was preferred in 14% of the patients. In the postoperative period, 22 patients underwent a pain pump containing tramadol, 7 of them had a meperidine-containing pain pump, 1 of them with an epidural pain pump and 20 of them with classical painkillers and opiat application. In the postoperative period, 7 patients had wound infection and debris, 1 had arrest, 1 had sepsis and 1 had postspinal headache and 34 had no complication. In the postoperative period, 14% of the patients were followed up in the intensive care unit.

Discussion/conclusion: Because of serious complications such as ICU admission, wound infection, sepsis, we investigated patients with multi-trauma, especially pelvic fractures.

OP-002**INTERSCALENE AND SUPERFICIAL CERVICAL PLEXUS BLOCK FOR CLAVICLE FRACTURE IN A PATIENT WITH POSSIBLE DIFFICULT INTUBATION**

Duygu DEMİRİZ GÜLMEZ, Alparslan APAN, Özgün ÇUVAŞ APAN, Jülide SEZER
Giresun University Op.Dr.A.İlhan Özdemir Education And Research Hospital

Purpose: We present a case report requiring surgical repair of clavicle fracture has limited mouth opening due to vehicle accident and neglected mandible fracture.

Materials and Methods: Signed consent was obtained from patient before the surgery. 24 years old female patient was admitted for open reduction and internal fixation of right clavicle fracture to our hospital. Her inter-incisural distance was found as 2 cm. Ultrasound guided interscalene brachial plexus block was performed using portable machine using linear probe (12-18 MHz). Stimuplex 50 mm needle was advanced to the middle cord of chain and local anesthetic mixture containing 20 mL bupivacaine and 10 mL prilocaine was administered in increments. Superficial cervical plexus block was performed after skin wheal with 1 mL prilocaine on the middle point of the lower border of sternocleidomastoid muscle using the same needle under the guidance of ultrasound. 5 mL bupivacaine and 5 mL prilocaine was infiltrated with directing the needle. No additional analgesic or sedative was required during the surgery except 1 mg midazolam iv was given for sedation. Surgery was completed after 75 min and postoperative analgesia was last about 8 h.

Results: Difficult airway remains to be a serious problem despite various types of device and tools in use. Failed anticipated difficult intubations may associate with severe complications (1). Even using lesser invasive techniques such as supraglottic airway devices is not seems to eliminate this problem (2).

Discussion: Whenever possible, ultrasound-guided peripheral nerve blocks provide effective surgical anesthesia and valuable alternative in possible difficult intubation to avoid potential harmful consequences.

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OP-003**ULTRASOUND-GUIDED ANTERIOR SCIATIC NERVE BLOCK IN A PREGNANT PATIENT WITH A POPLITEAL ARTERY ANEURYSM**

Melike KORKMAZ TOKER¹, Başak ALTIPARMAK², Ali İhsan UYSAL¹, Mustafa TURAN², Semra GUMUS DEMIRBILEK²

¹ Mugla Sıtkı Kocman University Research and Training Hospital, Department of Anesthesiology and Reanimation, Mugla, Turkey

² Mugla Sıtkı Kocman University Department of Anesthesiology and Reanimation, Mugla, Turkey

Purpose: Locoregional procedures are the options of choice in pregnant patients undergoing non-obstetric surgery [1]. The anterior approach to sciatic nerve blockade has the advantage that the sciatic nerve block can be performed in supine position without changing the patient's position [2]. We aimed to present the anesthetic management of a parturient in the first trimester scheduled to undergo popliteal artery aneurysm repair with ultrasound (US) guided anterior sciatic nerve block.

Materials and Methods: A 32-year-old pregnant woman at 8 weeks of gestation referred to our clinic for preoperative evaluation before the right popliteal artery aneurysm surgery. Doppler imaging revealed a 6 mm diameter pseudoaneurysm at the right popliteal fossa. Physical examinations revealed hyperalgesia at the painful region. After usual monitoring, she received fentanyl 100 mcgr for pain control before the nerve block. She was positioned in the supine position with the hip and knee on the operated side flexed and the leg externally rotated at approximately 45 degrees. The anterior approach to the sciatic nerve was performed under US (SonoSite M-Turbo; FUJIFILM SonoSite, Washington, US) and nerve stimulator (B.Braun Melsungen AG, Germany) guidance. The US was first positioned 8 cm distal to the inguinal crease. The hyperechoic sciatic nerve image located posterior and medial to the lesser trochanter was obtained (Figure 1). A 100 mm- 21-gauge nerve block needle was advanced to elicit foot plantarflexion. Subsequently, 30 mL of 0.375% levobupivacaine solution was injected. The operation started 20 minutes after the block. After a 2-hour long uneventful surgical intervention, the patient was transferred to the recovery room. Her pain score was 2 according to the numeric rating scale. She did not have any analgesic demand for 16 hours postoperatively.

Results: Our main objective was to maintain maternal hemodynamic stability, ensuring adequate utero-placental perfusion in order to avoid periods of hypotension.

Discussion: The anterior approach to sciatic nerve block could be performed easily and successfully in a pregnant patient undergoing lower limb surgery.

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OP-004**PERIPHERAL BLOCK APPLICATION IN A HIGH RISK PATIENT USING ANTICOAGULANT TREATMENT**

Süheyla ABİTAĞAOĞLU, Ahmet KACIROĞLU, Ceren KÖKSAL, Dilek ERDOĞAN ARI
University of Health Sciences Fatih Sultan Mehmet Health Application and Research Center,
Department of Anesthesiology and Reanimation

Purpose: The risk of perioperative cardiac event increases in patients with coronary artery disease and congestive heart failure who have undergone non-cardiac surgery (1). Perioperative management of anticoagulant therapy is an important problem. Parkinson's disease(PD) is a common neurodegenerative disease and drugs used in the treatment can interact with anaesthetic agents. In this case report, we aimed to present our anaesthesia management for amputation in a patient with PD, who underwent anticoagulant therapy for heart and peripheral vascular diseases.

Materials and Methods: Minor joint amputation was planned in a 48-year-old male patient due to diabetic foot. The patient had coronary artery disease, congestive heart failure, diabetes mellitus(DM), internal carotid artery stenosis and PD, and had undergone bypass surgery 4 years ago. Patient was using pramipexole, piribedil, rasagiline for the treatment of PD, insulin for DM, clopidogrel, enoxiparine, spironolactone, furosemide, metoprolol, isosorbide mononitrate, ivabradine, cilastazol and iliomedine due to cardiac and vascular diseases. Ejection fraction was 25% and pulmonary artery pressure was 50mmHg, and the patient was considered to have a high cardiac risk. Anticoagulant treatment could not be discontinued due to existing diseases. Preoperative tests were within normal limits. Based on the evaluation of benefit-loss balance, peripheral nerve block application was decided. After imaging the popliteal nerve by ultrasound(USG), block was applied by 20ml 1% lidocaine-0.25% bupivacaine. During the surgery, hemodynamics remained stable and no procedure-related complication was encountered. The block area was evaluated by USG at postoperative 0, 2 and 24 hours and no hematoma was seen.

Results: Hematoma is one of the most serious complications that can be encountered after regional anaesthesia in patients receiving anticoagulant therapy(2). In the application of peripheral nerve blocks, the risk of neurological damage due to bleeding is lower due to the expanding potential of application area (3). In our study, popliteal nerve block application was preferred because of the existing comorbidities and possible interaction between the drugs used and general anaesthetics. No complication occurred after popliteal nerve block in our patient.

Discussion: If there is anticoagulant use in cases where general anaesthesia is very risky, the benefit-loss balance should be evaluated and peripheral block can be applied.

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OP-005

COMPARISON OF LOW-DOSE SPINAL ANESTHESIA AND ADDUCTOR CANAL BLOCK COMBINATION WITH CONVENTIONAL DOSE SPINAL ANESTHESIA IN OUTPATIENT ARTHROSCOPIC KNEE SURGERY

Seyda OZALP¹, Sanem CAKAR¹, Ramazan AKMESE², Volkan BAYTAS¹, Feyhan OKTEN¹

¹ Ankara University, Anesthesiology and Reanimation Department, Ankara, Turkey

² Ankara University Orthopaedics and Traumatology Department, Ankara, Turkey

Purpose: There are many pain modalities which are effective and frequently used in management of pain following arthroscopic knee surgery but most of them have several adverse effects. In the current study, we aimed to compare low dose spinal anesthesia-adductor canal block(SA) combination with conventional dose spinal anesthesia(S) in terms of intraoperative anesthesia characteristics, block recovery characteristics and postoperative analgesic consumption.

Materials and Methods: In the present retrospective, cohort study, data of 48 patients was collected from hospital medical records between October 2016 and April 2017. Intraoperative hemodynamic variables, time to reach sensorial block of T12 and maximum level of motor block and time to reach maximum motor block level, sensory block regression to L2, complete motor block recovery were recorded. Postoperative pain scores at rest and during flexion and postoperative analgesic consumptions were recorded. Adverse effects were recorded.

Results: Demographical characteristics were similar in both groups. VAS was significantly high at 1th hour in SA group whereas it was high at 4th and 12th hours in S group. In all other measurement points, VAS was similar in both groups. Total opioid consumption was higher in S group. But opioid-related adverse effects such as nausea and vomiting were similar.

Discussion: In the current study, it has been demonstrated that low dose spinal anesthesia combined with adductor canal block provides adequate anesthesia with lower pain scores and less analgesic consumption.

OP-006**ULTRASONOGRAPHY GUIDED POPLITEAL BLOCK APPLICATION IN HIGH RISK TRAUMA PATIENTS**

Sedat SAYLAN

Karadeniz Technical University Faculty of Medicine,
Department of Anaesthesiology and Reanimation, Trabzon, TURKEY

Purpose: Background: High-risk patients have an increased incidence of morbidity and mortality due to the interaction of several factors, including comorbidities, multiple drug use, cardiorespiratory dysfunction and fragility. Peripheral nerve blocks with the help of ultrasound (US) provide patient comfort without the need for general anaesthesia and complications of general anaesthesia may be avoided in high-risk and emergency patients. We present the application of popliteal block in two trauma patients with high comorbidity.

Materials and Methods: Case report: Case 1: A 62-year-old patient with right bimalleolar fracture had coronary artery disease and COPD. The patient with exertional dyspnoea had an EF of 25%. The patient was evaluated as ASA-3 with these findings (Figure 1). Case 2: Diabetic mellitus, coronary artery disease, and hypertension were present in a 65-year-old male patient who had an open wound on his right foot due to a billet fall. The patient with EF 45% was considered as ASA-3 (Figure 2). Considering the present diseases of both patients, right popliteal block was applied with US guidance and with the help of neurostimulator. Block applications were performed with 10 ml of 0.5% bupivacaine and 10 ml of 2% lidocaine through 80 mm long block needle. Patients were hemodynamically stable during surgery, and surgery was completed without any problems. Patients without any complications were discharged.

Results: Discussion: The most important advantages of peripheral nerve blocks compared to general anaesthesia and central blocks are minimal respiratory and haemodynamic effects (sympathetic block, hypotension, bradycardia, etc.), less risk of developing complications related to anaesthesia, and shorter recovery period. No problems were encountered during and after the operation. It is also known that peripheral nerve blocks provide better and longer postoperative analgesia. In our cases, postoperative analgesia was determined as 14 hours in the first patient and 8 hours in the second patient.

Discussion: Conclusion: These two cases demonstrated that ultrasonography-guided popliteal block could be a safe anaesthetic method in high-risk patients.

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OP-007**REGIONAL ANESTHESIA MANAGEMENT FOR A PATIENT WITH EISENMENGER SYNDROME AND PULMONARY HYPERTENSION UNDERGOING CESAREAN SECTION**

Sedat SAYLAN

Karadeniz Technical University Faculty of Medicine,
Department of Anaesthesiology and Reanimation, Trabzon, TURKEY

Purpose: Background : Eisenmenger syndrome is a cyanotic congenital heart disease associated with septal defects or patent ductus arteriosus with reverse or two-way shunt comprising pulmonary hypertension. The maternal mortality rate is high with 30-70% of risk. Death can occur at any time during pregnancy or puerperium. We present the anaesthesia management of caesarean section of a pregnant patient with Eisenmenger and high pulmonary artery pressure.

Materials and Methods: Case report: A 27-year-old 35-week pregnant woman operated for congenital heart disease (ventricular septal defect) during neonatal period discontinued her treatment for the diagnosis of pulmonary hypertension. She had shortness of breath, bruising and swelling in the legs. The patient's laboratory findings were normal and normal sinus rhythm and right ventricular hypertrophy were present in the ECG. Echocardiography revealed a large VSD (2 cm), right ventricular dilatation, biventricular hypertrophy and pulmonary artery pressure (PAP) of 140 mmHg. The patient who underwent emergency operation had an entrance saturation of 85%. Routine monitoring and invasive arterial monitoring were performed. Combined spinal-epidural (CSE) anaesthesia was applied with 1 ml = 5 mg bupivacaine from the intrathecal space. 4 mg of lidocaine and 5 mg of bupivacaine were administered in 10 ml SF through the epidural catheter at 10th minute. Oxytocin infusion was administered slowly. Postoperative analgesia was obtained through the epidural catheter. The patient was followed up in the postoperative anaesthesia intensive care unit and then discharged.

Results: Discussion: Patients with Eisenmenger syndrome have high risk for anaesthesia. Two major problems facing a pregnant patient are systemic vascular resistance reduction and thromboembolism. Anaesthesia management should aim to minimize shunting from right to left to prevent hypoxemia from deteriorating. Combined spinal-epidural anaesthesia provides the advantages of both spinal and epidural block while reducing the potential risks of general anaesthesia and presents haemodynamic stability.

Discussion: Conclusion: Pregnancy is risky for a woman with Eisenmenger syndrome due to high maternal mortality rate and possible poor prognosis. The patient should be evaluated by a multidisciplinary team of obstetrics, anaesthesia, cardiology and neonatal doctors. In conclusion, CSA anaesthesia may be preferred as an aesthetic method which provides cardiovascular stability in patients with ES.

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OP-008**IS A TRAUMA PATIENT ONLY A TRAUMA PATIENT?**

Hatice Akdu, Soner Özcan, Filiz Alkaya Solmaz, Eyyüp Sabri Özden, Pakize Kirdemir
Suleyman Demirel University Medical School, Department of Anesthesiology and Reanimation

Purpose: In patients with trauma, medicines and herbal products should be questioned as well as additional diseases. The effects of herbal products, especially popular slimming products (rarely known cherry stalk), on coagulation should be considered in trauma patients. We aimed to discuss a case of gastrointestinal bleeding after trauma.

Materials and Methods: A 54-year-old patient with BMI:36,2 was admitted to the emergency department due to hematoecia one day after falling from the tree. GCS:15, BP:85/41mmHg, HR:45beats/min, Hb:11, PLT:127000, INR:2.09, AST:23, ALT:13. There were no any limb pathology according to radiological examinations, no ulcer and anticoagulan background, and also the patient had been drinking cherry stalk tea (1000cc/day) for 3 days to lose weight. The patient with hypotensive was admitted to the ICU. 5U ES, 4U TDP were given due to blood loss. Noradrenaline infusion was begun and non-invasive CPAP was applied. The patient with confusion and low satO₂ was intubated. Endoscopy was performed due to active melena. Duodenal ulcer was detected and sclerotherapy was performed. Despite 8U ES, 8U TDP, 1U thrombocytapheresis, K-vit, transamine, re-endoscopy was performed when the score of Hbg:6.8 and PLT:46000. Sclerotherapy was performed after seen active bleeding ulcer in stomach cardia and bulbus duodeni. Despite Hbg:4.6 and inotrope infusion, total gastrectomy and esophagojejunostomy were performed upon hypotensive condition. Hydration was provided to the patient with Cre:1.8, INR:2.3 and ABY at postoperative period. Hemodialysis couldn't be performed due to hypotensive condition. The patient was dead on the 6th day.

Results: There hasn't been enough pharmacological study on herbal products, and the mechanisms of action, side effects, drug interactions haven't been shown in studies. When the use of herbal products begins at the same time as the patient's complaints besides exclusion of other specific causes for any diseases, this condition reminds the pathology association with the using of these products. There is no specific diagnostic test and it may interfere with any acute/chronic liver disease. In our case, it was thought that cherry stalk tea triggered prolonged INR and bleeding because there is no other pathology or drug background to explain the reason of this condition.

Discussion: The cherry stalk is included in many of the popular slimming products and effects on coagulation are known. Other pathologies as well as the expected findings of trauma should be considered in the patients with trauma and it should be noted that emergency treatment should be begun immediately.

OP-009**COMPARISON OF PERIPHERAL BLOCK AND GENERAL ANESTHESIA IN UPPER EXTREMITY TRAUMA**

Eyyüp Sabri ÖZDEN, Mustafa Soner ÖZCAN, Filiz ALKAYA SOLMAZ, Hatice AKDU, Pakize KIRDEMİR
Süleyman Demirel University, School of Medicine, Anesthesiology and Reanimation

Purpose: Regional anesthesia plays an increasing role in trauma surgery. Rapid advances in ultrasonography guided block techniques have made peripheral blocks more viable. Peripheral block application in upper extremity surgery is thought to offer recovery time advantages over general anesthesia. In our study, we aimed to compare the duration of hospital discharge of patients who were applied peripheral blocks with ultrasonography and general anesthesia during the upper extremity trauma surgery.

Materials and Methods: In 2018, 363 patients who underwent upper extremity trauma surgery were searched retrospectively. Age, sex, ASA score, anesthesia type (general anesthesia, peripheral blocks (infraclavicular, axillary)), complication and comorbidity, postoperative hospital stay and intensive care unit stay were retrieved from our e-database and patient records. ASA IV-V patients, aged below 18, who were administered local anesthesia were excluded from the study. 264 patients were enrolled in the study.

Results: Data of 264 patients concerning age, gender, ASA score and anesthesia type are shown in Table 1. The mean age of females was significantly higher than males, whereas peripheral (infraclavicular) block application was significantly higher in males. Although interscalene and supraclavicular blocks are well known, ultrasound-guided infraclavicular block (ICB) is a potentially safer and more effective technique. A significant relationship was observed among age, sex and anesthesia type. ASA score increases as comorbidities increase with age. Complications of patients increase with comorbidities and also the length of hospital stays. A significant correlation between the increase in age and ASA score and length of hospital stay was found but any difference in length of hospital stay between general and peripheral blocks was not found (Table 2). Six patients, who were administered general anesthesia, were admitted to intensive care unit and one patient was ex.

Table.1

Age	Gender	N	Mean±Std	
	Male	214	39,27±14,931	
	Female	50	47,12±18,968	
	Total	264	40,76±16,034	
ASA		N	Gender	N
	I	218	Male	181
			Female	37
	II	36	Male	27
			Female	9
	III	10	Male	6
Female			4	
Anesthesia type				
Gender	General (N)	Peripheral(N)		N
Male	92	122	Axiller	9
			Infraclavicular	113
Female	34	16	Axiller	3
			Infraclavicular	13

Table.2

		N	Mean±Std	p
Age	General	126	43,63±17,663	0,005
	Peripheral	138	38,13±13,938	
Length of stay	General	126	3,51±4,836	0,595
	Peripheral	138	3,22±3,794	
Age	Male	214	39,27±14,931	0,002
	Female	50	47,12±18,968	
		General	Peripheral	p
Gender	Male	92	122	0,001
	Female	34	16	
	ASA	N	Mean±Std	p
Age	I	218	38,24±14,488	0,004
	II	36	47,47±15,533	
	III	10	71,50±11,355	
Length of stay	I	218	2,98±3,988	0,001
	II	36	4,42±4,831	
	III	10	7,90±6,280	

Discussion: Anesthesia type was observed to have no effect on the length of hospital stay. Peripheral blocks are preferred more in our clinic despite their difficulty to apply to trauma due to the complexity of early resuscitation and polytrauma patients. Prospective studies involving a larger number of patients are needed to evaluate the effect of peripheral blocks on specific indications in trauma, length of hospital stay, development of chronic pain and opioid dependency.

OP-010**ANESTHESIA TECHNIQUE AND LENGTH OF STAY AFTER SURGERY FOR EXTREMITY INJURIES**

Melis Sumak Hazır, Dilek Unal

University Of Health Sciences Diskapi Yıldırım Beyazıt Training And Research Hospital

Purpose: The relation of anesthesia techniques and length of hospital stay (LOS) in patients undergoing surgery for extremity injuries were evaluated.

Materials and Methods: This retrospective study was performed using data of patients that underwent surgery for extremity injuries at our institution from January 2018 to December 2018. Data was collected from the institutional computerized database. Data concerning patient characteristics, types of trauma, anesthesia methods and LOS (days) were extracted. Patients who received general anesthesia alone were the general anesthesia cohort (GA); the regional anesthesia cohort (RA) was composed of patients who received regional anesthesia (neuraxial block, peripheral nerve block) alone or in addition to GA. Ethical approval was obtained

Results: We analyzed 881 patients, mean age was 41.9 ± 10.6 years (median 42, range 2-94), male/female ratio was 539 (61%) to 342 (38%). The American Society of Anesthesiologist physical class was I-II in 748 (85%); \geq III in 133 (15%). Of these, 349 (39.6 %) had upper extremity; 530 (60.1%) had lower extremity injuries. The RA and GA cohorts each consisted of 362(41%); 519 (58.9%) patients respectively (Table1, 2). The peripheral nerve blocks performed were axillary block in 51 (14,4%); infraclavicular block in 50 (13.8%); interscalene block in 25 (6.9%) and femoral and sciatic in 25 (6.9%) cases. The GA and RA cohorts were different with respect to patient age 44.1 ± 16.9 vs. 38.5 ± 24.4 years respectively ($p < 0.001$). Hospital length of stay was longer in patients who received GA mean 2.02 ± 3.1 (median 1, range: 1-37) days for the GA cohort and 1.52 ± 1.6 (median 1, range 1-17) days for the RA cohort ($p = 0.01$). Our results favor regional anesthesia methods in patients undergoing surgery for extremity injuries, as it provides early discharge from hospital. However the patients in the GA cohort were older, this fact may have influenced our results. Increasing the utilization of regional anesthesia techniques in the elderly may provide shorter LOS for these patients.

Table 1. Patient characteristics and injury description

Total patients	(n)	881
Gender n (%)	Male	539 (61.1)
	Female	342 (38.8)
Age (years)	Mean \pm sd	41.9 \pm 23.6
	Median (range)	42 (2-94)
n (%)	<18	151 (17.1)
	\geq 65	170 (19.2)
ASA n (%)	I-II	748 (85)
	\geq III	133 (15)
*Upper extremity injuries n (%)		349 (39.6)
Radius- Ulna- Wrist fractures		130
Rotator cuff ruptures		116
Humerus fractures		103
*Lower extremity injuries n (%)		530 (60.1)
Femur fractures		202
Tibia fractures		105
Malleol fractures		98
Cruciate ligament ruptures		125
Clavicle- Scapula fractures		2

ASA: American Society of Anesthesiologists physical class.

Values are numbers (frequencies), mean \pm standard deviation, median (range).

*There are patients in whom both upper and lower extremity injuries exist.

Table 2. Anesthesia methods

General anesthesia <i>n</i> (%)	519 (58.9)
Regional anesthesia <i>n</i> (%)	362(41)
Neuraxial block	191(21.6)
Peripheral nerve block	91(10.3)
General anesthesia+ Peripheral nerve block	47(5,3)
Neuraxial block +Peripheral nerve block	13(1.4)
Peripheral nerve blocks <i>n</i> (%)	
Axillary	51 (14,4)
Infraclavicular	50 (13.8)
Interscalene	25 (6.9)
Femoral/ Sciatic	25 (6.9)

Values are numbers (frequencies)

Discussion: Regional anesthesia provides shorter length of stay for patients undergoing surgery for extremity injuries. There is a need to ascertain the impact of anesthesia techniques on LOS in the elderly with adequately powered studies.

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OP-012**ANESTHETIC MANAGEMENT OF MORBID OBESE PATIENT WITH PELVIC TRAUMA**

Ferda YAMAN, Ayten BİLİR

Department of Anesthesiology and Intensive Care, Osmangazi University Faculty of Medicine,
Eskişehir

Purpose: Anesthetic management of morbid obese patient can be challenging of difficult airway, drug dosing. Both trauma and obesity are independent risk factor for thromboembolic events. We report the anesthetic management of morbid obese patient with pelvic fracture.

Materials and Methods: A 39-year-old man with a body mass index (BMI) of 58 (weight: 150 kg; height: 160 cm) was admitted to operation room from emergency service for pelvic fixation. The patient had a motorbike accident caused bilateral multiple pelvic fractures. Glasgow Coma Scale was 15. He had massive blood transfusion at the emergency service. He was hypotensive and tachycardic also noreadrenalin infusion was started. He had a full stomach and he was intubated after preoxygenation by videolaryngoscope with first attempt with the operating room table in the reverse Trendelenburg position. His mallampati could not estimated he was at supine position. After airway management, ultrasound guided central venous catheter was inserted to internal jugular vein and invasive artery monitoring was performed. After pelvic fixation and repair of the lacerations, the patient was extubated after neuromuscular block reversed by sugammadex and transferred to intensive care unit. Inferior vena cava filter placement was performed by interventional radiologists. After 1 month later he was suffering from infection at his sacral decubitis and still he was immobile. His treatment is proceeding at the yard of Clinical Bacteriology and Infection Diseases.

Results: Morbid obesity has been associated with increased mortality after trauma. This may result from difficult airway control, and higher number of pelvic injuries that occurs in morbidly obese trauma patients.(1). Videolaryngoscopy reduces the number of failed intubation attempts by improving the glottic view while also reducing laryngeal/airway trauma. (2) Also, the difficulty in surgical intervention and immunocompromised state are with morbid obesity may also contribute to this higher mortality. (3)

Discussion: The use of the videolaryngoscopy for tracheal intubation of obese patients provides feasibility. Multidisciplinary treatment is crucial for a morbid obese trauma patient.

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OP-013**TRAUMA-RELATED ADMISSIONS TO INTENSIVE CARE UNIT: SINGLE CENTER EXPERIENCE FOR MAJOR TRAUMA**

Süheyla Karadağ Erkoç, Pınar Karabak Bilal, Volkan Baytaş, Ali Abbas Yılmaz, Mustafa Kemal Bayar
Ankara University School of Medicine, Anesthesiology and Reanimation

Purpose: Major trauma is one of the major causes of hospitalization and intensive care unit (ICU) admission worldwide associated with increased mortality. The aim of this study was to investigate the complications and characteristics of major trauma patients admitted to ICU.

Materials and Methods: We analyzed major trauma patients admitted to our ICU between 2015-2018 retrospectively. The admission criterion was "Injury Severity Score" (ISS) >15 in the course of ICU admission. Demographic data including age, sex, type of injury, rates of complications, 30-day mortality, length of stay (LOS) in ICU and hospital were evaluated. Acute Physiology and Chronic Health Evaluation (APACHE II) score and Injury Severity Score (ISS) were calculated on the day of ICU admission to evaluate the injury severity.

Results: There were 61 major trauma admissions to our ICU during 2015-18 period. There were 19 (31.1%) males and 42 (68.9%) females. The ages ranged from 15 to 88 years, and the mean age was 42.6±19.2 years. There many types of injuries but most of them were unintentional injuries (n=53; 86.8%) as road traffic accidents (65.6%), falls (16.4%), and work accidents (4.9%). Only 8 of them were penetrating injuries as bullet wounds (11.5%) and sharp object injury (%1.6). LOS of ICU (16.2± 28 days) and hospital (27.7±33 days) were increased with complications among trauma patients. 67.2% of trauma patients developed complications. The most common complications were acute kidney injury (45%), pulmonary complications (34.4%), severe sepsis or septic shock (32.8%). ICU-LOS were significantly different between patients with and without complications (33.5±21.9 and 4.7±3 days respectively) ($p < 0.001$). Mean APACHE II and ISS were 15,8±9.4 and 48.6±18.6. The rates of 30-day mortality has a positive correlation with ISS and APACHE II ($p < 0.05$, $p < 0.001$). The rates of 30-day mortality was correlated with number of complications ($p < 0.01$).

Discussion: Major trauma resulting from road traffic accidents is a leading cause of intensive care utilization and mortality was correlated with complications. Improved ICU care of trauma victims will improve the outcome of major trauma patients.

OP-014

PERIOPERATIVE COMPARISON OF PREEMPTIVE AND NONPREEMPTIVE RENAL TRANSPLANT RECIPIENTS

Sami AYTEKİN, Bora DİNÇ¹, Zeki ERTUĞ, Necmiye HADİMİOĞLU
Akdeniz University Medical Faculty Department of Anesthesiology and Reanimation

Purpose: Renal transplantation in end-stage renal failure patients is the best treatment option that maximizes the patient's lifetime and the quality of life. Preemptive transplantation cannot be performed for all patients due to the limited number of donors. The aim of this study was to evaluate the perioperative effects of dialysis before renal transplantation.

Materials and Methods: In this study, 666 patients who underwent kidney transplantation at our center were investigated retrospectively. Patients were divided into two groups as pre-transplant dialysis patients (67.3%, N = 448) and preemptive transplant patients (32.7%, N = 218). Preoperative, intraoperative, and postoperative comparisons were carried out between groups.

Results: There was no difference in terms of intraoperative blood transfusion, crystalloid and colloid requirement, inotropic-vasopressor agent administration and hemodynamic parameters between the pretransplant dialysis and preemptive transplant patients. It was observed that dialysis requirement, delayed graft function, and acute rejection development were significantly higher during the postoperative period in patients who underwent dialysis before transplantation. In non-preemptive patients, the decrease of serum creatinine levels at the first postoperative month was more prominent when compared to preemptive patients; however, that difference disappeared on the first year follow-up. No significant difference was found for serum albumin levels and proteinuria alterations of the patients in long-term follow-up. Additionally, patient and graft survival comparisons between non-preemptive and preemptive transplant patients on 3 years follow-up revealed no significant difference.

Discussion: In conclusion, preemptive transplantation treatment is suggested to be considered as the first treatment option for end-stage renal failure patients since patients with preemptive transplantation appear to have less metabolic function impairment, complication risk, and more successful outcomes in terms of cost-effectiveness.

OP-015**KARTAGENER'S SYNDROME: GENERAL ANESTHESIA AND BILATERAL FUNCTIONAL SINUS SURGERY**

Onur ÖZLÜ, Cihan ŞAHİN, İklil GEMLİK, Mustafa SAATÇI
TOBB University of Economics and Technology, Medical School Hospital

Purpose: Kartagener's Syndrome is a subset of primary ciliary dyskinesias (PCD). It is an autosomal recessive inherited disorder with an incidence of 1 in 25 000 live birth. It is characterized by total situs inversus, bronchiectasis and sinusitis. General anesthesia is required for surgical treatment of complications of mucociliary dyskinesia of respiratory tract. We presented a case of 20 year old girl underwent general anesthesia for surgical treatment of recurrent nasal polyposis and chronic paranasal sinusitis.

Materials and Methods: A twenty year old girl with complaints of recurrent nasal obstruction and secretion, headache, and mucopurulent productive cough was planned to nasal polypectomy and functional endoscopic sinus surgery under general anesthesia. Diagnosis of Kartagener's syndrome was made during infancy because of recurrent runny nose and fever. Nasal polypectomy and sinus drainage were performed four times until came to our institute. She has bilateral bronchiectasis, situs inversus and bronchial asthma, paranasal sinusitis, bilateral nasal polyposis and allergy for amoxicillin, pollen and fungi. Due to pleurisy antibiotic therapy was applied one month before surgery. Antihistaminic (loratadine) inhaled bronchodilator and corticosteroid (salbutamol, fluticasone) were used by the patient. Midazolam 1 mg were used for sedation and cefazolin 2 gr was used for infection prophylaxis preoperatively. After induction with pheniramine maleate, propofol, vecuronium and fentanyl, endotracheal intubation was performed. Anesthesia was maintained using, remifentanil infusion and sevoflurane. Paracetamol 1 g iv, morphine sulphate 1 mg iv, patient controlled analgesia using with tramadol were used for postoperative analgesia. Neuromuscular block was antagonised with sugammadex. After aminofilin 240 mg administration she was extubated. After observing in the recovery room, she was transferred to the ward and discharged 24. hours postoperatively following an uneventful period.

Results: Increased mucus retention and failure to clear pathogenic organism cause exacerbation of infection and obstructive airway symptoms. So antibiotic prophylaxis, short recovery period, early ambulation with effective pain management are important points. Precautions should be taken to prevent asthmatic attacks during extubation and recovery period.

Discussion: General anesthesia, administrated considering patient's clinical features is a safe technique for Kartagener's syndrome

OP-016**CAN NOT VENTILATE CAN NOT INTUBATE SITUATION WITH SCLERODERMA: APPLICATION OF LIFE-SAVING LARYNGEAL TUBE**

Hüsne BAYRAK ŞAHİN, Yeşim MACİT, İklil GEMLİK, Onur ÖZLÜ
TOBB University of Economics and Technology, Medical School Hospital

Purpose: Scleroderma is a chronic connective tissue disorder characterized by the presence of hardened skin. The systemic form is associated with presence of calcinosis, Raynaud phenomenon, esophageal dysmotility, pulmonary fibrosis, renal disease, serious systemic hypertension. Emergency airway management of a patient who developed respiratory failure because of gastric content aspiration and scleroderma related esophageal dysfunction is presented.

Materials and Methods: A 83 years old female patient, with diffuse scleroderma (failure to swallow, esophageal dysfunction, gastroesophageal reflux, interstitial involvement of lungs) diagnosis was followed by gastroenterology and chest disease clinics over 10 years. After hospitalization for gastroesophageal reflux a midnight code blue was given for respiratory failure. Her respiratory rate was 32 min⁻¹, O₂ saturation was SpO₂ 70%. She had cyanosis and severe cough. The patient who had PEG was admitted to ICU. Thoracic CT and SFT had showed interstitial lung involvement. Biliary content was aspirated from the trachea. Efficient ventilation could not be provided with CPAP via face mask (FM) Because thoracic wall and pulmonary compliance were decreased due to interstitial lung involvement and skin sclerosis. The SpO₂ values decreased to 50%. Awake endotracheal intubation could not be performed because stiff neck had no movements and her mouth opening was 1,8 cm. Then insertion of classic LMA trial was unsuccessful. While trying to ventilate with FM and 100% O₂, 100 mg propofol and 40 mg rocuronium was administered intravenously. Insertion of Proseal LMA (in order of 4, 3, 2 sizes) were unsuccessful. Finally, laryngeal tube (size 3) insertion was allowed ventilation and SpO₂ value raised to 92%. Meanwhile ear-nose-throat surgeon was called for emergent tracheostomy. Tracheostomy was difficult due to dissection of sclerotic tissues and right deviation of trachea. Patient was ventilated mechanically with SIMV mode and after aspiration pneumonia treatment she was discharged on 21. day of ICU with tracheostomy to the ward.

Results: Can not ventilate and can not intubate situation is the most catastrophic position for an anesthesiologist. We did not do emergent cricothyroidotomy due to connective tissue stiffness and lack of neck movements.

Discussion: Having all kinds of difficult airway devices in ICU is life saving.

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OP-017**ANESTHETIC CHALLENGES: CRANIOSYNOSTOSIS UNDER GENERAL ANESTHESIA**

Onur ÖZLÜ, Dostali ALİYEV, Hüsne BAYRAK ŞAHİN, Yeşim MACİT
TOBB University Of Economics And Technology, Medical School Hospital

Purpose: Craniosynostosis is premature fusion of one or more cranial sutures, leading to restriction in skull growth, dysmorphic cranial shape, increased intracranial pressure, damage to the optic nerves and globes. The incidence of nonsyndromic craniosynostosis varies from 0.25 to 0.6/1000 live births. The most common suture involved is the sagittal suture (Scaphocephaly), followed by the coronal suture (Plagiocephaly), the metopic suture (Trigonocephaly), and the lambdoid suture. Treatment is performed by a pediatric neurosurgeon and a plastic surgeon collaboratively. We presented seven nonsyndromic craniostotic infants underwent surgery for cranial remodelling and frontoorbital advancement or strip craniectomy.

Materials and Methods: All patients were monitored, inhalational induction was done with sevoflurane and N₂O. After intravenous catheter insertion 0,5 mg/kg-1 rocuronium was injected. Trachea was intubated. Then radial artery and internal jugular venous catheters, urinary catheter and rectal temperature probe were placed. Blood gas was analysed when necessary. Anesthesia was maintained using remifentanyl infusion and sevoflurane in air/O₂ mixture. Ringer lactate, 0.9% NaCl or 3.33% dextrose-0.3% NaCl were infused. Blood losses were replaced using erythrocyte suspension and fresh frozen plasma. Sugammadex was used for antagonization. Morphine 0,01-0,02 mg/kg-1 and acetaminophene 10 mg/kg-1 were infused for postoperative analgesia. All patients were observed in Intensive Care Unit (ICU) postoperatively.

Results: The management of craniostosis should be a multidisciplinary approach. The anesthetic challenges continue as management of prolonged anesthesia, massive blood loss, venous air embolism, disseminated intravascular coagulation, positional injury and hypothermia.

Discussion: Monitoring, timely infusion of blood and fluid, adequately warming the baby are milestones of this anesthesia management.

OP-018**EVALUATION OF PERIOPERATIVE ANESTHESIA IN PEDIATRIC PATIENTS UNDERWENT PERCUTANEOUS ENDOSCOPIC GASTROSTOMY**Sengül ÖZMERT¹, Feyza SEVER¹, Arzu Meltem DEMİR²¹University of Health Sciences Ankara Child Health and Diseases Hematology Oncology Training and Research Hospital Anaesthesiology and Reanimation Department²University of Health Sciences Ankara Child Health and Diseases Hematology Oncology Training and Research Hospital Pediatric Gastroenterology Department

Purpose: Percutaneous endoscopic gastrostomy (PEG) is a simple, inexpensive and effective procedure with low complication rates. It is used with children who have normal gastrointestinal function with swallowing problems and long-term need for enteral nutrition. Enteral nutrition is preferred instead of parenteral nutrition as normal bowel functions continue. PEG placement in children is performed under deep sedation or general anesthesia.

Materials and Methods: 77 patients who underwent PEG between 2010-2018 were evaluated for anesthesia, intraoperative and postoperative complications. In the operating room, after routine monitoring of our clinic, patients were given different combinations of intravenous midazolam (0.05-0.1 mg/kg), ketamine (1-2 mg/kg), fentanyl (1-2 µg/kg) and propofol (2-3 mg/kg). PEG procedure was performed by preserving the spontaneous ventilations of the cases. Patients who underwent sedoanalgesia were treated with 100% O₂ by nasal cannula at 4 lt/min rate during the procedure. Patients undergoing general anesthesia were intubated after intravenous administration of 1 µg/kg fentanyl, 2-3 mg/kg propofol and 0.6 mg/kg rocuronium. In the maintenance of anesthesia, sevoflurane at 2-3% concentration, 50% N₂O and O₂ were used.

Results: 11 patients underwent general anesthesia and 66 patients underwent deep sedation. 38 of the patients were female. The mean age was 6.5 ± 0.70. The mean weight was 21 ± 1.41. 88% of our PEG indications consisted of neurological diseases (Cerebral Palsy and Mental Retardation, neurometabolic disease, posttraumatic neurological sequelae, SSPE, etc.). 65 of the cases were performed by the gastroenterologist and 12 by the pediatric surgery specialist. During the procedure, some patients developed short-term desaturation, but no cardiac arrest or life-threatening bronchospasm was developed. 27 patients hospitalized in ICU were transferred back to the ICU after the procedure and only 6 of 50 patients in the service were transferred to ICU due to respiratory problems.

Discussion: Patients who underwent PEG usually have chronic lung disease and are high-risk patients for anesthesiologists. However, the optimum preoperative anesthesia preparation in these patients and the application of the procedure under deep sedation without requiring intubation as much as possible is of importance in order to prevent complications.

OP-020**BURN INJURY IN 35 WEEK PREGNANT PATIENT**

Tuba KUVVET YOLDAŞ, Alev ATALAY, Cansu BALCI, İlkin ÇANKAYALI, Kubilay DEMİRAĞ, Mehmet UYAR
Ege University Anesthesia And Reanimation Department

Introduction: Pregnancy leads to many maternal physiological changes. Burn injury effects these physiological changes significantly(1). Mortality and morbidity are significantly higher in pregnant patients with severe burn injury when compared with other burn patients(2). In this case report; We present a 35 week pregnant patient with flame burn injury.

Case: 21 year old pregnant woman was referred to our burn intensive care unit 12 h after flame burn. Her weight was 70kg and height was 165cm. The patient's total burn surface area was 25% including anterior trunk, bilateral anterior thighs, bilateral hands and right arm. On arrival her vital signs were as follows; body temperature=36.5°C, heart rate 98/min, blood pressure 118/60 mmHg, respiratory rate=17 breaths/min, SpO₂=97%. Complete blood count and biochemical tests were normal except total protein and albumin (4.1 g/dL and 2.1 g/dL). Obstetrical evaluation was normal. Fetal heart rate was 150/min. She did not have any co-morbid diseases. In the first 24 hr, 6000 ml crystalloid and 500 ml colloid were infused. In the first 24 hr, urine output was around 50-70 ml/h. Invasive monitoring with arterial cannulation and central catheterization was achieved. On the 3rd day of admission, tachycardia (130 min/beat) and low saturation(SpO₂=92%) were observed. After consulting with the obstetrician, cesarean section was performed under general anesthesia. A live male baby was delivered (2810 gr, 46 cm and APGAR score 10). She had spontaneous respiration during her intensive care follow up and no systemic infection or organ dysfunction was observed. Excision and grafting were successfully performed twice during her stay. After 37 days of her burn injury, she was discharged from the hospital.

Discussion: In pregnant burn patients, early intervention and obstetric care are important. Some factors affecting maternal and fetal mortality were the percentage and depth of the burn area, age, co-morbidities and gestational weeks. Young age of our patient, moderate percentage of burn area, frequent obstetric examination and the rapid decision about caesarean section positively affected mortality and morbidity in our case.

Conclusion: Due to the complex clinical situation of the pregnant burn patients, multidisciplinary approach is required to provide optimal maternal and fetal care.

Keywords; Pregnancy, burn injury, intensive care

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OP-021

THE EFFECT OF CERIUM OXIDE ON ERYTHROCYTE DEFORMABILITY IN DESFLURANE INDUCED RATS

Halil KARA¹, Faruk Metin COMU², Aycan OZDEMIRKAN³, Volkan SIVGIN³,
Aysegül KUCUK⁴, Mustafa ARSLAN³

¹Yıldırım Beyazıt University, Faculty of Medicine, Department of Pharmacology, Ankara

²Kırıkkale University, Faculty of Medicine, Department of Physiology, Kırıkkale

³Gazi University, Faculty of Medicine, Department of Anesthesiology and Reanimation, Ankara

⁴Kutahya Health Sciences University, Faculty of Medicine, Department of Physiology, Kutahya

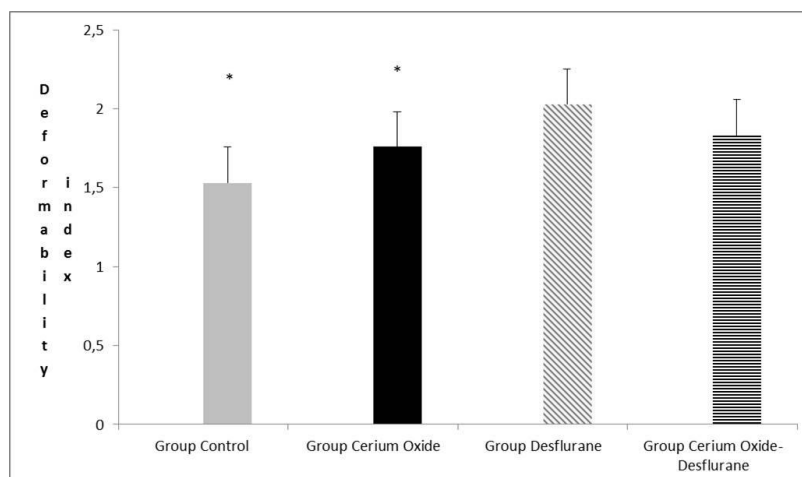
Purpose: Nanomedicine, which has emerged with the advances in the interdisciplinary fields of physics, engineering and biomedical sciences, is used to protect and develop the latest technology in human health. The introduction of antioxidant nanoparticles as potential therapeutics is an important result established from interdisciplinary research studies. The aim of this study was to demonstrate the effect of cerium oxide on erythrocyte deformability in desflurane induced rats and to contribute to a limited number of literature studies.

Materials and Methods: A total of 24 rats were equally and randomly divided into four groups as follows: Control (C), Cerium Oxide (CO), Desflurane (D) and Cerium Oxide-Desflurane (COD). Cerium Oxide was intraperitoneally administered at 0.5 mg/kg dose 30 minutes prior to the procedure in group CO and COD. Desflurane (6.8%) was given for three hours in D and COD groups. Whole rats were sacrificed under anesthesia and heparinized total blood samples were used to prepare erythrocyte packs. Erythrocyte suspensions were used for deformability measurement. Kruskal-Wallis test and Mann Whitney U test were used for statistical analysis

Results: There was a significant difference ($p=0.009$) in terms of erythrocyte deformability among the groups. The erythrocyte deformability index was significantly higher in group D, when compared with the controls and group CO ($p < 0.0001$ and $p=0.041$, respectively). It was observed that cerium oxide administration has slightly decreased the erythrocyte deformability index when compared to group D, but this was statistically insignificant ($p=0.100$) (Figure).

Discussion: We have concluded that cerium oxide has partially corrected the erythrocyte deformability in rats exposed to desflurane. We think that the use of cerium oxide in daily practice would be more widespread by the conduction of further and boarder studies with different dose and time variables.

Keywords: Cerium oxide, erythrocyte deformability, desflurane, rat
Figure: Erythrocyte deformability index values of the groups. Each bar represents the mean \pm sd. * $p < 0.05$ compared to the Group Desflurane



OP-022**EVALUATION OF PULMONARY FUNCTION TESTS IN
OBESE PATIENTS RELATION TO SMOKING**

Ayca Sultan SAHIN, Ziya SALIHOGLU, Süreyya ÖZKAN
SBU Kanuni Sultan Suleyman Education and Training Hospital, Istanbul

Purpose: Spirometry is the most comprehensive screening method for lung functions. Obesity (BMI 30 kg/m² or greater) could be another risk factor for respiratory function disorders. FEV₅₀ and FEV₂₅₇₅ give information about the disorders. FEV₁/FVC and FEV₂₅₇₅, and to a lesser extent FEV₁, change more significantly as a result of cigarette smoking. The main objective of the study was to evaluate expiratory flows in smoker or non-smoker obese patients who underwent elective surgery.

Materials and Methods: The ages, weight and height, BMI, smoking status, pulmonary function test values of the morbidly obese patients who admitted to the Anesthesiology polyclinic were recorded. The inclusion criterias of the study were; morbidly obese patients aged > 18 years and BMI > 30.

Results: Total of 40 patients were included in the study. Twenty-three were female and 1 was male of the 24 patients who non-smoker, 6 were female and 10 were male of the 16 patients who smoker. 10 of the smokers used less than 20 packs / year and 6 of them used more than 20 packs / year. The mean age of the 16 smokers was 56.25 years. Of the 16 patients who smoker, BMI: 39.87 ± 5.42 and non-smoker 24 patients had BMI: 40.28 ± 5.17, no statistically significant difference was found between the two groups. When the parameters of the respiratory function tests were evaluated, the values of the patients who were smoker were found to be lower than those who were non-smoker and there was a statistically significant difference (p

Discussion: One of the most commonly used indicators of respiratory function, FEV₁, shows significant decrease with increased duration of smoking. Bottai M. et al. reported that lower values of FVC and FEV₁ in the general population were linked to an increased BMI and after a weight reduction the respiratory parameters had improved (5). Another popular indicator in the diagnostic practice is FEV₁/FVC. Khalid G. et al. (11) found reverse correlation between FEV₁/FVC and pack years. In our study, tests showed that smokers had lower FEV₁/FVC than non-smokers. In conclusion, in obese patients, smoking adversely affects pulmonary function tests.

OP-024**THE STRUGGLE FOR SURVIVAL WITH HEMOGLOBIN 1.3 AFTER POSTPARTUM ATONIA:**

Ayca Sultan SAHIN, Ziya SALIHOGLU, Süreyya ÖZKAN
SBU Kanuni Sultan Suleyman Education and Training Hospital, Istanbul

Purpose: Infection, preeclampsia and bleeding are known as the maternal mortality (death) triad. 70% of maternal mortality are preventable causes and 20% - 25% of them are the result of postpartum hemorrhage. We aimed to present the patient who was still alive and followed up in our intensive care unit after hysterectomy with emergency surgery and was admitted to our hospital with postpartum hemoglobin 1.3 after birth.

Materials and Methods: The patient's blood pressure could not be measured referred to the emergency room with pupillary fix dilated GKS:3,IR:-/-,Pulse:150/min due to atony bleeding after vaginal delivery. The patient was accepted to the operating room with hemorrhagic shock due to atonia. Patient whose GKS:3, IR: -/-, pulse: 155/min, SpO2:70% were intubated with 50mg ketamine,40 mg esmeron. Hb:1.4 g/dl,Htc: 4.3%,Plt:79.000. ORh(-) and crystalloid-colloid fluid resuscitation were continued. PH:6.9, PO2:206, PCO2:27, HCO3:5.4, BE:-25, lac:12.3 and hemogram; hgb:9.1, Htc:28, Plt: 92.000 were determined. During laparotomy, uterus was white and there was no bleeding. Hysterectomy was performed after the blood supply were seen in the uterus with adequate fluid-blood transfusion. Totally 8 ES, 4 TDP, 4TS, 4 gr fibrinogen suspension replacement were performed to the patient during the operation. ABG; Ph: 7.14,PO2:282, PCO2:36,HCO3:12,BE:-16,Hb:7.3,Htc:21,lac: 10.5. The patient was treated with hypothermia by external cooling in the intensive care unit and 3 ES, 3 TDP, 4 gr fibrinogen were given. The patient did not need transfusion and extubated on the 12th day.

Results: The patient was discharged to home at 30th day, she can do her routinely works at home.

Discussion: Postpartum hemorrhage is the most common cause of maternal mortality. The main cause of mortality is late diagnosis and non-detectable amount of bleeding. Gynecology team, anesthesia team, blood bank and intensive care team should work in multidisciplinary approach.

OP-025

COMPARISON OF DIFFICULT AIRWAY PREDICTION TESTS IN DIABETIC PATIENTS

Ismail Eren DURMUŞ, Gaye AYDIN, Yucel KARAMAN, Pervin Sutas BOZKURT
SBU Izmir Tepecik Egitim ve Araştırma Hastanesi

Purpose: In this prospective study, our primary goal was to compare difficult airway prediction tests and ultrasonographic airway measurements in more and less than 10 years of DM patients, and to determine its relationship with difficult laryngoscopy. Our secondary aim was to identify difficult airway prediction tests that could be used in daily practice in the most appropriate way to detect difficult intubation in DM patients.

Materials and Methods: After the local ethical committee approval with Type II DM total 54 patients, over 18 years, ASA II-III, BMI

Results: Group 1 and Group 2 cases were compared in terms of DM diagnosis year, DSE, HMDR, CL and age were statistically significant high in favor of Group 1. When Group 1 and Group 2 were compared in terms of difficult laryngoscopy, it was found to be significantly higher in ULBT Group 1. In all diabetic patients, the incidence of difficult laryngoscopy was 20.3%; BMI, MS, CEM, PS, PPT and HMMO were found to be statistically significant. In Group 1, the incidence of difficult laryngoscopy was 37.5%; BMI and DSE, PS, PPT, HMDR were statistically significant. In group 2, difficult laryngoscopy incidence was 6,66% and BMI, HMDR were statistically significant. In all diabetic patients, DSE(100%) ve PS(81.8%) were most sensitive tests.

Discussion: Predictive tests CEM and PS were found to have the highest sensitivity and specificity. We believe that it can be used to determine difficult laryngoscopy in DM patients. Especially with USG and difficult laryngoscopy, we think that performing studies in larger populations in DM cases may have more clear results.

Falcetta, Stefano, et al. "Evaluation of two neck ultrasound measurements as predictors of difficult direct laryngoscopy: A prospective observational study." *European Journal of Anaesthesiology (EJA)* 35.8 (2018): 605-612.

OP-027

EFFECT OF FULLERENOL NANOPARTICLES ON ERYTHROCYTE DEFORMABILITY IN RATS INDUCED BY SEVOFLURANE

Volkan SIVGIN¹, Aysegul KUCUK², Faruk Metin COMU³, Gulfem YALCIN¹, Mustafa ARSLAN¹¹ Gazi University Faculty of Medicine, Department of Anesthesiology and Reanimation, Ankara, Turkey² Kütahya Health Sciences University, Faculty of Medicine, Department of Physiology, Kütahya³ Kırıkkale University Faculty of Medicine, Department of Physiology, Kırıkkale

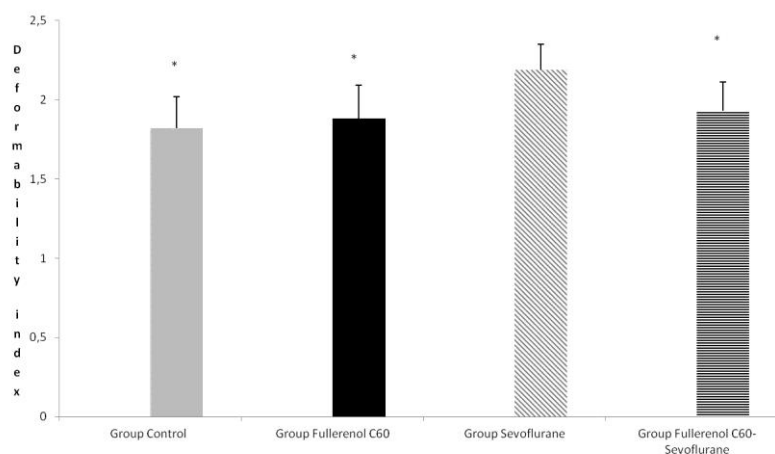
Purpose: Fullerenol is a water-soluble C60 fullerene derivative firstly introduced by Cheng et al, which has been demonstrated to scavenge free radicals in vivo and in vitro. Protective aspect of fullerenol has been reported in ischemia and reperfusion studies, however additional data is required to reveal its effect on erythrocyte deformability. In the current study, we aimed to investigate the possible effect of fullerenol C60 on erythrocyte deformability in sevoflurane administered rats.

Materials and Methods: A total of 24 rats were equally and randomly separated into four groups as follows: Control (C), Fullerenol C60 (F), Sevoflurane (S), Fullerenol C60-Sevoflurane (FS). In F and FS groups, Fullerenol C60 was intraperitoneally given at 100 mg/kg dose 30 min prior to the procedure and sevoflurane (2.3%) was applied for three hours in S and FS groups. Whole rats were sacrificed under anesthesia and heparinized total blood samples were collected to prepare erythrocyte packs. Erythrocyte suspensions were then used for deformability measurement. Kruskal-Wallis test and Mann Whitney U test were used for statistical analysis

Results: It has been observed that sevoflurane administration increased the relative resistance in all groups ($p < 0.0001$). Erythrocyte deformability index was significantly higher in group S when compared with group F and controls ($p < 0.0001$, $p=0.002$, respectively). We have found that Fullerenol C60 administration significantly decreased the erythrocyte deformability index when compared to the group S ($p=0.017$), (Figure).

Discussion: As a result, it can be concluded that Fullerenol C60 administration may improve the erythrocyte deformability in case of sevoflurane exposure. We believe that the protective effect of Fullerenol C60 will be more clearly indicated in anesthesia practice with conduction of further and more comprehensive studies, and use indications of Fullerenol C60 would be more widespread by the time.

Keywords: C60, erythrocyte deformability, sevoflurane, kidney Figure: Erythrocyte deformability index values of the groups. Each bar represents the mean \pm sd. * $p < 0.05$ compared to the Group Sevoflurane



OP-028**DIAGNOSIS AND TREATMENT OF TRACHEO-EUSOPHAGEAL FISTULA IN TETRAPLEGIC- VENTILATOR DEPENDENT PATIENT,**Fatma ÖZKAN SİPAHİOĞLU¹, Murat SAYIN¹¹University of Health Sciences, Dışkapı Yıldırım Beyazıt Training and Research Hospital, Department of Anesthesiology and Reanimation, Ankara, Turkey

Purpose: Tracheo-esophageal fistula (TEF) which is difficult to treat, is a rare complication that we should not be forgotten during ICU treatment. Cuff related tracheal tube damage is the most common cause among the benign causes of TEF. Most of the patients are diagnosed during on ventilator treatment. Here we present, the diagnosis and treatment of TEF in a ventilator dependent tetraplegic patient with TEF.

Materials and Methods: A 45-year-old patient with tetraplegia due to cervical fracture after a traffic accident was admitted to our intensive care unit from another center where he was followed up with tracheostomy on mechanic ventilator. It was learned that the patient underwent percutaneous tracheostomy on the 6th day after cervical stabilization operation. There was a sudden deterioration in patient's general condition while he was stable on the 37th day of tracheostomy. Despite adequate ventilation, the patient had CO₂ retention and abdominal distention was developed. Air was seen in drainage nasogastric tube. Tomography was planned for suspicion of TEF and tracheo-esophageal conjunction was observed (Figure 1). Endoscopy was performed for definitive diagnosis. Cuff was observed to pass to the esophagus from the posterior tracheal wall (Figure 2). Tracheostomy cannula was replaced by an endotracheal tube and the balloon was inflated away from the fistula. The patient underwent a primary repair surgery successfully one week later. In the postoperative period the patient was followed-up with an adjustable tracheostomy cannula so that the cuff was inflated caudal to the fistula. The patient is still under treatment.

Results: TEF is one of the late complications of tracheostomy and its incidence is less than 1%. Early diagnosis is important to protect the patient from possible fatal pulmonary complications. Increased tracheal secretions, aspiration of gastric contents, ventilation difficulties, abdominal distention or air filling to the nasogastric tube should alert us for TEF.

Discussion: TEF may not be recognized immediately in ventilator dependent patients. Especially we should consider TEF in patients who need high cuff pressure. Adjustable tracheostomy cannules should be considered in special cases.

Figure 1: TEF, thorax tomography axial sectional image

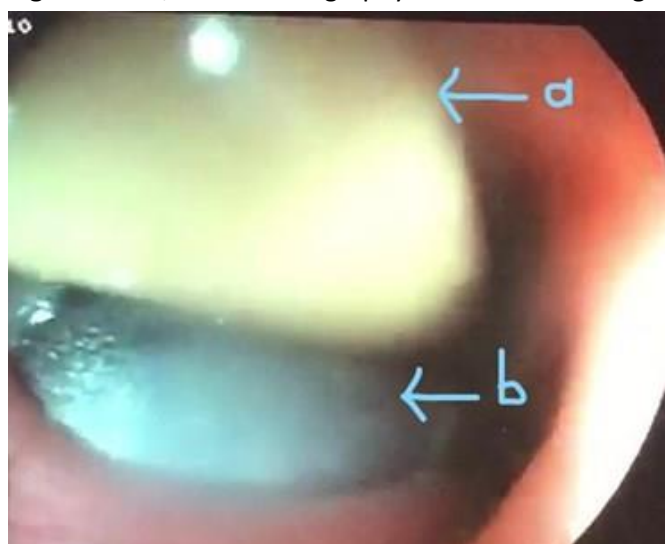
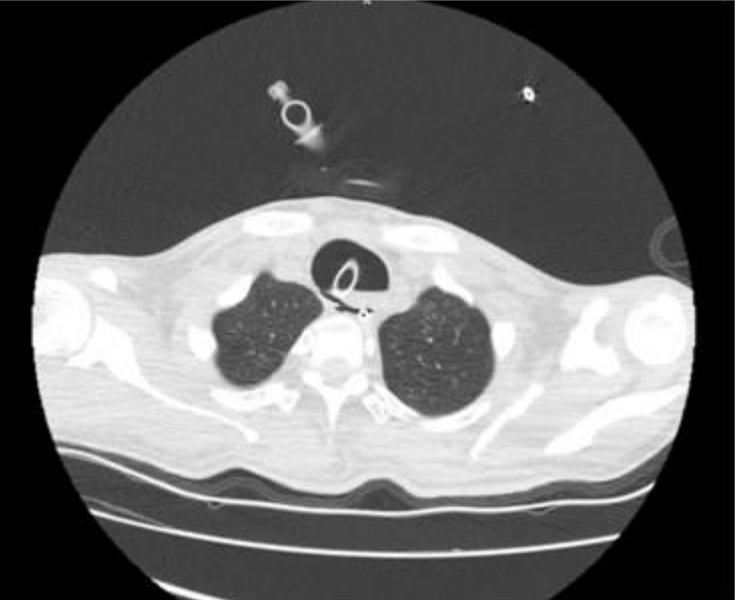


Figure 2: TEF endoscopic view a: Nasogastric tube, b: Tracheostomy cannule cuff



OP-029**EVALUATION OF PATIENTS WITH BRAIN DEATH DIAGNOSIS AND THE EFFECT OF NEW REGULATION ON THE DURATION OF DIAGNOSIS**

Savaş ALTINSOY

University of Health Sciences, Diskapi Yildirim Beyazit T&R Hospital, Department of Anesthesiology and Reanimation

Purpose: Today, the number of patients waiting for organ transplantation is increasing. Recent developments in organ transplantation in Turkey have made the brain death more important. With the Regulation on Organ and Tissue Transplantation No: 28191 dated 01.02.2012, the minimum requirements for the diagnosis of brain death have been established. In 2014, new regulations were published by the Turkey Ministry of Health. In the literature, there was no study examining the effects of this change. In this study, we aimed to determine whether the current regulation change has an effect on the duration of the diagnosis brain death.

Materials and Methods: After obtaining the approval of the local ethics committee, the data of patients diagnosed as "brain death" between 2009-2018 were examined. The demographic data of the patients, time of hospitalization, diagnosis of the "brain death", the status of being an organ donor, the tests performed for the diagnosis, the physicians who were named in the brain death detection record and the time of cardiac death were noted. All cases were divided into two groups as before 2014 (Group I) and after 2014 (Group II).

Results: In this study, 118 patients were included. There were 51 (44.1%) patients in Group II and 67 (55.9%) in Group I. Nineteen (16.1%) of the patients were children (

Discussion: In this study, new regulation in 2014 made a positive contribution to the time of diagnosis of brain death and shortened this period in our hospital.

OP-030**THE EFFICIENCY OF USING I-GEL DURING ENDOBRONCHIAL ULTRASONOGRAPHY GUIDED TRANSBRONCHIAL NEEDLE ASPIRATION**

Savaş ALTINSOY, Jülide ERGİL

University of Health Sciences, Diskapi Yildirim Beyazit T&R Hospital, Department of Anesthesiology and Reanimation, Ankara-Turkey

Purpose: Endobronchial ultrasonography (EBUS) is the process of entering into airway with a bronchoscopy device, and screening the airway lumen and structures outside the lumen and lungs using a probe through the tunnel of a bronchoscope. We aimed to compare different airway devices (i-gel and endotracheal tube) used in this common process which held under general anaesthesia and the role of these devices on the occurring complications.

Materials and Methods: 40 patients were included in this study ASA risk scores of patients were between I-III and the had an age range of 18-70 years. Patients were divided into two groups. The first group was intubated within an endotracheal intubation tube (group ET). I-gel as a supraglottic airway device in the second group (group I-gel) was used. Demographic information of the patients was recorded. Pulse, diastolic arterial pressure (DAP), systolic arterial pressure (SAP), mean arterial pressure (MAP) and peripheral oxygen saturation (SPO2) was recorded before anaesthesia induction (T1) and after induction (T2). Coughing, throat soreness, ear pain, difficulty swallowing, nausea and vomiting in the postoperative time was recorded. And intraoperative and postoperative complications were recorded.

Results: Each group of patients had similar demographic features in this study. In the ET group, postoperative throat soreness was more common ($p < 0.05$) in the comparison of two groups. Two groups were similar to each other as intraoperative and postoperative complications were compared ($p > 0.05$). Hemodynamic features were similar during the pre-intubation time. However, in the period after intubation more hemodynamic changes were seen in group ET ($p < 0.05$).

Discussion: I-gel can use safely as the endotracheal tube during ultrasonography process. Also, postoperative throat soreness can be prevented by the use of I-gel rather than an endotracheal tube and this would increase the patient comfort. The less occurring hemodynamic changes in the I-gel usage can cause a lesser increase in oxygen consumption and this would prevent the occurrence of cardiac complications.

OP-031**THE ROLE OF SCUBE-1 IN ISCHEMIA-REPERFUSION INJURY IN PATIENTS WITH OR WITHOUT DIABETES MELLITUS WHO UNDERWENT KNEE REPLACEMENT SURGERY**

Savaş ALTINSOY¹, Başak GÜLEL¹, Derya ÖZKAN¹, Ali YALÇINDAĞ², L. Tuğba HANCI², Aslı DÖNMEZ¹,

¹University of Health Sciences, Diskapi Yildirim Beyazit Training and Research Hospital, Department of Anesthesiology and Reanimation, Ankara-Turkey

²University of Health Sciences, Diskapi Yildirim Beyazit Training and Research Hospital, Department of Clinical Biochemistry

Purpose: Diabetes Mellitus (DM) is a common disease with high mortality and morbidity worldwide. Excessive generation of reactive oxygen species and reduced antioxidant defence mechanism plays a significant role in the development and progression of DM. In the current study, using malondialdehyde (MDA), total antioxidant status (TAS) and signal peptide-CUB-EGF domain-containing protein 1 (SCUBE-1), we aimed to assess and compare the oxidative stress level between patients with and without DM who underwent knee replacement surgery using a pneumatic tourniquet.

Materials and Methods: ASA I-II patients aged between 18-70 years old who underwent knee replacement surgery using a pneumatic tourniquet were enrolled in the study. Patients were assigned into either the diabetic (group D; n = 15) or non-diabetic group (group K; n = 15). Demographic features, HbA1C levels, durations of tourniquet use, anaesthesia and surgery were recorded. MDA, TAS and SCUBE-1 levels were assessed at three time points: before spinal anaesthesia (T1), 5 minutes before (T2) and 2 hours after deflation of the tourniquet (T3).

Results: Groups were well matched. Although not significant, SCUBE-1 levels were higher at T2 and returned to normal levels at T3. MDA and TAS levels were correlated with SCUBE-1 at all the three time points.

Discussion: SCUBE-1 concentration, in parallel to MDA and TAS, increased following tourniquet application in patients who underwent knee replacement surgery using a pneumatic tourniquet and returned to normal levels during the reperfusion period. The degree of increase, however, did not differ between patients with or without DM. Our results suggest that SCUBE-1 may be used as a marker of tourniquet-related ischemia-reperfusion injury.

OP-032**THE VALUE OF INTEGRATED PULMONARY INDEX MONITORING AFTER ELECTROCONVULSIVE THERAPY**

Demet LAFLI TUNAY

Cukurova University Faculty of Medicine, Department of Anesthesiology and Reanimation, Adana, Turkey

Purpose: The Integrated Pulmonary Index (IPI) is an algorithm integrated 4 major parameters end-tidal carbon dioxide (EtCO₂), respiratory rate (RR), oxygen saturation (SpO₂), and pulse rate (PR) measured by commercially available monitors in order to provide a simple indication of the patient's overall ventilatory status. IPI provides to determine the need for additional clinical assessment or intervention by evaluating respiratory status of patient. The aim of the study was to study the value of IPI monitoring for assessment of respiratory status and recovery from anesthesia after electroconvulsive therapy (ECT).

Materials and Methods: Total 64 patients, ranging in age from 18 to 65 years and undergoing maintenance ECT treatments for various psychiatric disorders, were enrolled in this prospective observational study. All patients were anesthetized with a standardized technique in which thiopental was used for induction and succinylcholine for neuromuscular blockage (NMB). After the patient resumed spontaneous ventilation, in addition to the standard monitoring, all patients were monitored with microstream EtCO₂, is a portable bedside monitor that continuously monitors a patient's EtCO₂, RR, SpO₂, PR and IPI. All those parameters and also modified aldrete score (MAS) were recorded during the first 5 minutes immediately after NMB recovery and the first 10 minutes in the post anesthesia care unit (PACU) stay, at 1-min intervals. Supplemental oxygen requirement, any interventions improving the patency of airway and any complications such as apnea, bradypnoea, tachypnoea etc. were also recorded.

Results: There were 1089 IPI readings ranging from 1 to 10. When IPI readings classified as low (1–3), medium (4–6) and high (7–10) IPI groups, there were statistically significant differences between EtCO₂, RR, SpO₂ and PR ($p < 0.05$). Additionally, there was a moderate correlation between MAS and IPI values in PACU followings.

Discussion: The IPI monitorisation can be useful over the standard monitorisation in terms of better evaluation of respiratory status, and also provide to make decision about PACU discharge, after ECT therapy.

OP-033**THE USE OF VASOACTIVE-INOTROPIC SCORE IN ADULT PATIENTS WITH SEPTIC SHOCK IN INTENSIVE CARE**

Iskender Kara¹, Mehmet Sargin², Yeşim Şerife Bayraktar¹, Hatice Eyiol², Ipek Duman³, Jale Bengi Çelik¹

¹Selçuk University Faculty of Medicine, Department of Anesthesiology and Reanimation, Critical Care Medicine,

²Selçuk University Faculty of Medicine, Department of Anesthesiology and Reanimation,

³Necmettin Erbakan University, Meram Faculty of Medicine, Department of Medical Pharmacology

Purpose: This retrospective study was designed to investigate the relationship between the Vasoactive-inotropic score and the outcome of sepsis patients in ICU by calculating the initial 48 hour use of vasoactive drugs.

Materials and Methods: The data of 392 patients with the diagnosis of septic shock in adult ICU were assessed. Vasopressors and inotropic support (dopamine, noradrenaline, adrenaline and dobutamine) of the patients during the first 48 hours after the diagnosis of septic shock were evaluated. Mean and peak VIS values were calculated. The patients were divided into groups according to the mean $VIS \geq 10$, peak $VIS \geq 10$ and outcome were analysed. Vasoactive-Inotropic Score = dopamine dose ($\mu\text{g}/\text{kg}/\text{min}$) + dobutamine dose ($\mu\text{g}/\text{kg}/\text{min}$) + 100 x adrenaline dose ($\mu\text{g}/\text{kg}/\text{min}$) + 100 x noradrenaline dose ($\mu\text{g}/\text{kg}/\text{min}$) + 10 x milrinone dose ($\mu\text{g}/\text{kg}/\text{min}$) + 10.000 x vasopressin dose (U/kg/min)

Results: The median age were 68 (54.25-79) years and 239 (61%) were male. Dopamine 188 (47.9%), noradrenaline 365 (93.1%), adrenaline 53 (13.5%) and dobutamine 15 (3.8%) were used in the patients. The mean VIS was 9 (4-15), while the number of mean $VIS \geq 10$ patients were 192 (49%). Peak VIS values were 11 (5-20), and the number of peak $VIS \geq 10$ patients were 220 (56.1%). The mortality rate of the patients included in the study was 42.1%. The mean VIS score (13 vs 6, $p=0.000$), mean $VIS \geq 10$ patient ratio (71.5% vs 32.6%, $p=0.000$), peak VIS score (16 vs 8, $p=0.000$), and peak $VIS \geq 10$ patient ratio (73.3% vs 43.6%, $p=0.000$) were higher in the exitus group. The parameters such as mean VIS [OR 1.123, 95% CI 1.027-1.229, $p=0.011$], mean $VIS \geq 10$ [OR 3.455, 95% CI 1.625-7.345, $p=0.001$] and peak VIS score [OR 0.917, 95% CI 0.851-0.989, $p=0.024$] were determined as independent risk factors for mortality. The cut-off value of mean VIS values according to the Receiver Operating Characteristic analysis performed to predict mortality rate was found as 9.75 [AUC:0.713, 95% CI 0.662-0.764, $p < 0.0001$]. In septic shock, vasopressors and/or inotropic support is necessary. It may be useful to have a simple scoring system to predict mortality and morbidity.

Discussion: We conclude that vasoactive-inotropic score may be useful in predicting the outcome of septic shock patients.

OP-034

LIFE-THREATENING EVENT AT ENDOSCOPIC PARATHYROIDECTOMY

Emel GÜNDÜZ, Bora DİNÇ, A. Gülbin ARICI

Akdeniz University, Faculty Of Medicine, Department Of Anesthesiology And Reanimation Antalya, Turkey

Purpose: Nowadays, Natural orifice transluminal endoscopic surgery which was developed for neck surgery become increasingly popular. Herein, an innovative transoral endoscopic parathyroidectomy vestibular approach (TOEPVA) was developed for primary hyperparathyroidism. In this study, a 52-year-old male patient who underwent TOEPVA presented bradycardia and hypotension during insufflation stage

Materials and Methods: When the patient was taken to the operating room, preoxygenation was performed with 80% oxygen after ECG and pulse oximetry monitoring. The patient's values were evaluated as 107/75 mm/Hg blood pressure, 62 beats/min heart rate and SpO₂: 99. General anesthesia was induced with 3 mg midazolam, 5 mg / kg thiopental, 50 mcg / kg fentanyl and 0.6 mg / kg rocuronium. The patient was orotracheally intubated with an electrode tube for intraoperative neuromonitoring. An arterial catheter was placed in the left radial artery for rapid serum parathyroid hormone measurement. Anesthesia was maintained with remifentanyl, sevoflurane. The patient was in a supine position with neck extension. A blunt-tipped 10-mm trocar was inserted for a 10 mm 30 endoscope. The CO₂ insufflation pressure was set at 6 mmHg. Two 5 mm trocars were inserted at the junction between the incisor and canine on both sides pointing down to the anterior neck under direct endoscopic vision. The patient developed sudden hypotension after surgical insufflation. The patient's heart rate was 62 beats/min to 40 beats/min, and the blood pressure dropped to 40/20 mm/Hg. CO₂ insufflation was terminated and CO₂ extraction was performed immediately. The patient received 0.01 mg adrenalin intravenously. The patient returned to normal sinus rhythm and blood pressure in 10 seconds without any further intervention

Results: Bradycardia, hypotension, arrhythmia and sudden cardiac arrest might be seen due to insufflation of neck region with carbon monoxide

Discussion: We think that cardiovascular support and CO₂ evacuation will be option in case there is bradycardia and hypotension in insufflation stage during the operation

OP-035**ABSENCE OF THE RIGHT INTERNAL JUGULAR VEIN DURING ULTRASOUND-GUIDED CANNULATION**

Emine YAGLI, Perihan KEMERCI, Gokce SELCUK SERT, Nevriye SALMAN,
Umit KARADENIZ, Sumru SEKERCİ
SBU Turkiye Yuksek Ihtisas Training and Education Hospital

Purpose: Ultrasonography (USG) guided central venous cannulation enables the detection of anatomical variations and needle positioning during cannulation. Thus, shorter catheterization time, fewer procedures and less complications are achieved. The rate of developmental venous anomalies in the head and neck ranges between 0.05 and 0.25%, but high rates of up to 20% can be observed. In addition, the rate of anatomic variation in the internal jugular vein (IJV) was reported to be 2.5%. In this case; we aimed to report the absence of right internal jugular vein during ultrason-guided cannulation in our patient who underwent atrial septal defect (ASD) repair.

Materials and Methods: ASA II, 30 years old, 70kg, 182 cm, male patient was hospitalized for ASD repair operation with a diagnosis of large secundum ASD. After the standard monitoring procedures (electrocardiogram, blood pressure and pulse oximetry) were performed, anesthesia induction was performed. The patient was planned to insert a central catheter into the right IJV under USG guidance. The table was brought to the Trendelenburg position and the patient was prepared for cannulation sterile condition. A 9 L USG linear probe (5.0-13.0 MHz, multifrekans, boardband) was placed in the right neck region. In the USG, the right carotid artery was clearly observed, while the right IJV was not detected (Figure 1). Therefore, left IJV was evaluated by USG and left IJV was easily detected (Figure 2). Ultrason-guided central venous catheter was placed in the left IJV without complication. The patient underwent ASD repair operation and was then transferred to intensive care.

Results: Commonly used central venous cannulation is an invasive procedure. Despite long-term use in anesthesia practice, complication rates are still high. Because cannulations are generally performed according to anatomical signs. However, in 5.5% of patients, the anatomical position of IJV cannot be predicted based on anatomical markers. Because agenesis of IJC and its variations can be seen. Therefore, USG guidance is important during central venous cannulations.

Discussion: As in our case, USG-guided central cannulation can easily identify abnormalities in central veins, protect from unnecessary interventions and prevent possible complications.

OP-036**RETROSPECTIVE ANALYSIS OF PATIENTS BRAIN DEATH**

Sermin Eminoglu, seyda Efsun Ozgunay

University of Health Sciences Bursa Yuksek Ihtisas Research and Education Hospital

Purpose: We aimed to retrospectively analyze brain death cases in the intensive care unit of our hospital between 2014 and 2018

Materials and Methods: We examined archive records of brain death cases diagnosed between January 01, 2014 and July 01, 2018. We recorded patients' demographics (age, gender, place of birth, blood type and diagnosis on admission), time from the start of clinical suspicion of brain death to the preparation of the report, additional tests performed, rate of organ donation, donor rate, and number of organs removed.

Results: A total of 151 brain death cases were detected. Of these, 69 were female. The average age was 53.96 years. A Rh+ was the most common type (39.7%) in blood type analysis. Intracranial hemorrhage was the primary reason (54.3%) for admission. Apnea test was performed for 88 patients. Radiological imaging was used to support diagnosis in 129 (85.4%) cases; computed tomography angiography being the most commonly performed method with 79 (52.3%) cases. There was no incompatibility between clinical diagnosis and imaging methods. Forty four patients' families consented to organ donation. Considering the place of birth for donors, Marmara Region was the leader with 18 (40.9%) donors. Of the 82 brain death cases diagnosed with intracranial hemorrhage, 35 (42.68%) donated organs and this rate was significantly high ($p=0.002$). The mean follow-up period for brain death was 1.49 days.

Discussion: Conclusions: Medical team is responsible for identifying brain death and should approach the issue professionally, attempting to increase organ donation. They should act rapidly and avoid wasting time after the diagnosis. Family interviews to be conducted by an experienced and trained organ donation coordinator may increase donations by emphasizing the importance of organ donations. Giving wide media coverage to organ donation may increase awareness of the community of organ donation.

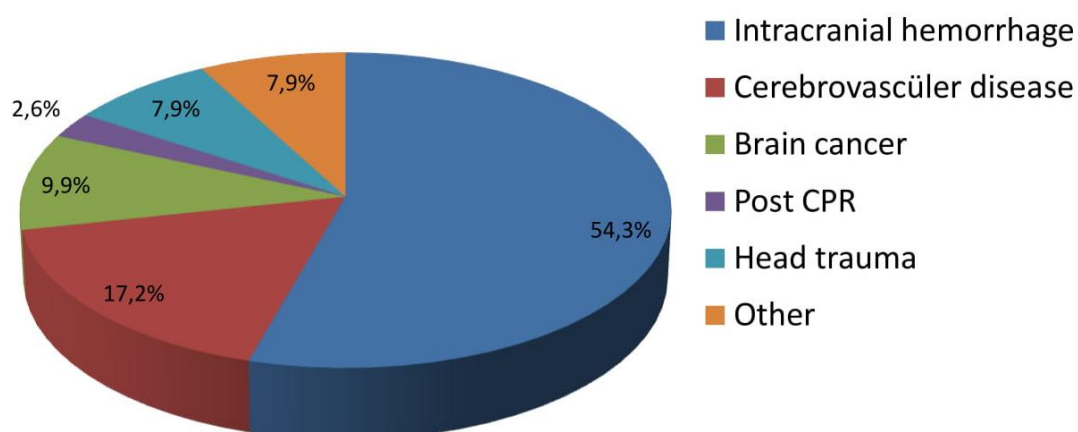
Tablo1: Demographic characteristics

	n (%)
Age Grups	
1-17 yaş	7 (4,6)
18-45 yaş	36 (23,8)
46-64 yaş	62 (41,1)
65-74 yaş	24 (15,9)
75-84 yaş	17 (11,3)
85-100 yaş	5 (3,3)
Gender, Female	82 (54,3)
Blood Type	
A Rh pozitif	60 (40)
A Rh negatif	7 (4,7)
B Rh pozitif	21 (13,9)
B Rh negatif	4 (2,6)
AB Rh pozitif	7 (4,6)

AB Rh negatif	-
O Rh pozitif	48 (31,8)
O Rh negatif	3 (2)
Region of Birth	Brain Death / Donor
Marmara Region	59 (39,1) 18 (40,9)
Aegean Region	13 (8,6) 5 (11,6)
Mediterranean Region	1 (0,7) -
Inner Anatolia Region	6 (4) 1 (2,27)
Southeast Anatolia Region	11 (7,3) 2 (4,54)
East Anatolia Region	11 (7,3) 4 (4,09)
Black Sea Region	25 (16,6) 9 (20,45)
Abroad	25 (16,6) 5 (11,6)

Tablo 2: Organs removed and used

	removed / used (n)
Kidney	41 / 35
Liver	45 / 37
Heart	14 / 5
Lungs	10 / 6
Cornea	26 / 24
Pancreas	3 / 0
Small Bowel	1 / 0

**Figure 1: Diagnosis on admission**

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OP-037**ASSESSMENT OF SURVIVAL AFTER CARDIOPULMONARY ARREST IN A TERTIARY HOSPITAL: PRELIMINARY STUDY**

Sinan YILMAZ

Department of Anesthesiology and Reanimation, Aydın Adnan Menderes University Faculty of Medicine

Purpose: Despite significant improvements in the field of cardiopulmonary resuscitation, different results have been reported in terms of survival rates after in-hospital cardiac arrest. This study was aimed at investigating the effect of comorbid diseases on the survival.

Materials and Methods: This study was designed retrospectively. And, the in-hospital cardiac arrests registration was examined over a year between January 1, 2016 and December 31, 2016. The study was approved by the local ethics committee (2017/1191). The resuscitation team consisted of an anaesthesiologist with at least two year of experience and at least one specially trained nurse. The calls from the anaesthesia intensive care units and newborn or paediatric intensive care units were not included.

Results: A total of 264 in-hospital cardiac arrest calls [mean age 70.6 (13) years] were included, and no intervention was performed in 49 inappropriate cases. Out of the remaining 215 patients, 145 were males. In-hospital cardiac arrest was the most frequent in intensive care units (60.9%). Malignancies (32.5%) and cardiac diseases (23.2%) were the most common factors in the aetiology. The rate of VF/VT rhythm was 12.1%. The arrival time of the resuscitation team to cardiac arrest site was 3(3) minutes median (IQR). The median (IQR) cardiopulmonary resuscitation time was detected as 25 (15) minutes. The rate of return of patients with spontaneous circulation was 77.7%. However, the long-term survival rate was lower (9.7%) than the most frequently observed survival rates (15-20%). The factors contributing to the survival rates may be due the higher proportion of patients over the age of 65, in-hospital cardiac arrest with underlying chronic diseases, and cardiopulmonary resuscitation durations of >20 min .

Discussion: Comorbid diseases and longer cardiopulmonary resuscitation duration are important for survival. And also, in-hospital cardiac arrest calls that are true an on time prevent mortalities. The periodic basic and advanced life support trainings instituted to the healthcare personnel working in intensive care units potentially further enchances the survival following in-hospital cardiac arrest.

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- 3.Sandroni C, Nolan J, Cavallaro F, Antonelli M. In-hospital cardiac arrest: incidence, prognosis and possible measures to improve survival. *Intensive Care Med*. 2007; 33(2):237-45.

OP-038**HUMAN ALBUMIN INFUSION RECRUIT HEMORHEOLOGY IN LIVER TRANSPLANT PATIENTS**

Hatice TAZEGUL(1), Pinar ULKER(2), Nur OZEN (2)

Akdeniz University, Department of Anesthesiology and ICU(1), Akdeniz University, Department of Physiology(2)

Purpose: Human albumin solutions are frequently used for the management of patients undergoing liver transplantation peroperatively in terms of maintaining desired plasma oncotic pressure (1)(2). The aim of this clinical prospective study was to investigate the acute effects of human albumin infusion on hemorheologic parameters (red blood cell aggregation and deformability, whole blood/plasma viscosity) which may alter graft survival via altering microcirculation.

Materials and Methods: Hemorheologic variables of 6 liver transplant patients were evaluated before and after infusion 100ml of 20% human albumin solution, intraoperatively and at ICU postoperatively. Red blood cell deformability and aggregation were analyzed by using an ektacytometer (LORCA, RR Mechatronics, Hoorn, The Netherlands). Whole blood and plasma viscosities were measured at the rate of 10-20 and 50 rpm. Concurrent blood gases, serum fibrinogen and albumin concentrations, hemodynamic variables, hematocrit levels, vasoactive drug usage and sofa scores were noted. The study was approved by local ethic committee of Akdeniz University.

Results: The maximal elongation index increased significantly in the 90th minute after albumin (0.67 ± 0.02) compared to before albumin (0.64 ± 0.02). ($P < 0.05$). The aggregation index was found to be lower in the 90th minute after albumin ($35,80 \pm 5,04$) than in the 15th minute after albumin ($46,26 \pm 5,50$) ($p < 0.05$).

Discussion: The results of the study indicate that human albumin replacement performed peroperatively leads to acute recruitment of hemorheologic parameters which may alter blood liquidity and efficient tissue perfusion. Long term results and prognostic analysis are needed to address the clinical importance of our findings.

1. Albumin mass balance and kinetics in liver transplantation Mariam Amouzandeh,1,2 Greg Nowak,2,3 Anna Januszkiewicz,1,2 Jan Wernerman,1,2 Olav Rooyackers,1,2 and Åke Norberg 1,2 2. Physiology, Albumin. Moman RN1, Varacallo M2.

OP-039**ANESTHETIC MANAGEMENT OF A PATIENT WITH PARRY-ROMBERG SYNDROME**

Pınar NİSANİ , Türkey ÇAKAN, Melis ENGİN, Meltem BEKTAŞ, Hülya BAŞAR
SB Ankara Eğitim ve Araştırma Hastanesi Anesteziyoloji ve Reanimasyon Kliniği

Purpose: Parry Romber Syndrome (PRS) is a rare condition presenting with hemifacial atrophy involving skin, bone and soft tissue. It is often found in females and the first decade of life(1). Its etiology is still unknown but the possible factors are trauma ,viral infections, heredity, endocrine or fat methabolism disturbance and auto-immunity (2). Various perioperative promblems may occur due to progresive facial asymmetry and it's associated with other outoimmune disorders and multi-system involvement.

Materials and Methods: A 54 year old female with PRS, diagnosed 28 years before starting with a small facial trauma and history of 4 facial reconstruction surgery due to progressing facial asymmetry and pain. Presently, she was admitted for microvascular free flap surgery for asymmetry correction. In preanaesthetic examination she had new diagnosed diabetes mellitus, hypertension and pulmonary hypertension. She hadn't any outoimmune disease known. The patient's face had generalized left sided atrophy. She had a Mallampati III classified airway and < 3 cm mouth opening(Figure 1) Before anesthesia induction different sizes of facial masks ,laryngeal masks, gum elastic bougie, videolaryngoscope, fiberoptic bronchoscope and sugammadex were prepared because of the risks of difficult mask ventilation, difficult intubation and in no ventilation/intubation case for awakening the patient. Rutin monitoring with electrocardiography, non invasive blood pressure and SpO2 were applied. After anesthesia induction adequate ventilation was provided with a disposable silicone mask. Patient was nasal intubated with a 7.0 mm endotracheal tube through the right nostril using Macintosh blade and McGill's forceps with grade 1 Cormack Lehane view without any difficulties. The intra-operative period was uneventful as well as at the end of the surgery patient was extubated successfully(Figure 2)

Results: Facial asymmetry causing difficult ventilation and intubation is the primary problem in patients with PRS. Multi-system involvement is also important for us. So before the surgery patients examination must be through and equipments for difficult airway must be prepared.

Discussion: Careful preoperative evaluation, proper access to difficult airway and hemodynamic stability are the key aspects of the anesthetic management of PRS. Key words: Airway management, difficult ventilation, facial hemiatrophy, Parry- Romberg Syndrome



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OP-041

ANESTHETIC MANAGEMENT OF A PATIENT WITH HEREDITARY ANGIOEDEMA

Aysun ANKAY-YILBAS, Mohammed SEVIMLI, Adem HALIS, Meral KANBAK
Hacettepe University, Faculty of Medicine, Department of Anaesthesiology and Reanimation, Ankara,
Turkey

Purpose: Hereditary angioedema (HA) is characterized by uncontrolled, epinephrine-resistant edema involving larynx, face, neck and upper extremities which could easily be triggered by trauma, stress, infections and hormonal fluctuations. During perioperative management, airway edema and hypovolemic shock due to the tissue leak of fluids might be challenging even for the most experienced anesthesiologist (1,2). In this case report, the anaesthetic management of a patient with HA is reported.

Materials and Methods: A 19-year-old, 54-kg female patient diagnosed with HA was scheduled for open-technique septorhinoplasty. The patient's history revealed frequent itchy swellings including various parts of her body and facial edema. In consultation with allergy department, 1000 units of C1-inhibitor concentrate (Cinryze®) was administered preoperatively. Following standard anesthesia induction and intravenous methylprednisolone administration, a gentle endotracheal intubation with 6.5 cuffed, armed, local anesthetic applied endotracheal tube was performed by an experienced anesthesiologist. The pilot balloon of the tube was inflated with the lowest pressure preventing leakage. The surgery was completed successfully and there was no need for additional C1-inhibitor concentrate during the perioperative period. A gentle extubation was performed following reversal of neuromuscular blockade by sugammadex. The patient was transferred to post-anesthesia care unit extubated.

Results: HA is a rare autosomal dominant disease related to C1 esterase inhibitor deficiency. Although the most common symptom is painless-itchy swelling, the incidence of death due to laryngeal edema is 25-30%. The most frequent cause of attacks during surgery is pressure-induced traumas and stress. Preoperative treatment with C1-inhibitor concentrate is recommended especially for dental interventions, endotracheal intubation and endoscopy due to the risk of life-threatening laryngeal edema (1,2). During perioperative management of our case, attention was paid to avoid applying excessive pressure with the face mask, to perform gentle intubation and extubation, to use a smaller sized tube, and not to over-inflate the pilot balloon.

Discussion: Patients with hereditary angioedema require close follow-up in terms of anesthesia. Without regard to the anesthetic method, a safe perioperative approach should include appropriate prophylaxis with C1-inhibitor concentrate, smooth and gentle performing of all invasive procedures, close monitoring for signs of angioedema and early administration of additional C1-inhibitor concentrate if needed.

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Background: Hereditary angioedema (HA) is characterized by uncontrolled, epinephrine-resistant edema involving larynx, face, neck and upper extremities which could easily be triggered by trauma, stress, infections and hormonal fluctuations. During perioperative management, airway edema and hypovolemic shock due to the tissue leak of fluids might be challenging even for the most experienced anesthesiologist (1,2). In this case report, the anaesthetic management of a patient with HA is reported.

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body and facial edema. In consultation with allergy department, 1000 units of C1-inhibitor concentrate (Cinryze®) was administered preoperatively. Following standard anesthesia induction and intravenous methylprednisolone administration, a gentle endotracheal intubation with 6.5 cuffed, armed, local anesthetic applied endotracheal tube was performed by an experienced anesthesiologist. The pilot balloon of the tube was inflated with the lowest pressure preventing leakage. The surgery was completed successfully and there was no need for additional C1-inhibitor concentrate during the perioperative period. A gentle extubation was performed following reversal of neuromuscular blockade by sugammadex. The patient was transferred to post-anesthesia care unit extubated.

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Conclusion: Patients with hereditary angioedema require close follow-up in terms of anesthesia. Without regard to the anesthetic method, a safe perioperative approach should include appropriate prophylaxis with C1-inhibitor concentrate, smooth and gentle performing of all invasive procedures, close monitoring for signs of angioedema and early administration of additional C1-inhibitor concentrate if needed.

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OP-042**THE EFFECT OF NUTRITION STATUS ON MORTALITY OF PATIENTS IN ADMISSION TO INTENSIVE CARE: RETROSPECTIVE STUDY**

Gamze KÜÇÜKOSMAN, Bengü Gülhan AYDIN, Rahşan Dilek OKYAY, Hilal AYOĞLU
Zonguldak Bülent Ecevit University, Department of Anesthesiology and Reanimation, Zonguldak

Purpose: It has been reported that malnutrition may occur when patients are admitted to the intensive care unit (ICU)(1). Nutritional Risk Screening (NRS) is a nutritional assessment test used for ICU patients to determine the risk of malnutrition, to find malnourished patients, and to assess the adequacy of nutritional support (2). We aimed to investigate the nutritional status of ICU patients with NRS-test and the relationship between malnutrition and mortality.

Materials and Methods: After ethics committee approval, data of 156 patients between June-December 2018 were screened retrospectively. Demographic data were recorded (age, sex, weight, body mass index). Patients were divided into two groups (NRS \geq 3:bad, NRS

Results: Nutritional risk for mortality at admission was 38.4%. Mortality rate was 40% in NRS \geq 3 and 12.5% in NRS< 0.001). Demographic characteristics and biochemical parameters are shown in Table 1. When the factors affecting the mortality were examined; blood transfusion and MV need were statistically independent risk factors in ICU (Table 2). The prevalence of malnutrition in ICU patients varies between 30-50% (3). It is stated that an early diet plan is as important as the treatment of the underlying disease to reduce the risks associated with mortality (4).

Discussion: The first procedure to prevent and treat malnutrition is the use of nutritional status screening and evaluation methods to determine the patients with malnutrition. For this purpose, the clinician and other personnel responsible for the patient's follow-up and treatment should be trained and informed.

Tablo 1. Comparison of demographic characteristics and biochemical parameters

	NRS\geq3 (n=60)**	NRS<3 (n=96)**	p*
Age (year)	70 (20 \pm 97)	62 (9 \pm 90)	0.029
Female/ Male	25 (41.7)/ 35 (58.3)	41 (42.7)/ 55 (57.3)	0.898
Weight(kg)	70 (45 \pm 96)	73 (20.1 \pm 130)	0.743
BMI (kg/m²)	25.45 (16.7 \pm 35.2)	24.5 (1 \pm 50.8)	0.807
Hb (g/dl)	10.5 (6.7 \pm 15.3)	11.05 (5.5 \pm 16.9)	0.226
NLR	8.5 (1.4 \pm 70.3)	7.85 (0.6 \pm 91)	0.891
ALT (IU/l)	28.5 (3 \pm 6390)	19 (1 \pm 1996)	0.115
AST (IU/l)	31.5 (3 \pm 7830)	25 (3 \pm 2919)	0.041
Albumin (g/dl)	2.8 (1.8 \pm 4.6)	3.2 (1.3 \pm 4.9)	0.113
Creatinine (mg/dl)	1.05 (0,3 - 9)	0.9 (0.2 \pm 48)	0.289
BUN (mg/dl)	51 (11 \pm 237)	40.5 (1 \pm 244)	0.157

*Mann Whitney U testi, **ortanca (min \pm max); BMI:body mass index; Hb: Hemoglobin; NLR:Neutrophil/lymphocyte ratio; ALT:Alanine transaminase, AST:Aspartate transaminase; BUN: Blood urea nitrogen.

Table 2. Factors affecting mortality

	OR (%95 CI)	p
Gender	1.308 (0.283 – 6.058)	0,731
Age (year)	1.031 (0.981 – 1.083)	0.225
BMI (kg/m2)	0.984 (0.876 – 1.106)	0.791
Cause of hospitalization	2.127 (0.797 – 5.674)	0.132
number of comorbidities	0.842 (0.341 – 2.078)	0.709
number of drugs used	3.118 (0.998 – 9.735)	0.050
Re-hospitalization in three months	1.21 (0.235 – 6.221)	0.819
Admission place	0.593 (0.274 – 1.282)	0.184
need for blood transfusion	8.102 (1.421 – 46.199)	0.018
Need for MV	8.543 (1.619 – 45.079)	0.011
Type of feeding at admission	2.194 (0.858 – 5.609)	0.101
Begining time of feeding	0.809 (0.514 – 1.273)	0.360
Length of stay in the ICU (days)	1.008 (0.97 – 1.047)	0.698

OP-043**THE EFFICIENCY OF THE USE BISPECTRAL INDEX MONITOR IN PATIENTS WITH ENDOSCOPIC RETROGRADE CHOLANGIOPANCREATOGRAPHY**

Enise OĞRAŞ¹, Bülent BALTACI², Hülya BAŞAR³, Mehmet ÇAKIRCA⁴, Murat KEKİLLİ⁵, Yusuf Harun İREN⁶
Sağlık Bilimleri Üniversitesi, Ankara SUAM Anesteziyoloji ve Reanimasyon Kliniği ve Gastroenteroloji Kliniği

Purpose: Conscious sedation is carried out in order to increase patient comfort, to facilitate the work of physician and to increase success rates during Endoscopic Retrograde Cholangiopancreatography (ERCP). The main aim is to provide a regular and stable sedation balance without leading to cardiac and respiratory depression. The aim of the present study was to investigate the effect of the use of BIS monitorization in ERCP procedures carried out with propofol sedation on titration of sedation level and the satisfaction of operator and on reduction of sedation associated complications

Materials and Methods: Records of 100 patients undergoing ERCP procedure under propofol sedation in whom level of sedation was evaluated with BIS monitor or Ramsey sedation scale (RSS) were investigated. Patients in whom BIS monitorization was used were allocated to Group B (n=49) and those monitorized with RSS were allocated into Group C (n=51). In addition to demographic data of the patients, duration of procedure, overall drug dose used, duration of recovery, endoscopist satisfaction and complications occurring procedure were recorded and evaluated

Results: Overall 100 patients were included in the study (Group B 49, Group C 51). Mean 271,4±122,3 mg propofol was used in Group B, while in Group C mean 326,0±121,9 mg propofol was used. Overall dose of propofol used was significantly higher in Group C (p=0,02). Endoscopist satisfaction was significantly higher in Group B. No significant difference was found between two groups with respect to the number of complications

Discussion: The use of BIS monitorization decreases the dose of drug used and increases the satisfaction of endoscopist but is not efficient enough in the prevention of complications associated with sedation. If duration of preparation and cost is not taken into account, BIS is a beneficial method that can be used in the monitorization of sedation in ERCP procedures.

OP-044

A CASE REPORT BY THE CENTRAL NERVOUS SYSTEM PRESENTATION IN AIDS

Çetin KAYMAK¹, Çiğdem ATAMAN², Meryem GÜLHAN¹, Ayşe ÖZCAN¹,
Esra YÜKSEKKAYA², Serkan DUMANLI¹, Hülya BAŞAR¹

¹Health Science University, Ankara Training and Research Hospital, Department of Anaesthesiology
and Reanimation, Health Science University,

²Health Science University Ankara Training and Research Hospital, Department of Infection Disease

Background: Central nervous system (CNS) involvement can be seen in AIDS patients as multifocal leukoencephalopathy, cryptococcal meningitis, CMV infection or lymphoma. For all that, the involvement of the CNS due to secondary infections is in the late period. In this article, a case of HIV at intensive care unit with toxoplasma encephalitis is presented.

Case: A 49-year-old male patient presented to emergency department with change of consciousness and incontinence, also he had complaints of dizziness in the last week. On physical examination of the patient, while consciousness and confusion impairments were existed, there were no signs of meningitis. Cerebral and cerebellar multiple suspicious lesions were detected in cranial computerized tomography. No significant changes were found in the laboratory findings systemic insufficiency. Anti-HIV. The result of HIV-RNA RT-PCR was found 1.418.000 IU/ml in viral serology. In MRI imaging, diffusion restrictions were observed in both cerebral and cerebellar hemispheres and it was thought to be secondary to a septic or metastatic process. After MRI Sect-Perfusion revealed infectious pathologies considering the patient's clinic and early onset of toxoplasma was suspected and also leukoencephalopathy and lymphoma diagnoses were excluded. The toxoplasma IgM (-) and Toxoplasma IgG (+) were determined in the serological tests of the patient. Thereafter, trimethoprim-sulfamethoxazole therapy was initiated. There were no leukocytes and microorganisms in the microscopic examination in the BOS. In addition, HSV Type 1 and 2, Enterovirus, Par echovirus, EBV, CMV, and Adenovirus PCRs were negative. , H. Influenza, N. Meningitidis and S. Pneumoniae cultures were reported as negative.

Conclusion: The incidence of Toxoplasma infection is reported to be 32% in HIV positive cases. Although toxoplasmosis is asymptomatic in the majority of healthy individuals, it may be observed in cases with a single lesion in the brain or rapid progressive and high mortality with widespread encephalitis in immunocompromised cases. Therefore, we believe that the rate of success in early diagnosis and treatment is increased.

Key Words: AIDS, Toxoplasma, Encephalitis

OP-045**SHOULD WE ALWAYS DELAY? GASTRIC ULTRASOUND OF THE ELECTIVE BABY PATIENT WHOM NO CLEAR INFORMATION ABOUT BREASTFEEDING TIME**

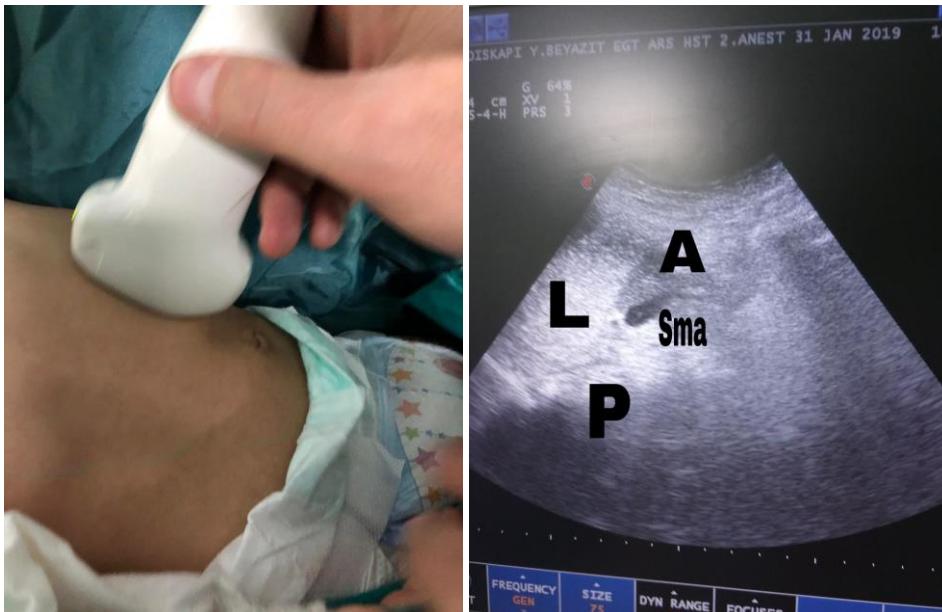
Sibel CATALCA, Gokcen KULTUROGLU, Savas ALTINSOY, M. Murat SAYIN, ELİF ŞULE ÖZDEMİR
SBÜ Dışkapı Yıldırım Beyazıt Eğitim Araştırma Hastanesi

Purpose: One of the most feared complications of general anesthesia is pulmonary aspiration. The American Society of Anesthesiology (ASA) recommended preoperative fasting times to prevent this complication. We present a patient with unclear information about breastfeeding time and inspected with gastric ultrasound for the presence of gastric contents.

Materials and Methods: A 12-month-old male patient weighing 10 kg was planned for flexor tendon incision. Her mother had breastfed him in the morning, but she didn't know the time. Gastric ultrasound was performed to evaluate the patient's gastric volume in order not to postpone the operation (Figure 1). The imaging revealed minimal clear fluid in the stomach and the patient was admitted to the operation room (Figure 2). Electrocardiogram (ECG) and peripheral oxygen saturation (SpO₂) were monitored. The patient was intubated with propofol 3 mg/kg, fentanyl 1mcg/kg and rocuronium 0.6 mg / kg. After intubation, clear fluid was aspirated with orogastric tube (Figure 3). Anesthesia was maintained with 3% sevoflurane in 50% O₂ + 50% N₂O mixture. At the end of operation, the patient was extubated without complication.

Results: Fasting is recommended for 4 hours after breastfeeding and 6 hours after cow's milk or formula due to ASA guidelines. It is therefore recommended that anesthesiologists comply with the current guidelines of ASA. Sometimes the information about the duration of starvation can not be obtained from the parents exactly. Cancellation of the case causes agitation in the patient and parents, prolonged hospitalization with increased cost. We evaluated gastric contents with usg in order to not delay the operation in our patient, whose fasting time was not known exactly, and we applied routine anesthesia induction to the patient after the appearance of a 'starrysky' which is known as clear fluid imange in antrum.

Discussion: Ultrasound evaluation of gastric content is a fast, reliable, easily reproducible and non-invasive method, some think that every anesthesiologist should have this imaging ability. By using this method, we think that both unnecessary rapid induction will not be performed and the cases will not be cancelled unnecessarily.



OP-046**THE EFFECT OF PREOPERATIVE FLUID REPLACEMENT ON INTRAOPERATIVE HEMODYNAMIC PARAMETERS IN DIABETIC PATIENTS**

Emel Yıldız

Kütahya Evliya Çelebi Eğitim ve Araştırma Hastanesi

Purpose: Diabetes Mellitus; the world wide prevalence is among the major causes of mortality and morbidity. Hemodynamic response after anesthesia can be eliminated in diabetic patients. Hydration is important in anesthesia management of diabetic patients. In this study, we aimed to determine whether preoperative hemodynamic response due to anesthesia could be prevented by providing hydration in diabetic patients preoperatively.

Materials and Methods: 80 patients diagnosed with diabetes were recorded for demographic and preoperative characteristics, comorbid accompanying diabetes mellitus, type of operation and haemodynamic follow-up. Diabetic autonomic neuropathy was detected preoperatively. The sympathetic system was evaluated with the presence of orthostatic hypotension, parasympathetic system, deep inspiratory tachycardia response. Patients were randomly divided into two groups as control group (Group C) and saline group (Group S). No preoperative fluid was given to the control group. Intravenous (iv) 10 ml / kg 0.9% isotonic sodium chloride infusion was administered within 10 minutes before saline group preoperative anesthesia induction. Systolic blood pressure (SBP), diastolic blood pressure (DBP), mean blood pressure (MBP) and heart rate (HR) values of patients were compared after induction and intubation. Analysis of the data was done with the SPSS package program. It was investigated whether there was a statistically significant difference between groups in terms of averages.

Results: Diabetic autonomic neuropathy was detected in 95% of saline group patients and 67.5% of control group patients. No significant difference was observed between the groups during the operation in SBP, DBP, MBP and HR. However, the mean of all time in DBP was higher in saline group compared to the control group but no significant difference was observed."1"

Discussion: As a result; detection of diabetic autonomic neuropathy by simple methods is necessary for perioperative hemodynamic stability. We observed that preoperative fluid administration in diabetic patients did not change the meaning of SBP, DBP, MBP and HR.

OP-047**PERIOPERATIVE MANAGEMENT OF A PATIENT WITH A LEFT VENTRICULAR ASSIST DEVICE PRESENTING WITH A FEMORAL NECK FRACTURE**

Sanja KONOSIC, Visnja IVANCAN, Zeljko COLAK, Mirabel MAZAR, Rajka GABELICA, Mario PAVLEK
University Hospital Center Zagreb, Clinic of anesthesiology, reanimatology and intensive care

Purpose: To emphasize the need of educating anesthesiologists about the basics of caring for patients with implanted left ventricular assist devices (LVAD) in non-cardiac setting.

Materials and Methods: A 60-year-old LVAD patient presented with a femoral neck fracture and total hip replacement was indicated. He previously underwent LVAD replacement due to device thrombosis despite being compliant to the anticoagulation therapy. After being submitted to extensive hematological examination, no results associated with thrombophilia were revealed. Due to this life-threatening unexplained thrombotic event occurring previously and total hip replacement being a bleeding high-risk procedure, careful perioperative anticoagulation strategy was necessary. After judiciously considering the results of laboratory and point-of-care tests, only martefarin was withheld for three days while antiplatelet therapy was continued. Enoxaparine was given twice daily as bridge therapy and anti-Xa levels were monitored. The procedure was scheduled on the fourth day after admission. In the operating room patient was managed by a trauma surgical team, cardiac anesthesiologist and perfusionist. After establishing monitoring (SpO₂, ECG, IBP) and inducing general anesthesia, central venous line and urinary catheter were introduced. Immediately following patient's placement in left decubital position, low pump flow alarm was activated. The reason for this was, seemingly, a drop in preload, as it was successfully solved by circulatory volume augmentation with crystalloids. Procedure went uneventfully with excellent surgical bleeding control, creating no need for blood products transfusion. Patient was admitted to the cardiac intensive unit where martefarin was reinstituted on the second postoperative day with enoxaparine continued until goal INR values were achieved. Patient was mobilized and transferred to the coronary unit on the third day. No signs of device thrombosis were observed, but the recovery was complicated by the formation of a retroperitoneal hematoma.

Results: Perioperative management of LVAD patients for non-cardiac surgery is demanding and requires thorough understanding of hibrid physiology with its implication on hemodynamics and coagulation.

Discussion: The incidence of scheduled and emergent procedures performed on LVAD patients is increasing due to an upsurge in number of implantations and therefore all anesthesiologists should be introduced to the basics of caring for these patients. Key words: non-cardiac surgery, LVAD patient

OP-048**IS SERUM LACTATE CONCENTRATION A BIOMARKER OF MALIGNANCY IN BRAIN TUMOURS? PRELIMINARY REPORT**Oguzhan ARUN¹, Mustafa BUYUKCAVLAK¹, Funda ARUN², Bahar OC¹¹ Selcuk University Faculty of Medicine Department of Anesthesiology and Reanimation,² Selcuk University Faculty of Dentistry Department of Pedodontics

Purpose: Warburg effect is description of elevated lactate production in tumour glycolysis. Lactate is associated with tumoural cell invasion, metastasis and resistance to cell death. We aimed to investigate possible correlation between tumor malignancy and pre-intraoperative serum lactate concentrations in brain tumours.

Materials and Methods: After institutional ethical committee approval, we retrospectively analyzed documents of patients undergone craniotomy for tumour resection from January 2012 to January 2019 at Selcuk University Hospital. Patients with congestive heart failure, renal/liver dysfunction, those who needed inotropic support and blood transfusion of more than four units were excluded. The data collected included patient demographics, co-morbidities, tumour pathology, grading of the tumour, location and size of the tumour, total amount of fluids given and blood loss during the intraoperative period, use of mannitol, patient position during surgery, blood gas results. A baseline lactate >2 mmol/L was considered as significant baseline elevation and an intraoperative elevation of lactate >3 mmol/L was considered as significant intraoperative elevation. Bivariate and multivariate regression analyses were performed to determine the correlation between serum lactate and the variables. p value

Results: This is the preliminary report of 47 patients (25 men and 22 women). The mean age of patients was 51.89±13,7. Seventeen patients out of 47 (36%) had elevated baseline lactate (≥2.0 mmol/L) and 6 patients (12.7%) had an intraoperative rise in serum lactate (≥3 mmol/L). Out of total 47 patients, 18 had high-grade and 30 had low-grade brain tumours. Seven patients (7/18, 38,8%) in the high-grade tumour group had elevated baseline lactate compared to nine (9/29, 31%) in the low-grade tumour group. Of the 6 patients who had an intraoperative rise of serum lactate, 4 also had baseline lactate elevation and all of these 4 had high-grade brain tumours. The remaining 2 patients had low-grade brain tumour.

Discussion: There are limited studies (with limited study populations) demonstrate that lactate can be used as a non-invasive biomarker to determine malignancy for brain tumors. Further analyses of larger populations are essential.

OP-049

EVALUATION OF THE KNOWLEDGE LEVELS OF ANESTHESIOLOGISTS ON PATIENTS' RIGHTS REGULATION: SINGLE CENTER EXPERIENCE

Ergin ALAYGUT ¹, Pervin SUTAS BOZKURT ²¹ Tepecik Training and Research Hospital, Anesthesiology and Reanimation Clinic ,² Istanbul University Cerrahpasa Medical Faculty, Department of Anesthesiology and Reanimation

Purpose: Patient rights are considered as a differentiated extension of basic human rights in the field of health. Turkish Republic Constitutions, International Treaties, Laws and other legislations expresses that patients rights are guaranteed by the National Bodies. Patients' Rights Regulation is not well known by both patients and physicians. All the precautions should be taken in prevention of undesirable events as well as human dignity and human rights that target people by the Health institutions and organizations. In order to create awareness and increase knowledge in our Anesthesiology and Reanimation department this study was undertaken.

Materials and Methods: A seminar was given related to current Patients' Rights Regulations in May 2018 and the legislations were distributed electronically. Five months later, all physicians in Tepecik Training and Research Hospital, Anesthesiology and Reanimation Clinic informed that they will be assessed by a test within a month related to this topic. A 30-minute test with 16 questions with a single correct answer of multiple choice questions was performed related to content of the Patient Rights.. The test sheets were blinded and only the duration in the proficiency was noted. The results were scored by the correct number of answers. Wrong answers were not evaluated.

Results: A total of 49 physicians were included in the study. Fifty one percent of the participants were consultants and 49% were residents. In total the average number of correct answers was 12.96 ± 2.4 . The median value was 13. (Minimum 5-maksimum16). The number of correct answers by consultants and residents were 11.8 ± 2.6 and 14.1 ± 1.5 , respectively. When the correct response numbers of the two groups were compared, the residents were more successful than the experts ($P = 0.001$). The success graph of for each questions is shown in Figure 1.

Discussion: The level of knowledge of residents about patient rights was found to be significantly higher than that of experts. The students are more prone to learn and take exams more seriously than consultants. Overall the outcome of this study had increased the awareness in our clinic about Patient Rights.

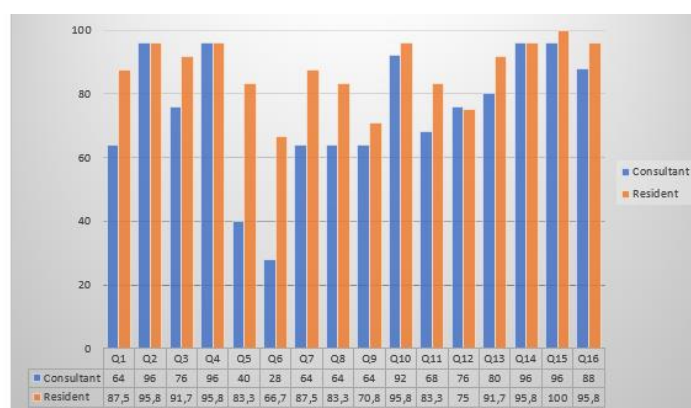


Figure 1: Group's correct response success rates

Conclusion: The level of knowledge of residents about patient rights was found to be significantly higher than that of experts. The students are more prone to learn and take exams more seriously than consultants. Overall the outcome of this study had increased the awareness in our clinic about Patient Rights.

OP-050**A CASE OF ECLAMPSIA INDUCED PRESS SYNDROME**

Mesut ÖTERKUŞ, İlksen DÖNMEZ
Kafkas University Faculty of Medicine

Purpose: The purpose of this presentation is to raise awareness about press syndrome

Materials and Methods: Our case is presented; A 22-year-old, 41-week pregnant female patient presented to the external central emergency service with nausea and vomiting. The patient's blood pressure was measured as 190/110 mmHg. Patient underwent emergency caesarean section because of seizure of eclampsia. After the 6 g / h loading dose, magmezyum was started with maintenance dose from 1.5g / h. The patient was referred to our hospital. When we came our hospital, the patient's conscious was open, the general condition was good, and the measurements were as follows: Tansion arteriale: 180 / 120mmHg, satO2: 98, HR: 98.

During her first day of hospitalization, she was intubated due to seizure again and sedation was started. Cranial MRI showed pons in bilateral basal ganglia and occipital lobe, posterior lobe hyperintense gliotic changes on T2a and Flair sections. Diffusion defects were found in the left occipital right parietal right basal ganglia with acute infarction on diffusion MRI. PRES syndrome was considered. Phenytoin (2 x 100 mg), mannitol (4x125cc), frosamide (4x10 mg), nimopidine 30mg (6x2), acetylsalicylic acid (1x100 mg) and Enoxaparin 60 mg (1x1) were started. On the Day 2 of ICU admission, the patient was extubated. There was a paroksismal disorder added to the common ground slowness in the EEG. The patient, who was hemodynamically stable, did not have a seizure and was transferred to the obstetrics clinic on the 4th day of his admission to the intensive care unit.No pathological findings were found in brain MRI taken on the 14th day of hospitalization.

Discussion: As a result; We can identify the PRESS syndrome as a multidisciplinary disease which should be considered in the presence of neurological changes in pregnant women with preeclampsia and eclampsia.

Key words: PRESS Sendromu, Vasogenic Edema, Eclampsia

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Posterior reversible encephalopathy syndrome (PRES) is a neurological condition typically involving various symptoms such as headache, vision loss, impaired consciousness, and epileptic seizures etc. Etiology may also include eclampsia, preeclampsia, hypertensive encephalopathy, drugs, renal failure, etc; however, the main pathophysiological cause is vasogenic edema. On neuroimaging, lesions are characteristically found in parieto occipital region of the brain due to vasogenic edema.

OP-051**OUR ANESTHETIC EXPERIENCE IN A PATIENT WITH SUCCINIC SEMIALDEHYDE DEHYDROGENASE ENZYME DEFICIENCY: A RARE DISORDER**

Ayşegül Ceylan, Mehmet Burak Eşkin, Mert Çırakman
Sağlık Bilimleri Üniversitesi Gülhane Eğitim Ve Araştırma Hastanesi

Purpose: Succinic semialdehyde dehydrogenase (SSD) enzyme deficiency is a congenital metabolic disorder in the group of catabolism disorders of gamma amino butyric acid (GABA). Main findings are hypotonia, nystagmus, hyporeflexia, choreoatetosis, convulsion, aggressive behavior and varying degrees of mental retardation.

Materials and Methods: 9 years old girl. She was diagnosed with enzyme deficiency in the pediatric clinic of our hospital when she was investigated because of walking problem at the age of 18 months. She had signs and symptoms including generalized epileptic seizures, developmental delay, hypotonia, dysphagia, speech disorder, 2nd degree of mitral valve failure, arrhythmia and mental retardation. She was planned to be performed tonsillectomy plus adenoidectomy. Monitorization was started; oxygen (O₂) saturation was 90-92 percent during spontaneous respiration and then we performed preoxygenation for 3 minutes. After inserting an intracath, 1 mg/kg of propofol and 0.25 µg/kg of fentanyl were given intravenously. Because of her hypotonic condition, muscle relaxants were avoided and sevoflurane was added during induction achieving the MAC to be 2. Vocal cords were seen during intubation and mivacurium was reserved in case of the need for muscle relaxant. Induction with remifentanyl was started at the dose of 0.02 µg/kg/min. for maintenance. In CMV mode, 8 ml/kg air+O₂ and 16 breaths/min. were adjusted. Four peeps were opened. Paracetamol (15 mg/kg) and prednisolone (1 mg/kg) were administered intravenously. After surgery, 0.01 mg/kg of naloxane was administered. Hemodynamic parameters did not alter during the surgery. Thirty minutes after the end of surgery, spontaneous respiration became sufficient and then the patient was taken to wake-up unit.

Results:

Discussion: Barbiturates and benzodiazepines show their effectivity by binding to GABA receptors. Etomidate is metabolised by pseudocholinesterase and may cause tonic and clonic contractions in skeletal muscles and depression in adrenocortical function. Ketamine increases heart rate, cardiac output and systemic and pulmonar arterial pressures and attention should be paid to the increase in secretion. Propofol is a potent hypnotic agent having the features of rapid onset of action and early recovery which have increased its applicability in outpatients.

OP-052

INVESTIGATION OF POSTOPERATIVE PAIN, NAUSEA AND VOMITING EFFECTS OF DIFFERENT GENEL ANAESTHESIA APPLICATIONS IN LAPAROSCOPIC CHOLECYSTECTOMY OPERATIONS

Süheyla DUMAN, Hale YARKAN UYSAL, Gülten SAĞIR, Yusuf Harun İREN, Hülya BAŞAR

Ministry of Health Ankara Training and Research Hospital, Anaesthesiology and Reanimation Clinic

Purpose: In the recent years it has been suggested that common usage of opioids at the intraoperative period is associated with postoperative hyperalgesia and increased opioid analgesic consumption during postoperative period. In present study, we aimed to compare the postoperative pain intensity, analgesic consumption and nausea and vomiting effects of opioid and non-opioid general anesthesia methods applied in patients undergoing elective laparoscopic cholecystectomy.

Materials and Methods: After institutional ethics committee and patients' approval, 46 patients with ASA classification 1-2 and between 18-65 years old who underwent elective laparoscopic cholecystectomy were enrolled in the study. Patients who received low-dose ketamine (0,1 mg/kg/h) or remifentanyl infusion (0,1 mcg/kg/dk) in the intraoperative period were defined as Group K and Group R, respectively. VAS scores during rest and cough, shoulder pain, nausea and vomiting scores and sedation scores were recorded postoperatively. First analgesic requirement time, total analgesic amount applied at the end of 24 hours and satisfaction levels of patients before discharge were recorded. Continuous variables were compared using unpaired t-test (or Mann-Whitney U test) and categorical variables by Chi-square test. Statistical significance was set at $P < 0.05$.

Results: The sedation scores of the patients in Group K were higher than those of Group R at the time of entry and exit to the PACU (p

Discussion: In present study, our data showed that opioid sparing general anaesthesia using low dose ketamine infusion for laparoscopic cholecystectomy operation can provide adequate postoperative analgesia without causing any psychomimetic side effects and improves postoperative patient satisfaction by reducing the number of patients who need antiemetic compared with general anesthesia with opioid.

Keywords: Postoperative analgesia, postoperative nausea-vomiting, opioid free anaesthesia, low dose ketamine, laparoscopic cholecystectomy

OP-053**HIGH INTRAOPERATIVE CUFF PRESSURE INCIDENCE DUE TO ENDOTRACHEAL CUFF INFLATION METHODS AND ITS CLINICAL EFFECTS**

İlkay BARAN, Savaş ALTINSOY, Özge YAMANKILIÇ MUMCU , Aslı DÖNMEZ

University of Health Sciences, Diskapi Yildirim Beyazit T&R Hospital, Department of Anesthesiology and Reanimation, Ankara-Turkey

Purpose: Endotracheal tube (ETT) cuffs allow positive pressure ventilation and reduce the risk of aspiration. However, cuff pressure is significant as low cuff pressure has the risk of air leakage and micro-aspiration of pharyngeal contents, and high pressure jeopardizes mucosal perfusion pressure. Over-inflation causing high pressures may cause sore throat, hoarseness and serious complications such as tracheal rupture, stenosis, etc. The aim of this study is to measure cuff pressures during routine anesthesia practice and investigate whether ETT cuff inflation methods like palpation of the pilot balloon and checking minimum leakage volume is accurate and related with complications.

Materials and Methods: After ethics committee approval, 249 ASA I-IV patients were included in the study. All patients received the same anesthesia protocol, and same ETT type and brand. Patients' data, ETT size, and ETT cuff inflation method used by the anesthesiologists were recorded. After 15 minutes, cuff pressures were measured with a manometer(VBM medizinchnick,GmbH Germany). Patients were divided into four groups according to cuff pressures: Group C(control) (20-30 cmH₂O), group I (30-50 cmH₂O), group II (50-70 cmH₂O) and group III (> 70 cmH₂O). If the measured cuff pressure is high, cuff was deflated until no leakage was observed. Complications like sore throat, hoarseness and dysphagia were recorded in the recovery room and at postoperative 24th hour.

Results: Results are shown in the table.

Discussion: Although routine ETT cuff pressure measurement is recommended, it is still not a routine practice after ET intubation. With this study, we observed that routinely used ETT cuff inflation methods like palpation of the pilot balloon and checking minimum leakage volume are not accurate. These methods can cause high pressures that are related with complications as sore throat, hoarseness and dysphagia postoperatively.

OP-054**EMERGENT USE OF A SMALL LUMEN VENTILATOR (VENTRAIN®) DURING ANESTHESIA MANAGEMENT OF A PATIENT WITH SUBGLOTTIC STENOSIS:**

Sevda Gökçe ERTÜRK, Elif Şule ÖZDEMİR, Dilek ÜNAL

University of Health Sciences Diskapi Yildirim Beyazit Training and Research Hospital

Purpose: Background: Partial or complete narrowing of the subglottic area is a rare and challenging condition for the anesthetist. Anesthesia management of a case with subglottic stenosis, ventilated by a small lumen ventilator is presented.

Materials and Methods: Case report: A 33 year old female presented for an open gastrostomy operation. Her history revealed previous surgery and radiotherapy to her neck due to hypopharynx carcinoma 2 years ago. On physical exam stridor, voice change and fibrous tissue in front of neck was observed; blood pressure was 90/60 mmHg and heart rate was 76 beats/ min. Pulmonary function tests showed upper airway obstruction. Nasal endoscopy revealed significant subglottic stenosis, the airway diameter was 4-6 millimeters (Figure 1). Her American Society of Anesthesiologists (ASA) Physiologic Status was II. After preparing for difficult ventilation and difficult intubation, standard ASA monitors were placed, patient was pre-oxygenated reaching an end tidal (ET) oxygen level > 90% prior to induction of general anesthesia using fentanyl, propofol, and rocuronium. After 2 attempts with a 5 and 4 mm tube we were able to intubate the patient with a 3 mm cuffed endotracheal tube, anesthesia was maintained with sevoflurane in oxygen-air. After 10 minutes, the airway obstruction made passive expiration impossible and airway pressure (Paw) increased up to 50 cm H₂O. Surgeon warned about emphysema in the omentum. The anesthesia plan was changed to ventilation with a small lumen ventilator (Ventrain®, Ventinova, USA) (20 breaths/ min; 300 ml tidal volume; 10 L/min flow) and total intravenous anesthesia with propofol, remifentanyl for maintenance. A cylinder was used as oxygen source for the Ventrain device with 10 L/min flow (Figure 2, 3). The Paw decreased to 18 cmH₂O, ETCO₂ and peripheral oxygen saturation was in normal ranges. Surgery was further completed uneventfully in 75 minutes. Patient consent was obtained.

Results: Discussion: Ventrain a flow-regulated, manually operated ventilator designed for ventilation through narrow-tubes, is driven by a predetermined flow of oxygen from a high-pressure source and facilitates expiration by suction.

Discussion: Conclusion: The Ventrain® device is effective for emergent use in patients with subglottic stenosis in case passive expiration is prevented through a small lumen endotracheal tube.

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OP-055**ESOPHAGEAL PERFORATION SECONDARY TO SHRAPNEL SHOT AND ITS' INTENSIVE CARE PROCESS**İbrahim MÜNGAN¹, Büşra TEZCAN¹, Bahar AYDINLI²¹Turkey Advanced Specialty Education and Research Hospital,²Mersin City Training and Research Hospital

Purpose: Traumatic injuries of the esophagus are rare but life-threatening while the most esophageal perforations (EP) are iatrogenic following esophageal instrumentation. Therapeutic options are surgical repair or resection or conservative management with cessation of oral intake and antibiotic therapy. The application of self-expanding covered stents offer an alternative treatment to surgery. Although the first method used in diagnosis is a chest radiograph, the definitive diagnosis is made by the endoscopic examination to determine the level of rupture and to decide treatment method. In this case report, we present a traumatic esophageal perforation which was managed with non-surgical methods in our intensive care unit (ICU).

Materials and Methods: A 36-year-old man was admitted to the emergency department with a preliminary diagnosis of esophageal perforation + tracheoesophageal fistula secondary to shrapnel shot. Radiological examination revealed a foreign body in the posterior mediastinum and esophagoscopy showed an esophageal tear indeterminate depth, 30 cm from the teeth. Oral intake was ceased and antibiotic therapy was initiated after admission to ICU and 36 hours later a 14 cm full-covered self-expandable metallic stent was placed with esophagoscopy. Four days later he subsequently underwent flexible tracheobronchoscopy and repeat esophagoscopy and no leakage or migration of stent was detected. Feeding started after 7 days and one week later the patient was discharged.

Results: In the era of endoscopy, iatrogenic EP incidence is increasing while traumatic cases are few. This presented case, besides its rarity, highlights the importance of early diagnosis and intervention, and the potential benefit of endoscopic stent placement for definitive management of esophageal trauma. Unless the perforation is closed in short order, patients can quickly progress to mediastinitis and even peritonitis which are life-threatening complications. Cessation of oral diet and administration of prophylactic antibiotherapy are also important. Due to the high mortality and morbidity rate, clinicians in multiple disciplines, including emergency medicine, thoracic surgery, and intensive care, must be knowledgeable regarding their diagnosis and management.

Discussion: In conclusion, our case supports the primary role of the endoscopic procedures in the treatment of esophageal perforation while no serious complication was detected.

OP-056**A BRADYCARDIA AND CARDIAC ARREST FOLLOWING SUGAMMADEX APPLICATION:**

Ahmet Furkan GÜREL, Gülerdem CERİTOĞLU, Melis ENGİN, Güray ALP, Çetin KAYMAK, Bülent BALTACI, Hülya BAŞAR
Ankara Training and Research Hospital

Purpose: Drugs that reverse neuromuscular blockade are used by anaesthetists at the end of surgery to accelerate recovery from drug-induced muscle relaxation. Sugammadex is a modified gamma cyclodextrin designed to selectively reverse the effects of the neuromuscular blockers rocuronium and vecuronium. In this case report unexpected cardiac arrest after sugammadex is discussed.

Materials and Methods: 69-year-old ASA class 2 female patients' preoperative examination only revealed right bundle branch block and she underwent cataract surgery under general anesthesia. 60 mg of lidocaine, 75µg of fentanyl, 150mg + 50mg of propofol, 10mg + 30mg rocuronium was used for induction of anesthesia. Maintenance of General Anesthesia was carried out using 50% O₂ + 50% N₂O and sevoflurane via laryngeal mask anesthesia. The operation lasted 75 minutes and patient was intraoperatively stable. At the end of operation 2 mg/kg-1 sugammadex was injected to patient intravenously and patient was extubated in 1 minutes. While extubated patients' spontaneous respiration was continuing smoothly; progressive bradycardia and hypotension developed. No response to atropine developed, cardiac arrest occurred and approximately 10 minutes of cardio-pulmonary resuscitation was performed. After that duration the intubated patient was admitted to intensive care unit and her treatment continued at intensive care unit. After patient regain consciousness and cardiac rhythm returned normal, patient was extubated. In laboratory increase in creatinine levels was detected and patient was graded as grade 1 according to AKIN. Kidney functions returned to normal in 2 day without dialysis necessity. But patient was re-intubated due to pneumonia which developed during this period and she is still receiving treatment in intensive care unit.

Results: In literature, 15 case reports about sugammadex and bradycardia was encountered. One of these was from our country and was a 3rd degree of anaphylaxis case. Bhavani et al. reported 2 cases which sugammadex caused serious bradycardia and resulted with asystole. Similarly, there are only a few case presentations that show coronary vasospasm may be correlated with sugammadex.

Discussion: With this case, it is assumed that sudden bradycardia and cardiac arrest occurring after sugammadex usage is a side effect of sugammadex with unknown mechanism.

OP-058**OUTCOMES OF PATIENTS WITH BLUNT CHEST TRAUMA TREATED IN THE INTENSIVE CARE UNITS AND POSSIBLE RISK FACTORS AFFECTING MORTALITY**

Tülay TUNÇER PEKER¹, Nevzat Mehmet MUTLU¹, Güzin CERAN²,
Özlem BALKIZ SOYAL², Yavuz AKÇABOY³

¹ Health Science University, Ankara Numune Education and Research Hospital,
Intensive Care Department

² Health Science University, Ankara Numune Education and Research Hospital,
Anesthesiology Department

³ Health Science University, Ankara Numune Education and Research Hospital, Algology Department

Purpose: Trauma is the leading cause of death worldwide. Blunt chest trauma is associated with a high risk of mortality. Respiratory complications may necessitate prolonged ventilation and result in death. The present study aimed to investigate possible signs of trauma and the prognosis of trauma patients with thoracic injuries and identify risk factors for mortality.

Materials and Methods: After local ethical committee approval retrospective study was performed to investigate the clinical characteristics and treatment outcomes of trauma patients with blunt chest injuries who treated in the intensive care units of our hospital (January 2016–July 2018). Detailed information including patient charts were extracted from the hospitals electronic database. Data collection included demographic details, mechanism of injury, details of injuries with scoring based on the Revised Trauma Score (RTS) and Chest Trauma Score. Management of patients, surgical procedures, ventilator requirement, vasopressor or inotrop requirement, length of stay in intensive care unit, and hospital length of stay, as well as injury related complications of these patients were recorded. Factors affecting mortality were evaluated.

Results: A total of 190 patients (142 males) with chest injuries were included in our study. Mean age was 43.3 years. Road accidents were the most common cause for severe chest injury, followed by fall from a height. Rib fractures comprised the largest group of thoracic injuries. The incidence of pneumothorax was 57.4%, while the incidence of hemothorax was 30%. The associated injuries of our study population included abdominal injuries, extremity fractures and head trauma. Twentynine of 190 analyzed patients died during their ICU stays; accordingly, we classified patients as survivors and nonsurvivors. These groups differed significantly regarding the RTS and APACHE II ($p < 0.001$), mechanical ventilation, vasopressor and inotrop requirement ($p < 0.001$), length of stay in hospital ($p = 0.004$). However, no significant differences in the presence of hemothorax, pneumothorax, rib fractures, Chest Trauma Score were observed between the groups.

Discussion: Among hospitalized trauma patients with blunt thoracic injuries, APACHE II, RTS, mechanical ventilation, vasopressor and inotrop requirement were identified as risk factors for mortality. Patients with thoracic trauma should receive multidisciplinary care and be monitored closely to improve survival.

Key words: Blunt trauma, chest injury, mortality, revised trauma score, hemothorax

OP-059**CASE REPORT: INFRACLAVICULAR BLOCK IN A PATIENT WITH TAKAYASU'S ARTERITIS**

Melis Sumak Hazir, Derya Ozkan, M.Tugba Kokulu Arslan
University of Health Sciences Diskapi Yildirim Beyazit Training And Research Hospital

Purpose: Takayasu's arteritis (TA) is a rare, chronic, progressive form of inflammatory panarteritis. Anesthetic management can be complicated in patient with TA. In this case report, we discussed infraclavicular block, anesthetic management and per-operative problems in a patient with TA.

Materials and Methods: A 57-year-old female patient with hypertension, goiter and TA was operated electively for right distal radius fracture. Our patient had been diagnosed with TA for 2 years and had taken prednisolone, methotrexate, acetyl salicylic acid, clopidogrel, indapamide. She had a transient ischemic attack 2 years ago. Discontinuation of antiaggregant treatment was risky because the patient had 85% stenosis right ICA and 30% stenosis of left ICA. Patient was monitored with electrocardiogram(ECG), non-invasive blood pressure measurement(NIBP) and pulse oximetry (SpO₂) from her left arm in the operation room. After the positioning and visualising of the axillary artery and the cords of the brachial plexus with linear probe, infraclavicular block was performed. Operation was completed in 65 minutes without any complications. During the 24 hours follow-up, motor blockage and sensory blockage completely faded in 3 and 7 hours respectively.

Results: Takayasu's arteritis is a vasculitis characterized by inflammation of large vessels, predominantly of the aorta and its major branches. Anesthetic management of patients with TA can be complicated by stenosis of vessels, uncontrolled hypertension and organ dysfunctions. Despite previous reports have emphasized the importance and difficulty of adequate cardiovascular monitoring in TA, our patient was easily monitored. We chose infraclavicular block because under general anesthesia, tracheal intubation-extubation and inadequate depth of anesthesia could result in fluctuation in blood pressure which could lead to cerebral hemorrhage. Also hyperextension of cervical spine during laryngoscopy may compromise blood flow through obstructed carotid artery. (1)(2) Because previous reports have shown that local anesthetics are anti-inflammatory, regional anesthesia is more advantageous for patient with TA.

Discussion: Although many cases have been reported about administrating of central nerve blocks to patient with TA, reports on peripheral nerve blocks are limited. Our case report demonstrated that peripheral nerve blocks are also reliable and preferable in TA.(3)

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OP-060

ULTRASOUND GUIDED RHOMBOID INTERCOSTAL AND SUBSERRATUS BLOCK (RISS) FOR MULTIPLE RIB FRACTURE PAIN

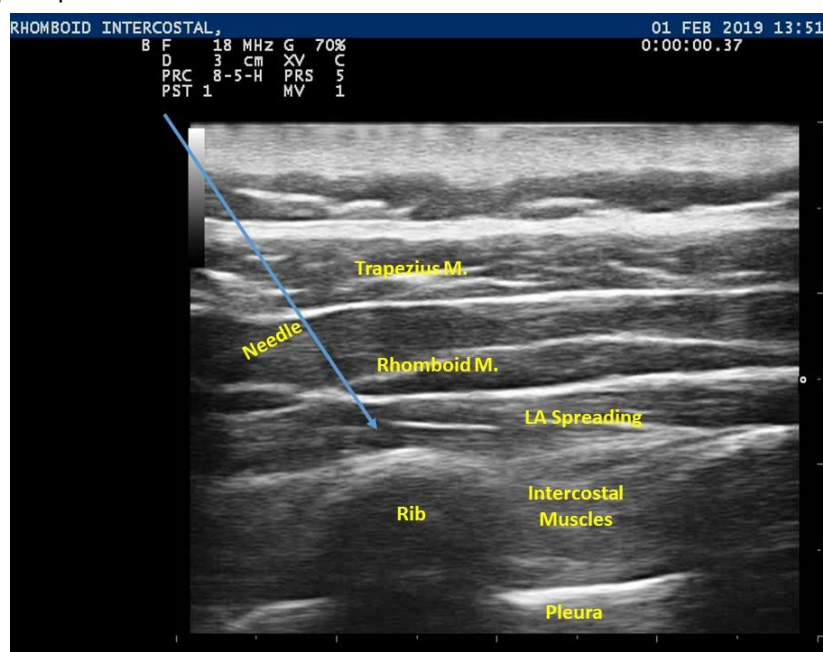
İrem ATEŞ1, Muhammed Enes AYDIN1

Ataturk University School of Medicine, Department of Anesthesiology and Reanimation

Purpose: Pain is the most common cause of admission to the emergency department. NSAII, opioids, epidural, paravertebral and intercostal blocks can be used traditionally. In recent years the use of ultrasound in regional anesthesia practice, plane blocks has become. One of the newest plane block; rhomboid intercostal block was first defined in 2016[1]. The block has experienced several surgeries for postoperative analgesia[2]. Rhomboid intercostal block provides effective analgesia between T2-T7. Recent modification of this block gained a new option for larger dermatomes which named rhomboid intercostal-suberratus block(RISS) for T2-T11[3]. Here it we report use of RISS block for effective analgesia in a patient with multiple rib fracture

Materials and Methods: Case was 65 years-old-women was scheduled to pain clinic for inadequate pain control due to multiple rib fracture (3th-9th left postero-lateral ribs). We planned performed RISS block to pain control. Ultrasound guided RISS was performed in the lateral decubitus position and the ipsilateral arm adducted across the chest, scapula moved laterally. The procedure was performed with using Xperius™ US systems by high frequency linear ultrasound under sterile conditions. Ultrasound probe was placed in oblique sagittal plane orientation over the medial border of the scapula at the T5-T6 level. Trapezius muscle, rhomboid major muscle, ribs, intercostal muscles and pleura were visualized respectively. The 50mm needle was advanced into the plane between rhomboid major muscles and intercostal muscles from cranial to caudal approach, using in-plane technique. A total of 20 ml mixture of 5 ml lidocaine 2%, 10 ml bupivacaine 0.5%, 4 mg dexamethasone and 4 ml saline was administered then the probe was advanced caudally and laterally to identify the plane between the serratus and external intercostal muscle for the sub-serratus block at T9 level and 10 ml same mixture was injected

Results: Sensorial block was between T2-T10 dermatomes. Analgesia was maintained NSAII and paracetamol. The post-procedure pain scores were between 0/10 and 4/10. The patient's VAS was $\leq 4/10$ until the post-procedure 16th hour



Discussion: Ultrasound guided RISS block provides effective analgesia for multiple rib fracture pain management. However, randomized clinical studies are needed to validate efficacy for this indication.

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OP-061**THE USAGE OF ULTRASOUND DURING NEURAXIAL BLOCK PERFORMANCE FOR FEMUR FRACTURE SURGERY IN A PATIENT WITH PREVIOUS ACUTE MYELOID LEUKEMIA**

Ahmet ÖZDEMİR¹, Başak ALTIPARMAK², Melike KORKMAZ TOKER¹,
Ali İhsan UYSAL¹, Semra GÜMÜŞ DEMİRBİLEK²

¹ Muğla Sıtkı Koçman University Training and Research Hospital, Department of Anesthesiology and Reanimation

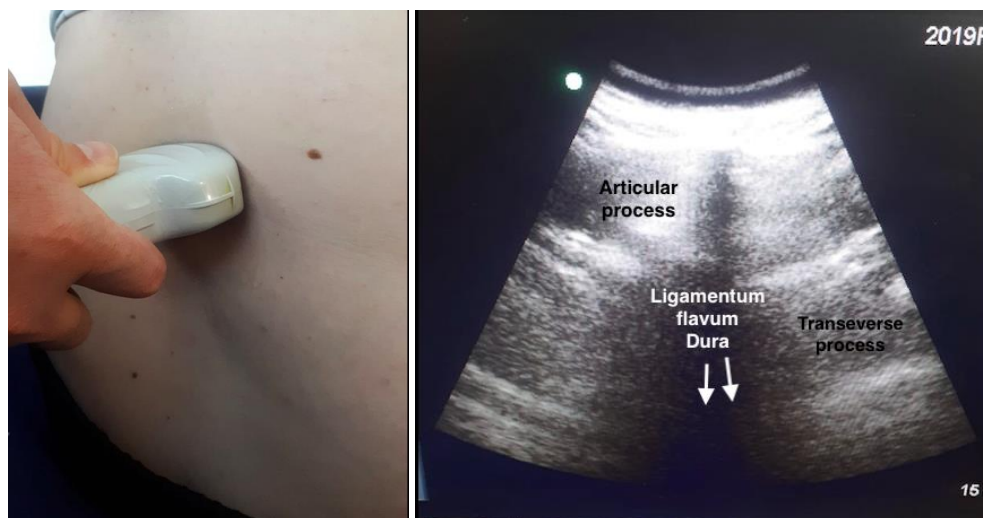
² Muğla Sıtkı Koçman University, Department of Anesthesiology and Reanimation

Purpose: Acute myeloid leukemia (AML) is a hematological malignancy which is characterized by clonal proliferation of immature myeloid cells. Patients with AML are increasingly seen in anesthesia practice. However, there are limited number of cases concerning anesthetic management of the patients with AML in the current literature. In this case report, we aimed to present the ultrasound (US) usage during neuraxial block performance for femur fracture surgery in a patient with previous AML diagnosis.

Materials and Methods: A fifty years-old, female patient was scheduled for a femur trochanteric fracture surgery. She had been diagnosed with breast cancer in 2011, then she was diagnosed with AML-M3 in 2014 and received chemotherapy. A week ago, she had femur trochanteric fracture due to bone metastasis. The peripheral blood smear analysis was evaluated as normal, and AML was accepted as "in remission". The patient rejected a general anesthesia procedure with great insistence. Spinal anesthesia under ultrasound guidance was planned for intraoperative anesthetic management. Under aseptic conditions, a 5-MHz curved array transducer was located between the T4 and T5 spinous processes in the transverse plane. When a large equal sign (=) was observed in the midline of US image, a 25-gauge spinal anesthesia needle was inserted. In total, 10 mg bupivacaine and 20 microgram fentanyl were applied to the subarachnoid space. The operation lasted for 100 minutes. The patient was followed-up by hematology department until the discharge and no blast crisis was seen.

Results: Traditionally, clinicians avoid neuraxial blocks in patients with leukemia. Traumatic lumbar punctures are thought to cause central nervous system relapse. The most likely reason is the tissue coring phenomenon; cancer cells from extramedullary blast are believed to infiltrate to the epidural/dural spaces when advancing the needle. The preoperative blood analysis and peripheral blood smear of our patient were normal, AML was in remission. Therefore, we planned to perform a spinal anesthesia under US guidance in order to avoid a traumatic procedure. A previous meta-analysis reported that ultrasound improved the precision and efficacy of neuraxial anesthetic techniques.

Discussion: In the current case, spinal anesthesia was successfully performed and no complications were seen.



OP-062

TRANSNASAL SPHENOPALATINE GANGLIN BLOCK FOR POSTDURAL PUNCTURE HEADACHE MANAGEMENT FOLLOWING SPINAL ANESTHESIA IN NON-OBSTETRIC PATIENTS

Suna AKIN TAKMAZ¹, Mustafa KARAOĞLAN¹, Bülent BALTACI², Meltem BEKTAŞ², Hülya BAŞAR²

¹ University of Health Sciences, Ankara Health Application and Research Center, Anesthesiology and Reanimation Clinic, Algology Department ² University of Health Sciences, Ankara Health Application and Research Center, Anesthesiology and Reanimation Clinic

Purpose: Epidural blood patch is considered as the gold standard treatment for management of postdural puncture headache (PDPH) when conventional measures fail. However, it is also an invasive method that can cause permanent neurological sequelae such as radiculopathy, spinal-subdural hematoma, spinalepiarachnoid hematoma, intrathecal hematoma, arachnoiditis, and infection. The aim of this study was to assess the efficacy and safety of transnasal-SPGB for the management of PDPH.

Materials and Methods: Twenty six patients with PDPH following spinal anesthesia, resistant to conventional treatment modalities, were evaluated retrospectively via medical chart review. Transnasal-SPG block was performed in each nostril in the supine position with head extension, using sterile 10 cm cotton-tipped applicator that was dipped in 2% lidocaine. Both applicators remained in the nostrils for 15 minutes and procedure was repeated 1 more time if enough analgesia could not be obtained. visual analog scale (VAS) in sitting position (baseline, 15min-30min-24h-48h), patients global impression of change (PGIC) scores (48h after treatment), and side effects were recorded.

Results: There was a rapid and significant relief of headaches observed at 15 minutes and, treatment effect was sustained at 48 hours after procedure in all patients. 38,4 %, 46,1 %, 42,3 %, and 42,3 % of patients were completely headache-free at 15min, 30min, 24h and 48h respectively, while 92,3 %, 92,3 %, 100 %, and 100 % of patients were achieved VAS \leq 3 headache relief at 15min, 30min, 24h and 48h, respectively. PGIC scores were high,,the majority of patients reported feeling either very good or good. The procedure was well tolerated with few side effects, which were mild and transient and less than 24h.

Discussion: In conclusion,when postspinal headache does not respond to conservative treatment, it may be treated effectively with transnasal-SPG block, which is a non-invasive, safe, well-tolerated and easy method with a low complication rate and may be considered before the application of a blood patch, an invasive method with morbidity potential. It is clear that this method as an alternative to EBP needs clinical proof.

OP-063**EVALUATION OF THE ATTITUDES OF ANESTHESIOLOGISTS TOWARDS THE USE OF CLINICAL
USG**

Fatma KAVAK AKELMA1

1 University of Health Sciences Diskapi Yildirim Beyazit Training and Research Hospital,
Anesthesiology and Reanimation Clinique, Ankara, Turkey

Purpose: Recently, ultrasound technology has rapidly progressed with numerous applications in anesthesia, intensive-care medicine, airway, lung, central, peripheral vein, and artery interventions, and pain medicine, increasing efficacy and safety of procedures. This study evaluates the use of USG in clinical anesthesia and its role in changing clinical practice among anesthesiologists.

Materials and Methods: This study was approved by the independent Ethics Committee. 146 anesthesiologists were asked to fill a questionnaire about their ultrasound use and during practice either by e-mail or by meeting face to face. Their attitudes were evaluated with a 5-point Likert scale.

Results: The mean age of the participants was 38.45 (± 9.49), 28% were residents and 72% were specialists; 53.4% of them were employed in the research and training hospital, 21.2% were in the state hospital, 16.4% were in the university hospital and 8.2% were working in a private hospital (Table 1). Clinical USG use is mostly preferred for central venous cannulations. Other preferred ultrasound uses were airway (30.1%), thorax (26.7%), abdomen (24%) interventions and echocardiography (20.5%). Assistant physicians used USG in both regional and clinical anesthesia interventions compared to specialist physicians ($p: 0.004$) (Table 3). The number of residents and specialists who thought that USG contributed to their clinical practice were comparable ($p: 0.068$). The number of residents who thought that USG education was sufficient was more than specialists ($p: 0.001$). Specialist physicians were more in need of additional courses ($p: 0.037$) (Table 3). The majority of participants think that USG use contributes well to clinical practice (Figure 1). Among hospitals, training and research hospitals and university hospitals were more likely to have USG facilities, and physicians' USG use was higher than in other hospitals. ($p: 0.001$) (Table 4).

Discussion: Ultrasound has been thought to offer excellent guidance for central venous access, the anatomy of the difficult airway, gastric residual volume, for evaluation of lung and for cardiac imaging or in an otherwise high-risk patient where interventional procedure is required. Therefore, training on the use of USG should be generalized.

OP-064**SUCCESSFUL EPIDURAL BLOOD PATCH: NON-SURGICAL TREATMENT OF LUMBAR CEREBROSPINAL FLUID FISTULA FOLLOWING EXTERNAL DRAINAGE**

Gökçen KÜLTÜROĞLU, Savaş ALTINSOY, Derya ÖZKAN
Dışkapı Yıldırım Beyazıt Training and Research Hospital

Purpose: In spinal surgery, cerebrospinal fluid (CSF) fistulas after dural opening or traumatic dural tears need to be readily recognized, and appropriately treated because of significant complications such as meningitis, intracranial hernia and coma.

Materials and Methods: A 55-year-old male patient ,who operated for intracranial mass and used external lombar drain to reduce of intracranial hypertension, consulted by neurosurgery. It was learned that catheter of external lombar drain was removed and presented an abundant asymptomatic fluid leak from the puncture site. He was treated with antibiotic prophylaxis, compression of skin orifice of the fluid leakage and rest but continued leaking. The decision to treatment with epidural blood patch was given. Epidural blood patch with eighteen milliliters of autologous blood was performed at the lower spinal space (L4-5) with a 16 G Touhy needle in the operating room(Figure-1). No complication was encountered. The patient without cerebrospinal fluid leakage during the follow-ups was discharged on the 7th day.

Results: Persistent CSF-cutaneous fistulae are rare clinical events defined as an abnormal continual tract between the subarachnoid space and the skin. Patients with a CSF-cutaneous fistula may or may not have a postural headache. Clear fluid at the puncture site may be an obvious clinical finding, but sometimes a wet spot on the mattress is the only evidence of a fistula. In this case,the patient had no headache but he had clear fluid leakage at lumbar drainage site. Currently, there are no established treatment guidelines for CSF fistulae. Non-surgical interventions in the literature have included conservative treatment, skin sutures at various points along the cutaneous tract, and epidural blood patch. This case supports an epidural blood patch as an effective treatment for a CSF-cutaneous fistula after external lumbar drainage.

Discussion: It should be kept in mind that epidural blood patch with high success rate in spinal cerebrospinal fluid leakage should be tried before surgical repair.



OP-065**PROLONGED MOTOR AND SENSORY BLOCK FOLLOWING ULTRASOUND-GUIDED SUPRACLAVICULAR BLOCK**

Burak BAHADIR, Mert ÇIRAKMAN, M.Burak EŞKİN, Gökhan ÖZKAN
SAĞLIK BİLİMLERİ ÜNİVERSİTESİ GÜLHANE EĞİTİM VE ARAŞTIRMA HASTANESİ

Purpose: Although regional nerve blocks have defined complications, they are frequently used in anesthesia practice because of providing safe anesthesia and long-lasting analgesia. Brachial plexus block is the application of regional nerve block in the upper extremity and brachial plexus block can be applied with various approaches. In this case we aimed to present a prolonged motor and sensory block in the patient whose surgery was performed under ultrasound guided supraclavicular block using bupivacaine and lidocaine.

Materials and Methods: A 54-year-old woman who will undergo open reduction due to distal radius fracture of the left radius was found to have no findings other than hypertension under control. There are no sensory or motor deficits revealed at patient neurological examination. Surgery was planned by using regional anesthesia after patient consent was obtained. Supraclavicular nerve block with ultrasound was performed with a mixture of 6 ml, 120 mg 2% lidocaine + 14 ml, 70 mg 0,5% bupivacaine. In the ultrasound image, it was observed that the local anesthetic completely surrounded the brachial plexus. No side effects were observed during the procedure. The operation lasted 90 minutes. After the surgery, the patient was monitored for half an hour in the PACU, her vitals were normal, then she transferred to her ward. 15 hour after the procedure The patient was consulted to our clinic because the motor and sensory block continued. Neurological consultation determined and EMG planned, and ordered for hourly neurological examination. 18 hours after the procedure patient showed improvement in sensory and motor functions. Complete recovery of motor and sensory functions required 28 hours. No pathology was detected in the EMG examination.

Discussion: Regional nerve blocks provide comfort for patients due to safe anesthesia and long lasting analgesia. However, it is a fact that there are known complications in regional anesthesia. Although there are several reports of prolonged motor and sensory block, the reason is still not clear. But local anesthetic injection close to the nerve is responsible for it. It should be kept in mind that nerve damage may occur during the procedure, neurological follow-up should be done and should be contacted with related clinics if necessary.

OP-066**DEVELOPED DIPLOPIA AFTER CAESAREAN SECTION WITH SPINAL ANESTHESIA**

İklil GEMLİK, Hüsne ŞAHİN, Yeşim Macit, Onur Özlü
TOBB ETÜ Hastanesi

Purpose: Neuroaxial blocks in elective caesarean section are preferred to avoid the complications of general anesthesia and for the mother to live the birth of her child . Dura puncture during neuro-axial block leads to CSF loss and intracranial hypotension that develops causes neurological complications. The risk of developing intracranial hypotension is high at the dura puncture in pregnant women. A patient with combined spinal-epidural anesthesia who underwent C / S surgery and postoperative diplopia was presented.

Materials and Methods: ASA I, 39 weeks pregnant who had elective caesarean, combined spinal-epidural anesthesia was performed,in the sitting position. When motor and sensory block were not developed, endotracheal intubation was performed after induction propofol and rocuronium . Anesthesia was maintained with sevoflurane ,O2 / air. The patient was given postoperative analgesia by the epidural PCA method. In the postoperative period, she had no pain , but she developed headache which aggravated in the standing position at the 7th hour.The patient who did not accept the epidural blood patch was given paracetamol 500 mg 4X1 , plenty of fluids and discharged on the postoperative 3rd day. In the neurological examination of the patient, who had complaints of double vision on postoperative day 10, there was minimal limitation in the right eye conjugated view to the right. On examination ,she had diplopia at conjugated view to the right, and she had no diplopia at conjugated view to the left. Cranial MRI and MR-venography showed no pathology. In the patient, temporary right N.Abducens damaged caused by intracranial hypotension was thought .Rest and hydration were recommended and diplopia improved on the 16th postoperative day.

Results: Intracranial hypotension due to CSF loss was the highest, due to the long distance in the intracranial area, VI.cranial nerve is affected. Stress in the nerve leads to local ischemia and dysfunction. Abducens nerve palsy may develop as a single or bilateral lesion within 4-14 days and completely recovers between 4 weeks and 4 months.

Discussion: When diplopia develops after spinal anesthesia, radiological examination should be performed for differential diagnosis with other intracranial pathologies. It is important to inform the patient with conservative treatment.

OP-067**COMBINED SPINAL-EPIDURAL ANESTHESIA FOR A PARTURIENT WITH CORRECTED GREAT ARTERY TRANSPOSITION: A**

Ülkü Ceren KÖKSOY, Hakan YILMAZ, Baturay Kansu KAZBEK, Züleyha KAZAK BENGİSUN, Filiz TÜZÜNER
Ufuk University Faculty of Medicine

Purpose: In obstetric anesthesia heart diseases, being third most common cause of maternal death can induce haemodynamic instability¹. The criss-cross heart, a congenital disease with transposition of the great arteries, is often palliated by creating a single ventricle pathway where patients remain cyanosed afterwards².

Materials and Methods: A 25 year old primagravida 37 weeks of gestational age with upper respiratory tract infection, who underwent bidirectional caval-pulmonary shunt at the age of eight for criss-cross heart, pulmonary stenosis, ventricular septal defect (VSD) and straddling atrioventricular valve anomaly, with no peripheral cyanosis was appointed for c-section. Transthoracic echocardiogram showed right ventricular hypertrophy, broad inlet VSD, 2nd degree mitral regurgitation and a subvalvular increased gradient in the pulmonary valve where she had a 5/6 systolic murmur. She received 4000 IU enoxaprin sodium daily until 4 days prior to surgery. With normal coagulation parameters, the ASA 3 patient had a 104 beats/min regular heart rate, 145/81 (99) mmHg blood pressure, 92% SpO₂ in room air and 14 breaths/minute respiratory rate. Electrocardiogram, invasive arterial blood pressure and pulse oximetry monitorisation was performed. After obtaining written informed consent, combined spinal-epidural anesthesia was administered through the L3-4 space, 10 mg 0.5% heavy bupivacaine hydrochloride and 12,5 micrograms fentanyl was given intrathecally and an epidural catheter was placed. Following T4 level sensory block surgery was initiated, no hypotension or bradycardia occurred. After the delivery of a healthy infant, oxytocin and methylergonovine maleate was given. Postoperatively the patient received epidural bupivacaine hydrochloride via a patient controlled analgesia device, had no pain and was discharged in three days.

Results: Patients with a criss-cross heart have ventricular-arterial discordance, valve-ventricle anomalies, VSD and are treated with shunts³. Prior to anesthesia the nature of the shunt operation, ventricle dimensions, VSD and outflow must be evaluated. Haemodynamic parameters must be monitored closely while maintaining adequate pre- and afterload, attenuating stress response, avoiding excessive administration of intravenous fluids which can cause increased shunting.

Discussion: In patients with corrected congenital heart diseases anesthesiologists must guide the type of anesthesia and intraoperative maintenance according to the patients preference, current heart condition and the nature of the surgical correction.

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OP-068

THE EFFECT OF SINGLE SHOT EPIDURAL ANALGESIA ON OPIOID CONSUMPTION FOLLOW DONOR NEPHRECTOMIES: A RETROSPECTIVE STUDY

Hakan YILMAZ, Baturay Kansu KAZBEK, Ülkü Ceren KÖKSOY,
Perihan EKMEKÇİ, Filiz TÜZÜNER, Züleyha Kazak BENGİSUN

: Ufuk University Faculty of Medicine, Department of Anesthesiology and Reanimation, Ankara
Turkey

Background and Goal of Study: Approximately 2700 live donor nephrectomies in our country and 27,000 in globally are performed annually. Donor nephrectomies are severely painful in the postoperative period and have a 25% risk of turning into chronic pain. Effective pain control in the first 6 postoperative weeks is associated with a better mental status. The effect of single shot epidural analgesia on postoperative opioid consumption has been retrospectively evaluated in patients who underwent donor nephrectomy in our hospital.

Following ethics committee approval, patient controlled analgesia (PCA) data of 70 patients who underwent donor nephrectomy in our center between 2016 and 2018 were retrospectively investigated and opioid consumption, nausea, vomiting, additional analgesic consumption and length of hospital stay were recorded. Intravenous tramadol PCA was used postoperatively in Group 1 where epidural bupivacain and morphine were administered preemptively while intravenous tramadol PCA alone was used in Group 2.

Results: Data of 66 patients was accessible. The groups were similar concerning demographic variables. Bolus demand and delivery were significantly lower in Group 1 ($p < 0,001$ for both parameters). There were no differences concerning nausea, vomiting, pruritus, additional analgesic consumption and length of hospital stay. Single shot epidural analgesia provides effective analgesia following donor nephrectomies and seems advantageous to continuous epidural techniques in terms of ease of application and systemic opioid administration in terms avoiding adverse effects of opioids.

Conclusion: Preemptive epidural analgesia has significantly lowered opioid requirements in the postoperative period and provides efficient pain control.

OP-069**POST-THYROIDECTOMY TRACHEAL DEVIATION AND DIFFICULT INTUBATION**

Nevriye SALMAN, Eda BALCI, Aslihan AYKUT, Hülya YIĞITOZAY, Sumru ŞEKERCI
SBU Turkiye Yuksek Ihtisas Training and Education Hospital

Purpose: The incidence of difficult intubation varied between 0.05% and 18% in various studies and it is the most common cause of morbidity and mortality in anesthesia (1,2,3). Therefore, adequate equipment and preparation are important for unexpected difficult intubations.

Materials and Methods: A 50-year-old woman patient, which was 98 kg, 160 cm, mallampati score II, ASA II, was hospitalized for laparoscopic cholecystectomy. The patient had hypertension and levothyroxine due to subtotal thyroidectomy. In addition, our patient had a history of variceal surgery under spinal anesthesia. In the preoperative evaluation, laboratory findings were normal but trachea deviation was detected on the posteroanterior chest radiograph (Figure 1). For this reason, equipment preparation (guide, gum-elastic bougie, video laryngoscope, cricothyroidotomy set, etc.) was made for difficult intubation and experienced anesthesia doctor was informed. In the laryngoscopy performed with machintosh blade following anesthesia induction after preoxygenation, it was seen that the epiglottis blocked the appearance of vocal cords and the vocal cords were deviated to the right due to the deviation of the trachea. The patient was intubated with the guide by the experienced anesthesiologist. At the end of the operation, the patient was extubated without any problem with 4 mg/kg sugammadex and then he was followed up in the service and discharged one day later.

Results: Difficult intubation will reduce the risk of difficult intubation which is not expected to be detected in a good and careful preoperative evaluation. Especially as in our patient this condition becomes more important in patients with a low score of mallampati but difficult intubation.

Discussion: In addition to routine evaluation in patients with thyroidectomy; preoperative evaluation for trachea deviation and ultimately difficult intubation in the chest X-ray is becoming more important.

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OP-070

ANESTHETIC PRACTICE IN A PATIENT WITH RETROSTERNALGOITER ACCOMPANIED BY TRACHEAL COMPRESSION AND SEVERE DSYPNEA

Pelin UZUN SARITAŞ¹, Seda ÖZEN ZUNAL¹, Aykut SARITAŞ¹,
Tepecik Training And Research Hospital

Purpose: Airway management can be difficult in patients with retrosternal goiter undergoing thyroid surgery. Thyroid gland extending to mediastinum might apply compression on trachea. Precautions should be taken in such patients regarding the anesthesia induction and management. Preparations for difficult airway managements should be made beforehand.

Materials and Methods: Thyroidectomy was planned in a 35 years old, ASA 1, mallampati 2, male patient with massive retrosternal goiter. Dsyypnea and orthopnoea were among the patient's symptoms. We evaluated the patient with tracheal compression as difficult entubation. Trachea was seen under compression towards posterior and lateral to the right and airway constriction was seen in neck CT. It was observed that the border line between vena cava and thyroid tissue was erased. Trachea was not in midline, it was deviated to the right. The patient had severe dsypnea and orthopnea, yet the saturation was 97% in room air preoperatively. Blood pressure was 142/76 mmHg and heart rate was 102/min. All preparations were made for difficult airway. Topical lidocaine was sprayed in mouth and the patient was ventilated with 100% oxygen for 3 minutes. 1 mg of midazolam, 60 mg of lidocaine, 60 mg of propofol, 80 mg of prednisolon, 50 mg of ranitidine and 100 mcg of fentanyl were used in anesthesia induction. No difficulty was encountered during ventilation and patient was intubated with video laryngoscope in the first attempt. 140 mg of propofol was added after intubation and 50 mg of rocuronium was used for neuromuscular blockade. The patient was delivered to surgeons without any problems. After 2 days of ICU follow up, the patient was extubated on postoperative day 3 and given to service.

Results: In patients evaluated as difficult ventilation and intubation, intubation can be performed under deep sedation, preserving spontaneous breathing. In this case, pre-oxygenation was applied to increase tolerance to hypoxia.

Discussion: When difficult airway is anticipated, we believe that appropriate management of anesthesia and necessary preparations like videolaryngoscope will improve patient safety.

OP-071**THE EFFECT OF HEAD POSITIONING ON INTRAOPERATIVE OPTIC NERVE SHEATH DIAMETER AND POSTOPERATIVE COGNITIVE FUNCTION OF PATIENTS UNDERGOING THYROIDECTOMY**

Başak Altıparmak¹, Melike Korkmaz Toker², Ali İhsan Uysal²,
Mustafa Turan¹, Semra Gümüş Demirbilek¹

¹Muğla Sıtkı Koçman University, Department of Anesthesiology and Reanimation, Muğla Turkey

²Muğla Sıtkı Koçman University

Purpose: Traditionally, a roll is placed behind the shoulders of patients to provide extension of the neck during thyroidectomy surgery. However, hyperextension of the neck was previously reported to be associated with carotid and vertebral artery occlusions. Therefore, disrupted blood flow in these arteries may cause an increase in intracranial pressure. In the current study, our primary hypothesis is that patients positioned with a shoulder roll will have lower postoperative cognitive functions than the patients positioned without a shoulder roll. Our secondary hypothesis is that patients in the shoulder roll group will have greater degree of neck extension and greater optic nerve sheath diameter (ONSD).

Materials and Methods: After the approval of Institutional Ethical Committee, forty-eight patients with ASA II, aged between 18-65 years, and scheduled for an elective thyroidectomy surgery were included in the study. All patients were screened by MoCA test at the preoperative and postoperative periods. Patients were positioned with a shoulder roll in Group 1 and without a roll in Group 2. ONSD was measured at six different time points. After positioning patients, degree of neck extension was measured by using the angle between Frankfort plane and horizontal plane of the operation table in natural position.

Results: Mean postoperative MoCA score was significantly higher in Group 2 (23.57+-2.37) compare to Group 1 (20.56+-2.71) ($p < 0.001$). ONSD measurements varied significantly between the times (T0 to T5) in overall ($p = 0.000$), however, interaction effect results showed that there was no group wise difference in the overall model for the times in which ONSD measured ($p = 0.333$). The degree of neck extension was significantly higher in Group 1 (126+-4.36) compare to Group 2 (116+-3.74). Positioning of the head with a shoulder roll was previously found to cause significant reductions in carotid blood flow diameter of the carotid artery. However, postoperative cognitive functions were not evaluated in the previous study.

Discussion: Positioning the head with a shoulder roll resulted in lower MoCA scores after thyroidectomy surgery. Although greater degrees of neck extension were detected in Group 1, there was no difference in ONSD measurements between the groups.

OP-072**RELATION OF ANTHROPOMETRIC MEASUREMENTS TO DIFFICULT INTUBATION IN OBESE PATIENTS WHO WILL UNDERGO GENERAL ANESTHESIA**

Cigdem KIZILAY, Mehmet CAKIRCA , Hulya BASAR, Meltem BEKTAS, Bulent BALTACI
Ankara Training and Research Hospital

Purpose: In obese patients, obesity-related systemic diseases have a high incidence of difficult airway due to thick neck, small mouth opening, short sternomental and thyromental distance in addition to morbidity. In this study, it is aimed to evaluate the effect of Height/Neck Circumference(H/NC), Neck Circumference/Tiromental Distance(NC/TD) and Neck Circumference/Sternomental Distance(NC/SD) ratios in determining difficult intubation in addition to standard measurements such as neck circumference, mouth opening, sternomental and thyromental distance.

Materials and Methods: After the approval of Ankara Training and Research Hospital Education Planning Board, 100 cases who were older than 18 years, BMI > 30 kg/m², ASA II-III group elective operation scheduled for endotracheal intubation were included with informed consent. The Mallampati score was evaluated according to the Samsoon-Young modification in all cases taken in the operation room. Later necessary measurements for the study were made. These measurements were; height, body weight, neck circumference, thyromental distance, sternomental distance, mouth opening. These measurements have been shown to be inadequate for showing difficult intubation alone. For this purpose, the relationship between H/NC, NC/SD, NC/TD ratios and intubation difficulty was also examined. After induction of anesthesia and 3 minutes of mask ventilation, Cormack-Lehane score was assessed with Macintosh Laryngoscope and endotracheal intubation was performed. During laryngoscopy; the intubation time and the number of intubation attempts were recorded. Intubation time was defined as the time from the laryngoscope entering the mouth to the tube is seen to have passed the vocal cords. The Intubation Difficulty Scale (IDS) was used when assessing intubation difficulty. Failure after performing 3 attempts at intubation was considered as unsuccessful intubation. Data analysis was performed with SPSS 15.0 and MS-Excel 2016 package programs.

Results: In our study, 7 (7%) difficult intubations were encountered according to IDS score. Mallampati classification, Cormack-Lehane classification, Neck Circumference and H/NC ratio were found to be useful in determining difficult intubation cases.

Discussion: It was determined in this study that in addition to neck circumference, Mallampati and Cormack-Lehane classifications, H/NC ratio was showed significant correlation with difficult intubation. It has been concluded that the use of these parameters would be useful in determining difficult intubation cases that are important in anesthesia practice.

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OP-073**ANESTHESIA MANAGEMENT FOR THE IMPLANTATION OF VENTRICULAR ASSIST DEVICE
IMPLANTATION: SINGLE CENTER**

Nevriye SALMAN, Perihan KEMERÇİ, Melike DEMİR, Umit KARADENİZ, Aysegul OZGOK, Mustafa PAC
SBU Turkiye Yuksek Ihtisas Training and Education Hospital

Purpose: Ventricular assist device (VAD) have basically three indications; the bridge to recovery, the bridge to transplantation and destination therapy. It is known that mechanical assist device is used for bridge to transplantation in 80% of patients. In this study, we wanted to share our anesthesia management and experiences in VAD implantations.

Materials and Methods: The demographic (age, gender, height, weight, comorbidities) and etiological data of 119 patients with VAD were collected retrospectively in April 2015-December 2018. In addition, ICD, ECMO, mechanical ventilation, intra-aortic balloon pump and inotropic agent use were investigated. As intraoperative data were investigated used agents for anesthesia induction and maintenance, VAD type, blood products used, NO and inotropic agents, CPB and duration of surgery. Postoperative extubation, ICU and hospital stay time and heart transplantation and exitus data of the patients were also determined.

Results: Of the patients, 78.1% were male, the mean age was 41.9 ± 17.1 years, and 108 patients were ≥ 18 years. The most common comorbidity was CAD and HT (15.1%) and heart failure were mostly non-ischemic (59.7%). Usually fentanyl, midazolam, ketamine and rocuronium were used for induction and maintenance of anesthesia. While LVAD was performed in 91.6% of patients; noradrenaline, dopamine and dobutamine were generally used as inotropic agent. In addition, extubation time 8.7 ± 15.7 days, 14.4 ± 15.2 days in the ICU stay time and 47.3 ± 29.8 days in hospital stay time were seen. While heart transplantation was performed in 8.4% to the patients, it was also found that 34.4% of the patients were exitus. Cardiac hemodynamic, end organ failure and comorbidities of the patients are gaining importance in anesthesia management. Therefore, all anesthetics agents should be titrated to provide anesthetic depth and cardiac stability.

Discussion: Anesthetist in VAD implantation; should have sufficient knowledge and experience about heart failure, end organ dysfunction, the device used and must have mastered of cardiac anesthesia.

OP-074**DOES PREOPERATIVE STROKE EFFECT INTRAOPERATIVE HEMODYNAMICS, NEAR INFRARED SPECTROSCOPY (NIRS) AND POSTOPERATIVE COMPLICATIONS PATIENTS UNDERGOING CAROTID ENDARTERECTOMY?**Bahar OC¹, Funda ARUN², Oguzhan ARUN¹, Ates DUMAN¹, Mehmet OC³¹ Selcuk University, Faculty of Medicine, Department of Anesthesiology and Reanimation,² Selcuk University, Faculty of Dentistry, Department of Pedodontics,³ Selcuk University, Faculty of Medicine, Department of Cardiovascular Surgery

Purpose: Carotid endarterectomy (CEA) is a prophylactic beneficial operation for high-grade carotid artery stenosis. Carotid cross-clamping (CCC) impedes cerebral and myocardial circulation. Near Infrared Spectroscopy (NIRS-rSO₂) can be used to monitor cerebral perfusion during CEA. We aimed to assess intraoperative hemodynamic and NIRS changes during the CCC in patients undergoing CEA with or without preoperative stroke.

Materials and Methods: After Ethics Committee approval, theretrospectiv study was conducted from the data of 77 patients undergoing CEA surgery with unilateral carotid artery clamping under general anaesthesia. Stroke severity was determined by using the National Institutes of Health Stroke Scale (NIHSS). Patients were in two groups: Group S (patients with stroke, n=56), group NS (patients without stroke, n=21). Standard monitoring (ECG, SaO₂, invasive-arterial blood pressure-IABP) and anaesthesia were used. Bilateral continuous NIRS monitoring was recorded during and after surgery. A decrease of >20% from the baseline of rSO₂ was considered as significant reduction in cerebral perfusion. Demographic data, IABP and rSO₂ before, during (1st, 3rd, 5th, 10th and 15th min) and after CCC time, intraoperative medications for IABP control, postoperative neurological complications (PNC) and discharge times were recorded. Patients who received re-operations and emergency surgery were excluded. Students t-test and chi-square test were used as appropriate, p < 0.05 was considered as significant.

Results: Demographic data were similar (p > 0.05). Carotid clamping time was similar between the groups (p > 0.05). During CCC period rSO₂ levels decreased more in group S (18.1%-1st, 16.3%-3rd, 17.6%-5th from the baseline) than group NS (13.4%-1st, 9.8%-3rd, 11.5%-5th from the baseline) (p < 0.05). In group S rSO₂ values were lower in < 0.05). IABP was higher in the group S than the group NS in all times and intraoperative medications usage was more in the group S (p < 0.05). PNC and discharge times were similar in two groups. Following the operation, there were no additional neurological abnormalities in any patient.

Discussion: Changes in cerebral perfusion and related hemodynamic changes during CEA surgery generally requires adaptation of anaesthesia practice. These reactions are more pronounced in patients experiencing stroke. It is important to monitor the NIHSS perioperatively for safer anaesthesia

OP-075

ANAESTHETIC CONSIDERATION FOR A PATIENT WITH TRAUMATIC CAROTID ARTERY DISSECTION: A CASE REPORT

Bahar OC1, Mehmet OC2, Oguzhan ARUN1, Ates DUMAN1,

1 Selcuk University, Faculty of Medicine, Department of Anesthesiology and Reanimation, 2 Selcuk University, Faculty of Medicine, Department of Cardiovascular Surgery

Ates DUMAN / dumanates@yahoo.com / 00905059152391

Purpose: In general, blunt carotid injury is observed in 1%- 2.6% of blunt trauma cases and in 2.7% of patients with severe multisystem trauma. Blunt traumatic carotid artery dissection (CAD) is a very rare injury associated with motor vehicle collision (MVC). It is estimated that it occurs in 1-3 % of MVC and dissections are estimated to only account for 2 % of ischemic strokes in total. The optimal diagnostic strategy for carotid dissection following blunt trauma is yet unclear. We describe a case of a traumatic CAD with delayed presentation sustained after MVC.

Materials and Methods: A 65-year-old man had a high-speed MVC. On arrival in the emergency department (ED) his vital signs were stable and his GCS score was maximal. His abdominal, thorax and cranial CT findings were normal. The patient was followed up in the ED for 24 hours and he discharged without any problem. After two weeks he refers to the neurology outpatient clinic with complaints of dizziness. Carotid Doppler showed right common carotid artery intimal flap and ulceration. The neurologic finding was normal during preoperative evolution. After ECG, SpO₂, arterial cannulation and near-infrared spectroscopy (NIRS) monitoring, anaesthesia induction was achieved with pentothal sodium 5 mg/kg, rocuronium 0.5 mg/kg and fentanyl 3 mcg/kg. Anaesthesia was maintained with propofol 5-7 mg/kg/h, remifentanyl 0.4-0.5 mcg/kg/min and rocuronium 0.2 mg/kg. NIRS values did not change during the right carotid clamping. Total resection of the dissected segment and graft (10) interposition was achieved. According to NIRS values carotid shunt not used. Patient transferred CICU and discharged postoperative fifth day.

Results: Blunt traumatic CAD remains a rare injury associated with a significant traumatic event. Traumatic CAD is probably still underdiagnosed. CAD causes for unusual neurologic symptoms must be considered. It can, however, lead to severe consequences with a significantly associated rate of stroke and intracranial haemorrhage. Appropriate early identification and treatment is essential to help reduce the risk of stroke.

Discussion: Patients with traumatic CAD remain a subgroup of cases that require special considerations and management in an interdisciplinary setting. NIRS monitoring during surgery is crucial.

OP-076

OUR CLINIC'S ANESTHETIC PRACTICE IN ENDOVASCULAR REPAIR OF AORTIC ANEURYSMS: RETROSPECTIVE ANALYZES

Filiz AKASLAN¹, Fatma ÖZKAN SİPAHİOĞLU¹, Aylın PERDİ¹, İlker İNCE², İbrahim DUVAN², Aslı DÖNMEZ¹

¹University of Health Sciences, Diskapı Yıldırım Beyazıt Training and Research Hospital, Department of Anesthesiology and Reanimation,

²University of Health Sciences, Diskapı Yıldırım Beyazıt Training and Research Hospital, Department of Cardiovascular Surgery, Ankara, Turkey

Purpose: Endovascular aortic aneurysm repair (EVAR) is a minimally invasive procedure to repair an aneurysm. EVAR procedure can be performed under general, regional or local anesthesia. It is still controversial whether the chosen anesthesia technique has an effect on outcome of the patients. In this study, we retrospectively reviewed our EVAR patients' perioperative data on anesthesia basis, and postoperative outcome, and compared these data according to general anesthesia (GA), local anesthesia (LA) or sedoanalgesia (SA).

Materials and Methods: We reviewed 136 patients' records that underwent EVAR procedure in our clinic between January 2017 and December 2018. Demographic data, comorbidities, duration of the procedure, vasoactive drug use, intensive care and hospital stays, postoperative complications and mortalities were recorded.

Results: Of the 136 patients, 69 (51%) received general, 29 (21%) local anesthesia and 38 (28%) received sedoanalgesia. EVAR procedure was successfully completed in all patients. Demographic data, anesthesia types and complications are shown in tables. Mean duration of the procedure and duration of ICU stay and hospital stay was longer in GA group when compared to other groups ($p < 0.05$). Inotropic support, surgical complications and mortality rate was also higher in GA group but this was not statistically significant (Table-2). There are studies suggesting that the preference of anesthesia type may positively affect postoperative mortality in both emergency and elective cases. Especially, it is observed that LA has a positive effect on outcome of emergency EVAR surgery. Our results were similar with the literature; durations of the procedure and ICU stay were shorter, inotropic need and complication rates were lower in LA group.

		General Anesthesia	Local Anesthesia (LA)	Sedoanalgesia + LA
Number of Patients		69 (51%)	29 (21%)	38 (28%)
Gender	Male	53 (76.8%)	23 (79.3%)	28 (73.7%)
	Female	16 (23.2%)	6 (20.7%)	10 (26.3%)
Age (year)		59.8 ± 14.9	69.8 ± 14.5	70.3 ± 11.7
Weight (kg)		78.41 ± 13.7	77.86 ± 15.7	72.9 ± 10.7
Height (cm)		169.7 ± 7.2	170.48 ± 6.9	167.08 ± 6.9
ASA	II	11 (15.9%)	6 (20.7%)	6 (15.8%)
	III	39 (56.5%)	21 (72.4%)	25 (65.8%)
	IV	18 (26.1%)	2 (6.9%)	7 (18.4%)

	General Anesthesia	Local Anesthesia (LA)	Sedoanalgesia + LA
Number of patients (n=136)	69 (51%)	29 (21%)	38 (28%)
Procedure time (min)	239.8*	161.7	169.4
Inotropic need	11 (15.9%)	1 (3.6%)	6 (15.8%)
ICU stay (hour)	58.8*	35.6	42
Hospital stay (hour)	77.28*	62.4	61.44
Mortality rate	10 (14.5%)	2 (6.9%)	4 (10.5%)
Surgical Complication	49%	17.2%	34.2%

*p<0.05, compared to other groups

Discussion: Our results demonstrate that LA may be advantageous during EVAR procedures. However controversies continue due to lack of randomized trials on the ideal type of anesthesia for EVAR surgery.

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OP-077

THE EFFECT OF ALBUMIN ON MORTALITY AND MORBIDITY AS A PROGNOSTIC FACTOR IN GERIATRIC PATIENTS WITH CARDIOVASCULAR SURGERY

Hulya YIGITÖZAY, Nevriye SALMAN, Sumru SEKERCİ
SBU Turkiye Yuksek Ihtisas Training and Education Hospital

Purpose: In recent years, the number of elderly patients who have been hospitalized is increasing with the rise of the average life expectancy. Although many parameters have been used to determine the prognosis of hospitalized patients, evidence is inadequate or contradictory in evaluating the effects of elderly patients in recovery. In this study, we aimed to investigate the effect of preoperative and postoperative parameters as a risk factor on hospital stay, complication and morbidity in patients over 65 years of age who underwent cardiovascular surgery.

Materials and Methods: All patients aged over 65 years who underwent cardiovascular surgery between April 2015 and March 2017 were included in the study retrospectively. Demographic data (age, sex, body mass index, type of surgery, comorbidities), preoperative and postoperative hemoglobin, neutrophil/lymphocyte ratio, mean platelet volume, erythrocyte distribution width, platelet, glucose, urea, creatinine, albumin values and postoperative data (intensive care and hospital stay, mortality and morbidity) were recorded.

Results: The mean age of 346 geriatric patients included in the study was 70.7 ± 4.4 years and 70.1% was male. While 54.3% of the patients had a comorbidity, 63% of the patients underwent CABG surgery. Postoperative complications were seen on 28.3% of the patients, 30-day mortality was 11.5%, intensive care unit stay was 3.07 ± 6.3 days and hospital stay was 8.4 ± 7.5 days. In addition, high levels of the postoperative glucose and urea and low levels of the postoperative albumin were found to be risk factors for postoperative complications and mortality.

Discussion: It is known that hypoalbuminemia increases mortality in acute surgical interventions like many other diseases (e.g. pancreatitis, femur fracture, trauma, some types of cancer). However, both preoperative and postoperative hypoalbuminemia were found to be risk factors for postoperative complications and mortality in patients undergoing geriatric and cardiovascular surgery. Therefore, we suggest that correction of hypoalbuminemia may be considered to be important in the recovery of geriatric patients.

OP-078**QUADRATUSLUMBORUM TYPE 3 BLOCK PROVIDES EFFECTIVE POSTOPERATIVE ANALGESIA FOR HIP SURGERY: CASE REPORTS**

Enise Armağan Koza, Ahmet Murat Yayik, Sevim Cesur, Figen Öztürk

Regional Training and Research Hospital, Department of Anesthesiology and Reanimation, Erzurum, Turkey

Introduction: Hip arthroplasty has become a common orthopedic surgery. This surgery leads to severe postoperative pain. And postoperative mobilization of the patient in hip surgery is very important in terms of preventing morbidity and mortality. For all these reasons postoperative pain management is very important¹.

Quadratuslumborum block (QLB) is widely used for analgesic management in lower abdominal surgery². In this technique, local anesthetic is injected between the quadratuslumborum and psoas muscles. The local anesthetics spread along the muscles and provide T6-L3 sensory block. Therefore, it was used in pelvic and hip operations as reported in literature³.

Case report : We present five cases of hip arthroplasty performing the QLB in this report (Table 1).

Before the surgery, QLB type 3 was performed and the patients were taken to the operating room. One of the patients was operated with general anesthesia and four of them were operated with spinal anesthesia.

A written consent form was obtained from the patients.

Table 1. Summary of Five Patients in This Case Series

	Case 1	Case 2	Case 3	Case 4	Case 5
Demographic/clinical details	72-year-old male, 80kg, 172cm, coronary artery disease, hypertension, ASA 3	65-year-old female, 76kg, 155cm, diabetes mellitus, ASA 2	68-year-old male, 88kg, 176cm, hypertension and diabetes mellitus, ASA 2	74-year-old female, 156cm, 67kg, heart failure, ASA 3	57-year-old male, 84kg, 180cm, significant smoking history, ASA 2
Anesthesia type	GA	SA	SA	SA	SA
Duration of surgery	2 hours	1 hour	2 hours	1 hour	2 hours
NPRS postop 4 hours	0	2	0	0	3
NPRS postop 8 hours	2	4	2	0	4
NPRS postop 12 hours	2	4	2	2	5
NPRS postop 24 hours	4	5	4	2	6
Postoperative total tramadol consumption	50 mg	80 mg	75 mg	40 mg	100 mg

NPRS: Numeric Pain Rating Scale ranges from 0 (no pain) to 10 (worst pain imaginable); ASA 1,2,3: American Society of Anesthesiologists Scores

Discussion:

Hip fractures are usually seen in the older age and these patients usually have comorbidities such as diabetes, hypertension, and cardiac instability. Management of anesthesia and postoperative analgesia should be planned considering these comorbidities.

We think that quadratus lumborum block can be used to alleviate postoperative acute pain in hip surgery because it provides unilateral anesthesia without muscle weakness.

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Conflicts of interest

The authors declare no conflicts of interest.

KeyWords: Quadratus lumborum block, hip surgery, postoperative analgesia

OP-079**CAN LARYNGOSCOPY-ASSISTED TECHNIQUE BE AN ALTERNATIVE TO CLASSIC TECHNIQUE FOR DIFFICULT LMA INSERTION?**M. Tuğba ARSLAN¹, M. Murat SAYIN¹, Güleser SAYLAN²University of Health Sciences Dışkapı Yıldırım Beyazıt Training and Research Hospital,
Department of Anaesthesiology

Purpose: This study compares laryngoscopy-assisted LMA insertion with classical technique with respect to ease of LMA insertion, first attempt success, hemodynamic variability due to LMA insertion, and complications.

Materials and Methods: 184 patients, between ages of 18-70, with ASA physical status I-III scheduled for minor urological surgery were included in the study. Patients were randomly divided into two groups; standard technique (n=92), and laryngoscopy-assisted technique (n=92). All patients received the same anesthetic induction. Same senior anesthetist carried out LMA insertions. In each group anesthetist tried LMA insertion with the technique identified for the group for 3 times and if failed at the end of 3rd attempt, switched to the other technique. Success at the end of each trial has been recorded. In all patients correct placement of LMA was verified by fiberoptic evaluation. Effect of LMA placement on hemodynamics and complications were also recorded.

Results: The success of first attempt LMA insertion with standart technique was 79.3% compared with 89.1% of laryngoscopy-assisted LMA insertion (p=0.06). Total success rate (all 3 attempts) was 85.8%, compared with 95.6% (p < 0.05). Insertion technique was changed to other in 13 patients (14.1%) in standart and 4 patients (4.3%) in laryngoscopic technique. One patient in standart and 2 patients in laryngoscopic technique were intubated because of unsuccessful LMA insertion. Mean arterial pressures and heart rates were comperable and postoperative sore throat was more common with standart technique (17.4%-7.7%, p < 0.05).

Discussion: With increasing knowledge about alternative techniques of LMA insertion, difficult LMA insertion can be handled easily. more: In cases where classic technique of LMA insertion fail, alternative techniques should be kept in mind.

OP-080**THE EFFECTS OF GENERAL ANESTHESIA AND ULTRASONOGRAPHY-GUIDED INTERSCALENE BLOCK ON PAIN AND OXIDATIVE STRESS WITH THE ASSESMENT OF THIOL-DISULFIDE HOMEOSTASIS AND CRP IN PATIENTS UNDERGOING SHOULDER ARTHROSCOPY**

Murat ÖKSÜZ¹, Süheyla ABİTAĞAOĞLU¹, Ahmet KACIROĞLU¹,
Ceren KÖKSAL¹, Özcan EREL², Almıla ŞENAT AYDIN²

¹Fatih Sultan Mehmet Health Application and Research Center, Department of Anesthesiology and Reanimation

²Yıldırım Beyazıt University Medical Faculty, Department of Biochemistry

Purpose: Thiol-disulfide homeostasis is a powerful antioxidant mechanism that protects the organism against the harmful effects of oxidative stress (1). Decrease in total thiol and native thiol levels, increase in disulfide level are evaluated as an indicator of oxidative stress. The aim of this study is to evaluate the effects of general anesthesia and interscalene block on pain and oxidative stress with the assesment of thiol-disulfide homeostasis and C-Reactive Protein (CRP) in patients undergoing shoulder arthroscopy.

Materials and Methods: After the approval of Ethics Committee and receiving informed consent from 42 patients, with an ASA I-II, 18-75 years of age, who were undergoing shoulder arthroscopy were included in the study. The patients were randomized to interscalene block (Group-IB, n: 20) and general anesthesia (Grup-GA, n: 22) using sealed envelope technique. In Group IB patients, ultrasound-guided interscalene block was performed with 20 ml of 0,25% bupivacaine + 1% lidocaine. In Group GA, general anesthesia was performed. Patient-controlled analgesia with a bolus dose of morphine was used postoperatively and additional analgesic was applied when visual analog scale(VAS) score>4. Blood sample was obtained to measure thiol disulfide homeostasis and CRP levels preoperatively (T0) and at the intraoperative 30th minute (T1), postoperative 3rd (T2), 6th (T3) and 18th (T4) hours from the patients. Demographic and hemodynamic data of patients, VAS scores, morphine and additional analgesic consumption levels were recorded.

Results: Demographic data is seen in Table 1. Native thiol and total thiol levels were higher in Group IB, whereas disulfide level was lower in the postoperative 18th hour (Table 2,3). CRP levels were similar. In Group-GA, VAS scores, morfin and additional analgesics consumption were higher. Mean arterial pressure was lower in intraoperative and higher in the postoperative period in Group-GA. In the previous studies, general anesthesia was found to have higher oxidative stress markers when compared to neuroaxial block (2,3). In our study, lower postoperative oxidative stress in Group-IB was associated with better pain control with interscalene block.

Discussion: In shoulder arthroscopy, interscalene block causes more effective pain control and less oxidative stress than general anesthesia in the postoperative period.

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Key words: brachial plexus block; general anesthesia; oxidative stress; thiol.

Table 1. Demographic data of the patients

	Group-IB (n:20)	Group-GA (n:22)	p
	median (min-max) / n (%)		
Age (years)	49,5 (18-66)	48,5 (22-71)	0,668 ¹
Gender			
Female	14 (70)	12 (54,5)	0,303 ²
Male	6 (30)	10 (45,5)	
Height (cm)	1,64 (1,54-1,83)	1,61 (1,5-1,8)	0,578 ¹
Body Weight (kg)	71,5 (55-95)	75,5 (53-95)	0,632 ¹
BMI (kg/m²)	27,95 (22-38,2)	26,95 (20,3-35)	0,687 ¹
ASA score			
I	10 (50)	10 (45,5)	0,768 ²
II	10 (50)	12 (54,5)	

¹Mann-Whitney U test, ²Chi Square

Table 2. Time-based changes of native and total thiol levels

	Group-IB	Group-GA	p
	median (minimum-maksimum)		
Native thiol			
T1-T0	4,75 (-126-151,6)	-11,55 (-113,8-132,5)	0,650
T2-T1	-11,85 (-122,2-22,7)	-1,95 (-56,3-79,7)	0,113
T3-T2	7,95 (-68,3-59,6)	-3,9 (-52,8-39,9)	0,032
T4-T3	13,35 (-164,1-110,5)	4,05 (-92,5-89,1)	0,571
Total thiol			
T1-T0	-7,75 (-141,2-175,3)	-20,5 (-92,8-41,7)	0,339
T2-T1	-20,05 (-118,6-21,9)	2,5 (-72-70,3)	0,021
T3-T2	22,4 (-70,3-70,3)	-7,05 (-37,7-36,2)	0,012
T4-T3	8,35 (-179,6-224,9)	6,45 (-62,8-89,8)	0,940

Mann-Whitney U test

Table 3. Disulfide levels

	Group-IB	Group-GA	p ¹
	median (minimum-maksimum)		
Disulfide (µmol/L)			
Basal	10,65 (3,7-24,95)	16,2 (5,2-59,3)	0,124
Intraoperative 30 th min	9 (1,15-23,9)	9,93 (2,25-32,1) [#]	0,930
Postoperative 3 rd hour	6,45 (1,5-23,35) ^{&}	10,35 (1,65-34,35) [#]	0,314
Postoperative 6 th hour	8,48 (3,8-19,2)	11,2 (2,05-26,1) [#]	0,273
Postoperative 18 th hour	5,88 (1,05-73,65) ^{&}	10,5 (1-28,25)	0,032

¹Mann-Whitney U test, [&]Wilcoxon test, p<0,05

OP-081**HEMODYNAMIC MONITORING WITH PULSE CONTOUR CARDIAC OUTPUT (PICCO) IN TRAUMA PATIENTS**

Alev ÖZTAŞ, Yücel MERİÇ, Arzu YILDIRIM AR, Süheyla ABİTAĞAOĞLU

Health Science University, Fatih Sultan Mehmet Health Application and Research Center, Intensive Care Clinic/Anesthesiology and Reanimation Clinic, İstanbul

Purpose: Fluid management in trauma patients is often complicated by reason of coagulopathy and bleeding. Although Advanced Trauma Life Support(ATLS) shows similar approaches in different types of trauma, there are differences in fluid therapy strategy. The physiological effect of the infused fluid volume in trauma patients may be more importance than the type of selected fluid(1). While excessive fluid replacement causes diffuse tissue edema; leads to disruption to organ functions by increasing the distance required for the transport of oxygen at the cellular part(2). Follow-up of hemodynamic parameters in evaluating the volume of extravascular lung fluid, which produces adequate cardiac output, to provide tissue oxygenation and organ perfusion due to excess fluid replacement is vital. Our aim is to demonstrate the applicability of continuous monitoring of these parameters with pulse contour cardiac output(PICCO) which is a minimally invasive method in trauma patients and their benefits in fluid management.

Materials and Methods: We have retrospectively reviewed trauma patients who were followed up between January and December 2018, after obtaining the permission of hospital's scientific studies committee(17073117-050.06). We included 9 patients who underwent PICCO monitoring over the age of 18 with intensive care hospitalization for more than 24 hours after trauma. Their measurements were made using the PICCO system(Pulsion Medical Systems, Munich, Germany). Cardiac Index(CI), Extravascular Lung Water Index(EVLWI), stroke volume variation(SVV) measurements, in the first 24 hours after catheterization, the average of 3 values taken with 8 hour intervals was recorded.

Results: Demographic characteristics and average values are given in Table-1. Following measurements in 3 patients using inotrope prior to PICCO measurements; inotropic support was terminated by applying fluid replacement in 1 patient, both fluid and inotropic support was provided in 1 patient, whereas only inotropic support was provided in 1 patient; after the measurement inotropic use and fluid replacement were performed in 1 patient who doesn't have an inotropic support before measurement. Cardiac output(CO) is associated not only with intravascular volume but also with myocardial contractility and vascular resistance. Excess fluid resuscitation may not always provide sufficient CO(3).

Discussion: Our view is that follow-up of PICCO in fluid management in trauma patients who are in the intensive care unit is beneficial.

Table 1:

		Mean±SS(Min-Max)
Gender (F/M)		5/4
Age(year)		60.3±8.3 (24-87)
Primary Diagnosis	Cranial Trauma	2
	Extremity Trauma	4
	Multiple Trauma	3
Length of ICU (day)		28.6±6.8 (2-60)
APACHE II Score		20.3±3.5
SAPS II Score		41.6±9.5 (6-66)
Glasgow Coma Scale (GCS)		11.2±1.3 (5-15)

Number of NIV day		3.5±1.7 (0-16)
Number of IMV day		22.1±6.9 (1-60)
Duration of PiCCO measurement time (hour)		108.3±38.4 (15-380)
1st day	CI	3.4±0.3 (1.5-5)
	SVV	14.7±2.4 (6.3-29)
	EVLWI	9.4±0.5 (7-12)
Outcome (Alive/Ex)		6/3

NIV: Noninvasive mechanic ventilation, **IMV:** Invazive mechanic ventilation

CI: Cardiac Index, **SVV:** Stroke volume variation

EVLWI: Ekstravasular Lung Water Index

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OP-082**DOES DIFFERENT TYPES OF GENERAL ANESTHESIA ALTER THE INCIDENCE OF MYOCARDIAL ISCHEMIA IN TRANSURETHRAL RESECTION OF PROSTATE?**

Nevzat Mehmet MUTLU¹, Murat SAKALLI², Özlem BALKIZ SOYAL¹, Tülay TUNÇER PEKER¹, Deniz ERDEM¹, Nermin GÖĞÜŞ¹

¹Department of Anesthesiology and Reanimation, Ankara Numune Education and Research Hospital, Ankara, TURKEY,

²Department of Cardiology, Özel Farabi Hospital, Konya, TURKEY

Purpose: Transurethral resection of prostate(TURP) is a surgical intervention for benign prostatic obstruction with a mortality rate of 1.5% mostly due to cardiovascular complications. Myocardial ischemia(MI) is a common causes of perioperative morbidity and mortality in non-cardiac surgery. The studies concerning perioperative MI mostly consist of heterogeneous surgical interventions. Studies comparing different types of general anesthesia are very few. We aimed to compare the difference of incidence and risk factors of MI between balanced anesthesia (remifentanil-etomidate-sevoflurane) with total intravenous anesthesia(TIVA) (remifentanil-propofol) in patients undergoing TURP.

Materials and Methods: After ethics committee approval, 66 ASA II-III patients aged-50-87 scheduled for TURP were randomly assigned to two groups; Group-B(balanced anesthesia) or Group-T(TIVA). All patients were premedicated with 0,03mg/kg i.v. midazolam. Anesthesia was induced with 0,5-1µg/kg i.v. remifentanil, 1.5-2.5mg/kg i.v. etomidate in Group-B(n=33) and with 0.5-1µg/kg i.v. remifentanil, 1-2mg/kg i.v. propofol in Group-T(n=33). Patients were intubated following muscle relaxation with 0.1mg/kg vecuronium. Anesthesia was maintained with sevoflurane(%1-3), %66/%33(N2O/O2) in Group-B and remifentanil(0.1-0.5µg/kg/min), propofol(3-6mg/kg/hr), %66/%33(N2O/O2) in Group-T. ST segment monitoring of DII, V5 and AVL derivations were recorded along with routine monitoring. MI was mainly evaluated in seven periods including preoperative 15 minutes, intraoperative (following induction, intubation and extubation respectively), postoperative 15 minutes, 6th and 24th hours using ECG. Laboratory values were recorded preoperatively, following surgery and 24 hours after surgery. Statistical analysis was performed by SPSS.

Results: Demographic and characteristic features, comorbidities and postoperative complications, laboratory values, MI comparisons are shown in tables-1,2,3,4,5. Although there were hemodynamic differences between Remifentanil-Propofol-TIVA and Remifentanil-Etomidate-Sevoflurane-balanced anesthesia, there was no difference in the incidence of MI between two different general anesthesia types.

Discussion: In conclusion we can say that MI in TURP may develop due to hemodynamic changes, operation-related events, decrease in hemoglobin and possible ischemic risk factors of patients rather than the choice of general anesthesia.

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Table-1 Comparison of Demographic and characteristic features

	Group B (n = 33)	Group T (n=33)	p
Age (years)	67.7 ± 8.5	69.5 ± 5.8	0.286
Weight (kg)	70.3 ± 13.2	70.9 ± 15.2	0.856
Height (m)	1.64 ± 0.07	1.61 ± 0.06	0.057

BMI (kg/m ²)	25.97 ± 4.2	27.21 ± 5.2	0.349
ASA II / III	25 (75.8) / 8 (24.2)	23 (69.7) / 10 (30.3)	0.580
Goldman Low/Intermediate/high	22 (66.7) / 8 (24.2) / 3 (9.1)	18 (54.5) / 11 (33.3) / 4 (12.1)	0.602
Duration of resection (min)	46.94 ± 20.1	47.27 ± 18.1	0.700
Duration of anesthesia (min)	55.91 ± 21.3	57.21 ± 19.3	0.686
Volume of Glycine used (L)	14.73 ± 6.02	15.99 ± 6.6	0.302
Volume of Glycine absorbed (L)	0.62 ± 0.6	1.1 ± 0.9	0.041*
Weight of the prostate tissue resected (g)	18.85 ± 13.1	21.91 ± 14.6	0.267
Preoperative EF %	65.7 ± 5.8	60.3 ± 11.2	0.034*
Incidence of MI	16 (48.5)	13 (39.4)	0.457

BMI; body mass index, ASA; American Society of Anesthesiologist Score, MI; myocardial ischemia

Values were specified as mean ± SD, n (%)

* p<0,05

Table-2 Comparison of Comorbidities and postoperative complications

	Grup B (n = 33)	Grup T (n=33)	p
Comorbidities	2.27 ± 1.15	2.76 ± 1.82	0.301
Hypertension	14 (42.4)	10 (30.3)	0.306
Diabetes mellitus	4 (12.1)	4 (12.1)	1
COPD	13 (39.4)	16 (48.5)	0.457
Atrial fibrillation	1 (3)	2 (6.1)	0.555
Smoking	19 (57.6)	18 (54.5)	0.804
Heart failure	6 (18.2)	7 (21.2)	0.757
Previous stroke	1 (3)	5 (15)	0.087
Lack of exercise	5 (15.2)	10 (30.3)	0.142
Mitral regurgitation 1+	3 (9.1)	7 (21.2)	0.170
Aortic regurgitation (mild)	1 (3)	3 (9.1)	0.302
Coronary artery disease	5 (15.2)	2 (6.1)	0.230
Obesity	6 (18.2)	8 (24.2)	0.547
Complications	1.39 ± 0.99	1.58 ± 1.09	0.415
Atrial fibrillation	1 (3)	0 (0)	0.500
Ischemic stroke	1 (3)	1 (3)	1
TUR Syndrome	0 (0)	2 (6.1)	0.246
Chest pain	1 (3)	0 (0)	0.500
Ventricular premature systole	0 (0)	1 (3)	0.500
Pulmonary thromboembolism	0 (0)	1 (3)	0.500
Hyponatremia			
Mild	11 (33.3)	7 (21.2)	0.269
Moderate	3 (9.1)	9 (27.3)	0.056
Severe	4 (12.1)	6 (18.2)	0.492
Hypopotassemia	14 (42.4)	17 (51.5)	0.459
Anemia (Hb<9 mg/dl)	8 (24.2)	7 (21.2)	0.769

COPD; chronic obstructive pulmonary disease, TUR; transurethral resection of prostate

Values were specified as mean ± SD, n (%)

Table-3 Comparison of Laboratory values

	Grup B (n = 33)	Grup T (n=33)	p
Preoperative Hb	13.8 ± 2.2	14.03 ± 1.5	0.575
Postoperative day 0 Hb	12.3 ± 2.3	11.7 ± 1.6	0.220
Postoperative day 1 Hb	11.2 ± 2.2	10.4 ± 2.1	0.119
Maximum Hb variation	2.7 ± 1.8	3.7 ± 1.9	0.030*
Preoperative Hct	40.6 ± 6.1	41.2 ± 4.3	0.634
Postoperative day 0 Hct	35.7 ± 6.2	34.4 ± 4.7	0.333
Postoperative day 1 Hct	32.6 ± 6.7	30.1 ± 6.1	0.113
Maximum Htc variation	8.4 ± 5.2	11.2 ± 5.8	0.044*
Preoperative CK-MB/CK	0.26 ± 0.13	0.33 ± 0.17	0.078
Postoperative day 0 CK-MB/CK	0.37 ± 0.19	0.46 ± 0.24	0.118
Postoperative day 1 CK-MB/CK	0.12 ± 0.1	0.16 ± 0.16	0.225
Preoperative CK-MB	16.79 ± 6.6	18.52 ± 10.2	0.419
Postoperative day 0 CK-MB	26.91 ± 12.1^Ω	29.09 ± 17.9^{&}	0.563
Postoperative day 1 CK-MB	22.21 ± 17.3^{ΩΩ}	21.52 ± 12.8^{&&}	0.853
Preoperative Na	139.06 ± 3.9	140.27 ± 3.5	0.185
Postoperative day 0 Na	133.30 ± 6.3	130.36 ± 7.6	0.092
Postoperative day 1 Na	136.21 ± 4.7	136.33 ± 3.8	0.908
Preoperative K	4.08 ± 0.5	4.02 ± 0.5	0.619
Postoperative day 0 K	4.14 ± 0.7	4.11 ± 0.7	0.859
Postoperative day 1 K	3.65 ± 0.4	3.58 ± 0.5	0.501

Hb; hemoglobin, Hct; hematocrit, CK; creatine kinase, CK-MB; creatine kinase– myocardial, Na; sodium, K: potassium

Values were specified as mean ± SD, n (%)

Intra-group comparison for CK-MB

Ω p<0,001 Comparison of preoperative CK-MB with postoperative day 0 CK-MB in Group B

ΩΩ p=0,079 Comparison of preoperative CK-MB with postoperative day 1 CK-MB in Group B

& p=0,002 Comparison of preoperative CK-MB with postoperative day 0 CK-MB in Group T

&& p=0,233 Comparison of preoperative CK-MB with postoperative day 1 CK-MB in Group T

Table-4 Comparison of myocardial ischemia (MI) properties in ischemic patients between groups

	Group B (n=16)	Group T (n=13)	p
Total duration of MI (min)	31.94 ± 26.04	27.15 ± 20.76	0.559
Preoperative duration of MI (min)	2.56 ± 3.6	2.85 ± 2.8	0.619
Intraoperative duration of MI (min)	24.81 ± 23.5	22.85 ± 18.6	0.983
Postoperative duration of MI (min)	4.56 ± 4.5	1,46 ± 2.1	0.056
Number of MI periods	3.63 ± 1.3	3.54 ± 2.1	0.779

MI; myocardial ischemia

Values were specified as mean ± SD, n (%)

Table-5 Comparison of myocardial ischemia (MI) properties for periods between groups

	Group B (n=33)	Group T (n=33)	p
Maximum amplitude of ST depression	1.58 ± 0.29	1.57 ± 0.30	0.987
Maximum amplitude of ST elevation	2.76 ± 0.59	2.72 ± 0.40	0.876
Number of patients with preoperative MI	6 (18.2)	8 (24.2)	0.547
Number of patients with MI on induction	9 (27.3)	8 (24.2)	0.778
Number of patients with MI on intubation	10 (30.3)	8 (24.2)	0.580
Number of patients with MI on extubation	10 (30.3)	6 (18.2)	0.251
Number of patients with MI on postoperative 15th min	12 (36.4)	5 (15.2)	0.045*
Number of patients showing MI on ECG on postoperative 6th hour	6 (18.2)	5 (15.2)	0.741
Number of patients showing MI on ECG on postoperative 24th hour	5 (15.2)	5 (15.2)	1

MI; myocardial ischemia

Values were specified as mean ± SD, n (%)

OP-083

A RARE COMPLICATION WITH CEVOX CATHETER

Halil ISLAMOGLU¹, Behiç GIRGIN², Nevriye SALMAN³, Umit KARADENİZ⁴
Türkiye Yüksek İhtisas Training and Research Hospital

Central venous catheterization (CVC) is employed when a patient needs frequent or continuous injections of medications or fluids for nutritional support. Cevox catheter is the one which helps to detect the cardiac output, stroke volume variation, pulse pressure variation, ScvO₂, etc. in special surgery procedures like orthotopic liver transplantation (OLT). ScvO₂ offers quick reacting information on the patients haemodynamic status. ScvO₂ is much more sensitive than blood pressure and heart frequency for detecting shock status of any origin. The indications for ScvO₂ monitoring for early detection are: Imbalance between oxygen supply and oxygen consumption, state of shock of any origin, Insufficient cardiac output (surrogate parameter). Advantages are immediate recognition of insufficient tissue oxygenation, access via standard-CVC, reduction of blood gas analysis, oxygen balance in real-time and easy handling - no in-vitro calibration required. We hereby present a clinical case of 37 years old male patient with a history of cirrhosis belongs to hepatitis B infection underwent liver transplantation from a living donor because of chronic end-stage liver failure. Cevox catheter was important for this case; so that we insert Cevox catheter through CVC; but it was more difficult from the other Cevox catheters that we inserted before. Along the surgical procedure there was no problem with that. After the end of surgery Cevox catheter was tried to be removed and found to be difficult. Because the catheter itself was too thin, it was found that the proximal end was severed with slight force (Picture 1). Then, the catheter was fixed with the clamp and the central catheter was carefully removed in the intensive care unit. In this case, we tried to present a rare complication of Cevox catheter.

OP-084**IATROGENIC BILE DUCT INJURY AND ITS MANAGEMENT WITH INTENSIVE CARE UNIT
PROCESS: A SINGLE CENTER EXPERIENCE**İbrahim MÜNGAN¹, Büşra TEZCAN¹, Bahar AYDINLI²¹Turkey Advanced Specialty Education and Research Hospital, ²Mersin City Training and Research Hospital

Purpose: Laparoscopic cholecystectomy (LC), the standard of care for symptomatic cholelithiasis, and Endoscopic retrograde cholangiopancreatography(ERCP), the gold standard diagnostic pathway for biliary disease, may lead to serious complications like bile duct injury (BDI). The management of BDI may require additional procedures ranging from ERCP to surgical reconstruction and even liver transplantation. Patients with BDI may present with life-threatening complications such as peritonitis, sepsis, cholangitis or external biliary fistulae. The aim of this study was to analyze the clinical outcomes of iatrogenic BDI and intensive care unit (ICU) process.

Materials and Methods: In this single-center, retrospective, cohort study, all patients with BDI after LC or ERCP were enrolled from January 1, 2016 to July 31, 2018. Patient characteristics, details of BDI, and hospital course from the medical records were collected. Statistical analysis was performed using SPSS version 20.0 for Windows.

Results: Throughout the study period, 17 patients developed BDI and mostly after LC(82.4%). 14 of these patients were referred us from another hospital and since 94.1% of them admitted in the first week, the main symptom was abdominal pain. Surgery was required only in 41.2% and the in-hospital mortality rate was 17.6% and sepsis was the main cause. The length of stay in hospital and in ICU were 18.12 and 12.47 days respectively. Various sources cite different rates of BDI in LC, ranging from 0.3% to as high as 2.6% and perforation is one of the ERCP-related complications. Surgical interventions or endoscopic management which has a success rate of approximately 80% was preferred according to the type of injury, time-to-diagnosis interval and symptoms of the patient. Initial presentation of a missed BDI can be subtle due to nonspecific symptoms and delayed detection may lead to increased morbidity, treatment failure and even death. Any patient who does not rapidly recover after cholecystectomy should be critically evaluated for BDI and suspicion is a must for an intensivist.

Discussion: BDI cause considerable morbidity and a definite mortality. Late diagnosis with peritonitis leading to sepsis is the main cause of mortality. If detected early and properly managed in a specialized centre, the damage can be successfully limited.

OP-085

THE EFFECT OF ANESTHESIA TYPE ON OUTCOME IN ENDOVASCULAR ANEURYSM REPAIR OPERATIONS

Tugba AVCI , Bahadır AYTEKIN , B. Bogachan AKKAYA, Nevriye SALMAN, E. Utku UNAL, H. Zafer ISCAN
SBU Turkiye Yuksek Ihtisas Training and Education Hospital

Purpose: After the approval of endovascular repair as a dominant treatment in abdominal aortic aneurysms, the types of anesthesia are now started to be discussed worldwide. In many centers, miscellaneous anesthetic techniques such as; general anesthesia (GA), regional anesthesia (including spinal and epidural anesthesia) and local anesthesia (LA) are successfully applied. The aim of our study is to investigate the effects of anesthesia types on 134 patients' immediate outcomes that treated via EVAR with modular or unibody grafts.

Materials and Methods: During the years 2012 and 2018; 42 patients (mean age 68.6 years, 40 men) treated by using local or regional anesthesia (locoregional group), 92 patients (mean age 69.9 years, 84 men) treated by using general anesthesia (general anesthesia group). Anesthetic management was decided by the patients' ASA classification risk profile as local, regional or general anesthesia.

Results: None of the patients were needed to conversion to general anesthesia. The procedure time is 133.9 ± 30.5 min in locoregional group and 156.4 ± 53.4 min in general anesthesia group ($p=0,012$). In the early postoperative period (30-day), there was 1 (1,1%) mortality. There was no renal morbidity. 1 patient (%1,1) in general anesthesia group had a MI after the procedure. In locoregional group; ICU period was 8.5 ± 6.4 hours, LOS was 2.9 ± 1.5 day. In general anesthesia group; ICU period was $9,6 \pm 25,7$ and LOS was 3.1 ± 2.98 day. ICU periods between two groups is statistically significant ($p=0,013$). The amount of radio-opac solution between two groups is also statistically significant ($p=0,01$).

Discussion: Endograft types, ASA classification, patient emotional suitability, aneurysm anatomy or challenging anatomies, high risk of conversion to open surgery is the keypoints for anesthesia types. Types of anesthesia does not effect immediate results. Local anesthesia is more suitable and mostly used in unibody grefts and high risk patients.

OP-08&**APPLICABILITY OF ASA CLASSIFICATION FOR ELECTIVE ENDOVASCULAR INFRARENAL ABDOMINAL ANEURYSMS**

Bahadır AYTEKIN , Tugba AVCI , H. Mehmet OZBEK, Nevriye SALMAN, E. Utku UNAL, H. Zafer ISCAN
SBU Turkiye Yuksek Ihtisas Training and Education Hospital

Purpose: The most important factor for successful endovascular aortic aneurysm repair is patient selection. Technical success depends on anatomical suitability, however long term survival largely depend on the patient comorbidity and risk profile. Some grading methods are used to objectify patient comorbidity. We evaluated our elective EVAR experience with The ASA classification of physical status for applicability and accuracy for postoperative mortality morbidity.

Materials and Methods: ASA classification system was studied using a retrospective database of 134 elective infrarenal abdominal aortic aneurysms. Patients divided into two groups; Group I Low Risk Patients (63 patient-ASA class 1-2), and Group II High Risk Patients (71 patient-ASA class 3-4). Urgent procedures, hybrid procedures or EVAR with concomitant surgery were excluded from the study.

Results: A total of 134 patients had elective EVAR procedure for infrarenal abdominal aortic aneurysm. Early mortality was 1.1% (1 patient from group II) There was conversion to open surgery and technical success rate was 100% for both group. Unibody endografts were mostly used 59.2% for high risk Group II. ICU period and LOS was longer for high risk group, however did not reached statistically significance

Discussion: Patients unfit for open surgery can safely performed endovascularly, if aneurysm anatomy is suitable. Technical and clinical success rates do not appear to be significantly influenced by ASA classification. Patient comorbidity and high risk patients may predict long term survival and morbidity.

OP-087**DOES THE TYPE OF PATIENT CONTROLLED ANALGESIA ALTER PATIENT ANXIETY IN MAJOR ABDOMINAL SURGERY?**Özlem BALKIZ SOYAL¹, N.Mehmet MUTLU¹, Süheyla ÜNVER², M. Özcan ERDEMLİ³¹Department of Anesthesiology and Reanimation, Ankara Numune Education and Research Hospital, Ankara Turkey,²Department of Anesthesiology and Reanimation, Ankara Dr Abdurrahman Yurtaslan Oncology Education and Research Hospital, Ankara Turkey,³Department of Anesthesiology and Reanimation, Acibadem Altunizade Hospital, İstanbul Turkey

Purpose: Patients scheduled for elective surgery are prone to anxiety due to the uncertainty of both the surgical and the anesthetic procedure as well as the fear of pain. In this study we aimed to compare anxiety in relation to two different patient controlled analgesia (PCA) methods in patients undergoing elective major abdominal surgery.

Materials and Methods: Two different postoperative analgesia methods were planned for 50 ASA II-III patients aged >18 years scheduled for major abdominal surgery after approval of ethics committee. Patients with ongoing pain management, contraindications to thoracic epidural injection or communication problems were not included in the study. Demographics, history of previous operations and analgesia as well as preoperative continuous (STAI-II) and state (STAI-I) anxiety scales were recorded preoperatively. In Group-I (thoracic epidural patient-controlled analgesia) epidural catheters were inserted by T7-10 levels for postoperative analgesia. Following administration of 50 mg lidocaine through the epidural, i.m. premedication midazolam and atropine was administered. Patients received thiopental, alfentanil and rocuronium for induction, 1 MAC Sevoflurane and 50%/50% N2O/air, alfentanil for maintenance. Postoperative analgesia protocols were started in PACU. Group-I received %0.125 bupivacaine and 2µg/ml fentanyl while Group-II (intravenous patient controlled analgesia) received 1 mg/ml meperidine in 100 ml 0.9% NaCl intravenously for analgesia. The patients were re-evaluated at the 24th hour for anxiety. The duration of PACU stay, duration of postoperative hospitalization were recorded. Statistical analysis was performed by SPSS and p

Results: Demographics, anxiety levels are shown in table 1-2-3. Although continuous anxiety(STAI-II) scores were statistically higher in Group II, values did not comply with anxiety. Preoperative state anxiety(STAI-I) levels showed anxiety in both groups and postoperative state anxiety was decreased postoperatively in both groups statistically.

Discussion: Thoracic epidural and intravenous PCA are good at controlling anxiety postoperatively so they can both be preferred in terms of anxiety in patients undergoing major abdominal surgery.

Table-1 Comparison of demographics

	Group I (n = 25)	Group II (n = 25)
Gender (Male/Female)	12 / 13	10 / 15
Age (years)	57.32 ± 14.94	53.40 ± 13.60
ASA II/III	15 / 10	12 / 13
Duration in Post Anesthesia Care Unit (hours)	24.24 ± 1.20	24.96 ± 4.80
Duration in hospital postoperatively (days)	6.60 ± 0.87	6.80 ± 1.38

The values are given as mean ± standard deviation

Table-2 Comparison of anxiety levels

	Group I (n = 25)	Group II (n = 25)
STAI-II	37.52 ± 8.32	42.80 ± 6.90*
Preoperative STAI-I	49.08 ± 8.88**	49.44 ± 12.36**
Postoperative STAI-I	35.60 ± 6.74	38.88 ± 10.73

STAI-I; state anxiety scale, STAI-II; continuous anxiety scale

STAI-I value ≥50 , STAI-II value ≥45 considered anxious

The values are given as mean ± standard deviation

* p<0.05 comparison between groups

** p<0.05 inside group comparison of preoperative anxiety with postoperative anxiety

Table-3 Comparison of anxiety by gender

	Female (n=22)	Male (n=28)
STAI-II	44.73 ± 6.45*	35.20 ± 7.90
Preoperative STAI-I	52.07 ± 11.14	48.06 ± 10.37
Postoperative STAI-I	41.47 ± 9.79*	35.43 ± 8.15

STAI-I; state anxiety scale, STAI-II; continuous anxiety scale

STAI-I value ≥50 , STAI-II value ≥45 considered anxious

The values are given as mean ± standard deviation

*p<0.05

OP-088**ANALYSIS OF PATIENS FALL FROM HIGH IN INTENSIVE CARE UNIT:
A RETROSPECTIVE STUDY**

Ümran KARACA, Derya KARASU, Şeyda Efsun ÖZGÜNAY, Şermin EMİNOĞLU
Bursa Yuksek Ihtisas Training and Education Hospital, Department of Anesthesiology and
Reanimation

Purpose: Injuries caused by falling from height are the second cause of death after traffic accidents due to the risk of injury. It is usually an accident and is a public health problem with high morbidity and mortality among all age groups(1). In this study we aimed to analyze the demographic characteristics and the effects on morbidity and mortality of the patients fall from high who were admitted to the intensive care unit.

Materials and Methods: Patients fall from high aged 18-70 years old who admitted to intensive care unit between 2017 and 2018 years after the approval of the local ethics committee were included the study. Patients were retrospectively analyzed the demographic characteristics, length of stay intensive care unit, mortality and laboratory results of patients at admission and discharge. Statistical analyses were carried out with the SPSS 21 Windows software. Variables were expressed as mean±SD, minimum-maximum and percentage.

Results: 30 patients were evaluated. Male patients were significantly higher than females. Table 1 describes the baseline characteristics of patients and Table 2 shows the laboratory results of patients. Mortality rate was 20%. While there was no difference between the mean ages of the patients with mortality than non-mortality, the GCS was significantly lower (respectively; 5.50, 11.87, p=0.02), length of stay intensive care unit was significantly lower (respectively; 4.83, 17.29 day, p=0.01) and the APACHE II score was significantly higher (respectively; 28.00, 19.95, p=0.008). Brain death occurred in 83.33% of patients who were mortal and 1 of them was donor.

Discussion: Many factors affect the mortality and morbidity of falls such as age of the patient, height of fall, type of fall, and type of injury(2). According to our results, the most affected body part is the head in high from fall patients, and the brain death in those with head trauma is higher than the other traumas. Brain death and donor care should be kept in mind in a group of head injuries admitted to intensive care unit. Keyword: fall from the height, intensive care unit, trauma, mortality

1.Kasim Turgut, Mehmet Ediz Sarihan,et al. Fall from height: A retrospective analysis.World J Emerg Med 2018;9(1):46–50 2.Liu CC, Wang CY, Shih HC, Wen YS, Wu JJ, Huang CI, et al. Prognostic factors for mortality following falls from height. Injury 2009;40:595-7.

Table 1: Characteristics of the patients who were included in this study (n= 30)

	n= 30
Age, year	43.76 ± 16.38
Gender, male, n (%)	26 (86.7)
Comorbid diseases	
Hypertension	9 (30)
Psychiatric disease	4 (16.7)
Diabetes mellitus	3 (10)
Chronic obstructive pulmonary disease	2 (6.7)
Cerebro vascular event	2 (6.7)
Coronary artery disease	1 (3.3)
Acute renal failure	1 (3.3)

Types of trauma, n (%)	15 (50)
Head	10 (33.3)
Thoracic	15 (50)
Upper extremity	15 (50)
Lower extremity	15 (50)
Abdomen	5 (16.7)
Cervical vertebrae	3 (10)
Thoracic vertebrae	7 (23.33)
Glasgow Coma Scale Score	10.6 ± 4.83
APACHE II Score	21.56 ±6.87
Need for mechanical ventilation, n (%)	18 (60)
Need for operations, n (%)	18 (60)
Need for inotropic agent, n (%)	13 (43.3)
Cardiopulmonary resuscitation, n (%)	3 (10)
Length of stay in ICU (day)	14.8±21.14
Mortality, n (%)	6 (20)
Brain death	5 (83.33)

Table 2: Laboratory results of patients who were included in this study

	At admission	At discharge
Hemoglobin	11.67±2.49	10.44±1.97
<u>White blood cell</u>	17.79±8.11	11.73±4.86
<u>Thrombocyte</u>	187.80±69.70	265.53±147.91
Glucose	189.50±66.23	133.36±63.13
Sodium	138.70±4.66	141.90±9.18
<u>Potassium</u>	4.06±0.65	4.01±0.55
Chlor	106.36±5.67	106.03±9.45
Aspartate aminotransferase	163.40±197.36	71.13±129.02
Alanine aminotransferase	93.10±115.01	48.16±42.82
<u>Blood urea nitrogen</u>	36.59±87.33	15.88±9.34
Creatine	1.18±0.53	1.10±1.90
<u>C-reactive protein</u>	58.18 ±63.84	80.41±61.75

OP-089**OBSTETRIC PROBLEMS REQUIRING INTENSIVE CARE UNIT ADMISSION: EXPERIENCE FROM A TERTIARY CENTER**

Gülseren YILMAZ, Ziya SALİHOĞLU

University of Health Science İstanbul Kanuni Sultan Süleyman Training and Research Hospital

Purpose: A substantial amount of obstetric patients, in particular, those undergoing cesarean delivery might require intensive care due to the antepartum and postpartum complications. The aim of this study is to review the obstetric cases followed up and treated in our ICU and to determine the reasons for ICU admissions and maternal mortality.

Materials and Methods: We reviewed the records of obstetric patients admitted to University of Health Science İstanbul Kanuni Sultan Süleyman Training and Research Hospital Adults Intensive Care Unit between January 2015 and September 2018. Data regarding the age, gender, additional diseases, conditions complicating pregnancy, the operation performed, APACHEII scores, transfusions required during the operation and postoperative period, the requirement for hemodialysis, mechanical ventilation, inotropic agents and antihypertensive agents and outcome were reviewed.

Results: A total of 115 patients (mean age was 30 ± 6 years and the mean APACHE II score was 9.2 ± 6.7) were included in this study. A preexisting medical disease was present in 32% of patients, cardiovascular diseases being the most common. Eclampsia and preeclampsia (60%) were the most common causes of admission to ICU. 96 (84%) of the patients were admitted from the operation theatre, 13 (11%) from the ward and 6 (5%) were transferred from secondary hospitals. Blood transfusions were required in 47 %, mechanical ventilation in 24 % and hemodialysis in 7 % of the study population. Six patients (5%) received iv. inotropic agents and 43 patients (38%) received antihypertensive agents. The mean length of stay in ICU was 3.2 ± 2 days (Table1). Three patients died during follow-up in ICU. Maternal mortality was significantly correlated with the eclampsia ($r=0.463$, $p < 0.001$) and iv. inotropic requirement ($r=0.246$, $p=0.12$).

Discussion: In obstetric patients presence of eclampsia and preeclampsia are the most common risk factors for ICU requirement. In these patients presence of eclampsia and iv. inotropic requirement were significantly correlated with maternal mortality. Close follow-up of patients with eclampsia is required to prevent mortality and complications occurring in these patients.

OP-090**FATAL COMPLICATION OF AN OPIOID INTOXICATION: SILENT FOREIGN BODY ASPIRATION**

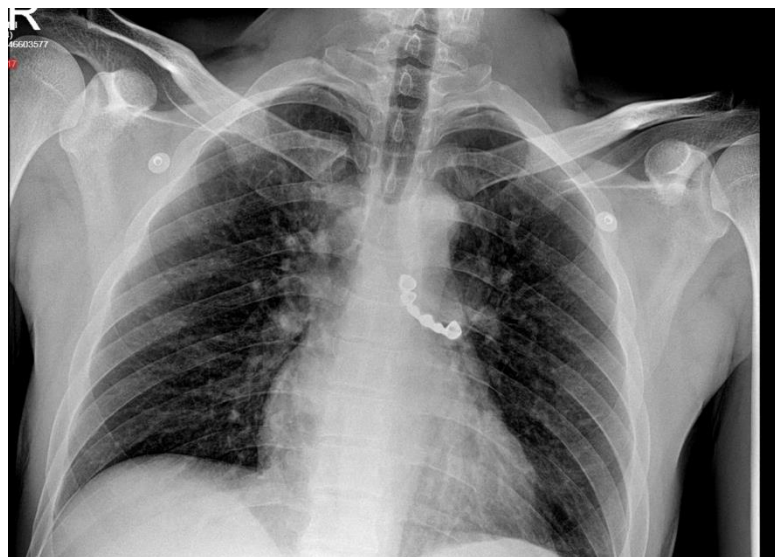
Gökçen KÜLTÜROĞLU, Sibel ÇATALCA, Murat SAYIN, Gülten UTABEY
Dışkapı Yıldırım Beyazıt Training and Research Hospital

Purpose: Opioid intoxications and associated complications have become an epidemiological problem with a 400% increase in the last decade. According to the 2017 European Drug Report, the number of high-risk opioid users has reached 1.3 million. Opioid intoxication mostly presents with coma, myosis and respiratory depression.

Materials and Methods: A 34-year-old male patient was brought to the emergency department with coma and was intubated during the transport. Patient's past history could not be taken. On physical examination, GCS was evaluated as 3, 1x1 cm ecchymotic lesion in right frontal region was observed and pinpoint pupils were detected. No intracranial pathology was detected in CT. The patient was diagnosed as opioid intoxication and naloxone treatment was started. After the patient gained his consciousness, he was extubated. He was transferred to ICU for a close follow-up. The patient asked for his prosthetic teeth which family could not find anywhere. Chest and abdominal X-rays were taken in order to eliminate the risk of swallowing but the prosthesis was observed in the left main bronchus (Figure-1). The patient was consulted to thoracic surgery department which removed the prosthesis by rigid bronchoscopy under general anesthesia. No complication was encountered. The patient was transferred to the psychiatry ward two days later.

Results: Complications such as central nervous system depression, injuries due to unconsciousness, trauma, respiratory system depression, noncarcogenic pulmonary edema, aspiration of gastric content, hypotension, bradycardia and other arrhythmias, hypothermia, death in severe cases in opioid toxicity are frequently encountered however, prosthesis in the main bronchus is a very rare complication. Tracheobronchial aspiration of foreign bodies is a serious problem that can result in serious complications. Although it is more common in children, it can rarely be encountered in adults. Mental retardation, maxillofacial trauma, intoxications, sedative drug use, dementia are risk factors for foreign body aspiration. In this case the aspiration of prosthesis may be due to intubation by inexperienced physician. Fortunately, the patient was treated early without any complications.

Discussion: In conclusion, it should be kept in mind that silent foreign body aspiration may be present in the opioid intoxication.



OP-091

THE AWARENESS OF PATIENTS ABOUT ANESTHESIA INTERVENTIONS AND ANESTHESIA PHYSICIANS IN PREOPERATIVE PERIOD: A QUESTIONNAIRE

Gökçen KÜLTÜROĞLU, Sibel ÇATALCA, Jülide ERGİL
Dışkapı Yıldırım Beyazıt Training and Research Hospital

Purpose: As the anesthesiology science progressed over the years parallel to the progress the role of anesthesiologists and anesthesia interventions also evaluated in perioperative patient care. In this context, our purpose was to determine the awareness of the patients about anesthesia interventions and the tasks of anesthesia physicians.

Materials and Methods: The survey consisted of 48 questions including demographic data, anesthesia and anesthesia physician's definitions and tasks was prepared according to Likert scale (Table 1)

Results: Among the 150 patients who surveyed 23 patients did not want to complete the questionnaire. Also 12 surveys of the remaining were excluded due to incompatibility of the data at the evaluation stage. As a result, 115 questionnaires were taken into consideration. Respondents mostly answered correctly to anesthesiologist's duties in the operating room but they did not agree that 'anesthesiologists treat patients with chronic pain (such as cancer pain)', with 49,5% (n=57). The participants who think that anesthesiologists are not involved in the follow-up and treatment of intensive care units were 54 (47%). While 52% of the participants stated that they did not know about anesthesia related complications, most of the patients are afraid of 'not wake up' in their own words (55,6%).

Discussion: In this study, we showed that most of the participants had information about the anesthesia practices in the operating room but unfortunately they did not aware of the others duties of anesthesiologists such as intensive care, pain control. We recommend that the creation of public spots on anesthesia and anesthesiologists by the Ministry of Health and anesthesiology societies and we think that preparation of informative texts and posters in both visual and printed media, having a visual training booklet in clinics and polyclinics will raise awareness about anesthesia interventions and anesthesiologists.

Tarih:

Form No:

BÖLÜM1- Demografik bilgiler

Yaş:

Cinsiyet:

- Kadın
 Erkek

Tanı:

BÖLÜM 2

Eğitim durumu:

- İlkokul
 Ortaokul
 Lise
 Üniversite

1. Daha önce "anestezi" kelimesini duydunuz n

Evet Hayır

2. Daha önce hiç ameliyat oldunuz mu?

- hiç
 bir kez
 birden fazla

3.

	Katılıyorum	Kararsızım	Katılmıyorum
Ameliyat sırasında anesteziyi Ameliyatı yapacak doktor (cerrah) uygular			
Ameliyat sırasında anesteziyi Anesteziyolog uygular			
Ameliyat sırasında anesteziyi hemşire uygular			
Ameliyat sırasında anesteziyi teknisyen uygular			

4. Ameliyat boyunca hastanın ağrı duymamasını, hastanın kalp hızı, tansiyon, ısı takiplerini, sıvı (serum) takviyesi ve gerekli olursa kan takılmasını

	Katılıyorum	Kararsızım	Katılmıyorum
Ameliyatı yapacak doktor (cerrah) sağlar			
Anesteziyolog sağlar			
Hemşire sağlar			
Teknisyen sağlar			

5. Ameliyattan sonra hastanın ağrısız uyanmasını kim sağlar?

	Katılıyorum	Kararsızım	Katılmıyorum
Ameliyatı yapacak doktor (cerrah) sağlar			
Anesteziyolog sağlar			

Hemşire sağlar			
Teknisyen sağlar			

6. Anesteziyolog veya anesteziist kimdir ?

	Katılıyorum	Kararsızım	Katılmıyorum
Teknisyendir			
Hemşiredir			
Asistandır			
Uzman Doktordur			

7. Aşağıdakilerden hangisi veya hangileri anesteziistlerin görevlerindedir?(birden fazla işaretleyebilirsiniz)

	Katılıyorum	Kararsızım	Katılmıyorum
Anestezi doktoru ameliyat olacak hastaların sağlık durumlarını inceler, muayene eder ve tetkiklerini inceler			
Anestezi doktoru ameliyat olacak hastaların anestezi alıp alamayacağına, ne tür bir anestezi alacağına karar verir			
Anestezi doktoru ameliyathanede hastaya en uygun pozisyonu verir			
Anestezi doktoru Hastanın yaşına ve ek hastalıklarına (tansiyon , diyabet, astım vb.) göre anestezi ilaç verir			
Anestezi doktoru hastanın ameliyatı boyunca sağlık durumunu takip eder (kalp hızı, tansiyon, idrar miktarı vb)			
Anestezi doktoru ameliyat sonrasında hastaların ağrılarının giderilmesini sağlar			
	Katılıyorum	Kararsızım	Katılmıyorum
Anestezi doktoru kronik ağrıları olan (kanser ağrısı gibi) hastaların tedavisini sağlar			

Anestezi doktoru yoğun bakım ihtiyacı olan hastaların tedavi ve takiplerini yürütür			
Anestezi doktoru gebelere ağrısız doğum hizmeti verir			
Anestezi doktoru ani kalp ve solunum durması olan hastaların yeniden canlandırılmasını sağlar			

8. Anestezi Uzmanı olabilmek için 6 yıllık tıp fakültesi eğitimi sonrası kaç yıl daha eğitim almak gerekir?

	Katılıyorum	Kararsızım	Katılmıyorum
2 yıllık uzmanlık eğitimi gerekir			
5 yıllık uzmanlık eğitimi gerekir			
7 yıllık uzmanlık eğitimi gerekir			

BÖLÜM 3

9. Farklı anestezi türleri ile ilgili bilginiz var mı?

	Katılıyorum	Kararsızım	Katılmıyorum
Genel anestezi hakkında bilginiz var			
Spinal/epidural anestezi hakkında bilginiz var			
Bölgesel anestezi hakkında bilginiz var			
Sedasyon(hafif uyku hali) hakkında bilginiz var			

10. Anestezi sırasında veya sonrasında yaşanabilecek istenmeyen olayları(komplikasyonları) biliyor musunuz?

- Evet (lütfen belirtiniz)
- Hayır

11. Anestezi hakkındaki bilgiyi ,

	Katılıyorum	Kararsızım	Katılmıyorum
Televizyon- gazete- internet- sosyal medyadan elde ettim			
Akraba-arkadaş- komşudan elde ettim			
Bir önceki anestezi deneyimimden elde ettim			
Ameliyatı yapacak (cerrah) doktordan elde ettim			
Hemşireden elde ettim			
Anestezi hekimimden elde ettim			
Anestezi onam formundan elde ettim			

12. **Ameliyatınız** ile ilgili yaşadığınız bir korku var mı?

• Yok

• Var

(lütfen

belirtiniz)

.....
.....

Anketimize katıldığınız için teşekkür ederiz

OP-092**SENSITIVITY OF NEAR INFRARED SPECTROSCOPY (NIRS) IN INTRACRANIAL HEMORRHAGE IN ORTHOTOPIC LIVER TRANSPLANTATION (OLT)**

Behiç GIRGIN¹, Halil ISLAMOGLU², Umit KARADENIZ³, Nevriye SALMAN⁴, Mustafa BINDAL⁵, Bülent YAMAK⁶

Turkiye Yuksek Ihtisas Education And Research Hospital

Purpose: Many possible complications of OLT worsens patient outcome. In this case; the patient had intracranial hemorrhage on ischemic areas in the postoperative period despite no significant decrease in intraoperative NIRS. We aim to discuss the sensitivity of NIRS on selected patients.

Materials and Methods: We hereby present a clinical case of a 37-year-old, ASA (V)E, 166 cm and 71 kg male patient who underwent liver transplantation from a living donor. Patient had no hepatic encephalopathy. Physical examination revealed periorbital ecchymosis. Patient's INR was 6.2, ionized sodium was 120 mEq/L and total bilirubin was 10.21 mg/dL. MELD score was 30, Glasgow Coma Score was 15. The patient was intubated under vasoconstrictor support and monitored with electrocardiogram, invasive blood pressure, bispectral index (BIS), NIRS, etc. The present periorbital ecchymosis increased intraoperatively (Picture 1). Intraoperative nasal bleeding and bleeding on the surgical site was observed and the patient was given whole blood, erythrocyte suspension, fresh frozen plasma and thrombocyte suspension and transamin infusion was performed. The NIRS values were below the values that should be expected intraoperatively, approximately 51/52 (10% changes from baseline). Both pupils were dilated and there was no light reflex on the postoperative first day. Hemorrhage was seen on bilateral frontal and temporal lobes under ischemic areas in the urgent CT. Re-monitorization showed a BIS value of 13 and a subsequent silence of the monitor. NIRS values was measured as 41/38.

Results: Autoregulation of cerebral blood flow (CBF) is an intrinsic protective mechanism that ensures a stable supply of oxygenated blood to the brain (Czosnyka et al, 2009). Impaired autoregulation is a recognized complication of the liver failure (Larsen et al, 1999). The mechanism is not clear although the cause is likely multifactorial (edema, high bilirubin levels, etc.)

Discussion: The patient died due to the cerebral hemorrhage on ischemic areas, caused by pro and anti-coagulation factor imbalance, low sodium, high bilirubin levels and cerebral autoregulation dysfunction in cirrhotic situation which could not be detected by BIS and NIRS intraoperatively.



OP-095

EFFECT OF DEXMEDETOMIDINE INFILTRATION ON EARLY WOUND HEALING IN RATS

Aysel GEZER¹, Derya OZKAN¹, Ali YALCINDAG², Evrim ONDER OZTURK³

¹University of Health Sciences Dışkapı Yıldırım Beyazıt Training and Research Hospital Department of Anesthesiology and Reanimation,

²University of Health Sciences Dışkapı Yıldırım Beyazıt Training and Research Hospital Department of Clinical Biochemistry,

³University of Health Sciences Dışkapı Yıldırım Beyazıt Training and Research Hospital Department of Clinical Pathology

Purpose: The aim of the present study is to assess the effect of local dexmedetomidine administration on cytokine levels, which are important markers of inflammatory response, and to demonstrate the effects of this application on wound healing.

Materials and Methods: After approval by the Ethics Committee, twelve adult male Sprague Dawley rats were used in the study. A 1 cm incision was made in the interscapular dorsal region in all rats. Wound lips were infused with 1 ml of 10 µg/kg dexmedetomidine in the experiment group (Group D) and 1 ml of the isotonic saline in the control group (Group S), and the incisions were closed with primary sutures. Blood samples were taken from the tail vein at 0 min, 30 min, 6 hours and 7 days after the procedure and plasma TNF- α , IL-6 and IL-10 concentrations were determined. At day 7, skin texture including the incisional zone was excised and analyzed for acute inflammation, chronic inflammation, granulation formation and fibrosis.

Results: In the experiment group, there was a significant decrease in TNF- α at 30 min ($p = 0.018$), TNF- α at 6th hour ($p = 0.016$) and IL-6 at 6th hour ($p = 0.011$) after the incision compared with the control group. IL-10 level was higher in Group E at 6th hour but not statistically significant ($p > 0.05$). There was no significant difference between the two groups when chronic inflammation and fibrosis levels were compared ($p > 0.05$).

Discussion: Dexmedetomidine reduces the inflammatory response by decreasing the expression of cytokines after incision. Wound infiltration with dexmedetomidine does not adversely affect histological recovery parameters.

OP-096**SAFE INTER-HOSPITAL TRANSFER FOR EXTREMELY LOW BIRTH WEIGHT INFANTS UNDERGOING PATENT DUCTUS ARTERIOSUS LIGATION**Mehmet OC¹, Bahar OC², Oguzhan ARUN², Ates DUMAN²¹ Selcuk University, Faculty Of Medicine, Department of Cardiovascular Surgery,² Selcuk University, Faculty Of Medicine, Department of Anesthesiology and Reanimation

Purpose: Patent ductus arteriosus (PDA) is an essential problem particularly in extremely low birth weight infants (ELBWI), and has high mortality and morbidity. Important issue for PDA ligation is the location of the operation. Because of the risks of transfer surgery in the NICU bedside is preferred nowadays. Due to the lack of cardiac surgeons and the cardiac anesthesiologists the patients need to be transferred to paediatric cardiac centres.

Materials and Methods: We report ELBWI cases with PDA, who were retrieved from external hospitals with advanced life-support ambulance. All patients had failed treatment with indomethacin for PDA closure. After standard monitoring (ECG, SpO₂ and NIBP) and standard anaesthesia (sevoflurane 5-6% or thiopental sodium 3mg/kg induction, rocuronium 0.4mg/kg and fentanyl 3mcg/kg) all patients were operated at the right lateral position. Our surgical procedure consists of posterior muscle sparing thoracotomy with a skin incision of 1.5-2.0cm, clipping PDA, and closing the thorax without tube thoracostomy. After surgery, the patients were transferred back by the same ambulance. Transport complications such, hemodynamic instability, medication use and respiratory failure were evaluated.

Results: Sixty-four ELBWI patients underwent surgical closure of PDA. The mean gestational age was 26 weeks (23-36), and the mean birth weight was 874.47g (450-1410g). The mean age at operation was 14.3 days (3-28), and the mean body weight at operation was 916.28g (490-1470g). Blood loss was minimal, and no pneumothorax, chylothorax, or chest tube insertion in the intensive care unit. There were no complications associated with surgery. All infants were transferred monitored with ventilator support. One infant death occurred in the sixth postoperative month; two infants died from intraventricular haemorrhage and sepsis. PDA ligation performed in another centre by transferring with advanced life-support ambulance is safe and feasible even in ELBWI. Any intra- or inter-hospital patient transfer should aim at maintaining optimal health of the patient which is carried out by transferring the patient to the nearest facility providing the highest specialised care.

Discussion: Babies with ELBWI can be safely transferred between hospitals like babies with normal gestation and body weight. Refraining from the use of the thoracostomy tube reduces the complications during transfer.

OP-097**EVALUATION OF THE RELATIONSHIP BETWEEN AIRWAY MEASUREMENTS WITH ULTRASONOGRAPHY AND LARINGOSCOPIC VIEW IN NEWBORN AND INFANTS**

Feyza SEVER, Sengül ÖZMERT

University of Health Sciences Ankara Child Health and Diseases Hematology Oncology Training and Research Hospital Anaesthesiology and Reanimation Department

Purpose: The overall incidence of difficult laryngoscopy in pediatric anesthesia is lower than in adults, but this risk is higher in patients younger than one year of age. In the last decade, different measurements have been used to obtain difficult laryngoscopy markers in children. In this study, we aimed to evaluate the relationship between the measurements performed by using ultrasonography (USG) and the difficult laryngoscopic view in neonates and infants.

Materials and Methods: Newborn and infant age group undergoing elective surgery requiring intubation under general anesthesia were included in the study. Patients' age, body mass index (BMI), thyromental distance, mandibula length, the distance between the lip corner and ipsilateral ear tragus, and the transverse length (measured by hand sign-middle-ring fingers adjacent side by side) measurements recorded. In thyromental distance measurement, "thyroid notch" was determined by USG. Glottic structures appearing during laryngoscopy were graded according to Cormack-Lehane (CL) Classification. According to this classification, patients were divided into two groups, patients with grade 1-2 were classified as easy laryngoscopy (Group E) and patients with grade 3-4 as difficult laryngoscopy (Group D).

Results: Of the 110 patients included in the study, 29 were female. Twenty-two patients had a CL grade of 3, and a patient (neonate and premature) with 4. The mean age was 3.7 ± 4.5 and 8.7 ± 6.3 months, the mean of BMI was 13.1 ± 1.9 and 14.7 ± 2.2 , the mean distance of the ear tragus-lip corner was 6.6 ± 0.6 and 7.6 ± 0.8 centimeters and the mean of three-finger length was 3 ± 0.6 and 3.3 ± 0.5 centimeters, in Group D and Group E, respectively. There was a significant difference between the two groups in all values. All values were lower in children with difficult laryngoscopy ($p < 0.05$).

Discussion: Preoperative airway evaluation in children is difficult and as a result, it is necessary to evaluate more than one parameter simultaneously. Cormack-Lehane grade was found to be inversely correlated with age, BMI, and all other measurements we have performed. We believe that these measurements can be used as difficult laryngoscopy markers in newborns and infants in clinical practice.

OP-098**PREOPERATIVE UPPER RESPIRATORY TRACT INFECTIONS AND ANESTHESIA: TURKISH PEDIATRICIANS' PERSPECTIVE**

Duygu KARA¹, Murat CAPANOGLU², Cafer Mutlu SARIKAS³,
Muhammet Emin NALDAN³, Soner Sertan KARA⁴

¹Adnan Menderes University, Medical Faculty,
Department of Anesthesiology and Reanimation, Aydın, Turkey

²Regional Training and Research Hospital,
Department of Pediatric Allergy and Immunology, Erzurum, Turkey

³Regional Training and Research Hospital,
Department of Anesthesiology and Reanimation, Erzurum, Turkey

⁴Adnan Menderes University, Medical Faculty,
Department of Pediatric Infectious Diseases, Aydın, Turkey

Purpose: The risks associated with the anesthetic management of a child with upper respiratory infection (URTI) may be unforeseen, especially by pediatricians. The goal of our study is to investigate the opinions, decisions, and attitudes of Turkish pediatricians affecting and contributing to the anesthetic management of children with URTI.

Materials and Methods: After ethical approval, we conducted a survey regarding pediatricians' opinions, decisions, and attitudes toward the perioperative management of children with URTI. Participants working in centers in which pediatric surgical procedures were performed during the previous month were included.

Results: Six hundred fourteen questionnaires were included in the study; 46.7% (n=287) of participants were men, and subjects' mean age was 37.9±9.2 (range; 24-68) years. Laryngospasm/bronchospasm (n=247, 40.2%) were the most frequently reported perioperative complications experienced concurrently with or within the first week of URTI. We observed that 41.5% (n=255) of participants cancelled all types of elective surgeries for children with URTI, while 5% (n=31) approved them. The median length of postponement of procedures was 1 (1-2) week. Increased secretions were the most commonly reported perioperative risk factor. Complete blood count was the most used preoperative test for both elective and urgent surgeries. University staff only approved operations involving short-term sedation when they were elective, but they approved all urgent procedures, even during URTI (p=0.001 for both). Preoperative tests were least employed by university staff.

Discussion: Turkish pediatricians' decisions and attitudes vary. University staff exhibited more accurate management strategies. Consensus guidelines and specialist training concerning the perioperative management of children with URTI are needed for pediatricians.

OP-099

ERECTOR SPINAE PLANE BLOCK IN ABDOMINAL SURGERY: PEDIATRIC CASE SERIES

Çağrı ÖZDEMİR Semin ÖNDER, Gökçen EMMEZ, Berrin IŞIK

Gazi University Faculty of Medicine Department of Anesthesiology and Reanimation

Purpose: Erector spinae plane block (ESPB) is a novel block where local anesthetic is deposited between the erector spinae muscle and the underlying transverse process. There is little spot of literature about ESP block on pediatric population. The aim of this study is to report 6 cases of ESPB used for pediatric surgical intervention.

Materials and Methods: The procedures were carried out in 6 patients (1 females, 5 males, ages 2-12 years) requiring abdominal surgery, including inguinal hernia, colostomy, UP tightness, pyeloplasty. Each patient required elective surgical intervention. Patients were administered the ESPB guidance with ultrasonography (T8-T9) after general anesthesia induction.

Results: Most of the patients with the ESP block maintained [Faces pain rating scale or a numerical rating scale (NRS)] for pain of 0–2/10 postoperatively. An occasional patient required paracetamol analgesia (50 mg/kg/day). There were no cases of opiate rescue.

Discussion: Safety of this technique is emphasized in the majority of reports, but need to be vigilant related complications and side effects. We report the case series of patient performed ESPB for lower abdominal surgical interventions with no complication. ESPB, which produces analgesia by blocking trunk nerves, is an appropriate approach to pediatric patients requiring abdominal surgery.

1-Thomas D T & Tulgar S. Ultrasound-guided Erector Spinae Plane Block in a Child Undergoing Laparoscopic Cholecystectomy. . Cureus, 2018;10(2), e2241. doi:10.7759/cureus.2241

2-Elkoundi A. et al. Priapism following erector spinae plane block for the treatment of a complex regional pain syndrome. Am J Emerg Med. 2019 [Epub ahead of print]

OP-100**ANESTHETIC MANAGEMENT IN NEWBORN INFANTS WITH EDWARDS SYNDROME: REPORT OF THREE CASES**Oguzhan ARUN¹, Bahar OC¹, Ates DUMAN¹, Mehmet OC²¹Selcuk University Faculty of Medicine Department of Anesthesiology and Reanimation,²Selcuk University Faculty of Medicine Department of Cardiovascular Surgery

Purpose: Edwards Syndrome (Trisomy 18), is characterized by growth deficiency, specific craniofacial features, marked psychomotor and cognitive developmental delay. We report anesthetic management of 3 newborn infants with Edwards Syndrome.

Materials and Methods: The first case: Full term 13 day-old girl (1540g). Atrial and ventricular septal defects (ASD, VSD), and patent ductus arteriosus (PDA); bilateral hydronephrosis and hydroureter in the right kidney and mega cisterna magna variation were also present. PDA clipped via left thoracotomy. The second case: Full term 20 day-old boy (1285g). Aorta-pulmonary window and single kidney was present. Standard surgical and CPB technics were used for total correction. Sternum was left open and closed on postoperative 3rd day. The third case: Full term 17 day-old boy (1600g). ASD, VSD and PDA were present. PDA clipped via left thoracotomy. All babies had microcephaly, malformed ears, micrognathia, and redundant skin at the neck, and hypotonia. Anesthetic management: After standard monitoring with ECG, SpO₂ and NIBP anesthesia was induced with sevoflurane in 50-50% oxygen in air (to refrain from risk of retinopathy), fentanyl and rocuronium. After tracheal intubation, central venous and arterial accesses were achieved. Anesthesia was maintained sevoflurane, fentanyl and rocuronium. All 3 operations lasted for 35-45 minutes without any surgical and/or anesthetic problem. The first baby was extubated at the postoperative 2nd day but she died in the NICU 10 weeks later after an episode of resistant bradycardia despite proper resuscitation. The second baby died in the CICU at postoperative 10th day. The third baby was transferred other center postoperative first day. He discharged the ward 24 day later.

Results: In the patients with Edwards Syndrome presence of major systemic malformations is common and any organ and system can be affected. The severity of the cardiac and extra-cardiac lesions is an important factor for the timing and extent of cardiac surgery.

Discussion: Neonates with trisomy 18 are an uncommon subgroup of cardiac surgery patients with a short life expectancy. Our knowledge of the proper anesthetic technique for children undergoing palliative or corrective surgery is limited. But still these children deserve a chance for proper correction.

OP-101

OUR PORT CATHETER EXPERIENCE IN CHILDREN'S HOSPITAL

Kübra EVREN SAHIN¹, Ugur KARAGOZ², Timucin SABUNCU²

¹ Dr Behcet Uz Children's Hospital Anesthesia Department,

² Dr Behcet Uz Children's Hospital Department of Pediatric Cardiovascular Surgery

Purpose: In this study, we aimed to demonstrate the complications of port catheters and port catheters implanted in our hospital in the last year.

Materials and Methods: Between 01.01.2018-01.01.2019, 108 procedures applied to 86 patients were retrospectively evaluated from hospital records. Demographic data of the patients, anesthesia methods, localization of catheterization, complications related to catheterization and reasons for port catheter removal were examined.

Results: The mean age of 86 patients (49K, 37E) included in the study was 7.04 ± 5.16 years (14 days-17 years). Diagnosis of patients with port catheters for chemotherapy, ALL (41), AML (3), Aplastic anemia (2), Brain stem neoplasm (3), Ewing's sarcoma (5), Hemophilia (1), Hepatoblastoma (2), Histiocytosis (2), Lymphoma (8), Medulloblastoma (3), Neuroblastoma (5), Ovarian tumor (1), Osteosarcoma (1), Propionic acidemia (1), Rhabdomyosarcoma (2), Retinoblastoma (1), Wilms tumor (5). 67 of these 108 procedures performed by general anesthesia were port catheter insertion and 41 of the port catheter removal. The reasons for the removal of port catheters were the completion of treatment (27), wound infection (11), vascular injury (1), port catheter leakage (1), malposition (1). During the perioperative period, catheter malposition occurred in 1 patient and vascular damage occurred in 1 patient. 27 operations were performed with LMA only under general anesthesia, while other procedures were performed by means of orotracheal intubation under general anesthesia. Doyurgan et al. Reported 6,7% of the complication rate as pneumothorax, hemothorax, malposition, arterial injury, arrhythmia, port thrombosis and port fracture in their study.¹ We performed 108 procedures under ultrasonography to reduce the complications related to the port catheter (vascular injury, port catheter leakage, malposition) to 2.8%.

Discussion: The use of ultrasound when inserting subcutaneous port catheters used for chemotherapy reduces the intraoperative complications that may occur and helps to detect them in the early period.

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OP-102**ANESTHESIA MANAGEMENT IN A CHILD WITH MOYA MOYA SYNDROME.**

Aylin INCESU, Ceren AYGÜN MUÇUOĞLU

Tepecik Education and Research Hospital, Department of Anesthesiology and Reanimation

Purpose: Moya moya syndrome (MMS) is a chronic, ischemic, occlusive cerebrovascular disease of the etiology of intracranial cerebral arteries that constitutes the willis polygon. This disease of unknown etiology is associated with some congenital, genetic, and neoplastic diseases. Symptoms are predominantly ischemic in children and hemorrhagic in adults.

Materials and Methods: A case of 6-year-old female patient with a diagnosis of MMS was hospitalized because of high fever and increased speech disorder. As a result of the tests, cerebral infarction was detected and cranioplasty was planned. No additional features were found at preoperative examination except mental retardation. She had a history of craniotomy 2 times due to cerebral edema and shifts due to cerebral infarction. She was taking 70 mg acetylsalicylic acid daily. General physical examination showed no abnormalities. Laboratory investigations, complete blood count were normal. Vitals include [Heart Rate = 108/min, Blood Pressure = 140/100 mm Hg, Sat. = %98]. Blood sugar was 169 mg/dl. Salin was started at 80ml / h for hydration. 8% sevoflurane with high flow oxygen was used for induction. 20µg fentanyl and 10 mg of atracurium were administered and intubation was performed with no 5 spiral endotracheal tube. Anesthesia was maintained with 50% O₂ and 50% air mixture , 2% concentration of sevoflurane and remifentanyl infusion. In the peroperative follow-up, the vitals were stable. The body temperature was 36-36.5°C and the etCO₂ value was 30-34 mmHg. 250 mg paracetamol and 25 mg tramadol were administered for analgesia. The operation took approximately 2 hours. At the end of the operation, the patient was decurarized with 200 µg atropine and 400 µg neostigmine and extubation was performed.

Results: There are different opinions in the management of anesthesia of the MMS. While some studies have suggested that inhalation anesthetics may be a good choice due to cerebral vasodilator effects, in some studies propofol and total intravenous anesthesia have been recommended because of the risk of inhalation anesthetics to create the phenomena of play.

Discussion: We preferred inhalation anesthesia because of the difficult vascular access and we did not experience any problems.

OP-103**COMPARISON OF MAKING PROPOFOL INJECTION FROM THE INJECTION PORT OF CANNULA OR FROM ONE WAY VALVE WITHOUT NEEDLE IN PREVENTING PAIN**

Esra UYAR TÜRKYILMAZ , Nihan AYDIN GÜZEY

Sağlık Bilimleri Üniversitesi Ankara Zekai Tahir Burak Kadın Sağlığı Sağlık Uygulama ve Araştırma Merkezi

Purpose: Propofol which frequently preferred for anaesthesia induction causes pain during intravenous injection. The aim of this study is to compare the effect of making the injection from the injection port of the intravenous cannula or from the one way valve without needle in preventing the propofol injection pain.

Materials and Methods: 110 patients, ASA I or II were enrolled into the study. All patients had intravascular access with 20 Gauge cannula from the dorsum of the hand. Patients were separated into two groups; .Group I: Propofol injection was made from injection port of cannula; Group II: Propofol injection was made from one way valve without needle. After 10 seconds from administration of one fourth of total propofol dosage, the patients were asked to evaluate the pain. The pain evaluation was made with two scales: 1. Wong-Baker Face Scale (WBFC) with observation of face expression of the patient 2. Four point verbal pain scale (VRS) 0=no pain, 1=mild pain 2=moderate pain and 3= severe pain. The demographical characteristics and ASA classification of the patients and mean arterial pressure (MAP) and heart rate (HR) before and after induction and intubation were recorded.

Results: The demographical characteristics and ASA classifications were similar between groups. MAP and HR were similar between groups before and after induction. The change in MAP was similar but the change in HR was statistically significant different between the groups before and after induction. No statistically significant difference between the groups in pain assessment with VRS and WBFS was observed ($p=0.442$, $p=.876$). Several methods have been tried to reduce the propofol injection pain including the addition of lidocaine, opioids or other drugs, cooling or warming or diluting the propofol solution, injection into a large vein. Because of the possible side effects of the additional drugs reducing the pain without additional medication is another objective.

Discussion: In this study no difference was found between making the injection from the injection port of the intravenous cannula or from the one way valve without needle in preventing the propofol injection pain. Further studies with different methods are needed.

Table 1. Demographical data and ASA classification of groups

	Group I (n=54)	Group II (n=51)	p
Age(year) (mean±SD)	43.11 ± 13.37	43.11 ± 12.10	0.998
Height(cm) (mean±SD)	159.90 ± 5.65	160.41 ± 5.40	0.495
Weight (kg) (mean±SD)	74.8 ± 13,3	71.49 ± 12.9	0.216
Education (n,%)	No education 4 (7 %)	No education 4 (7.8 %)	0.514
	Primary school 24 (44.4 %)	Primary school 24 (47.1%)	
	High school 18 (33.3 %)	High school 20(39.2 %)	
	College 8 (14.8 %)	College 3 (5.9 %)	
ASA (n,%)	ASA I 29 (53,7 %)	ASA I 19 (37.3 %)	0.091
	ASA II 25 (46.3 %)	ASA II 32 (62,7 %)	

Table 2. Mean arterial pressure (MAP) and heart rate (HR) of the groups before and after induction

	Group I (n=54) (mean±SD)	Group II (n=51) (mean±SD)	p
HR before induction (beat.min ⁻¹)	83.4 ± 16.5	77.8 ± 111.6	0.135
MAP before induction (mmHg)	96.5 ± 14.1	94.4 ± 13.6	0.436
HR after induction (beat.min ⁻¹)	80.0 ± 14.6	80.4 ± 14.8	0.875
MAP after induction (mmHg)	85.1 ± 15.0	81.6 ± 13.5	0.273
HR change before-after induction	↓↓ 3.42 ± 14.1	2.62 ± 10.5	0.015*
MAP change before-after induction	↓↓ 11.4 ± 16.1	↓↓ 12.7 ± 15.8	0.678

Table 3. VRS scores of the groups

	VRS 0* (No pain) N (%)	VRS 1* (Mild pain) N (%)	VRS 2* (Moderate pain) N (%)	VRS 3* (Severe pain) N(%)	p
Group I	29 (53.7 %)	14 (25.9 %)	9 (16.7 %)	2 (3.7 %)	0.442
Group II	28 (54.9 %)	18 (35.3 %)	4 (7.8 %)	1 (2.0 %)	

*0=no pain, 1=mild pain (pain reported in response to questioning without any behavioural sign), 2=moderate pain (pain reported in response to questioning and accompanied by a behavioural sign or pain reported spontaneously without questioning) and 3= severe pain (strong vocal response or response accompanied by facial grimacing, arm withdrawal or tears)

Table 4: WBFS scores of the groups

	WBFS 0 N (%)	WBFS 2 N (%)	WBFS 4 N (%)	WBFS 6 N (%)	WBFS 8 N (%)	WBFS 10 N (%)	p
Group I	27 (50.0 %)	11 (20.4 %)	7 (13 %)	7 (13 %)	1 (1.9 %)	1 (1.9 %)	0.876
Group II	27 (52.9 %)	11 (21.6 %)	8 (15.7 %)	4 (7.8 %)	0 (0.0 %)	1 (2.0 %)	

OP-104**THE EFFECTS OF PREGABALIN AND ADDUCTOR CANAL BLOCK ON POSTOPERATIVE PAIN IN ARTHROSCOPIC ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION**

Fatma KAVAK AKELMA, İlkay BARAN, Savaş ALTINSOY, Derya ÖZKAN, Julide ERGİL
University of Health Sciences, University of Health Sciences Diskapi Yildirim Beyazit Training and
Research Hospital, Anesthesiology and Reanimation Clinique, Ankara, Turkey

Purpose: Pregabalin is a structural analogue of γ -aminobutyric acid (GABA) acting on the $\alpha 2\delta$ subunit of voltage-dependent calcium channels. Pregabalin is frequently being used as a part of neuropathic and postoperative pain management (1). Adductor canal block (ACB), a distal block of the femoral nerve performed in the mid-thigh, is becoming an alternative to FNB as the peripheral nerve block of choice for total knee surgery (2). To determine the effectiveness of pregabalin and ACB on postoperative pain, opioid consumption and fast-tracking.

Materials and Methods: A total of 51 ASA I-II patients aged 18-70 years who were scheduled to undergo elective arthroscopic knee surgery were included in the study. Demographic data along with block features, hemodynamic data, mean tramadol consumption, numerical rating scale score, White's fast-track score, and postoperative adverse effects were recorded. Patients were randomised into groups P, A and C. Patients in group P (n=16), received preoperative 150 mg oral pregabalin, patients in Group A (n=17) received postoperative adductor canal blockade, and patients in group C (n=18) did not receive any medication. Surgeries were performed under spinal anesthesia with hyperbaric bupivacaine following monitorization.

Results: Demographic characteristics, block features, and hemodynamic data were similar between the three groups. Postoperative opioid consumption was significantly lower in Group A and P compared with Group C. Patients in Group P had higher fast-track scores at 8 and 12 hours compared with controls. The rate of a postoperative headache, urinary retention, nausea, vomiting, confusion, diplopia, and drowsiness was similar between the groups.

Discussion: Although ACLR, compared with the conventional knee surgery, is less invasive in nature, patients can still experience moderate to severe post-arthroscopic pain. Multimodal analgesia is, therefore, important in the management of postoperative pain. ACB is an established component of multimodal analgesia for knee replacement but pregabalin has also the potential to provide similar analgesia with high fast-tracking scores.

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OP-105**CEREBRAL INFARCTION PRESENTING WITH LOMBER RADICULAR PAIN AND ISOLATED FOOT DROP**

Mustafa KARAOĞLAN, Suna AKIN TAKMAZ,

University of Health Sciences, Ankara Health Application and Research Center, Anesthesiology and Reanimation Clinic, Algology Department

Purpose: The differential diagnosis of lumbar radicular pain (LRP) and acute weakness (AW) in algology departments (AD) is broad and includes both neurological and medical reasons. We describe a 54-year-old male patient presenting with sudden onset of isolated foot drop and radicular low back pain, which cause of stroke.

Materials and Methods: A 54-year-old male was admitted to our AD with a weak history of left-sided foot drop. His motor strength was normal throughout the upper and lower extremities, except for weakness in toe dorsiflexors. Other examination findings were unremarkable. Lomber vertebral MRI revealed no pathology to explain the patient's clinic. After neurology consultation, diffusion-weighted magnetic resonance imaging (DWI-MR) revealed a focal high intensity signal in the right precentral gyrus at high convexity with a cerebral infarct.

Results: Interdisciplinary approach as well as detailed physical examination and history are extremely important for exact diagnosis and differentials of patients with LRP and AW. This case reminds us that a small infarct area of central nervous system may mimic peripheral nerve lesions, especially in elderly patients.

Discussion: Although the presentation of such complaints may play a distracting role to algology physicians, strokes must always be taught regarding elderly patients and, if necessary, infarct areas should be confirmed with DWI-MR.

OP-106

A COMPARISON OF TRANSVERSUS ABDOMINIS PLANE BLOCK AND QUADRATUS LUMBORUM BLOCK FOR POSTOPERATIVE PAIN CONTROL FOLLOWING LAPAROSCOPIC CHOLECYSTECTOMY

Merve KAÇAN, Handan GÜLEÇ, Berrin KOŞAR, Seda İLHAN, Eyüp HORASANLI
Beylikdüzü Hospital, Yıldırım Beyazıt University, Keçiören Training and Research Hospital, Yüksek
İhtisas Training and Research Hospital, Yıldırım Beyazıt University

Purpose: This study aimed to compare Quadratus Lumborum Block (QLB) and Transversus Abdominis Plan (TAP) block for postoperative pain control after laparoscopic cholecystectomy. The primary objective of the study was to compare postoperative morphine demand and consumption in patients receiving preoperative QLB or TAP block. The secondary goal was to compare VAS levels and possible side effects of morphine consumption in patients receiving QLB or TAP block.

Materials and Methods: The study was designed as prospective, randomized, controlled, double blind. Sixty patients who underwent elective laparoscopic cholecystectomy were identified by randomization. Preoperatively; QLB was implemented to the 30 patients, whereas TAP Block was performed to the 30 patients. Additional fentanyl dose, heart rate, systolic and diastolic blood pressures, SpO₂ in the intraoperative period; cumulative morphine consumption, morphine demand, VAS values, shoulder pain, heart rate, systolic and diastolic blood pressures, SpO₂, sedation score (Ramsey scale), itching, nausea vomiting, respiratory depression and other complications were recorded in the postoperative 0- 1-2-4-6-12-24. hours.

Results: According to the TAP group in QLB group, cumulative morphine demand and morphine consumption was significantly lower at all times between 0-24 hours postoperatively. It was observed that the VAS averages in the TAP group were higher than the QLB group at all times between 0-24 hours postoperatively, but the difference was not statistically significant. There was no statistically significant difference between morphine side effects of nausea, vomiting, sedation, and itching.

Discussion: According to the study results; Although effective analgesia was achieved generally in both groups, it was found that more effective analgesia was provided in the QLB group than in the TAP group. In the cases of laparoscopic cholecystectomy who were administered QLB, morphine demand and morphine consumption were lower in the first 24 hours postoperatively compared to those of TAP block. QLB can be preferred to TAP block in this respect.

OP-107**THE PAIN MANAGEMENT OF THE TRAUMATIC RIBS FRACTURES WITH ERECTOR SPINAE PLANE BLOCK IN ICU : A**

Canan GÜRSOY, Yağmur KUŞÇU, Semra GÜMÜŞ DEMİRBİLEK

Muğla Sıtkı Koçman University Research and Training Hospital, Anesthesiology and Reanimation Department, Intensive care unit

Purpose: Rib fractures are common injuries blunt chest trauma. It causes to severe thoracic pain that limit patients to cough and breathe deeply, which can lead to atelectasis and pneumonia. Various treatment of pain management of rib fractures have been described such as analgesics and regional anesthesia. The ultrasound-guided erector spinae plane block (ESP) is a novel myofascial plane block for thoracic analgesia after thoracic or abdomen surgery. We present a case that used ESP for pain management related to traumatic multiple rib fractures in intensive care unit.

Materials and Methods: The patient was a 34 year-old male who had a road traffic accident. He had sustained fractures of left distal ulnar bone and 3rd - 6nd posterior ribs on the left side. The pulmonary complication which was left lobar atelectasis has occurred on second day after trauma despite of using parenteral analgesic therapy for pain management. The patient had been admitted to intensive care unit and his respiration was immediately supported by non-invasive ventilation. Visual analogue scale (VAS) was 6/10 and 8/10 respectively at rest and cough. We planned regional anesthesia and ESP block guided with ultrasound which was performed at T4 level. Thirty minutes later, the patient reported that he had no pain. Visual analogue scale was 1/10. NIV support was stopped at 24th hour. 48 hour after ESP block, the patient was discharged from ICU.

Results: The erector spinae plane block is a newly-described technique for treating thoracic pain. It is simple to perform the block because of the key landmarks of tip of transverse processes and erector spinae muscle are easily visualized on ultrasound. This also allows to treat patients much more easier in ICU . ESP block provides effective analgesia starting within minutes. It may become vital because rib fractures can lead to pulmonary failure due to ineffective analgesic management

Discussion: In conclusion, in ICU, ESP block will be used more frequently in treatment of pain in the rib fractures with its easy application and rapid effects.

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OP-108

ALGOLOGY DEPARTMENT AWARENESS AMONG PATIENTS WITH CHRONIC PAIN

Mustafa KARAOĞLAN, Suna AKIN TAKMAZ

University of Health Sciences, Ankara Health Application and Research Center, Anesthesiology and Reanimation Clinic, Algology Department

Purpose: Patients with chronic pain are still suffering a lot, especially those in developing countries. The concept of algology departments improved and disseminated slowly in Turkey since the early 1990's. In this study; we reported awareness of algology department among patients with chronic pain.

Materials and Methods: Our study included the results of 472 patients with chronic pain who applied to our outpatient clinic between 1 January 2017 and 31 December 2018. In our outpatient clinic, all patients are queried with respect to the items contained on the "Pain Assessment Form" before the diagnosis and their answers are recorded. Their demographic characteristics, such as age, gender, occupation, marital status, education, economic status and how to apply to algology department, are also recorded on the forms. For the detailed pain anamnesis, the following factors are questioned and recorded on the pain assessment form: the location, quantity and starting time of pain, its period, the factors that increase and decrease the pain, duration of pain, and prior medication.

Results: The most frequent complaints were in the low back, shoulder and head. The three most frequent diagnoses were low back pain, musculoskeletal pain and headache. Visual analogue scale (VAS) value was found to be 8. Pain was mostly accompanied by weakness, muscle weakness, insomnia, nausea, and vomiting. The most frequent treatments were medical treatments along with invasive pain therapy. The mean duration of chronic pain was 21 months. Among the patients who presented to tertiary care clinics due to chronic pain, the awareness of the algology department was only 32%. Among the applicants, to the algology department; patients were most frequently referred by their relatives (69%). This was followed by referred patients from other departments (27%). A small majority learned about the algology department through social media (2%).

Discussion: As a result, most patients with chronic pain are still unaware of the algology outpatient clinics. In order to increase the awareness, more people should be contacted via social media and patients with chronic pain who apply to other departments such as neurosurgical department and neurology should be referred to algology.

OP-109**POSTOPERATIVE ANALGESIC EFFICACY OF TRANSVERSE THORACIC MUSCLE PLANE BLOCK AFTER MEDIAN STERNOTOMY**

Pelin UZUN SARITAŞ, Meltem ÇAKMAK
Tepecik Training and Research Hospital

Purpose: Cardiac surgery performed with median sternotomy is associated with severe postoperative pain. Effective postoperative analgesia is crucial for early recovery and extubation, patient comfort and overall satisfaction. Systemic opioid analgesics provide sufficient pain relief but they may cause side effects such as nausea, vomiting, respiratory depression and urinary retention. Regional techniques are offered as a part of multimodal analgesia and their use may reduce opioid consumption as well as side effects. An ultrasound (USG)-guided transversus thoracic muscle plane block (TTPB) has been described recently as a truncal interfascial plane block. It has been reported that TTPB can block multiple anterior branches of the intercostal nerves (Th2 to 6). We report two cases of TTPB for postoperative analgesia in whom cardiac surgery performed with median sternotomy.

Materials and Methods: Case 1 was 53 years old ASA III patient who was undergoing coronary artery by-pass graft (CABG) surgery. After induction of general anesthesia, we performed bilateral TTPB by injection of 0.25% bupivacaine 30 ml in total (15 ml injected into each side) between the transversus thoracic muscle and the intercostal muscle between the 4th and 5th intercostal space connecting at the sternum by using a high frequency linear probe placed transversally. Postoperative VAS scores at 6th, 10th and 24th hours were 2, 2, 0 respectively. 1 gr of paracetamol was administered at 6th and 24th hours. No additional opioid was needed. Patient was extubated within 3 hours after surgery. Postoperative course was uneventful. Case 2 was 60 years old ASA III patient who was undergoing CABG surgery. After induction of general anesthesia, we performed bilateral TTPB. The technique and dosage was the same as case 1. Postoperative VAS scores at 6th, 10th and 24th hours were 3, 0, 0 respectively. 1 gr of paracetamol was administered at 6th and 24th hours. Patient was extubated within 4 hours after surgery. Postoperative course was uneventful.

Results: Bilateral TTPB was effective after median sternotomy in both cases as a part of multimodal analgesia without any side effects or complications.

Discussion: TTPB can block anterior branches of the intercostal nerves. Future controlled studies are warranted to review the analgesic effects of the TTPB.

OP-110**THE EFFECT OF FAVORITE MUSIC ON POSTOPERATIVE ANXIETY AND PAIN**

Fatma KAVAK AKELMA, Savaş ALTINSOY, Jülide ERGİL

University of Health Sciences Diskapi Yildirim Beyazit Training and Research Hospital, Anesthesiology and Reanimation Clinique, Ankara, Turkey

Purpose: Pharmacological methods used to reduce the patient's anxiety as well as non-pharmacological methods such as music have a positive effect (1). The music draws the patient's attention from pain and anxiety, eliminates the feeling of being in a foreign environment, improves their adaptation to the environment and helps them relax (2-4). This study investigates the effects of favorite music on anxiety and postoperative pain.

Materials and Methods: After having received ethics committee approval, a total of 112, ASA I-II patients aged 18-70 years who were scheduled to undergo elective inguinal hernia surgery were included in the study. Demographic data, educational status, previous surgical experience, and anxiety status were recorded with the Spielberger state State-Trait Anxiety Inventory form Y1 (STAI form Y-1) and trait State-Trait Anxiety Inventory form Y2 (STAI form Y-2). After having recorded baseline heart rate, blood pressure and STAI levels patients were randomly divided into two groups as group M (n=56) and group C (n=56). Patients in group M patients listened to their preferred music with headphones. Patients in group M patients listened to their preferred music style with headphones. The control group received the standard care during their operation but with no music. Postoperatively, the STAI form Y-1 (4-6 hours after surgery) was repeated and NRS score (postoperative 1, 4, 8, 12, 24 hours) was recorded by a blinded investigator.

Results: The demographic data, educational status and previous surgical experience of the patients were similar between the groups ($p > 0.05$) (Table 1). There was no difference between the groups in the preoperative STAI Y-1 and 2 scores ($p > 0.05$). Postoperative STAI Y-1 Group M: 39 (35-43) was significantly lower than Group C: 41 (37-43) (p

Discussion: Music can be useful as a complementary method to control anxiety and to feel familiar to the atmosphere. Patients will be more relaxed and experience less discomfort.

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POSTER PRESENTATIONS

PP-001**DIFFUSE AXONAL INJURY (DAI)- OUR EXPERIENCES**

Hasib Lukac, Milena Roganovic, Dejan Lekovic, Tea Zarkovic
Clinic for Anesthesiology and reanimatology, Clinical Centre of Montenegro

Purpose: One of the most common and severe types of brain injury is known as diffuse axonal injury, or DAI. With DAI, the damage to the brain occurs over a large area, and is one of the major causes of unconsciousness and long-term coma after traumatic brain injury. DAI is the result of shearing forces, which stretch, twist, or tear these axon bundles. This type of injury usually results from rotational forces or violent stopping, such as in auto collisions, falls, and assaults. Vehicle collisions are the most frequent causes of DAI. Another common cause is child abuse, for example, shaken baby syndrome.

Materials and Methods: We report cases of four patients who were treated at the Intensive care Unit Clinical Centre of Montenegro (CCM) in 2018. The patients were injured in a car accident admitted to the ICU. The neurological finding at the reception was, for all four patients, almost the same: unconscious, intubated on respiratory support, pupils was the same, circular, reactive, extensions / flexion movements. Glasgow coma score (GCS) was 4 to 6. The CT scanner showed dotted contusion focal points, from discrete to very pronounced, as well as barely noticeable changes in the brainstem. Apart from neurosurgical injuries, patients also had joint injuries - orthopedic, surgical. On an anesthesiological side, patients were immediately placed on mechanical respiratory ventilation, including analgesia and sedation, aggressive antiedematous therapy (Manitol), rehydration, they are monitored and were hemodynamically stable.

All treatment measures were attempted, but the result was different: one patient died; two patients have successfully recovered with mild psycho-organic disorders, and one is still in a coma.

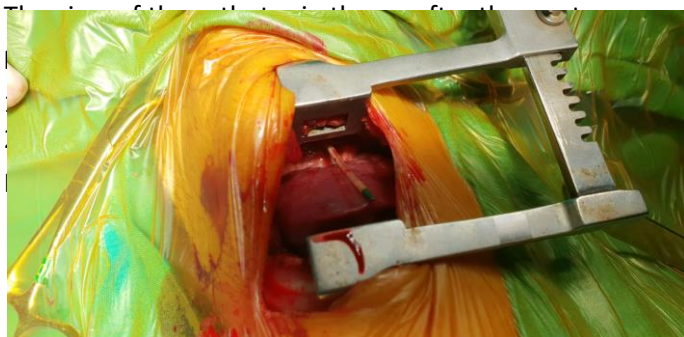
Discussion: There is a propensity for injury to occur in the central third of the brain, and the corpus callosum and brain stem are especially prone to injury. In these locations, traumatic axonal damage can occur in several degrees of severity, ranging from transient disturbances of ionic homeostasis to swelling, impairment of axoplasmic transport with secondary (delayed) axotomy and primary axotomy (tearing). Clinical symptoms is worse than CT findings! Recovery is a long and slow process and these patients will never be what they once were

PP-002**COMPLICATION OF A CENTRAL VEIN CATHETERIZATION IN PEDIATRIC PATIENT**Seda Özen Zunal¹, Aylin İncesu¹, Pervin Sutaş Bozkurt²¹Medical Sciences University Tepecik Hospital, Anesthesiology and Reanimation, Izmir, Turkey²Istanbul University Cerrahpasa Medical Faculty, Anesthesiology and Reanimation, Istanbul, Turkey

Background: Central venous catheterization (CVC) procedures are often performed in the operating room or intensive care unit for the purposes like central venous pressure measurement, long-term vascular access. The practitioner should use the most appropriate central vein and size of the catheter for the patient, taking into account his/her clinical experience(1).

Case: The informed consent of the parents were obtained for this presentation. A 5kg, 53 cm premature baby boy with a corrected age of 2 months transferred from a tertiary hospital, orotracheally intubated and with mechanical ventilator support. The patient had tachypnea and tachyarrhythmia when admitted to the operating room. He was monitored and initial SpO₂ measurement was %70. The attempted deep tracheal aspiration through the orotracheal tube was unsuccessful. The patient was re-intubated with 3.5 orotracheal tube after IV 0.5mg/kg atracurium administration. Patient positioned to left lateral position and right thoracotomy was performed. About 15 cc blood aspirated from thorax and than the end of the 5F central venous catheter which performed through right jugular vein in the external center was observed freely lying in thorax. The catheter removed in a controlled manner and suture was placed by surgery to the point where the catheter penetrated the vein. Perioperative and postoperative SpO₂ levels were within normal levels and the patient transferred to the external center intubated orotracheally and with the support of mechanical ventilator.

Discussion: Several reasons may increase the mechanical complications of central venous catheterization such as; the body mass index being >30 and <20, more than one needle puncture made by a clinician with inadequate experience, using an improper size of the catheter for the patients length and weight(1,2). In this case, haemothorax was diagnosed and many factors resulted with vital mechanical complications. In low-weighted pediatric patients the central vein catheters should be placed by experienced physician under the guidance of ultrasound and attention should be paid to use the suitable size of catheter for the patient with minimal number of punctures and all catheters must be controlled by aspirating the venous blood through all lumens.



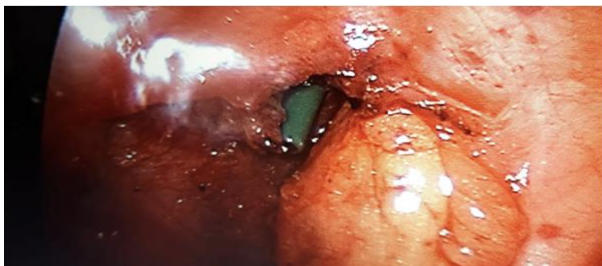
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The American Collage of Surgeons, 2007

PP-003**CENTRAL VENOUS CATHETER COMPLICATION IN A CASE UNDERGOING THORACIC SURGERY**Aylin İncesu¹, Seda Özen Zunal²¹Medical Sciences University Suat Seren Chest Diseases and Thoracic Surgery Hospital , Izmir, Turkey² Medical Sciences University Tepecik Hospital,Anesthesiology and Reanimation Department, Izmir, Turkey

Background: Some of the mechanical complications of central venous catheters (CVC) are arterial puncture, damage to the central veins, malpositioning of the catheter, haemothorax, air embolism and arrhythmias. In this report we present a case malpositioning of a CVC catheter diagnosed during surgical procedure.

Case: Sixty-three years old female patient was planned to undergo video-thoroscopic resection of thymoma. Patient was admitted to operating room .Following induction and intubation with double lumen tube , 8F triple lumen catheter was planned to be placed to the right side of the patient where the procedure was going to be performed. Due to shortneck of the patient the insertion of the catheter to internal jugular vein was successful after the 3rd attempt. Seldinger technique was used for insertion and all 3 lumens were aspirated for confirming the presence of venous blood. Distal line connected to the pressure transducer in order to measure central venous pressure. Later the transducer connection changed to arterial cannula for arterial blood pressure measurement. Intravenous solutions were started for infusion from two other lines. Patient positioned to left lateral decubitus and right thoracoscopy performed. Surgical team recognized an unusual green material within upper mediasten. Aneshesiologist diagnosed this as IJV catheter tip. The catheter was removed and after the bleeding control, surgery was continued. Surgery was completed successfully, the patient was awakened in the operation room and sent to intensive care unit for recovery and postoperative follow-up.

Discussion: CVC provides the possibility of CVP monitoring and fluid resuscitation in the intraoperative period. As in every interventional procedures, various complications may occur during CVC placement. Complication in this case was associated with the migration of the catheter end through the puncture point of the vein while positioning of the patient. Every catheter's site should be confirmed by intermittent aspirations during the procedures especially in the patients undergoing multipl punctures in order to discover possible migrations and early diagnosis of malpositioning.



The videothoroscopic view of the catheter in thorax

KEYWORDS: CVC, thracoscopy, tymoma, catheter malpositions

PP-004**MILITARY CHOPPER ACCIDENT, MULTI-TRAUMA, FIRST THREE DAYS**

Esra ADIYEKE, Nurten BAKAN, Nilüfer COŞKUN

Sancaktepe Sehit Prof. Dr. İlhan Varank Training and Research Hospital.

Purpose: In our study to share first three days of a multi-trauma patient survived following chopper crash and managed in our hospital.

Materials and Methods: A 29years old man arrived to our emergency department 12minutes after accident with loss of consciousness,dilated pupils, light reflexes(LR:-/-).The GCS was 3;thus,the patient was intubated and directly transferred to CT unit. A subclavian catheter was inserted to the patient without detectable blood pressure and inotropic support was initiated.The patient experienced cardiac arrest during CT scan;thus, cardiopulmonary resuscitation was performed over 3minutes.Subdural hematoma,contusion and hemopneumothorax at left lung,subdiaphragmatic free fluid,bilateral,double forearm fracture,pelvis fracture and left femoral fracture were detected in the patient.A chest tube was inserted and the patient underwent surgery.During surgery,subdural hematoma was evacuated with decompression; both forearms were placed into cast;external fixation was applied to pelvis;left femur was placed into traction;and explorative laparoscopy was performed.During perioperative period,blood and blood products replacement and electrolyte replacement based on blood gas values were performed.After 75minutes surgery,the patient with high dose inotropic support was transferred to postoperative intensive care unit. Hemodiafiltration was started on the hour 24due to onset of Crash syndrome and acute renal failure Table1.Pupils were 2mm in both eyes with positive LR:+/+ and spontaneous respiration effort was started;thus,the patient was sedated and inotropic support was down-titrated.The patient received 23units of erythrocyte suspension,14units fresh frozen plasma,20units of cryoprecipitate,7units of pooled platelet,4vials of fibrinogen and 6vials of albumin within first three days.Disseminated intravascular coagulopathy was developed after massive transfusion.The patient was referred to an academic center on day3.ECMO was initiated on day27;however, the patient died on day30.

Results: It is very important to establish hemodynamic stability;to identify pathologies;and to start appropriate interventions.Massive bleeding and subsequent massif transfusion results in severe complications including disseminated intravascular coagulopathy and acute renal failure.It will be beneficial to start hemodiafiltration in early phase as crash syndrome seen in multi-trauma patients will worsen renal failure.

Discussion: During3days follow-up,it was attempt to maintain hemodynamic and laboratory parameters within normal range.The reversal of pupil reflexes was an important improvement in the patient who underwent hemodiafiltration at early phase.Multi-trauma cases require a rapid,multidisciplinary approach but its mortality is high despite all efforts.

PP-005**RESPIRATORY COMPLICATIONS AND ANESTHETIC MANAGEMENT OF
ENDOSCOPIC MYOTOMY (POEM) CASE**Seda Özen Zunal¹, Gözde Derviş Hakim², Pervin Sutaş Bozkurt³¹Medical Sciences University Tepecik Hospital, Anesthesiology and Reanimation, Izmir, Turkey²Medical Sciences University Tepecik Hospital, Gastroenterology Clinic, Izmir, Turkey³Istanbul University-Cerrahpasa, Cerrahpaşa Medical Faculty, Anesthesiology and Reanimation, Istanbul, Turkey

Introduction: Peroral endoscopic myotomy (POEM) was discovered as a permanent and less invasive treatment method rather than the open or laparoscopic surgery and it's alternative to endoscopic Botox injection and balloon dilatation treatments of achalasia (1). POEM is a method performed by gastroenterologists or endoscopic surgeons. In this presentation, we aimed to share our anesthesia experience in our first POEM case.

Case: A 28-year-old male patient who had long-term complaints of swallowing was diagnosed with achalasia and had been treated with countless unsucced Botox injections and balloon dilatations. The patient receipt to the operating room for POEM. Following standart ASA monitoring and induction with 2mg/kg propofol, 1mcg/kg fentanyl and 0.5mcg/kg rocuronium IV; patient was intubated. In supine position endoscope was applied for myotomy procedure at the distal end of the esophagus. The ventilator settings were 8 ml/kg tidal with a respiratory rate of 14/min, 20-26 mmHg airway pressures and targeted end-tidal CO₂ was 35mmHg during the mucosal passage and submucosal dissection. During the myotomy phase the airway pressures increased and the SpO₂ decreased to %85-90 levels suddenly. The respiratory sounds in the right lung also decreased in the same time. In order to eliminate pneumothorax tidal volume decreased, respiratory rate increased and FiO₂ increased. Endoscopists were warned about reducing CO₂ insufflation and termination of the procedure as soon as possible. While the tube thoracostomy was preparing, myotomy procedure was finalized and the respiratory sounds became normal again. The patient was transferred to the intensive care unit (ICU) sedated and intubated. No evidence of pneumothorax found on the portable X-ray

Discussion: The most frequent complications of POEM procedure were reported as pneumoperitoneum and mediastinal emphysema(1,2). In this case, the increased pressures possibly caused by excessive CO₂ insufflation to both mediastinum and periton obstructed the expansion of right lung. We think in POEM cases full monitorization is required and in case of increased intra-abdominal and/or airway pressures it is necessary to warn the gastroenterologist and the necessary precautions should be taken.

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KEYWORDS: POEM, respiratory complication, pneumothorax

PP-006**SEDATION PROTOCOL FOR ENDOSCOPIC SUBMUCOSAL DISSECTION CASES****Seda Özen Zunal¹, Pervin Sutaş Bozkurt², Ömer Burçak Binicier³**¹Medical Sciences University Tepecik Hospital, Anesthesiology and Reanimation, Izmir, Turkey²Istanbul University- Cerrahpasa, Cerrahpasa Medical Faculty, Anesthesiology and Reanimation, Istanbul, Turkey³Medical Sciences University Tepecik Hospital, Gastroenterology Clinic, Izmir, Turkey

Introduction: Endoscopic submucosal dissection (ESD) is a technique that allows the removal of early-stage neoplasms of gastrointestinal epithelial lesions with a less invasive method (1). ESD, which allows the removal of potentially profound and wide lesions, is currently applied by physicians who perform endoscopic surgery (2). The anesthesia experience during ESD procedure are presented here.

Method: A total of 21 cases were admitted to gastroenterology clinic for ESD from March to October 2018. Patients with ASA II-III in the age range of 40-85 years, mostly men, had undergone the procedure by deep sedation in the endoscopy unit. After the monitorization midazolam 2 mg and fentanyl 1mcg/kg were administered. After the ketamine 1mg/kg and propofol 1 mg/kg IV boluses; propofol 25-50 mcg/kg/dk infusion was initiated with standard ASA monitorization and necessary equipment with nasal 5l/min O₂ insufflation. When deep sedation was not achieved iv ketamine 1mg / kg or 0.5mcg/kg fentanyl bolus was given. During the procedure, attention was paid to ensure that the patient was inactive and that anesthesia was maintained with spontaneous breathing. After the procedure, the patients were transferred to recovery room where nasal O₂ 4l / min delivered and patients monitored.

Results: No serious respiratory or hemodynamic complication was observed in any of the patients. In 8 patients, a slight decrease in SpO₂ was seen due to superficial ventilation and resolved with jawtrust maneuver. Recovery time was recorded as 25-50 min.

Discussion : ESD is an increasingly common process in our country in recent years. It is important that patients do not move in ESD, which is an important non-operating room process for anesthesia which requires close follow-up and experience in terms of anesthesia. We believe that it's important to make more studies and presentations for this process which has not reached the level of experience for practitioners and anesthesiologists yet.

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KEYWORDS: ESD, out-patient anesthesia, deep sedation

PP-009**SURGICAL PATIENT AND FAT EMBOLISM SYNDROME**

Senita BEHARIC1

Klinicki centar Univerziteta Sarajevo, Klinika za anesteziiju i reanimaciju

Purpose: Fat embolism syndrome (FES), condition characterized by hypoxia, bilateral pulmonary infiltrates, and mental status change, is commonly thought of in association with long-bone trauma. Symptoms usually occur hours to days after injury. We present a case of young patient with FES due to trauma femur fracture.

Materials and Methods: Male patient, 27 years old, was admitted at Orthopaedic Dept with trauma femur fracture, fully conscious, respiratory and hemodynamic stable. Fifth day of hospitalisation orthopaedic surgeon performed: Osteosynthesis femoris cum clavo intramedularis. Few hours after surgery, patient became restless, petechial rash was noted on neck, developed tachypnea and tachycardia, but there was no focal neurological deficit. Blood gas analysis revealed hypoxemia. He was shifted to ICU, where he was intubated and put on mechanical ventilation. CT chest showed bilateral lung contusion/ consolidation. CT abdomen was normal. Management of trauma patients is clinically challenging and required a multidisciplinary team approach. Prompt supportive treatment of patient's respiratory system and additional pharmaceutical treatment provided positive outcome, and patient health condition gradually improved: he was „weaned“ from ventilator, respiratory and hemodynamic stable. Control chest X-ray: regression of intrapulmonary changes and pleural effusions. Patient was shifted to the orthopaedic ward.

Results: Fat embolism (macroglobules), fat particles that enters circulatory system causing vascular occlusion, can cause a more serious condition called fat embolism syndrome (FES), in which there is multisystem dysfunction. Majority (95%) of cases of FES occur after major trauma. Incidence of FES with single long bone fracture is 1-3%, with bilateral femoral fracture is up to 33% of patients. An overall mortality is 5-15%. Pulmonary dysfunction in form of dyspnea, tachypnea and hypoxemia are the primary manifestations occurring in 75% of cases, 10% of cases may develop respiratory failure and 5-8% of patients may progress to severe ARDS.

Discussion: Prevention, early diagnosis, and adequate symptomatic treatment are very important. Early suspicion combined with chest radiography and CT/ MRI brain is the key answer to diagnosis. Incidence of FES is reduced markedly in the last decades due to early stabilization and surgical correction of long bones fractures.

PP-010**PATIENT WITH KYPHOSCOLIOSIS UNDERGOING PERCUTANEOUS NEPHROLITHOTOMY.
HOW WILL YOU MANAGE THE CASE?**

UYSAL Damla¹, YILDIRIM GÜÇLÜ Çiğdem¹, MEÇO Başak Ceyda¹, GÜVEN Ayşegül¹, GÖKÇE İlker²

¹Ankara University Faculty Of Medicine, Department Of Anesthesiology And ICU

²Ankara University Faculty Of Medicine, Department Of Urology

Purpose: Severe kyphoscoliosis causes restrictive lung disease. Due to decreased chest wall compliance and diaphragmatic function, tidal volume was decreased in these patients and respiratory activity was increased. Anesthetic management of these patients requires special attention in many issues like airway management, positioning and ventilatory management.

Materials and Methods: Patient aged 63, admitted to hospital for percutaneous nephrolithotomy. During preoperative evaluation, she had a history of dyspnea. She was diagnosed with kyphoscoliosis, Type II DM and hypertension. In physical examination, bilateral breathing sounds were decreased and laboratory examinations were normal. Chest radiography, bilateral lung volumes were decreased. The room air saturation rate was 94% and respiratory function test was reported as highly restrictive. After routine monitoring and anesthesia induction laryngeal mask inserted but was failed at first time. At second attempt, laryngeal mask, size 3 was inserted and correct placement was confirmed. Ventilatory settings were as follows; pressure control ventilation pressure was set as 20 mmHg at the beginning but tidal volume maintained was 200 ml, then pressure was increased incrementally to find appropriate tidal volume. After maintaining the position which took long time, the surgery started. Luckily the surgery was planned to perform in supine position. As the surgery ended and spontaneous breathing became adequate, laryngeal mask removed. The patient was followed up for one day in the intensive care unit and discharged from hospital at postoperative 3rd day without any complication.

Results: Kyphoscoliosis is an important risk for anesthesia due to adverse changes in respiratory mechanics, intubation and positioning difficulties. Because of the possibility of difficult airway, laryngeal mask, video-laryngoscope, fiberoptic bronchoscopy were prepared. This patient's surgery was tried in another centre but they could not give prone position. As the surgeon in our hospital maintains percutaneous nephrolithotomy in supine position, it provided an important advantage in positioning, and also in respiratory mechanics.

Discussion: Anesthetic management of these patients requires detailed preoperative evaluation of head and neck movements, respiratory functions, preparation of difficult airway and supporting lung function during intraoperative period. Also proper positioning of these patients is an important issue.

PP-011

RETROSPECTIVE EVALUATION OF ANESTHETIC APPROACH IN ENDOVASCULAR AORTIC RECONSTRUCTION

DuyguKARA¹ , Saniye CENGİZ², M. Nil KAAAN¹

¹Adnan Menderes University Faculty of Medicine, Anesthesiology and Reanimation Department,

²Göhlhisar State Hospital, Burdur, Anesthesiology and Reanimation Department

Purpose: The aim of our study is to document and investigate the anesthetic interventions of endovascular abdominal aortic aneurysm repair (EVAR) performed in our hospital

Materials and Methods: In our clinic, for the EVAR, anesthesia method is determined with the surgical team considering the comorbidities, anticoagulant antiaggregant, antiplatelet drug usage and the characteristics of the intervention. After the approval of the ethics committee, files and hospital records of patients who underwent EVAR under local (LA), regional (RA) (spinal, epidural) and general (GA) anesthesia between April 2010 and December 2018 were retrospectively analyzed.

Results: Of the 104 patients who underwent EVAR, 77 patients' files could be evaluated. LA was performed in 8, RA in 43 (4 epidural, 39 spinal) and GA in 26 patients. When the groups were compared according to the applied anesthesia method, demographic and clinical features were similar. There was no significant difference between groups about the usage of intraoperative fluid, blood product, vasoconstrictor and vasodilator usage. Preoperative and postoperative hemoglobin, hematocrit, urea and creatine levels were similar. No postoperative nephropathy was diagnosed. In the LA group, the duration of anesthesia and the duration of intensive care unit stay were shorter than the other two groups, but no significant difference was observed (Table 1). Six patients developed endoleak. Six of the patients died, so the file information could not be reached. In some studies, local and regional techniques have been shown to improve perioperative outcomes as the anesthetic method, while in some studies the effect of anesthesia on perioperative mortality and morbidity has not been demonstrated. The results of this retrospective study showed that no significant difference was found between the selected anesthesia techniques.

Discussion: In our study, the superiority of anesthesia techniques could not be demonstrated. The effect of comorbidities of the patient on mortality and morbidity in perioperative period seems to be more than the selected anesthesia method.

PP-012**COMPARISON OF RENAL SCORES OF RENAL REPLACEMENT THERAPY IN PATIENTS IN ICU**

Merve Erenler, Ayca Sultan Sahin, Ziya Salihoglu
SBU Kanuni Sultan Suleyman Education and Training Hospital, Istanbul

Purpose: Acute renal failure, as a result of renal functional decrease in a matter of hours to days, is a clinical state with excess collection of nitrogenous the end products such as urea, creatinine which gives rise to acid-base balance, fluid and electrolide balance and glomerular filtratation disturbance. In intensive care units Acute renal failure seen between 5 % to 20 % and mortality rate of the patients is as high as % 35-% 65. Studies reports that patients admitted with acute renal failure or patients who developed acut renal failure during follow up has longer staying time in intensive care unit. As a result, early diagnosis and threatment of the acute renal failure has great importance for the prognosis.

Materials and Methods: In order to determine that we compared RIFLE, KDIGO, renal SOFA. During the follow up of the 35 patients which were admitted to "Sağlık Bakanlığı Üniversitesi Kanuni Sultan Süleyman Eğitim ve Araştırma Hastanesi Anesteziyoloji ve Reanimasyon Intensive Care Unit" for renal replacement therapy due to acute renal failure, we investigated the demographical datas, GKS values during the admission, APACHE II scores; KDIGO stages, renal SOFA and RIFLE scores before starting the renal replasement therapy. Also when we started the renal replacement therapy, we recorded the vital parameters and laboratory values for the 12., 24., 48. hours of the therapy.

Results: Average age was $55,7 \pm 18,9$ and 60 % of the patiens were male. Most common reason for admission was ileus, second common reason was pneumonia. 68,6 % of the patients had chronic diseases, most common was hypertension 42,9 %).

Discussion: In conclusion as patients went on renal replacement therapy, many of the parameters were improved but RIFLE, KDIGO, renal SOFA scores were not superior from each other , to determine the mortality rates, when compared with each other.

Tablo: Hastaların RIFLE, renal SOFA ve KDIGO skorlarının Mortalite üzerine etkisi

(n: sayı; %: yüzde)

		Ex		Taburcu		p
		n	%	n	%	
RIFLE	R	8	% 66,7	4	% 33,3	0,193
	I	6	% 75,0	2	% 25,0	
	F	6	% 40,0	9	% 60,0	
rSOFA	0	2	% 100,0	0	% 0,0	0,118
	1	1	% 25,0	3	% 75,0	
	2	8	% 80,0	2	% 20,0	
	3	5	% 62,5	3	% 37,5	
	4	4	% 36,4	7	% 63,6	
KDIGO	1	1	% 100,0	0	% 0,0	0,421
	2	8	% 72,7	3	% 27,3	
	3	11	% 47,8	12	% 52,2	

PP-014**EPIDURAL ANESTHESIA FOR CESAREAN SECTION IN PATIENT WITH CORRECTED TETROLOGY OF FALLOT**

Gamze KÜÇÜKOSMAN, Bahar SAY

Zonguldak Bülent Ecevit University, Department of Anesthesiology and Reanimation, Zonguldak

Purpose: Few authors have focused on peroperative anesthetic management of pregnancies after surgical repair of Tetralogy of Fallot (TOF) (1). We describe the use of epidural anesthesia (EA) in a patient with repaired TOF for cesarean.

Materials and Methods: After consent was taken, 32 years old 37 week pregnant who had TOF surgery, taken into operation. Electrocardiogram showed right bundle branch block. Echocardiography (ECO) revealed normal left ventricle movement, 13mmHg gradient on the pulmonary valve, dilated right heart, and a systolic pulmonary artery pressure of 32mmHg. During the operation her blood pressure 117/79 mmHg, heart rate 117/min and SpO₂ were 95%. The epidural catheter was inserted at the L3-4 level. Total of 14 mL 0.5% bupivacain were performed in 30 minutes until sensorial loss reached the T5-6 level. No change in hemodynamia occured. Patient received epidural morphine 3 mg for postoperative analgesia and discharged at the 38th hour.

Results: TOF is characterized by ventricular septal defect, aortic overriding, pulmonary artery outflow obstruction and right ventricular hypertrophy (2). It is a commonly encountered congenital cardiac lesion in pregnancy (3). Patients with repaired TOF may exhibit residual cardiac disease such as pulmonary vascular anomalies, right or left ventricular failure, right ventricular obstruction. Thus, the anesthetic management in such a patient is based on, the existing degree of cardiovascular impairment and a knowledge of the underlying pathophysiology. The anesthetist should consider cardiovascular testing, including ECO findings, to develop a peroperative plan (4). So, we performed ECO and strict hemodynamic follow-up. We have made invasive blood pressure monitorization for early recognition of changes. There is no standard technique for the anesthesia of these patients. General anesthesia offered the benefit of better oxygenation but with the risk of adverse hemodynamic responses associated with intubation and possible complications (3). In pregnant with TOF EA or combined spino-epidural anesthesia is more beneficial (5). We preferred epidural anesthesia and analgesia to provide peroperative hemodynamic stability. Selection of agents for neuroaxial block is important to provide better cardiovascular stability (6). Therefore, bupivacain is administered.

Discussion: We think that application of EA in pregnant with repaired TOF is safe alternate to achieve good anesthesia and analgesia.

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PP-015**IN A CASE OF OPPORTUNISTIC CANDIDA PARAPSILOSIS IN INTENSIVE CARE UNIT**

Hülya BAŞAR, Gökçen ATILLA, Güray ALP, Serkan DUMANLI,
Yusuf Harun İREN, Ayşe ÖZCAN, Çetin KAYMAK

Health Science University, Ankara Training and Research Hospital, Department of Anaesthesiology
and Reanimation

Purpose: Candida Parapsilosis is a microorganism that is found in the skin as saprophyte and may cause infections at hospitalized patients through health care workers. The biofilm layer, which occurs especially after central and peripheral catheterization, is held responsible for candidiasis associated hyperalimentation. Moreover, it is considered as a nosocomial pathogen with clinical findings such as peritonitis, endophthalmitis, endocarditis, septic arthritis and fungemia which are usually associated with invasive procedures or prosthetic devices. In this paper, a case of candidemia in a patient with total parenteral nutrition infusion was presented.

Materials and Methods: An 80-year-old male patient with known Chronic Obstructive Pulmonary Disease was brought to the emergency room due to sudden loss of consciousness. He had a history of reduced oral intake and dyspnea for a week. He was rapidly intubated and resuscitation was performed. He had clarithromycin treatment for nine days and oseltamivir treatment for five days in general intensive care unit. After T-tube trial he was extubated on the 18th day of hospitalization. On the second day of his extubation, the patient was re-intubated and admitted to our unit. On the 21st day of hospitalization, the tracheotomy was performed. Candida parapsilosis was found in peripheral and central blood cultures on day 24 of hospitalization. Antifungal treatment was started and on day 4., 6. and 8. Candida parapsilosis continued to be isolated. No vegetation was observed with echocardiography and retinal examination was found to be natural. In the culture taken on the 10th day, the patient without candida growth was planned to receive antifungal for a further 14 days.

Discussion: Candida parapsilosis originates from an exogenous focus, such as a device and the hands of health care workers. It has been determined that the developing biofilm layer has increased significantly in the hyperalimentation solutions. In this respect, the application of hygienic protective protocols in the intensive care units and the early treatment are very important for the prevention of the cases of candidemia and the development of resistance

PP-016**CENTRAL NERVOUS SYSTEM FINDINGS IN A PATIENT WITH CARBON MONOXIDE POISONING**

Ayşe ÖZCAN¹, Ragıbe Gülşah DİLAVER², Meryem GÜLHAN¹,
Hüseyin YAĞCI², Çetin KAYMAK¹, Hülya BAŞAR¹

¹Health Science University, Ankara Training and Research Hospital, Department of Anaesthesiology and Reanimation,

²Health Science University, Ankara Training and Research Hospital, Internal Medicine

Çetin KAYMAK / cetinkaymak@yahoo.com / 05326545426

Purpose: Carbon monoxide (CO) poisoning is a clinical manifestation about oxygen transport and usage. The oxygenation defect disrupts the oxidative phosphorylation in mitochondria, pathophysiologically. Tissue toxicity and cell death occur and cause systemic organ failure. In patients with COHb levels above 60%, loss of consciousness and death are expected.

Materials and Methods: A 65-year-old female patient, who was followed an external center for the first 5 days of hospitalization due to CO intoxication as a result of stove poisoning. She was then admitted to our intensive care unit. She had Type 2 Diabetes Mellitus in addition and her glucose levels were regulated with oral antidiabetics. Her first laboratory values were urea: 120 mg / dL, creatinine: 1.43 mg / dL, LDH: 475; pH: 7.504, pCO₂: 35.4 mmHg, cHCO₃: 30 mmol / L, COHb: 1.0%, lactate: 1.7 mmol / L in venous blood gas. The patient, whose general condition was moderate, was unconscious and she was evaluated for hyperbaric oxygen therapy. She had no contraindications and hyperbaric oxygen therapy was applied 3 times one after another in three days. The brain MRI revealed widespread diffusion restriction in bilateral subcortical white matter and blood destruction products in SWI images in bilateral globus pallidus.

Results: .

Discussion: : Clinical effect of CO poisoning differs according to the severity of exposure and affected organs with underlying disorders. In our case, however there was serious CO poisoning, no cardiac and renal involvement was observed. But pathognomonic findings were detected secondary to brain injury. The absence of cardiac and renal involvement may also be caused by the rapid return of mitochondrial damage after oxygenation is achieved. The patient's husband was also affected in the same accident and had a mortal condition. Hyperbaric oxygen therapy has been shown to be particularly useful in the recovery of oxidative damage in the early stages. In our patient, acute neurogenic damage developed due to severe bleeding. Since hyperbaric oxygen therapy was performed late, there was no return in the clinic.

Background: Carbon monoxide (CO) poisoning is a clinical manifestation about oxygen transport and usage. The oxygenation defect disrupts the oxidative phosphorylation in mitochondria, pathophysiologically. Tissue toxicity and cell death occur and cause systemic organ failure. In patients with COHb levels above 60%, loss of consciousness and death are expected.

Case: A 65-year-old female patient, who was followed an external center for the first 5 days of hospitalization due to CO intoxication as a result of stove poisoning. She was then admitted to our intensive care unit. She had Type 2 Diabetes Mellitus in addition and her glucose levels were regulated with oral antidiabetics. Her first laboratory values were urea: 120 mg / dL, creatinine: 1.43 mg / dL, LDH: 475; pH: 7.504, pCO₂: 35.4 mmHg, cHCO₃: 30 mmol / L, COHb: 1.0%, lactate: 1.7 mmol / L in venous blood gas. The patient, whose general condition was moderate, was unconscious and she was evaluated for hyperbaric oxygen therapy. She had no contraindications and hyperbaric oxygen therapy was applied 3 times one after another in three days. The brain MRI revealed widespread diffusion restriction in bilateral subcortical white matter and blood destruction products in SWI images in bilateral globus pallidus.

Conclusion: Clinical effect of CO poisoning differs according to the severity of exposure and affected

organs with underlying disorders. In our case, however there was serious CO poisoning, no cardiac and renal involvement was observed. But pathognomonic findings were detected secondary to brain injury. The absence of cardiac and renal involvement may also be caused by the rapid return of mitochondrial damage after oxygenation is achieved. The patient's husband was also affected in the same accident and had a mortal condition. Hyperbaric oxygen therapy has been shown to be particularly useful in the recovery of oxidative damage in the early stages. In our patient, acute neurogenic damage developed due to severe bleeding. Since hyperbaric oxygen therapy was performed late, there was no return in the clinic.

Key Words: Carbon Monoxide, Poisoning

PP-017**REGIONAL ANESTHESIA FOR A PATIENT WITH A HISTORY OF CARDIAC ARREST: STABLE HEMODYNAMIA AND REDUCED COMPLICATION**

Sibel CATALCA, Gokcen KULTUROGLU, Savas ALTINSOY, M. Murat SAYIN, Elif Şule ÖZDEMİR
SBÜ Dışkapı Yıldırım Beyazıt Eğitim Araştırma Hastanesi

Purpose: Burn is a form of injury resulting from contact with hot or cold substances, chemicals, electrics, and radioactive rays. In electrical burns, in addition to thermal effect, heart rhythm disorders may occur. The aim of this case is to discuss the experience of a successful axillary block performed using ultrasound and neurostimulator (dual technique) in a patient with a history of cardiac arrest.

Materials and Methods: A male patient who was scheduled for operation due to skin contracture in his hand after electrical burns (Figure 1). The patient's vital signs were stable and he was in sinus rhythm. After skin sterilisation, ultrasound probe (Esaote LA435 linear probe, 10-18 MHz, Florence, Italy) was placed in the recommended area. The motor response of the nerves in the brachial plexus nerves were found by using the nerve stimulation needle (Echoplex +, Ecoen, France) and the neurostimulator (Plexygon; Vygon, France). Four nerves were blocked by using 20 ml of 5% bupivacaine and 10 ml 2% lidocaine with no complication.

Results: There are limited studies in the literature related to whether the dual technique provides an advantage over the use of ultrasound alone. In these studies, the rate of block success is similar when ultrasound alone or dual technique is used. However, we think that the use of dual technique in axillary approach will increase the success of the block because of the fact that the nerves around the axillary artery show many variations and the hyperechoic areas may be thought as nerve images. Bupivacaine is more cardiotoxic than other local anesthetics. In this patient with a history of cardiac arrest, both the dose of bupivacaine has been reduced and an intravascular complication has been prevented by using ultrasound and neurostimulator. Therefore, bupivacaine, reduced dose with using dual technique, can be safely used in regional anesthesia patients who are not preferred general anesthesia.

Discussion: Regional anesthesia is recommended in patients who require stable hemodynamics. In addition, peripheral nerve blocks applied by ultrasound-guided and neurostimulator are safe in burn patients with not severe nerve damages.



PP-018**EVALUATION OF PATIENTS WITH EMERGENCY SURGERY FOR TRANSFUSION AND INTENSIVE CARE: A PRELIMINARY STUDY**

Gökçen KÜLTÜROĞLU, Sibel ÇATALCA, Reyhan POLAT, Jülide ERGİL

Dışkapı Yıldırım Beyazıt Training and Research Hospital

Purpose: Morbidity and mortality associated with emergency surgeries are high compared to elective procedures, so an appropriate perioperative care plan should be created for the patients in emergency surgery. In this study, patients in emergency surgery were retrospectively evaluated for blood transfusion and intensive care.

Materials and Methods: The data of the patients who underwent emergency surgery in our hospital were analyzed retrospectively by the electronic system for 3 months after approval of local ethics committee (Table 1).

Results: Among of the 433 patients retrospectively examined, 11 patients had incomplete data, 23 patients were undergoing revision surgery and 3 patients were excluded because of intraoperative exitus. The majority of the remaining 396 patients were operated on general surgery (38,6%, n: 153) and orthopedics (35,8%, n: 142). General anesthesia was performed for 344 patients (86,8 %). It was determined that 10.3% (n: 41) of the patients had blood transfusions and 41.4% (n:17) of these patients underwent cardiovascular surgery. The mean preoperative and postoperative hemoglobin levels of the patients with blood transfusions were 11,14±2,85 and 9,68±1,94 g/dL, respectively. The duration of hospital stay in patients who had blood transfusions were approximately 12,5±12,9 days and mortality rate was 41.4% (n:17). It was found that 30% (n: 119) of all patients needed postoperative ICU treatment. The mean length of stay was 5,5±9,5 days for 396 patients and mortality rate was 8,3% (n:33).

Discussion: In this study, we determined that blood transfusion is mostly performed in patients undergoing emergency cardiovascular surgery and that these patients have longer hospital stay and mortality rates. Although there are clear limits for elective surgeries in patient blood management and transfusion awareness meetings, we think that we need more studies for emergency surgical procedures. We also found that 30% of the patients undergoing emergency surgery needed ICU treatment. According to data from the Ministry of Health in 2017, we know that the ratio of the number of ICU beds to the total number of beds is 16% and we think that we still need more ICUs.

Acil Ameliyata Alınan Hastalar İçin Değerlendirme Formu

Tarih
Hasta kodu
Yaş
ASA skoru
Cinsiyet
Bölüm
Travma varlığı
Anestezi Tipi
Transfüzyon
Postoperatif çıkış şekli
Postoperatif çıkış yeri
YBÜ kalış süresi/gün
Hastane kalış süresi/gün
Postoperatif mortalite/gün
İnvaziv arter monitörizasyonu
Santral ven kataterizasyonu

Acil Ameliyata Alınan ve Kan Transfüzyonu Yapılan Hastalar için Değerlendirme Formu

Tarih
Hasta kodu
Yaş
ASA skoru
Cinsiyet
Bölüm
Travma varlığı
Cerrahi Endikasyon
Anestezi Tipi
Transfüzyon edilen ürün
Transfüzyon Miktarı/ünite
Preoperatif Hb/Htc/Plt
Preoperatif Pt/INR/aPTT
Postoperatif Ph/Laktat/BE
Postoperatif Hb/Htc/Plt
Postoperatif Pt/INR/aPTT
YBÜ kalış süresi/gün
Hastane kalış süresi/gün
Postoperatif mortalite/gün
Transfüzyon komplikasyonu

PP-019

HYPERCARBIA AND SUBCUTANEOUS EMPHYSEMA DURING LAPAROSCOPIC BILATERAL INGUINAL HERNIA SURGERY

Beyza Meltem YURTSEVER¹, Asude AYHAN¹, Zeynep KAYHAN¹

Baskent University Faculty Of Medicine Anesthesiology And Reanimation Department

Purpose: Intraoperative hypercarbia due to anesthesia or surgery is a serious complication, if precautions are not taken during laparoscopy. Here, we present a case with progressive hypercarbia who underwent laparoscopic bilateral inguinal hernia repair surgery.

Materials and Methods: A 38-year-old male, ASA status I patient, was scheduled for a bilateral laparoscopic inguinal hernia surgery. He had no significant medical history except for two previous uncomplicated surgeries. He had a flu two weeks ago. In the operating room, standard monitors were placed. General anesthesia was induced. The patient was intubated atraumatically. Anesthesia was maintained with 50% oxygen, 50% air (a total of 2lt/min) and desflurane. Remifentanyl infusion was used additionally. The ventilator was set to deliver a tidal volume of 570 ml, positive end expiration pressure of 6 cmH₂O and rate of 12 breaths per minute. The initial end-tidal CO₂ (ETCO₂) was 33mmHg. Thirty minutes after initiation of surgery, ETCO₂ suddenly increased to 51 cmH₂O. The ventilator rate was increased to 16 breaths per minute but to no avail. Oxygen saturation was 98%. The surgeon was notified and potential causes like rapid rise of ETCO₂ were considered. The patient had subcutaneous emphysema in the chest. The operation was ended with a peak ETCO₂ of 56mmHg. Once trocars were removed and the insufflation of CO₂ ceased, the patient was reevaluated. As the patient had spontaneous breathing and ETCO₂ was less than 45mmHg, he was extubated and monitored in the postoperative recovery room. When the vital signs normalized, he was sent to his room.

Results: Later, the patient's SpO₂ was measured as 75%, he had tachycardia and chest pain. Cardiac pathologies were excluded. Thorax tomography showed pneumonic infiltration. He was taken to the intensive care unit and treated accordingly. After a day in the ICU, the patient's vital signs returned to normal and he was sent back to the ward. He was discharged three days later.

Discussion: The advantages of laparoscopic surgery are reduction of average length of hospitalization, patient recovery time and costs, however it also has disadvantages as in the case described. Anesthesia providers must anticipate and be prepared for these challenges.

Key words: anesthesia, hypercarbia, laparoscopic surgery, subcutaneous emphysema

PP-020**OUR ANESTHETIC EXPERIENCE WITH 8-YEAR-OLD PATIENT WHO SUFFERS FROM ARTHROGRYPOSIS MULTIPLEX CONGENITA SYNDROME**

Ufuk TURAN, M.Burak EŞKİN, Gökhan ÖZKAN, Ahmet COŞAR

Department of Anesthesiology and Reanimation, Ankara Gülhane Training and Research Hospital
Ankara, Turkey

Purpose: Arthrogyrosis multiplex congenita (AMC) is described a genetic syndrome of multiple nonprogressive limb contractures accompanied by some anomalies, including micrognathia, genitourinary defects, gastroschisis, cleft palate and cardiac defects. AMC syndrome generally requires various limb correction, abdominal, genitourinary and palate surgeries. Also during anesthesia this patients may have pyrexial response associated or not associated with malignant hyperthermia.

Materials and Methods: A 8-year-old 24-kg male child presented for circumcision. He had undergone previous limb correction surgeries without any anaesthetic or surgical complications. Physical examination revealed an oriented child with normal mental status and multiple joint contractures without micrognathia. Mallampati score was assessed three. Patient's neck movement ability was intact. It was predicted that venous access would be complicated due to multiple contractures and hypoplastic muscle mass. Therefore, he was sedated with oral midazolam 0.6 mg.kg⁻¹ 30 minutes before procedure in the pediatric premedication room. It was preferred right external jugular vein for venous access with 22 GA cannula. After induction with 3 mg.kg⁻¹ propofol and 1 mcg.kg⁻¹ fentanyl, Laryngeal Mask Airway was inserted uneventfully. Maintenance of anaesthesia provided by sevoflurane/nitrous oxide mixture. Penile blockage was performed for postoperative analgesia. After completion of surgical procedure, when the child patient was fully awake laryngeal mask airway removed. Perioperatively patient did not have any pyrexial response and complaint of pain.

Results:

Discussion: Arthrogyrosis multiplex congenita is a detectable defect at birth in utero using ultrasonography. Pediatric patients with arthrogyrosis multiplex congenita frequently present for multiple surgeries for numerous reasons requiring general anesthesia. Venous Access can be problematic in this syndrome due to limb deformities. Craniofacial abnormalities like cleft palate, micrognathia may cause airway management complicated. Malignant hyperthermia associated with several conditions especially musculoskeletal abnormalities. But this syndrome's associations are probably coincidental differently central core disease.

PP-021

THE DORSAL THORACIC INJURY: A CASE

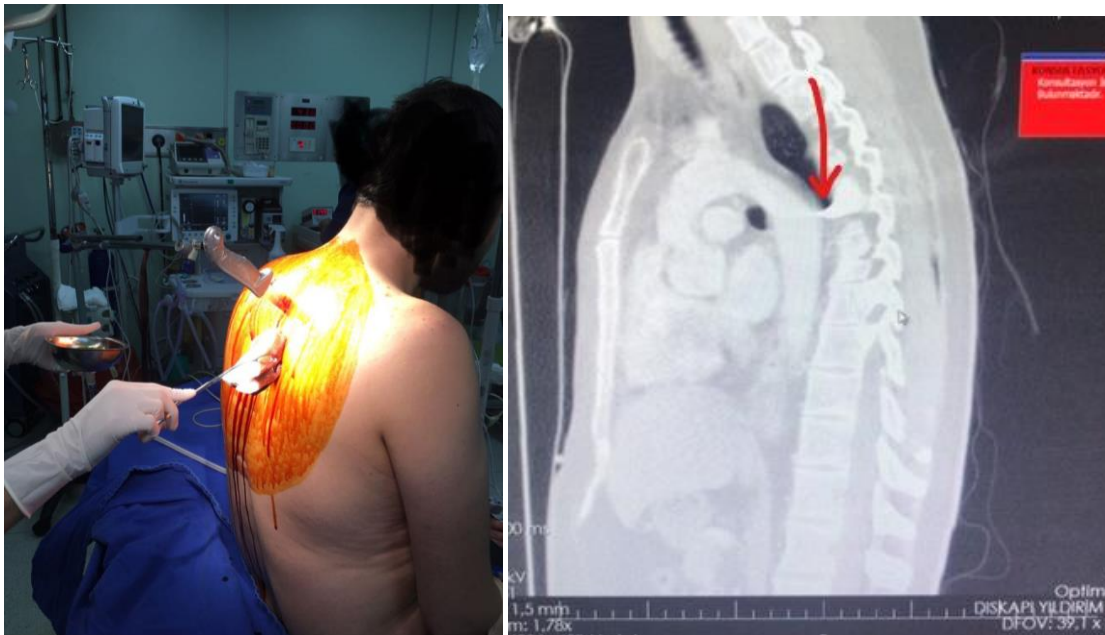
Gökçen KÜLTÜROĞLU, Sibel ÇATALCA, Yakup YILDIZ, Murat SAYIN
Dışkapı Yıldırım Beyazıt Training and Research Hospital

Purpose: Thoracic penetrating injuries have high mortality rates and require urgent surgical intervention. Anesthesia management is difficult due to hemodynamic instability caused by lung, diaphragm, spinal cord, large vessel and cardiac injuries. In addition, the patient may not be given a supine position as a result of trauma from the dorsal region.

Materials and Methods: A 38-year-old male patient was admitted to the emergency department with stabbing in the back. The patient was stabbed between the two scapula, 1 cm to the right of the spinal protrusions and the vertical plane(Figure 1). His vital signs were within normal limits and he had no neurological deficits. The knife, which ended at a very close distance to the descending aorta was in the thorax as seen on CT and did not damage any structure (Figure 2). The patient was taken into the operating room and had a large vascular access was obtained in the sitting position. The necessary equipments for complication senarios were prepared such as videolaryngoscope, endobronchial tubes and other devices for difficult airway. Sedation was provided using a dexmedetomidine infusion. After an application of local infiltration to the injury site, the knife was removed. No complication was observed. The patient was transferred to the ICU.

Results: Thoracic injuries are traumas with high mortality and morbidity rates. For this reason, all precautions should be taken for respiratory, neurological and cardiovascular damage. Large vascular access routes should be provided and the blood required should be prepared. Additionally, these patients may have full stomach and difficult airway for emergency surgery. Particularly in penetrating injuries from the dorsal region, anesthesiologists may be expected to provide airway in lateral or prone positions. In case, there was no damage the vital structures. Dexmedetomidine was a very good sedation option to maintain the breathing.

Discussion: As a result, it should be kept in mind that keeping ventilation and perfusion intact may be difficult in dorsal penetrating injuries and all necessary preparations for alternative airway interventions should be made.



PP-022**ANESTHETIC MANAGEMENT OF A CHILD WITH PANTOTHENATE KINAZ – ASSOCIATED NEURODEGENERATION (PKAN):**Funda ARUN¹, Oguzhan ARUN², Sibel YILDIRIM¹, Bahar OC²¹Selcuk University Faculty of Dentistry Anesthesiology Clinic,² Selcuk University Faculty of Medicine Department of Anesthesiology and Reanimation

Purpose: PKAN, formerly termed as Hallervorden-Spatz disease, is a rare autosomal recessive chromosomal disorder characterized by progressive neuroaxonal dystrophy. The characteristic features of PKAN are involuntary movements, rigidity, mental retardation, seizures and attenuation. We report anesthetic management of a child with PKAN scheduled for dental surgery under general anesthesia.

Materials and Methods: A 9-year-old girl weighing 17 kg diagnosed with PKAN was scheduled for dental surgery under general anesthesia. Physical examination revealed cognitive dysfunction, rigidity, opisthotonus, retrocollis, motor-mental retardation, thoraco-lumbar spine scoliosis. Airway examination showed Mallampatti class III, with normal thyromental distance and neck movements. No cooperation and orientation were observed. The investigations, including blood chemistry were within normal limits. She was taking klonazepam, phenobarbital and baclofen for epileptic seizures. Her elder two siblings were died of similar illness. She was transferred to the operation room without any premedication and monitored with ECG, SpO₂ and NIBP. After anesthesia induction with 1 mg/kg propofol, 1 mcg/kg fentanyl, 0.6 mg/kg rocuronium, trachea was intubated with a 4.5 mm spiral endotracheal tube successfully with the help of a guide. Anesthesia was maintained with sevoflurane 2%, in air and oxygen 50:50%. The surgical operation was completed in 90 minutes without any surgical and/or anesthetic problem and the patient was transferred to the PACU. She had an epileptic seizure in PACU and midazolam 1mg IV was given. After pediatric neurology consultation, the patient was shifted to ward.

Results: PKAN is a neurodegenerative disorder characterized by accumulation of iron in the basal ganglia. Characteristic neurological features include progressive rigidity, involuntary movements, seizures, cognitive dysfunction, visual impairment and difficulties in articulation, swallowing, and chewing. These symptoms may challenge the anesthetic management due to possible difficult airway, aspiration pneumonia, dehydration, seizure activity and post-operative respiratory and renal insufficiency.

Discussion: Detailed preoperative systemic evaluation is very crucial in patients with PKAN. Early postoperative period should be considered sufficiently and patients should be monitored longer than usual in the recovery room or admitted to the intensive care unit.

PP-023**ANESTHETIC MANAGEMENT OF A CHILD WITH ALLGROVE SYNDROME:**Funda ARUN¹, Oguzhan ARUN², Sibel YILDIRIM¹, Bahar OC²¹Selcuk University Faculty of Dentistry Department of Pedodontics,²Selcuk University Faculty of Medicine Department of Anesthesiology and Reanimation

Purpose: Allgrove syndrome (Triple A syndrome) is a rare autosomal recessive disorder characterized by alacrima, achalasia, adrenal insufficiency and autonomic/neurological abnormalities. We report the anesthetic management of a child with Allgrove syndrome.

Materials and Methods: A 3 year old girl weighing 9 kg was scheduled to undergo tooth extraction under general anesthesia in Selcuk University Hospital. Due to complaint of vomiting following eating and growth retardation after birth, she had been diagnosed with achalasia at 1 year old and gastrostomy was performed. Allgrove syndrome was diagnosed after identification of the classical triad. Oral hydrocortisone therapy for adrenal insufficiency has been started. After a seizure attack at 2 years old, sleep-deprived EEG test was done and antiepileptic treatment has been started. During the preoperative evaluation, typical facial features of the syndrome (fish mouth, narrow upper lip, and long filtrum), growth retardation, and alacrima were seen. Physical examination and laboratory tests were normal. Postural tests performed to assess autonomic dysfunction were normal. Pediatric neurology and endocrinology consultations were done. Following a short ACTH stimulation test adrenal functions were reported as normal. The child was transferred to the operating room without any premedication. After standard monitoring with ECG, SpO₂, and NIBP anesthesia was induced with 8% Sevoflurane. Due to failure of obtaining peripheral venous access, femoral venous cannulation was done and 3 mg/kg Propofol, 2 mcg/kg Fentanyl, 0.5 mg/kg Rocuronium were given. The trachea was intubated with 5.0 mm cuffed endotracheal tube without any problem. Eyes were protected with topical lubricant eye ointment. There was no need for intraoperative steroid replacement. Blood glucose levels was monitored hourly. The operation was lasted for 145 minutes uneventfully. The child was discharged from the hospital on postoperative day 5.

Results: For the patients with Allgrove Syndrome preoperative investigations should include esophageal motility tests, endoscopy, serum electrolytes, cortisol and ACTH levels, ACTH stimulation test and Schirmer test for semi quantitative measure of tearing.

Discussion: Detailed preoperative evaluation, stress dose of steroids, perioperative glycemic control, prevention of aspiration and careful eye protection are crucial for optimal anesthetic management of a patient with Allgrove syndrome.

PP-024**ANAESTHETIC MANAGEMENT OF A THREE YEARS OLD CHILD WITH TRAUMATIC FEMORAL ARTERIOVENOUS FISTULA**

Mehmet OC¹, Bahar OC², Esmâ METİN², Oguzhan ARUN², Ates DUMAN²

¹ Selcuk University, Faculty Of Medicine, Department of Cardiovascular Surgery,

² Selcuk University, Faculty Of Medicine, Department of Anesthesiology and Reanimation

Purpose: Arteriovenous fistula (AVF) is an congenital or acquired abnormal communication between the arterial and venous systems. Incidence varies from 0.006% to 0.14%. The femoral artery is the preferred catheterization site. AVF can cause hemodynamic relevant left-to-right shunts, congestive heart failure, pseudoaneurysm, haemorrhage, arterial thrombosis, peripheral embolization and may threaten limb circulation therefore prompt diagnosis and appropriate treatment are essential. AVF can reduce downstream blood flow and cause heart failure due to cardiac volume overload. We present a case of iatrogenic AVF both from superficial and deep femoral arteries to common femoral vein leading to progressively developing severe right sided heart failure in a three years old child.

Materials and Methods: A 3-year-old boy who underwent ventricular septal defect and atrial septal defect operations (18 months ago) and an angiography via the left femoral artery twenty months ago. Six months ago, he had complaints of exertion dyspnoea, palpitation. Physical examination of lower extremity revealed continuous bruit on the left groin with a palpable thrill. Doppler ultrasonography revealed a right superficial femoral artery to common femoral vein fistula. After standard monitoring anaesthesia induction was achieved with sevoflurane 8%, rocuronium and fentanyl. Patient was intubated, radial artery catheter and CVP catheter were inserted. Anaesthesia was maintained with sevoflurane 2-3%, fentanyl and rocuronium. Left vertical groin incision was performed. Superficial femoral artery (SFA) and deep femoral artery (DFA) were explored. AVF between DFA and common femoral vein (FV), 1 cm distal to DFA origin, was detected. AVF was occluded temporarily, and the thrill ceased. AVF between DFA and FV was ligated and divided at arterial and venous ends. Soon after the surgical procedure, clinical signs of right-sided heart failure decreased dramatically. The postoperative course was uneventful, and the patient was discharged four days after the operation.

Results: The patient had a medical history of diagnostic cardiac catheterization at the affected limb site. Surgical repair was successfully performed, and clinical signs and symptoms diminished dramatically afterwards. In paediatric patients with AVF cardiac failure is often attributed to the primary heart defect.

Discussion: During anaesthesia AVF should be considered for additional problems in these cases.

PP-025**REPAIR OF COARCTATION OF THE AORTA IN A 950 GRAMS NEWBORN**Bahar OC¹, Mehmet OC², Oguzhan ARUN¹, Ates DUMAN¹¹ Selcuk University, Faculty of Medicine, Department of Anesthesiology and Reanimation,² Selcuk University, Faculty of Medicine, Department of Cardiovascular Surgery

Purpose: The benefits of early correction of congenital heart disease in low-birth-weight neonates are known. However, repair of coarctation (CoA) at a very young age or a low birth weight could be anticipated to carry an increased risk of recurrent coarctation. Mortality for low-weight infants has been reported to be from 5% to 15% compared with mortality rates of less than 2% for repair of isolated coarctation in term infants. Low-weight infants have a mortality of 14%. We present our anaesthesia experience in a 950 g weight small infant with CoA undergoing correction operation.

Materials and Methods: A 26 weeks gestational, 23 days old, 910 g. Male baby was diagnosed as CoA, atrial septal defect, PDA and respiratory distress. In the ICU the patient was on CPAP via nasal cannula. Nine days later operation was planned. Anaesthetic induction was performed with pentothal sodium 4mg/kg, rocuronium 0.4mg/kg, fentanyl 3mcg/kg via I.V. catheter after ECG, SpO₂, NIBP monitoring. He was intubated with a 2.5 mm tube. Sevoflurane (2-3%) and 50% O₂ in air were used for maintenance. Right internal jugular vein (4F) and left femoral artery (22G) catheters were inserted. After right decubitus position was given to the patient, posterior muscle protective thoracotomy was performed and the CoA was corrected. The hemodynamic parameters were kept at normal. The patient was transferred to the PACU intubated. ABG during, at the end of surgery and PACU were normal. He was discharged to the ward without any problems in seven weeks.

Results: This is the second most low birth weight undergoing CoA in literature. Low birth weight is not a contraindication for early repair of congenital cardiac anomalies. CoA repair in infants weighing less than 1 kg can be performed safely with reasonable outcomes.

Discussion: The preoperative cardiac function, associated non-cardiac lesions, the duration of aortic cross-clamp, and postoperative ventilation support are the possible risk factors influencing mortality. Proper anaesthetic and ICU management is crucial in these low birth weight patients.

PP-026**ANESTHETIC MANAGEMENT IN A NEWBORN INFANT WITH GOLDENHAR SYNDROME:**Bahar OC¹, Oguzhan ARUN¹, Ates DUMAN¹, Mehmet OC²¹ Selcuk University, Faculty of Medicine, Department of Anesthesiology and Reanimation,² Selcuk University, Faculty of Medicine, Department of Cardiovascular Surgery

Purpose: Goldenhar syndrome is characterized by a wide range of congenital anomalies such as ocular, auricular, facial, cranial, vertebral and cardiac abnormalities. We aimed to report the anesthetic management of a newborn infant with Goldenhar Syndrome.

Materials and Methods: Our patient was a 13 day-old girl born at 38 weeks of gestation with 1600g body weight. She had dysmorphic face features including right ear agenesis, micrognathia, hypertelorism, and retention anomaly of the 1st phalanx at the right hand. Structural heart defects such as atrial and ventricular septal defects (ASD, VSD), patent ductus arteriosus (PDA) and pulmonary hypertension were also detected in the echocardiography. The baby was transferred to our hospital for PDA ligation and pulmonary banding. After standard monitoring with ECG, SpO₂ and NIBP general anesthesia was induced with sevoflurane 8% in 50-50% oxygen in air. Peripheral venous access was achieved with a 24 G iv catheter at the dorsum of the right hand. 2 mcg/kg of fentanyl and 0.5 mg/kg of rocuronium bromide were given intravenously. Central venous and arterial cannulations were achieved via the femoral route with 4F, double lumen, 5cm long and 22G, single lumen, 5 cm long catheters, respectively. Tracheal intubation was achieved with a 3.0 mm uncuffed endotracheal tube with the help of pediatric frova intubating introducer in the 2nd attempt. Anesthesia was maintained using controlled ventilation with sevoflurane 1.5–2% in 50-50% oxygen in air. 1 mcg/kg of fentanyl and 0.2 mg/kg of rocuronium were added as needed. The operation lasted for 45 minutes without any surgical and/or anesthetic problem and the intubated baby was transferred to the NICU. The baby was extubated at the postoperative 5th day and transferred to the pediatric ward after 61 day follow-up.

Results: Patients with this syndrome may be challenging for anesthesiologists due to multisystemic developmental abnormalities. Craniofacial anomalies increase the risk of difficult mask ventilation and intubation in patients with this syndrome.

Discussion: The perioperative management particularly for the cardiac surgical patients suffering from Goldenhar Syndrome depends on the type, extent, and severity of anomalies, cardiovascular problems, and nature of surgery.

PP-027**ANESTHETIC MANAGEMENT OF A PATIENT WITH SEVERE SILICOSIS UNDERGOING ACUTE ABDOMINAL SURGERY**

Evginar SEZER, Fatma ÖZKAN SİPAHİOĞLU, M. Murat SAYIN, Jülide ERGİL

University of Health Sciences, Dışkapı Yıldırım Beyazıt Training and Research Hospital, Anesthesiology and Reanimation Clinic, Ankara, Turkey

Purpose: Silicosis, is a rare chronic pulmonary disease, which may be exacerbated by other systemic diseases and duration of exposure to silicotic particles and therefore can present unique considerations to the anesthesiologist. The affected pulmonary system may show different functional restrictions that are relevant for decisions related to anesthesia. Therefore the anesthesiologist should be familiar with the special needs of such patients and be careful while dealing with intraoperative problems and complications of the disease. In this case report we aim to describe the anesthetic management of a patient with severe silicosis combined with asthma undergoing acute abdominal surgery.

Materials and Methods: A 57-year-old ASA IV man with severe pulmonary silicosis was scheduled for an acute lower abdominal surgery(perforated acute appendicitis). The patient was diagnosed with lung silicosis in 1994 due to foundry. He also had asthma, diabetes, hypertension and prostatic diseases. One month ago he was hospitalised in sanatorium due to increased pulmonary complaints. The patient recieved medical therapy (inhaling agents, drugs for the accompanying diseases) and ambulatory oxygen inhalation therapy. Preoperative evaluation revealed severe dispnea, cough, hypoxia on arterial blood gases, bilateral lung infiltrations on chest X-ray. Pulmonary function tests showed severe obstructive and restrictive pattern. In the operating room after standart monitorisation of the patient successful intrathecal intervention (spinal anesthesia) was performed between L3 and L4 intervertebral space with a 25G spinal needle and 12.5 mg hyperbaric bupivacaine (Heavy Marcain®) was administered. During 50 minutes of surgery, sensory block was spread at T8-T10 levels. The surgery was conducted uneventfully and the patient was transferred to the intensive care unit. The postoperative course was also stable without major complications.

Results: Detailed preoperative evaluation of the patient's general condition and pulmonary status can lead to precised treatment planning and successful anesthetic management in high risk patients with severe lung diseases such as silicosis combined with asthma. Neuraxial blockade reduces postoperative mortality and other serious complications in such patients.

Discussion: We can conclude that spinal(regional) anesthesia can be suitable and safe anesthetic technique for lower abdominal surgery in high risk patients with severe lung diseases providing hemodynamic and pulmonary stability.

Keywords: Anesthetic management, Silicosis, Abdominal surgery

PP-028**GENERAL ANESTHESIA MANAGEMENT IN PATIENT WITH ASBESTOSİS**

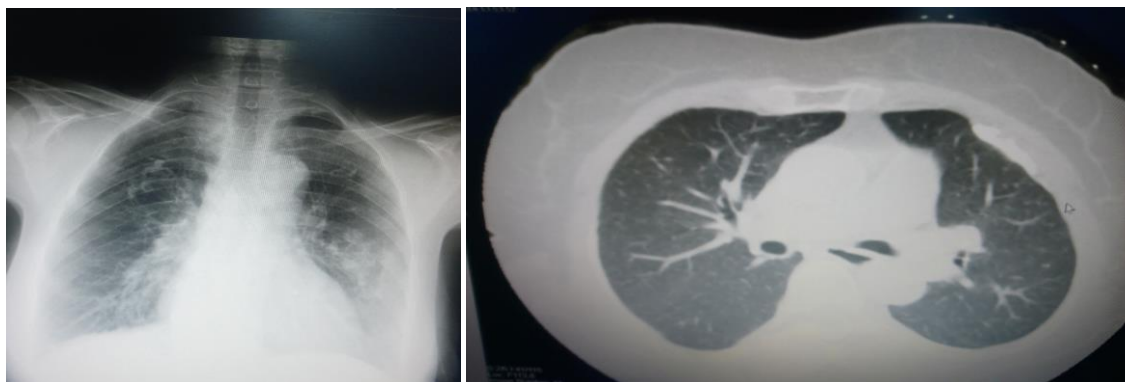
Sibel CATALCA, Gokcen KULTUROGLU, Savas ALTINSOY, M. Murat SAYIN, Elif Şule ÖZDEMİR :SBÜ
Dışkapı Yıldırım Beyazıt Eğitim Araştırma Hastanesi

Purpose: Interstitial pulmonary fibrosis caused by the inhalation of asbestos fibers continues to be an important cause of interstitial lung disease. The aim of this case report is to discuss the anaesthetic management and considerations in a patient with asbestosis disease.

Materials and Methods: A 69-year-old, 79-kg and 175-cm patient was operated due to basal cell carcinoma on the nose. In the preoperative evaluation, there was no disease in his history but pleural placks were observed in chest X-ray (Figure 1). Then the patient was consulted to a pulmonologist. In computed tomography, there was calcific placks and atelectasis (Figure 2) and in spirometry, FEV1:105%, FVC:85.6, FEV1/FVC:100% (restrictive pattern) was seen. Routine anesthesia monitorization was performed. Vital signs were recorded with a heart rate of 65 beats per minute, blood pressure of 135/75 mmHg, oxygen saturation of 91%. The patient received preoxygenation for 3 min before anesthesia. Intravenous induction was performed with fentanyl 1 ug/kg, propofol 2 mg/kg, rocuronium 0.6 mg/kg and the patient was intubated. Anesthesia was maintained with sevoflurane in oxygen and remifentani 0.05 mcg/kg/dk. End of surgery, the residual neuromuscular block was antagonized with atropine 0.02 mg/kg and neostigmine 0.05 mg/kg. The patient was extubated and transferred to the intensive care unit.

Results: Asbestosis is defined as bilateral diffuse interstitial fibrosis of the lungs caused by the inhalation of asbestos fibers. The clinical, physiologic, and radiologic findings of asbestosis are not in any way specific. Preoperative evaluation in asbestosis includes a comprehensive risk assessment with a thorough history and physical examination and review of pulmonary function tests and imaging. Choice of anesthetic technique should be made on an individual basis. In this procedure, the patient was intubated, because of the lesion area and long duration of the operation. Agents with prolonged respiratory depressant effects should be avoided in the postoperative period. Because of this reason, paracetamol 10 mg/kg and 50 mg dexketoprofen were administered for analgesic medication. Arterial oxygenation is impaired in patients with asbestosis, so we preoxygenated patient.

Discussion: Preanesthetic evaluation/preparation, intraoperative approach and postoperative care in asbestosis are important because of increased risk of postoperative respiratory complications.



PP-030

DEEP SEDATION ANESTHESIA FOR AMBULATORY PROSEDURE IN A PATIENT WITH PROGRESSIVE SUPRANUCLEAR PALSY

Osman SAHIN, Ruslan GASIMOV, Hale AKSU ERDOST, Leyla IYILIKCI
Dokuz Eylul University School of Medicine, Anaesthesiology Department

Purpose: Progressive supranuclear palsy (PSP), also known as Steele–Richardson–Olszewski disease, is an atypical Parkinsonian disorder associated with progressive axial rigidity, vertical gaze palsy, dysarthria and dysphagia. Different aspects of PSP must be considered to preplan the best anaesthetic approach.

Materials and Methods: We recently administered anaesthesia to a 66-year-old female with a history of PSP undergoing Percutaneous endoscopic gastrostomy(PEG).She was diagnosed with PSP 4 years ago,and also she had hypothyroidism and asthma. Physical examination showed problems with speech, stiffness and awkward movements, urinary incontinence, narrowing of the visual field and amnesia. Her preoperative labarotary results were normal. In OR midozolam (1 mg), fentanyl (50 mcg), propofol (0.7 mg/kg) administered,when necessary for maintaining deep sedation propofol administered. Procedure completed approximately 20 min ,by the time SPO2 was around 93-97.After procedure , flumazenil (0.1 mg)administered and she was transported to the recovery room.

Results: In this patients if sedation is required, it may be better to titrate short acting drugs using a start low and go slow approach; propofol seems adequate. Induced haemodynamic instability is another aspect to consider. Whenever possible, isolated peripheral nerve bocks are ideal for preventing hypotension. In our patient neither neuraxial blockade nor peripheral nerve blockade were an option. In literature search of anesthetic management in patients with PSP, we found seven case reports. There was no report on deep sedation anesthesia for a patient with PSP.

Discussion: In this case we showed that deep sedation anestheasia can be used safely in patients with PSP for ambulatory surgery

DEU

PP-031**ANESTHESIA MANAGEMENT IN A PATIENT WITH TUBULOINTERSTITIAL NEPHRITIS AND UVEITIS (TINU SYNDROME)**Yunus CELİK¹, Hale AKSU ERDOST¹, Serhan DERICI², Sevda OZKARDESLER¹¹Dokuz Eylul University School of Medicine, Anaesthesiology Department,²Dokuz Eylul University School of Medicine, Department of general surgery

Purpose: The majority of cases have been documented in the ophthalmology and pediatric nephrology literature via case reports and small descriptive series, often accompanied by myeloproliferative disease and/or tuberculosis.

Materials and Methods: A 22 year- old male patient diagnostic laparotomy planned for sampling of paraaortic lymph nodes. The patient had uveitis and high serum creatinine levels. The patient has become hemodialysis dependent after his follow up of 2 years. After administration of midazolam for anxiolysis, patient taken to the OR and monitored with ASA standard monitors also neuromuscular monitoring was applied. Prior to induction; the patient was administered intrathecal morphine (200 mcg), at L3-L4 level with a 25G Quincke spinal needle. No complications was encountered during this procedure. Anesthesia induction was made with, thiopental remifentanil infusion and rocuronium. The patient's vital values were stable during the operation. In the extubation stage, it was antagonized with Suggamadex. After TOF value was 100 resp after 76 sec of the isolation, spontaneous respiration was returned and cooperation was achieved. Another point we focused on in our patient was positively analgesia. 1 g paracetamol was applied to the patient before extubation for the purpose of postoperative pain. Visual analog scale (VAS) was determined as 10 when the patient woke up. The postoperative lowest VAS was 5 at 6-hour follow-up.

Results: In the literature this disease is mostly seen in nephrology or ophthalmology case reports. Tinu syndrome is a rare disease and even more rare these patients have an operation. So we believe that these kind of case presentations will be helpful for the practitioners who takes care of these patients.

Discussion: In the literature this disease is mostly seen in nephrology or ophthalmology case reports. Tinu syndrome is a rare disease and even more rare these patients have an operation. So we believe that these kind of case presentations will be helpful for the practitioners who takes care of these patients.

PP-032

INTENSIVE CARE TREATMENT OF A SEVERE BURN PATIENT

Cansu BALCI ,Alev ATALAY ,Tuba KUVVET YOLDAŞ , İlkin ÇANKAYALI , Kubilay DEMİRAĞ , Mehmet UYAR

Ege University Anaesthesiology and Reanimation Department

Purpose: Severe burn injury is a kind of trauma with a high risk of morbidity and mortality. Treatment of severe burn patients in intensive care units with a multidisciplinary approach increases the survival rates. In this case report, we present our successful treatment approach to a burn patient in our Burn Critical Care Unit.

Materials and Methods: 45 years old, 70 kg,170 cm male patient was admitted to our Burn Intensive Care Unit within 4 hours after the burn injury. He was conscious and had spontaneous respiration.Total burn surface area was 77% including face, trunk, arms, hands and legs with both second and third degree burns due to the flame resulting from the arc burn. All hemodynamic and vital parameters were in normal range. The respiratory tract was clear and respiratory support was not necessary. Fluid resuscitation was started according to Parkland formula.Arterial and venous catheterizations required for invasive monitoring of vital parameters were performed immediately. The patient was evaluated each day for about the hemodynamic parameters, body temperature, urinary output, total fluid balance, nutrition, infection parameters and wound healing. The wound care was performed daily under sedoanalgesia. In the bloodstream cultures, acinetobacter baumannii and pseudomonas aeruginosa were isolated. Antibiotics were prescribed according to culture antibiogram sensitivity. During intensive care stay, a total of five debridement and autografting operations were performed.After 120 days in intensive care unit, the patient was transferred to burn center service and was able to walk with a walking support device.

Results: In severe burn injuries, successful initial resuscitation, proper maintenance therapy, appropriate antibiotic selection, adequate nutrition and appropriate time selection for surgical interventions are important parameters that increase patient survival rate.

Discussion: Both resuscitation and maintenance therapies of major burns require a multidisciplinary approach and a harmonic team work of anesthesia and surgical team.

Intensive Care Treatment of a Severe Burn Patient

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Conclusion: Both resuscitation and maintenance therapies of major burns require a multidisciplinary approach and a harmonic team work of anesthesia and surgical team.

Key words: Major burn, intensive care, morbidity, mortality

PP-033**VERTEBRAL CORPUS FRACTURE WITHOUT SPINAL CORD INJURY:**

Icten Ezgi INCE, Gozde GURSOY, Ferim GUNENC
Dokuz Eylul University Hospital

Purpose: Vertebral fractures of spine is the one of the most challenging trauma for an anesthetist. Pathophysiological responses to the trauma and mechanical stabilization of the vertebral column should consider carefully.

Materials and Methods: A 72-year-old patient with a history of known hypertension, type-2 DM and gout was consulted us for preoperative evaluation for vertebral corpus fracture after falling from a height of about 4 meters. On the arrival to the emergency room, his vital signs were stable. Tube thoracostomy was observed due to left hemothorax. The patient had vertebra corpus fracture at the thoracic level, but there was no spinal cord compression. Neurological examination was normal. He had ankylosis based on the computerized tomography image. The patient was admitted to the operation room on the trauma board. Arterial catheterization was performed before induction. After controlling tube thoracostomy, 100 micrograms of fentanyl, 450 mg thiopental sodium and 100 mg rocuronium were used for induction. The videolaryngoscope was used with D Blade for intubation. Ultrasonography-guided internal jugular vein catheterization was performed with neutral head position in order to maintain spine stabilization. Surgery was started after turning the patient to the prone position without spinal movement, carefully. The operation lasted 3 hours. Hemodynamics remained stable throughout the procedure. At the end of the operation, the patient was transferred to the intensive care unit. After 12 hours, the patient was extubated and returned to the service without any problems.

Results: In our case, the patient was intubated with videolaryngoscope to perform spinal stabilization after vertebral fracture and catheterization was performed under ultrasound guidance.



PP-034**ANESTHETIC MANAGEMENT FOR PULMONARY THROMBOENDARTERECTOMY**

Elvin KESIMCI, Nükhet AKOVALI, Coşkun ARAZ, Zeynep KAYHAN
Başkent University, Faculty of Medicine, Department of Anesthesiology

Purpose: Chronic thromboembolic pulmonary hypertension (CTEPH) is a progressive disease due to the incomplete resolution of pulmonary emboli, leading to right heart failure, with a poor survival if left untreated. Pulmonary endarterectomy (PEA) is the only curative treatment. We herein, describe our successful anesthetic approach to a patient of CTEPH.

Materials and Methods: A 49 years-old, 70 kg woman was admitted for experiencing acute episodes of pulmonary emboli unresponsive to medical treatment. Her medical history consisted of DM, hypertension and homozygous factor V leiden mutation. General physical examination revealed normal findings. Pulmonary angiography revealed filling defect in right pulmonary artery and significant perfusion defect in right upper and mid segments of the lung. After anesthesia induction and invasive arterial and central venous pressure monitorization, the operation was performed through a median sternotomy incision with cardiopulmonary bypass (CPB) enabling hypothermia to 20°C. Deep hypothermic circulatory arrest (DHCA) under sodium thiopental and methylprednisolone administration was limited to 2 min. Ice bags providing better temperature control to the cranium were available and cerebral oximetry was also used. After right pulmonary thromboendarterectomy, re-warming commenced immediately. Simultaneously, the lungs were ventilated with the application of positive end-expiratory pressure to prevent accumulation of pulmonary oedema. Weaning from cardiopulmonary bypass was not attempted until the core temperature reached and remained at 36 °C for at least 15 min. A low dose of dobutamine and milrinone infusion was also commenced. At the end of the surgery, the patient with a stable hemodynamics, was transported to ICU. She was extubated on postoperative day 1 and followed on spontaneous respiration by nasal O₂ supply. As she had no hemodynamic and respiratory problems on her follow-up, she was discharged home on postoperative day 5.

Results: PEA is an effective surgical treatment for CTEPH. Afterwards haemodynamic recovery occurs almost immediately. The success of this surgical treatment depends on the proper preoperative diagnosis, evaluation, and perioperative care, as well as close collaboration of a multidisciplinary team including pulmonologists, cardiothoracic surgeons, and anesthesiologists.

Discussion: We report successful anesthetic management of a complex surgical procedure requiring cardiopulmonary bypass along with periods of deep hypothermic circulatory arrest.

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