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turkishspine

11th International Turkish Spine Congress

In memory of Prof. Dr. Hakan Caner

29 April - 3 May 2015

Sheraton Hotel Çeşme - İzmir

ABSTRACT BOOK

CONTENTS

INVITATION

Dear Friends and Colleagues,

First International Turkish Spine Congress was held in Çeşme, İzmir in May 1990. I am honoured to host you at 11th Congress, 25 year later, at the same location.

During these 10 congresses we had the privilege to listen to, inspire the legends of spine surgery, late RB Winter, late E Luque, J Dubousset to name a few.

The 11th Congress will focus on Trauma, Tumor, Degenerative conditions and infections of the spine as well as deformities as always been the main interest.

There will be AOSpine precourse on 29th of April. I am sure the topic will be attractive to most of you: ''New innovations and future fields of research in spine''. During the congress we will have the chance to listen to cutting-edge research outcomes on intervertebral disk degeneration followed by clinical implications. Evidence-based educational sessions on patient assessment, treatment, outcomes, complications and cost-effectiveness analysis together with "hot-topic" debates and open case discussions will meet the needs of continuous professional development in this live educational event. I am sure you will be able to find an interesting topic for your needs if you continue to browse the programme in deapth.

I cordially invite all of you to participate and be part of 11th International Turkish Spine Congress in 2015!

Haluk Berk M.D.
Congress President

Congress Secretaries:
Esat Kıter M.D.
Halil İbrahim Seçer M.D.

PROGRAM COMMITTEE

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Sait Şirin, MD

(in alphabetical order)

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SCIENTIFIC PROGRAM

29 April 2015

13:00 **AOSpine Symposium** **New innovations and future fields of research in spine** ***Ahmet Münir Sarpyener Hall***

Module 1 **Clinical Research**

Chairpersons: Emre Acaroğlu, Lorin Benneker

Basic statistical methodology answers to common clinical research questions	*Selcen Yüksel*
What's new? Statistical tools for new clinical problems	*Emre Acaroğlu*
Insight into clinical research areas for the future; where is the last frontier?	*Ufuk Talu*
From clinical research to medical education; where are we, where do we want to be?	*Federico Balague*

14:45 Interactive session (how to build a research project on real life research questions posed by the participants) *All Faculty*

15:30 **Coffee Break** **30'**

16:00 **Module 2** **Basic Science Research**

Anulus fibrosus repair strategies	*Lorin*
Homing of disc cells for IVD regeneration strategies	*Benneker*
New treatment concepts for Spinal Cord Injuries	*Mauro Alini*
	Erkin Sönmez

18:00 Adjourn

30 April 2015

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07:00	**Registration open**		
08:10	**Opening Ceremony**	***Ahmet Münir Sarpyener Hall***	
	President of Turkish Spine Society	*Serdar Kahraman*	**5'**
	President of Congress	*Haluk Berk*	**5'**
08:30	In Memory of Hakan Caner	*Sait Naderi*	**10'**
	Session 1 Intervertebral Disc/Basic Science	***Ahmet Münir Sarpyener Hall***	
	Moderators: Emre Acaroğlu, Sait Naderi		
	Clinical phenotypes of back pain	*Peter Paul Varga*	
	Biomechanics of degenerated disc and the challenges for the treatment with implants	*Hans-Joachim Wilke*	**15'**
	Disc Mechano-Biology. Disc biomechanics from the cell to the patient	*Cornelia-Neidlinger-Wilke*	**15'**
	Disc physiology and critical issues in cellular repair strategies	*Jill Urban*	**15'**
09:50	Discussion		**20'**
	Debate Evidence Based Treatment of Back Pain		
	Moderators: Erol Yalnız, Alparslan Şenköylü		
	Case presentation	*Erol Yalnız*	**5'**
	Evidenced based non surgical treatment	*Tufan Cansever*	**10'**
	Evidenced based surgical treatment	*Phillip Sell*	**10'**
10:30	Discussion		**15'**
11:00	**Coffee Break**		**30'**
	Session 2 Ankylosing Spondiylitis (AS)	***Ahmet Münir Sarpyener Hall***	
	Moderators: Teoman Benli, Ayhan Attar		
	Frequency of spondylarthropathies and the missed diagnoses		
	What is the impact of new generation treatment modalities on natural history of AS?	*Federico Balague*	**15'**
	Approach the spinal fractures in AS	*Federico Balague*	**15'**
	TL Spinal Osteotomies in Ankylosing Spondylitis	*Sedat Çağlı*	**15'**
	Cervical Spinal Osteotomies in Ankylosing Spondylitis; tips and tricks	*Mahir Gülşen*	**15'**
12:30	Discussion	*Vedat Deviren*	**15'**
13:50	**Lunch Symposium**		**15'**
	Keynote Lectures	***Ahmet Münir Sarpyener Hall***	**80'**
	Moderator: Ali Şehirlioğlu		
	Treatment of pediatric spinal deformities with posterior osteotomy techniques Spine and sports	*Azmi Hamzaoğlu*	**15'**
		Lorin Benecker	**15'**

Discussions 10'

14:30 **Free Papers**

Degenerative Spine ***Mim Kemal Öke Hall***

Moderators: Serkan Erkan, Güven Çıtak

Paper-1 Long Term Clinical Outcomes of Incidental Dural Tears During Lumbar Microdiscectomy *6'*
Uzay Erdoğan, Ali Ender Ofluoğlu, Ahmet Kayhan

Paper-2 Clinical Results of Dynamic Stabilization Adjacent to Fusion Level: A New Lumbar Hybrid Instrumentation *6'*
Meriç Enercan, Bahadır Gökçen, Sinan Kahraman, Mutlu Çobanoğlu, Sinan Yılar, Tunay Sanlı, Amjad Alrashdan, Erden Ertürer, Çağatay Öztürk, Azmi Hamzaoğlu

Paper-3 Effect of Platelet-Rich Plasma upon Epidural Fibrosis in Rats: Experimental Study *6'*
Serkan Güler, Ömer Akçalı, Baran Şen, Serap Cilaker Micilli, Namık Kemal Şanlı

Paper-4 Adjacent Segment Disease and "Topping-Off": A Biomechanical Evaluation of Two Different Types of Hybrid Instrumentations and Their Effects on Adjacent Segments *6'*
Hüseyin Übeyli, Peter Obid, Reza Danyalı, Gerd Hubert, Michael Reichl, Alexander Richter, Michael Morlock, Klaus Püschel, Thomas Niemeyer

Discussion *6'*

Paper-5 Clinical and Cost Analysis of Different Surgical Approaches in Lumbar Spinal Stenosis *6'*
Ali Erhan Kayalar, Mehmet Reşid Önen, Sait Naderi

Paper-6 Failed Back Surgery Syndrome: A Lesson to Learn *6'*
Malik Shakeel Ahmed, Ali Habash, Abdul Moeen Baco

Paper-7 Unilateral Percutaneous Pedicle Screw Instrumentation with Minimally Invasive TLIF for the Treatment of Recurrent Lumbar Disk Disease: 2 Years Follow-up *6'*
Erkin Sönmez, İlker Coven, Fikret Şahintürk, Cem Yılmaz, Nur Altınörs

Discussion *6'*

Paper-8 Assessment of Radiologic Parameters that Influence Disc and Facet Degeneration after Stopping Fusion at L3 in Ais: An Mri Study with Minimum 5 Years Follow Up *6'*
Sinan Kahraman, Meriç Enercan, Mutlu Çobanoğlu, Sinan Yılar, Levent Ulusoy, Ayhan Mutlu, Erden Ertürer, Çağatay Öztürk, Azmi Hamzoğlu

Paper-9 Epidural Anesthesia in Elective Lumbar Microdiscectomy Surgery: Is It Safe and Effective? *6'*
Akin Akakın, Baran Yılmaz, Murat Şakir Ekşi, Deniz Konya

Paper-10 Early Results of Lumbar Percutaneous Endoscopic Discectomy *6'*
Sevda Uğraş, İsmail Oltulu, Mehmet İşyar, Melih Malkoç, Ali Akın Uğraş

Paper-11 The Results of Epidural Steroid Injection for Postdiscectomy Pain Syndrome *6'*
Mehmet Nuri Erdem, Sinan Karaca, Mehmet Aydogan, Mehmet Fatih Korkmaz, Yener Erken, Mehmet Tezer

Discussion *6'*

14:30 **Pediatric Deformity** ***Güngör Sami Çakırgil Hall***

Moderators: Burak Akesen, Alihan Derincek

Paper-12 Safety and Efficacy of Apical Resection Following Growth Friendly Instrumentation in Myelomeningocele Patients with Gibbus: Growing Rod vs. Luque-Trolley *6'*
Can Emre Baş, Jonathan Preminger, Zeynep Deniz Olgun, Gökhan Halil Demirkıran, Paul Sponseller, Muharrem Yazıcı

Paper-13 Effects of Frequency of Distraction in Magnetically-Controlled Growing Rod Lengthening on Outcomes and Complications *6'*
Çağlar Yılgör, Gökhan Demirkıran, Kenneth Cheung, Kenny Kwan, Dino Samartzis, John Ferguson, Colin Nnadi, Ilkka Helenius, Muharrem Yazıcı, Behrooz Akbarnia, Ahmet Alanay

Paper-14 The Effects of Dual Growing Rods on the Natural Progress of the Pelvic Incidence in Idiopathic or Idiopathic-Like Early Onset Scoliosis *6'*
Şenol Bekmez, Yunus Atıcı, Halil Gökhan Demirkıran, Aykut Koçyiğit, Muharrem Yazıcı

Discussion *6'*

Paper-15 Sliding-Growing Rod Technique (SGRT) in the Treatment of Early Onset Scoliosis – More Than 2 Years of Follow-up *6'*
Meriç Enercan, Bahadır Gökçen, Sinan Kahraman, Mutlu Çobanoğlu, Sinan Yılar, Amjad Alrashdan, Tunay Sanlı, Erden Ertürer, Çağatay Öztürk, Azmi Hamzaoğlu

Paper-16 Choosing Distal Instrumentation Level in Growing Rod Surgery - Where to Stop? *6'*
Şenol Bekmez, Gökhan Demirkıran, Özgür Dede, Peter Sturm, Muharrem Yazıcı

Paper-17 The Effect of Distal Fusion Level on Pelvic Parameter in Adolescent Idiopathic Scoliosis *6'*
Turgut Akgül, Kerim Sarıyılmaz, Olcay Güler, Murat Korkmaz, Caner Günerbüyük, Okan Özkunt, Fatih Dikici

Paper-18 The Effect of Postoperative Thoracic Kyphosis on Cervical Sagittalalignment after Long Fusions of Lenke Type 3C And 6C Ais Curves *6'*
Hakan Serhat Yanik, İsmail Emre Ketenci, Serdar Demiröz, Fatma Gökel, Ayhan Ulusoy, Şevki Erdem

Discussion *6'*

Paper-19 New Instrumentation Technique for Growing Rod *6'*
Ufuk Aydınlı, Gökhan Kürşat Kara, Osman Yaray, Müren Mutlu

Paper-20 Change in Pelvic Sagittal Parameters with Growth in Surgically Treated Adolescent Idiopathic Scoliosis Patients *6'*
Murat Songür, John Ys Choi, Kenneth Man Chee Cheung

Paper-21 The Effect of Magnetically Controlled Growing Rod on the Sagittal Profile in Early-Onset Scoliosis Patients *6'*
Gökhan Demirkıran, Çağlar Yılgör, Kenneth Cheung, Kenny Kwan, Dino Samartzis, John Ferguson, Colin Nnadi, Ilkka Helenius, Ahmet Alanay, Behrooz Akbarnia, Muharrem Yazıcı

Paper-22 Lowest Instrumented Vertebrae Selection for Posterior Fusion of Lenke 5C Adolescent Idiopathic Scoliosis: Can We Stop the Fusion at Lower-End Vertebra-1? *6'*
İsmail Emre Ketenci, Hakan Serhat Yanık, Ayhan Ulusoy, Serdar Demiröz, Mehmet Soyarslan, Şevki Erdem

Discussion *6'*

14:30 **Non-Degenerative Spinal Conditions** ***Hami Dilek Hall***

Moderators:Murat Songür, Serkan Bilgiç

Paper-23	Mean 2 Years Experiences with a New Titanium Coated Radiolucent TLIF Cage *Mehmet Atıf Erol Aksekili, Lorin Benneker*	*6'*
Paper-24	Clinical Results of Cyberknife Radiosurgery for Spinal Metastases *Sait Şirin, Kaan Oysul, Berat Aral, Hasan Uysal*	*6'*
Paper-25	Benign Spinal Nerve Sheath Tumors *Mehmet Reşid Önen, Evren Yüvrük, Sait Naderi*	*6'*
Paper-26	3D Model Guided Surgery in The Severe Spinal Deformity Group Patients *Erbil Oğuz, Engin Yalçın, Ömer Erşen, Tolga Ege, Serkan Bilgiç, Burak Bilekli, Osman Demir, Ezgi Şahin*	*6'*
	Discussion	*6'*
Paper-27	Local Recurrence and Overall Survival After Surgical Treatment of Sacral Chordoma – An Analysis of Prognostic Variables from AOSpine Tumor Knowledge Forum Primary Spinal Tumor Retrospective Database *Peter Pal Varga, Aron Lazary, Zsolt Szövérfi, Ziya L Gökaslan, Charles G Fisher, Stefano Boriani, Mark B Dekutoski, Dean Chou, Nasir A Quraishi, Michael G Fehlings, Laurence D Rhines*	*6'*
Paper-28	Which Factors Influence the Surgery vs. Non-Surgery Decision for Adult Idiopathic Scoliosis Patients with Gray Zone (40-55°) Main Thoracic Curves? *Çağlar Yılgör, Meriç Enercan, Azmi Hamzaoğlu, Ferran Pellise, Paco Sanchez Perez Grueso, Emre Acaroğlu, İbrahim Obeid, Frank Kleinstück, Ahmet Alanay*	*6'*
	Posterior Vertebral Column Resection for the Treatment of Severe Angular Kyphosis *Yunus Atıcı, Akif Albayrak, Deniz Kargın, Mehmet Bülent Balioğlu, Mehmet Temel Tacal, Muhammed Mert, Mehmet Akif Kaygusuz*	*6'*
	Discussion	*6'*
Paper-29	Impact of Instrumented Single Level Lumbar Surgical Strategies on Quality of Life *Zafer Orkun Toktaş, Murat Şakir Ekşi, Baran Yılmaz, Deniz Konya*	*6'*
	Modification in Surgical Technique for Posterior Vertebral Column Resection *Ufuk Aydınlı, Müren Mutlu, Osman Yaray, Gökhan Kürşat Kara*	*6'*
Paper-30	Fusionless Percutaneous Pedicle Fixation of Degenerative Spinal Instability in Patients with Associated Co-Morbidities *Adem Çatak, Esat Kıter, Nusret Ök, Harun Güngör*	*6'*
	Discussion	*5'*

Coffee Break

Paper-31

Paper-32

16:00

16:30 **Session 3** **Pediatric Deformity**

Moderators: Azmi Hamzaoğlu, Esat Kıter

Growth friendly techniques for Early Onset Scoliosis

Growth Modulation in Adolescent Idiopathic Scoliosis

Evolution of sagittal plane during childhood: What is the normal, Normal is the best?

Management of Congenital spine deformities
Neurosurgical management of associated intraspinal pathology
Discussion

Debate AIS – Thoracic (Lenke 1C) Curve: Full Coronal Correction?

Moderator: Can Koşay

Case presentation
Full Correction is desirable
Full Correction is not desirable
Rebuttal

18:30	**End of day 1**
	Discussion

19:00 **Welcome reception/Photography exhibition**

Ahmet Münir Sarpyener Hall

Muharrem Yazıcı	**15'**
Amer Samdani	**15'**
Muharrem Yazıcı	**15'**
Murat Bezer	**15'**
Amer Samdani	**15'**
	10'

Can Koşay	**5'**
H. Mustafa Özdemir	**10'**
Erhan Sesli	**10'**
	5'
	10'

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07:00	Registration open		
08:30	**EUROSPINE SYMPOSIUM Cervical Trauma**	***Ahmet Münir Sarpyener Hall***	
	Moderators: Serdar Kahraman Phillip Sell		
	Traumatic spondylolysis of the axis	*Matti Scholz*	**15'**
	Traumatic injury of the vertebral artery – when to think about and what to do about Upper c-spine fractures in the pediatric patient Discussion Debate: Pro/Con C2 peg fracture fixation in the geriatric patient	*F. Cumhur Öner* *Kadir Kotil*	**15'** **10'** **10'**
	Case discussions: case presenter Thomas Blattert Upper cervical spine and stiff cervical spine	*Pro: C. Kılınçer Contra: P. Sell*	**30'** **25'**
	Presentation: Lower cervical spine including new AO-classification	*Blattert, Kotil, Öner, Kandziora, Sell*	
10:30		*Matti Scholz*	**15'**
11:00	**Coffee Break**		**30'**
	EUROSPINE SYMPOSIUM Complication avoidance and Patient safety		
	Moderators: Haluk Berk, Esat Kıter		
	My latest vascular complication		**15'**
	My latest implant failure	*Thomas Blattert*	**15'**
	My latest postop. infection complication	*Matti Scholz*	**15'**
	When signals go in surgery	*F. Cumhur Öner*	**15'**
12:30	Concluding lecture: Science of safety in spine surgery Discussion	*Phillip Sell* *Phillip Sell*	**15'** **15'**
13:50	**Lunch Symposium**		**80'**
	Keynote Lectures	***Ahmet Münir Sarpyener Hall***	
	Moderator: Çağatay Öztürk		
	Evidence in Spine Surgery: is there a problem? New fracture classification; What is new?	*F. Cumhur Öner* **15'** *Matti Scholz* **15'**	
	Discussion		**10'**
14:30	**Best of Show**	***Ahmet Münir Sarpyener Hall***	

Moderators: Tarık Yazar, Halil İbrahim Seçer

Paper-33 A Simple Examination Method for Evaluation of the Curve Flexibility: Modified Adam's Forward Bending Test 6'

Alpaslan Şenköylü, Necdet Altun, Mustafa İlhan, Kenneth Cheung, Erdem Aktaş, Keith Luk

Paper-34 Vitamin D Deficiency in Patients with Idiopathic Scoliosis: Something to Worry About? 6'

Mehmet Bülent Balioğlu, Akif Albayrak, Yunus Atıcı, Deniz Kargın, Süleyman Kasım Taş, Mehmet Akif Kaygusuz

Paper-35 Proximal Junctional Screw Pullout After Long Thoracolumbar Posterior Fusions for Adult Spinal Surgery: When Is Revision Required? 6'

Altuğ Yücekul, Halil Gökhan Demirkıran, Alexander Theologis, Murat Ekşi, Murat Pekmezci, Shane Burch, Sigurd Berven, Bobby Tay, Dean Chou, Praveen Mummaneni, Christopher Ames, Vedat Deviren

Paper-36 Evaluation of Safety and Efficacy of a New Interbody Fusion Device Using a Sheep Model 6'
Çağatay Öztürk, Bahadır Gökçen, Erden Ertürer, Yalçın Devecioğlu
Discussion *8'*

Paper-37 Traction X-Ray Under General Anesthesia (TRUGA): Does It Change the Upper And Lower Fusion Levels Selected Before Surgery? 6'
Sinan Kahraman, Meriç Enercan, Tunay Sanlı, Mutlu Çobanoğlu, Sinan Yılar, Bahadır Gökçen, Çağatay Öztürk, Azmi Hamzaoğlu

Paper-38 The Effects of Adult Spinal Deformity Surgery on Total Hip Arthroplasty Acetabular Component Position 6'
Altuğ Yücekul, Jeff Barry, Halil Gökhan Demirkıran, Murat Ekşi, Jun Mizutani, Murat Pekmezci, Erik Hansen, Christopher Ames, Vedat Deviren

Paper-39 Fixation of Dens Axis Fractures Alonzo II in the Old Age Through A Percutaneous Transarticular C1/C2 Screw Arthrodesis. Outcome and Pittfalls 6'
Rene Claus Michael Grass

Paper-40 Urological Improvements After Surgical Release in Patients with Secondary Tethered Cord Syndrome 6'
Veli Çıtışlı, Murat Kocaoğlu, Erdal Coşkun, Esat Kıter, Nusret Ök
Discussion *8'*

Paper-41 Does Pedicule Screw Fixation Under Age Five Cause Spinal Canal Narrowing? A Ct Study with Minimum 5 Years Follow-up 6'
Sinan Kahraman, Meriç Enercan, Mutlu Çobanoğlu, Sinan Yılar, Ayhan Mutlu, Levent Ulusoy, Tunay Sanlı, Bahadır Gökçen, Erden Ertürer, Çağatay Öztürk, Azmi Hamzaoğlu

Paper-42 Which Radiologic Parameters Are Associated with Disc and Facet Degeneration in the Lumbar Curve After Selective Thoracic Fusion in Ais: An Mri Study with Minimum 10 Years Follow-up 6'
Sinan Kahraman, Meriç Enercan, Mutlu Çobanoğlu, Sinan Yılar, Ayhan Mutlu, Levent Ulusoy, Tunay Sanlı, Bahadır Gökçen, Çağatay Öztürk, Ufuk Talu, Azmi Hamzaoğlu

Paper-43 Global Tilt: A Single Parameter Incorporating the Spinal and Pelvic Parameters Correlates with Health-Related Quality of Life Parameters 6'
Çağlar Yılgör, Meriç Enercan, Azmi Hamzaoğlu, Ferran Pellise, Francisco Javier Perez Grueso, Emre Acaroğlu, Ibrahim Obeid, Frank Kleinstück, Ahmet Alanay
Discussion *6'*

16:00	**Coffee Break**			**30'**
16:30	**Session 4**	**Spinal Tumors**	***Ahmet Münir Sarpyener Hall***	
	Moderators: Ömer Akçalı,Uygur Er			
	Classifications and scores for metastatic tumors		*Stefano Boriani*	**10'**
	Surgical treatment of metastatic tumours		*Stefano Boriani*	**15'**
	MIS in tumour surgery		*Hakan Bozkuş*	**15'**
	Radiosurgery in metastatic Spinal tumours		*Sait Şirin*	**10'**
	Discussion			**15'**
17:35	***Moderators: Stefano Boriani, Mehmet Akif Kaygusuz***			
	Case discussion- Metastatic tumor with neurology		*Faculty (SB, HB, SŞ, PPV)*	**25'**
	Discussion			**10'**
	Primary tumors of spine (including sacrum)		*Peter Paul Varga*	**20'**
18:30	**End of day 2**			
20:00	**Gala Dinner**			

02 May 2015

08:30	**Session 5** **Degenerative Spine Conditions**	***Ahmet Münir Sarpyener Hall***	
	Moderators: Serdar Özgen, Erdinç Civelek		
	Craniocervical pathologies: surgical strategy	*Kamil Sucu*	**15'**
	Key hole foraminotomy; motion preservation	*Suat Canbay*	**10'**
	Debate Cervical Myelopathy		
	Cervical myelopathy: I would go anterior	Erdal Coşkun	**10'**
	Cervical myelopathy: I would go posterior	Mehmet Aydoğan	**10'**
	Discussion		**10'**
	Moderators: Metin Özalay, Kamil Çağrı Köse		
	State of the art in sagittal ballance		**10'**
	Adult deformity in parkinson disease	Mehmet Bülent Balioğlu	**15'**
	Adult spinal deformity with stenosis	Ufuk Aydınlı	**15'**
	Tandem spinal stenosis	Vedat Deviren	**15'**
	Discussion	Murat Hancı	**10'**
	Coffee Break		**30'**
	Session 6 **Spinal Infection**	***Ahmet Münir Sarpyener Hall***	
10:30	***Moderators: Şevki Erdem, Bayram Çırak***		
11:00	Radiology and differential diagnosis in Spinal infections		**15'**
	Surgical site infections	*Dinç Özaksoy*	**15'**
	Spinal infection multidisciplinary management	*Vedat Deviren*	**15'**
	Management of spinal tuberculosis in Europe	*Stefano Boriani*	**15'**
	Antibiotic treatment in vertebral osteomyelitis: State of the art	*Phillip Sell*	**15'**
	Discussion	*Bilgül Mete*	**15'**
	Lunch Symposium		**80'**
	Keynote Lectures	***Ahmet Münir Sarpyener Hall***	
12:30	***Moderator: Serdar Kahraman***		
13:50	Is it malpractice or complication?	*Erdal Kalkan*	**15'**
	Management of Bleeding in Spinal Surgery	*Hakan Sabuncuoğlu*	**15'**
	Discussion		**10'**
	Free Papers		
14:30	**Cervical Diseases and Basic Science**	***Ahmet Münir Sarpyener Hall***	
	Moderators: Fatih Dikici, Mevci Özdemir		

Paper-44 Posterior Keyhole Foraminotomy for the Treatment of Cervical Radiculopathy *6'*
Zafer Orkun Toktaş, Orkun Koban, Baran Yılmaz, Deniz Konya

Paper-45 Radiological and Clinical Outcome of the Operated and Adjacent Segments Following M-6 Cervical Arthroplasty After a Minimum 18-Month Follow-up: A Single Surgeon Experience *6'*
Sinan Karaca, Mehmet Nuri Erdem, Mehmet Aydoğan, Mehmet Fatih Korkmaz, Selim Muğrabi, Mehmet Tezer

Paper-46 Biomechanical Comparison of Traditional Iliac Screw Fixation Versus Distal Iliac Screw (Dis) Fixation: A Cadaveric Study *6'*
Meriç Enercan, Mutlu Çobanoğlu, Sinan Kahraman, Sinan Yılar, Bahadır Gökçen, Erden Ertürer, Çağatay Öztürk, Azmi Hamzaoğlu

Paper-47 Evaluation of Human Bone Marrow-Mscs Transplantation in Experimental Spinal Cord Injury *6'*
Serhat Cömert, Erkin Sönmez, Serdar Kabataş, Fikret Şahintürk, Nur Altınörs

Discussion *6'*

Paper-48 The Dosimetric Impact of Mplants on the Spinal Cord Dose During Stereotactic Body Radiotherapy *6'*
Gözde Yazıcı, Sezin Yüce Sarı, Fazlı Yağız Yedekçi, Altuğ Yücekul, Sümeyra Duru Birgi, Gökhan Halil Demirkıran, Melis Gültekin, Pervin Hurmuz, Muharrem Yazıcı, Gökhan Özyiğit, Mustafa Cengiz

Paper-49 5-Year Scientific Report of Turkish Spine Society. *6'*
Ömer Erşen, Şafak Ekinci, Serkan Bilgiç, Erbil Oğuz, Serdar Kahraman

Paper-50 Thoracic Spine Growth Re-Visited: How Accurate Is the Dimeglio Data? *6'*
Gökhan Halil Demirkıran, Kadir Büyükdoğan, Özgür Dede, Erhan Akpınar, Muharrem Yazıcı

Paper-51 Fear of Undergoing Spine Surgery *6'*
Ahmed Hany Mohamed Tawfik Elhessy, Abdul Moeen Baco, Malik Shakil, Hazem Mohamed Nasef

Discussion *6'*

Paper-52 Reliability of Surgeon Dependent Agreement of Classification and Treatment Planning in Adolescent Idiopathic Scoliosis *6'*
Tolgahan Kara, Sait Akar, Safa Satoğlu, Ahmet Karakaşlı, Can Koşay, Ömer Akçalı, Haluk Berk

Paper-53 Cognitive Impairment Following Adult Spinal Deformity Surgery *6'*
Vugar Nabiyev, Selim Ayhan, Selcen Yüksel, Montse Domingo Sabat, Ferran Pellise, Ahmet Alanay, Francisco Javier Sanchez Perez Grueso, Frank Kleinstück, Ibrahim Obeid, Emre Acaroglu,

Paper-54 Development of Symptomatic and Radiographical Adjacent-Level Degeneration in Patients with or without Anterior Cervical Plate and Fusion *6'*
Serkan Erkan, Koray Tosyalı, Taçkın Özalp, Hüseyin Yercan, Güvenir Okçu

Paper-55 A Detailed Analysis of the Etiology of Neck and/or Shoulder Pain in Patients with Cervical Spondylotic Myelopathy Based on The Postoperative Change in the Region and Properties of the Pain *6'*
Yuto Ogawa, Osahiko Tsuji

Discussion *6'*

14:30 **Adult Deformity** ***Güngör Sami Çakırgil Hall***

Moderators: Erbil Oğuz, Gökhan Demirkıran

Paper-56 Multiple Regression Analysis of Factors Affecting the Mental Component Score Constituents of SF-36 in Adult Spinal Deformity *6'*
Selim Ayhan, Selcen Yüksel, Aslı Niyazi, Vugar Nabiyev, Ümit Özgür Güler, Montse Domingo Sabat, Ferran Pellise, Ahmet Alanay, Francisco Javier Sanchez Perez Grueso, Frank Kleinstück, Ibrahim Obeid, Emre Acaroğlu

Paper-57 The Effect of Fusion Level on the Radiologic and Functional Outcomes in the Surgical Treatment of Adult Deformity in Patients Older Than 65 Years-Old *6'*
Erden Ertürer, Sinan Yılar, Bahadır Gökçen, Sinan Kahraman, Mutlu Çobanoğlu, Meriç Enercan, Tunay Sanlı, Çağatay Öztürk, Mercan Sarıer, Azmi Hamzaoğlu

Paper-58 Posterior Vertebral Column Resection (PVCR) for the Management of Sharp Angular Kyphotic Deformity in Adult Population *6'*
Bahadır Gökçen, Meriç Enercan, Sinan Kahraman, Sinan Yılar, Mutlu Çobanoğlu, Amjad Alrashdan, Tunay Sanlı, Erden Ertürer, Çağatay Öztürk, Mercan Sarıer, Azmi Hamzaoglu

Paper-59 Distal Iliac Screw (DIS) Fixation Technique: An Alternative Iliopelvic Fixation Technique in Adult Deformity Surgery *6'*

Meriç Enercan, Sinan Kahraman, Bahadır Gökçen, Sinan Yılar, Mutlu Çobanoğlu, Tunay Sanlı, Amjad Alrashdan, Erden Ertürer, Çağatay Öztürk, Azmi Hamzaoğlu

Discussion 6'

Paper-60 Identifying the Best Treatment in Adult Spinal Deformity: A Decision Analysis Approach 6'
Emre Acaroğlu, Aysun Çetinyürek Yavuz, Ümit Özgür Güler, Selcen Yüksel, Yasemin Yavuz, Selim Ayhan, Montse Domingo Sabat, Ferran Pellise, Francisco Javier Sanchez Perez Grueso, Ahmet Alanay, Ibrahim Obeid, Frank Kleinstück

Paper-61 Comparison of Changes at Sacropelvic Junction After Surgical Treatment of Short Segment Kyphosis with Sharp Angle (Angular) and Scheuermann Kyphosis 6'
Olcay Güler, Turgut Akgül, Murat Korkmaz, Caner Günerbüyük, Fatih Dikici, Ufuk Talu, Kerim Sarıyılmaz

Paper-62 Are We Planning the Same? How Does the Classification and Surgical Planning Is Affected when Discussed 4 Weeks Apart? 6'
Tolgahan Kara, Mehmet Sait Akar, Safa Satoğlu, Ahmet Karakaşlı, Ömer Akçalı, Can Koşay, Haluk Berk

Paper-63 Mental Health and Self Image Perception of Non-Disabled Adult Idiopathic Scoliosis Patients Having Mild to Moderate Curves Compared to Normal Population 6'
Çağlar Yılgör, Meriç Enercan, Azmi Hamzaoğlu, Ferran Pellise, Francisco Javier Perez Grueso, Emre Acaroğlu, Ibrahim Obeid, Frank Kleinstück, Ahmet Alanay

Discussion 6'

Paper-64 Paraspinal Muscles and Sagittal Spinopelvic Alignment in Patients with Degenerative Spondylolisthesis 6'
Sibel Demir Deviren, Emel Ece Özcan Ekşi, İrem Kapucu, Murat Pekmezci, Murat Şakir Ekşi, Bobby Tay, Sigurd Berven, Shane Burch, Vedat Deviren

Paper-65 Effect of Treatment Complications on the Outcomes in Adult Spinal Deformity: A Decision Analysis Approach 6'
Emre Acaroğlu, Ümit Özgür Güler, Aysun Çetinyürek Yavuz, Selcen Yüksel, Yasemin Yavuz, Selim Ayhan, Montse Domingo Sabat, Ferran Pellise, Francisco Sanchez Perez Grueso, Ahmet Alanay, Ibrahim Obeid, Frank Kleinstück

Paper-66 How Reliable Is the Surgeon's Ability to Differentiate Between Idiopathic and Degenerative Deformity in Adults; What Parameters Help Them Decide? 6'
Emre Acaroğlu, Ümit Özgür Güler, Selim Ayhan, Montse Domingo Sabat, Ferran Pellise, Francisco Javier Sanchez Perez Grueso, Ahmet Alanay, Ibrahim Obeid, Frank Kleinstück

Paper-67 Efficiency of Intraoperative Halo-Femoral Traction for the Treatment of Scoliosis Over 70 Degrees 6'
Mehmet Nuri Erdem, Sinan Karaca, Mehmet Aydoğan, Mehmet Fatih Korkmaz, Selim Muğrabi, Mehmet Tezer

Discussion 6'

14:30 **Spinal Trauma** ***Mim Kemal Öke Hall***

Moderators:Serdar Akalın,Mutlu Çobanoğlu

Paper-68 Metallurgical Analysis of Broken Pedicle Screws 6'
Evren Yüvrük, Mehmet Reşid Önen, Cem Bülent Üstündağ, Sait Naderi

Paper-69 Towards Developing a Specific Outcome Instrument for Spine Trauma - An Empirical Cross-Sectional Multicenter ICF-Based Study by the AOSpine Knowledge Forum Trauma 6'
Said Sadigi, Mechteld Lehr, Cumhur Öner, AOSpine Knowledge Forum Trauma

Paper-70 Towards the Development of an International Disease Specific Outcome Instrument for Spine Trauma – Results of an International Consensus Meeting 6'
Said Sadigi, Mechteld Lehr, Cumhur Öner, AOSpine Knowledge Forum Trauma

Paper-71 The Value of Bone Biopsy During Percutaneous Vertebroplasty in Treatment of Presumed Osteoporotic *Vertebral Compression Fractures* 6'
Bahadır Gökçen, Meriç Enercan, Sinan Kahraman, Sinan Yılar, Mutlu Çobanoğlu, Erden Ertürer, Çağatay Öztürk, Azmi Hamzaoğlu

Discussion 6'

Paper-72 Towards the Development of an Outcome Instrument for Spine Trauma – An International Survey of Spinal 6'

Surgeons
Said Sadiqi, Mechteld Lehr, Cumhur Öner, AOSpine Knowledge Forum Trauma

Paper-73 Does the Minimal Invasive Dorsal Stabilization Technique in Spinal Fracture Fixation Affect the Ligamento- *6'*
Muscular-Stabilizing System of the Spine? An EMG Consideration of the Supraspinous Ligament-Muscular
Reflex
Rene Claus Michael Grass, Jaroslaw Pyrc

Paper-74 The Efficacy of Percutaneous Vertebroplasty and Kyphoplasty in Osteoporotic Vertebral Body Fractures: *6'*
A Comparative Study
Evren Yüvrük, Arif Tarkan Çalışaneller, Mehmet Reşid Önen, Sait Naderi
Discussion *6'*

Paper-75 Comparison of Two Segment Combined Spinal Fusion versus Three Segment Posterior Spinal Fusion in *6'*
Thoracolumbar Burst Fractures; A Randomized Clinical Trial with 10 Years Follow-up
Özkan Köse, Nazir Cihangir İslam, Gürkan Gümuşsuyu, Mutlu Güngör

Paper-76 Does the Location of Cement in the Vertebral Body Affect Disc Degeneration After Prophylactic *6'*
Vertebroplasty? An MRI Study
Sinan Kahraman, Meriç Enercan, Mutlu Çobanoğlu, Sinan Yılar, Ayhan Mutlu, Levent Ulusoy, Bahadır Gökçen, Tunay Sanlı, Erden Ertürer, Çağatay Öztürk, Azmi Hamzaoğlu

Paper-77 Proximal Junctional Vertebral Fractures After Adult Deformity Surgery. Which Are Neglected? Which *6'*
Necessitate Operation?
Altuğ Yücekul, Halil Gökhan Demirkıran, Murat Şakir, Alexander Theologis, Murat Pekmezci, Shane Burch, Sigurd Berven, Bobby Tay, Dean Chou, Praveen Mummaneni, Christopher Ames, Vedat Deviren

Paper-78 The Relationship Between Posterior Ligamantous Complex and the Force Required for the Occurrence *6'* of
Vertebral Fracture – A Biomechanical Study
Abdullah Merter, Tarık Yazar
Discussion *6'*

16:00	**Coffee Break**		**30'**
16:30	**Session 7**	**Spinal Trauma**	***Ahmet Münir Sarpyener Hall***
	Moderators: Cüneyt Şar, Cem Atabey		
	Spinal Fractures: Damage control approach in polytrauma.		**15'**
	State of art treatment in spinal cord injury	*F. Cumhur Öner*	**15'**
	MIS in thoracolumbar trauma	*Bayram Çırak*	**15'**
	Discussion	*Thomas Blattert*	**10'**
	Moderators: Emin Alıcı, Halil İbrahim Seçer		
	Management of multiple fractures in Toracolumbar spine		**10'**
	How to manage sacrum fractures with neurological injury	*Necdet Altun*	**10'**
	Discussion	*Yetkin Söyüncü*	**5'**
	Debate Toracolumbar Junction Fractures		
	Anterior support in TL junctional fractures: YES always	*Mehmet Tezer*	**10'**
	Anterior support in TL junctional fractures: Not necessarily	*Ender Ofluoğlu*	**10'**
	Discussion		**10'**
18:30	Closing Remarks		

End of day 3

1 Ulusal Omurga Cerrahisi Hemşireliği Sempozyumu

türkomurga

2 Mayıs 2015 Sheraton Hotel Çeşme - İzmir

SEMPOZYUM BAŞKANI

Yard. Doç. Dr. Özlem Bilik

Prof. Dr. Güler Aksoy
Prof. Dr. Neriman Akyolcu
Prof. Dr. Fatma Eti Aslan
Prof. Dr. Nurhan Bayraktar
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Doç. Dr. Ayla Akkaş Gürsoy
Prof. Dr. Sevgi Hatipoğlu
Prof. Dr. Nevin Kanan
Doç. Dr. Mevlüde Karadağ
Doç. Dr. Özgül Karayurt

1

Yard. Doç. Dr. Aklime Dicle Prof. Dr. Nedime Köşgeroğlu

Araş. Gör. Ayşegül Savcı
Araş. Gör. Hale Turhan Damar
Hem. Selviye Sertkaya
Yük. Hemş. Zerrin Ataman

EMPOZYUM DÜZENLEME KURUL

Yard. Doç. Dr. Özlem Bilik
Hemş. Sevil Cin
Hemş. Gülay Çörekçi
Ar. Gör. Hale Turhan Damar
Yük. Hemş. Saliha Özdöker
Hemş. Gülay Gökmen
Doç. Dr. Özgül Karayurt
Araş. Gör. Ayşegül Savcı
Hemş. Selviye Sertkaya
Hemş. Nihal Sirkeci
Hemş. Özgül Vatansever

SEMPOZYUM BİLİMSEL KURULU

Ulusal Omurga Cerrahisi Hemşireliği Sempozyumu

türkomurga

2 Mayıs 2015 Sheraton Hotel Çeşme - İzmir

HEMŞİRELİK BİLİMSEL PROGRAM

02 Mayıs 2015
Hami Dilek Hall

09.00-09.20	**Açılış Konuşmaları**

1

Yard. Doç. Dr. Özlem Bilik

1. Ulusal Omurga Cerrahisi Hemşireliği Sempozyumu Başkanı *Saliha Özdöker*

Dokuz Eylül Üniversitesi Hastanesi Hemşirelik Hizmetleri Müdürü
Prof. Dr. Haluk Berk
11. Uluslararası Türk Omurga Kongresi Başkanı

09.20-10.20	**Panel 1**
	Oturum Başkanları: Doç. Dr. Özgül Karayurt, Saliha Özdöker
	Omurga Cerrahisinde Ameliyathane Hemşiresinin Rol ve Sorumlulukları
	Omurga Cerrahisinde Hastanın Ameliyathanedeki Hazırlığı *Yaprak Kırmızı*
	Omurga Cerrahisinde Steril Alan Oluşturma ve Koruma Yöntemleri *Nihal Sirkeci*
	Omurga Cerrahisinde Ameliyat Sonrası Hemşirenin Rol ve Sorumlulukları *Hülya Selçuk*
10.20-10.30	**Kahve Arası**
10.30-11.00	**Konferans 1**
	Oturum Başkanı: Prof. Dr. Sevgi Hatipoğlu
	Omurga Travması ve Cerrahisinde Hemşirenin Rolü *Prof. Dr. Fatma Eti Aslan*
11.00-12.00	**Panel 2**
	Oturum Başkanları: Prof. Dr. Meryem Yavuz, Vildan Tanıl
	Omurga Cerrahisinde Hasta ve Çalışan Güvenliği
	Omurga Cerrahisinde Hasta Güvenliği *Doç. Dr. Hayriye Ünlü*
	Patient Safety in Spine Surgery *Phillip Sell, Eurospine Past President*
	Omurga Cerrahisinde Çalışan Güvenliği *Doç. Dr. Filiz Öğce*
12.00-13.10	**Öğle Yemeği**

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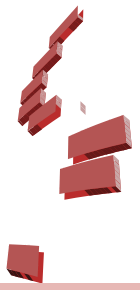


13.10-14.10	**Panel 3**
	Oturum Başkanları: Doç. Dr. Hayriye Ünlü, Sevil Cin
	Omurga Cerrahisinde Hemşiresinin Rol ve Sorumlulukları
	Omurga Cerrahisinde Ameliyat Öncesi Hemşirelik Bakımı *Banu Deniz*
	Omurga Cerrahisinde Ameliyat Sonrası Hemşirelik Bakımı *Selviye Kurtalan*
	Omurga Cerrahisinde Taburculuk Eğitimi ve Evde Bakımda Hemşirenin Rolü *Doç. Dr. Emel Yılmaz*
14.10-15.10	**Panel 4**
	Oturum Başkanları: Prof. Dr. Deniz Şelimen, Zerrin Ataman
	Omurga Cerrahisi Hemşireliğinde Güncel Yaklaşımlar
	Omurga Cerrahisinde Enfeksiyonun Önlenmesinde Kanıta Dayalı Hemşirelik Uygulamaları *Yard. Doç. Dr. Gülay Oyur Çelik*
	Omurga Cerrahisinde Derin Ven Trombozunun Önlenmesinde Kanıta Dayalı Hemşirelik Uygulamaları *Yard. Doç. Dr. Özlem Bilik*
	Omurga Cerrahisinde Yara Bakımında Kanıta Dayalı Hemşirelik Uygulamaları *Yard. Doç. Dr. Nurdan Gezer*
15.10-15.30	**Kahve Arası**
15.30-16.40	**Sözel Bildiri Oturumu**
	Oturum Başkanları: Yard. Doç. Dr. Özlem Bilik, Özgül Vatansever
16.40-17.00	**Sempozyum Değerlendirme ve Kapanış**

11th International Turkish Spine Congress

In memory of Prof. Dr. Hakan Caner

29 April - 3 May 2015 Sheraton Hotel Çeşme - İzmir

ORAL PRESENTATIONS

Paper-1

Long Term Clinical Outcomes of Incidental Dural Tears During Lumbar Microdiscectomy

Uzay Erdoğan, Ali Ender Ofluoğlu, Ahmet Kayhan

Bakırköy Research and Training Hospital for Neurology, Neurosurgery and Psychiatry, Neurosurgery Clinic, İstanbul, Turkey

An incidental durotomy (dural tear) is one of the most common intraoperative complications in lumbar spine surgery. The effect of a durotomy on long-term outcomes is, however, controversial. The purpose of this study was to report incidence of durotomy and patient outcomes.

We retrospectively reviewed 5084 consecutive cases involving patients (2412 women and 2672 men; mean age 54 years; age range 21–86 years) who underwent a surgical procedure for treatment of lumbar disc herniation disease at their institution between 2004 and 2013. The mean duration of follow-up among all of the intervertebral disc herniation patients whose data were analyzed was 124 ± 9 months. Postoperative clinical outcome were assessed with visual analog scale (VAS) for back pain and leg pain scores and Oswestry Disability Index (ODI)

A total of 5084 patients underwent first-time lumbar discectomy. There was an incidental durotomy in 184 (3.61%) of these cases. Which is sufficient documentation of 82 patients were included in the study. There were no significant differences between the durotomy and no-durotomy groups with respect to age, sex, race, body mass index, herniation level or type, or the prevalence of smoking, diabetes, or hypertension. However, there were no significant differences in incidence rates for nerve root injury, postoperative mortality, additional surgeries, Postoperative ODI (%) durotomy groups 12.6 (0-40.0) and no durotomy groups 8.4 (0-36.0) Postoperative VAS durotomy groups 2.8 (1-6), no durotomy groups 3.0 (1-7).

When outcome differences between the groups were analyzed, the durotomy group was found to have significantly increased operative duration, operative blood loss, and length of inpatient stay. There were no significant differences in the improvement of the Oswestry Disability Index and visual analog scale between the two groups.

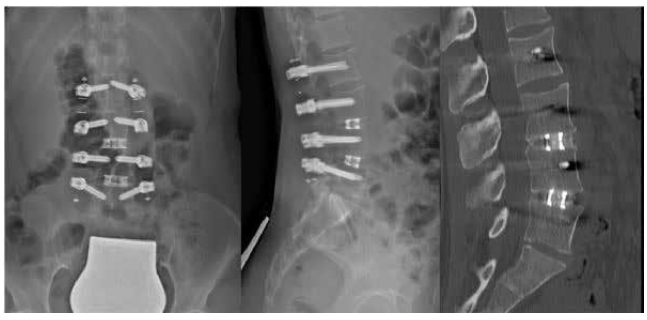
Paper-2

Clinical Results of Dynamic Stabilization Adjacent to Fusion Level: A New Lumbar Hybrid Instrumentation

Meriç Enercan[1], Bahadır Gökçen[2], Sinan Kahraman[2], Mutlu Çobanoğlu[3], Sinan Yılar[4], Tunay Sanlı[1], Amjad Alrashdan[1], Erden Ertürer[2], Çağatay Öztürk[2], Azmi Hamzaoğlu[1]

portion made of silicone pad aiming motion preservation and fusion portion is entirely made of PEEK. The aim of this study is to evaluate the efficiency of dynamic portion of the PEEK rod system in preventing adjacent level problems in the surgical treatment of multilevel lumbar degenerative disease. 54 patients (28F,26M),mean age 48,2 years(26-65) with 84 levels of TLIF's with more than 2 years of follow-up were reviewed retrospectively. All surgeries were performed using with CD HORIZON BalanC Spinal system. Preop, postop AP/L x-rays were measured for pelvic and sagittal parameters.Disc angles, ROM, anterior disc height (ADH) and posterior disc height (PDH) were measured for adjacent (AL) and supraadjacent (SAL) levels. All patients were evaluated with EOS images,dynamic x-rays and 3D CT scan at the final follow-up. Clinical evaluation was done with ODI and VAS.

Mean follow-up was 26,3 months (24-38). Average instrumented levels was 3,33 (2-5) and average fused levels was 1,66(1-3). TLIF's were at L5-S1 in 42 patients, L4-5 in 35 patients, L3-4 in 6 patients and L2-3 in 1 patient. TLIF's were single level in 10, 2 levels in 28 and 3 levels in 6 patients. Preop lumbar lordosis was restored to 42.7° and 49.3°at final follow-up. There were no significant differences in ADH, PDH and disc angles between preop and follow-up for adjacent and supraadjacent levels. Preop average ROM for supraadjacent level of 5,85° changed to 6.57°. Preop average ROM of 6,72° was decreased to 5,07° at adjacent level with a limitation of 24,6% postoperatively.3D CT evaluation revealed solid fusions for all TLIF levels. Mean of 43,51% ODI was improved to 18,93 and preop VAS score 7,2 was improved to 2,2. New hybrid lumbar instrumentation with PEEK rod system is effective in the treatment of multilevel degenerative lumbar disc disease. Dynamic portion of the hybrid system limits ROM by 24.6% at adjacent level. Adjacent and supraadjacent levels did not demonstrate any significant facet or disc degeneration at the end of minimum 2 years follow-up.



Hybrid instrumentation. CT scan demonstrated fusion at TLIF levels.

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[2] Department of Orthopaedics and Traumatology, İstanbul Bilim University, İstanbul, Turkey
[3] Department of Orthopaedics and Traumatology, Adnan Menderes University Faculty of Medicine
[4] Department of Orthopaedics and Traumatology, Erzurum Atatürk University Faculty of Medicine

Table

		Preoperative (°) Mean ± SD	Postoperative (°) Mean ± SD
Supra Adjacent Level	Flexion	2.29 ± 1.64	2.5 ± 2.73
	Neutral	6.88 ± 3.16	8.06 ± 3.63
	Extension	8.14 ± 2.91	9.07 ± 3.71
	ROM	5.85 ± 1.27	6.57 ± 0.98
Adjacent Level (Dynamic)	Flexion	3.14 ± 2.2	1.64 ± 2.67
	Neutral	8.94 ± 4.23	5.41 ± 2.87
	Extension	9.86 ± 4.11	6.71 ± 3.4
	ROM	6.72 ± 1.91	5.07 ± 0.73

ROM: Range of Motion

Paper-3
Effect of Platelet-Rich Plasma upon Epidural Fibrosis in Rats: Experimental Study

Serkan Güler[5], Ömer Akçalı[6], Baran Şen[3], Serap Cilaker Mıçılı[4], Namık Kemal Şanlı[5]

[1]Aksaray State Hospital, Orthopedics Clinic, Aksaray, Turkey
[2]Dokuz Eylül University Hospital, Department of Orthopedics and Traumatology, Izmir, Turkey
[3]Aliağa State Hospital, Orthopedics Clinic, İzmir,Turkey
[4]Dokuz Eylül University Hospital, Department of Histology and Embryology, İzmir, Turkey
[5]Dokuz Eylül University Hospital, Department of Hematology and Oncology, İzmir, Turkey

The cause of the recurring or ongoing symptoms after laminectomy may be the fibrosis. Clinically, it is not easy to treat the patients suffered from epidural fibrosis. For this reason, preventive measures of epidural fibrosis are more important than the treatment methods. The aim of this study is to compare the effect of Platelet Rich Plasma (PRP) on the development of epidural fibrosis with collagen dural matrix and free autogenous fat graft, thus to introduce a material obtained from the own blood of the patient as a treatment option in routine use, which is inexpensive, effective as well as having no side effects.

Wistar Albino type adult male rats of 250-300grams of weight were separated into 3 groups. Laminectomy was implemented on the rats and epidural fat pad was placed in the first group (n:7); equal size (4x2.5mm) of collagen dural matrix (DuraGen PlusTM) was applied in the second group (n:7); and single dose (1,5 cc) of PRP was applied in the third group (n:7). Rats were sacrificed after 4 weeks. Histological evaluation at laminectomy field was performed by a light microscope, by a unique histologist who was blinded to the groups. The grading scale of He et.al. was utilized for epidural fibrosis evaluation. Results were statistically analyzed with Kruskal Wallis and Mann Whitney-U tests.

Adjacent segment degeneration is a common (34%) problem following posterior spinal fusions in long term follow-up. We have been using a new hybrid design which has a dynamic

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[6] Technische Universität Hamburg-Harburg, Institut für Biomechanik, Hamburg, Germany [3]Universitätsklinikum Hamburg-Eppendorf, Institut für Rechtsmedizin, Hamburg, Germany

A biomechanical study.

The development or progression of an adjacent segment disease

It was determined that fibrosis was more prominent in collagen dural matrix group with respect to the PRP group. This difference between PRP and collagen matrix was statistically significant ($p<0.05$). Although grading of fibrosis was statistically similar between free fat flap and PRP groups, histological observations has been revealed that fibrosis development was mildly less in PRP group.

In order to prevent epidural fibrosis, epidural PRP application may lead to less fibrosis in comparison to collagen matrix. Production cost as well as the possibility of autogenous production in humans, can be considered as prominent advantages. However, these histologic findings should be evaluated with larger number of animal studies.

Paper-4

Adjacent Segment Disease and "Topping-Off": A Biomechanical Evaluation of Two Different Types of Hybrid Instrumentations and Their Effects on Adjacent Segments

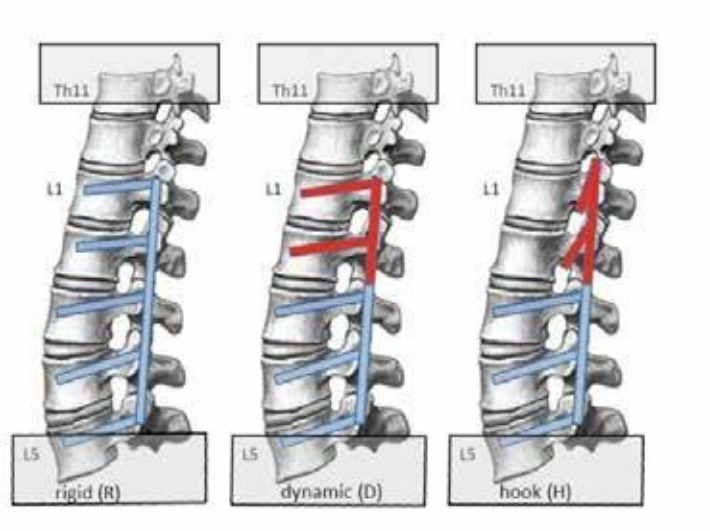
Hüseyin Übeyli[1], Peter Obid[1], Reza Danyali[2], Gerd Hubert[2], Michael Reichl[1], Alexander Richter[1], Michael Morlock[2], Klaus Püschel[3], Thomas Niemeyer[1]

(ASD) after spinal stabilization and fusion has been described widely and is seen as a major problem in spinal surgery today. Besides an optimal balancing of the sagittal profile a dynamic instrumentation is an often suggested procedure to prevent or slow down ASD. In a hybrid instrumentation a dynamic stabilization is combined with a rigid fusion to gain a stabilization by reducing loads while allowing motion to avoid hypermobility in the adjacent segment. Several studies have compared a dynamic instrumentation to a fusion or the native spine. Only few studies have compared fusions to "Topping- Off"-instrumentations. A relevant protection of the adjacent segment could not be shown. A clinical benefit of a hybrid instrumentation could not be shown either. In this study, the effects of two different types of hybrid instrumentation were evaluated on instrumented and adjacent segments of human cadaver Th11 to L5 spines. 18 human cadaver spines (Th11-L5) were instrumented from L1L5. The spines were separated into three groups: rigid, dynamic and hook. The spines were instrumented stepwise through the following conditions for comparison: native spine and rigid fixation L3-5 in all groups. In a last step the rigid group was instrumented with a rigid fixation L1-5. The dynamic group was instrumented with the dynamic Elaspine system L1-3 and the hook group was instrumented with laminar hooks L1-3 each additionally to the rigid instrumentation L3-5 in terms of a hybrid instrumentation. After application of a free bending load with 5° each of extension and flexion, the range of motion (ROM) for every single segment and step of the instrumentation was evaluated.

There was a significant increase in segmental stiffness and decrease in ROM associated with the rigid instrumentation as well as a compensatory hypermobility of the adjacent noninstrumented segments. In addition, there was no significant difference in segmental stiffness or ROM among the three types of instrumentation.

Based on our biomechanical data, hybrid instrumentation has no beneficial effect on the instrumented or adjacent segments.

Schematic overview showing the setup of the three test groups



I) group R: four-level rigid instrumentation; II) group D: two-level rigid instrumentation (L3-L5) combined with the Elaspine® system (L1-L3); and III) group H: two-level rigid instrumentation (L3-L5) combined with laminar hooks (L1-L3).

Paper-5

Clinical and Cost Analysis of Different Surgical Approaches in Lumbar Spinal Stenosis

Ali Erhan Kayalar, Mehmet Reşid Önen, Sait Naderi Department of Neurosurgery, Umraniye Teaching and Research Hospital

A variety of surgical techniques with different cost profiles are used in lumbar spinal stenosis. The aim of this study is to compare clinical and cost of two different surgical techniques, bilateral decompression using unilateral approach vs. total laminectomy + spinal instrumentation and fusion.

Data of the patients who were treated due to lumbar spinal stenosis at our clinic, between January 2013 to December 2013, were reviewed retrospectively. The results with preoperative and postoperative VAS scores, and the costs of both procedures were also reviewed. Mean ages of the first group (Decompression + instrumentation) and second group (uni- bilateral decompression) were found to be 56,22 and 58,84, retrospectively. Totally 158 levels at 100 patients were operated. L4-5 was the most common operated level in both groups,

The mean costs were found to 4824,66 TL and 1897,2 TL, for group one and group 2, respectively. Mean hospitalization of patients were 2,8 days for the first and 1,2 for the second group. Preoperative and postoperative VAS scores were found to be 7.96 and 2.88 for the group 1, respectively ($p<0.05$), and 7.7 and 2.74 for group 2, respectively ($p<0.05$). Postoperative VAS scores of

both groups were found to be similar. However, the cost of the first group was much higher than the cost of second group. It is concluded that bilateral decompression using unilateral approach is a good option in selected cases with lumbar spinal stenosis, and is associated with reduced cost, when compared to laminectomy + instrumentation.

Paper-6
Failed Back Surgery Syndrome: A Lesson to Learn

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Despite the evident progress in treating vertebral column degenerative diseases, the rate of a so-called "failed back surgery syndrome" associated with pain and disability remains relatively highAs there is increase in surgeries for degenerative spine for the last few years there is increase in Failed Back Surgery Syndrome cases.to overcome this complication we analyze the causes and preventive measures and to make a strategy for the best outcome of the degenerative spine surgeries. It is a retrospective study for the patients seen and operated during the last 3 years. We follow 40 patients having cervical or lumbar degenerative spine with radicular symptoms who had surgeries for degenerative spine either locally or abroad during the last 3years.we used oswestery disability index scores in pre and post-operative patients. Pre-operatively, patients were examined clinically, applying the Oswestry Disability Index (ODI) and magnetic resonance imaging (MRI). After surgery, participants were examined clinically and ODI were applied. All those with permanent or temporary pain syndromes were examined applying MRI imaging to validate the cause of pain syndromes; different types of blocks were applied. Patients showed a considerable rate of pain syndromes related to tissue damage during the intervention including facet joint pain, radicular pain, myofascial pain and implant failure. The results of our study show that an analysis of the reasons for failures and partial effects of applied interventions may help to understand better the efficacy of the interventions and could be helpful in improving surgical strategies.

Paper-7
Unilateral Percutaneous Pedicle Screw Instrumentation with Minimally Invasive TLIF for the Treatment of Recurrent Lumbar Disk Disease: 2 Years Follow-up

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We compared the clinical and radiological outcomes of recurrent disc disease in patients who underwent unilateral and bilateral percutaneous pedicle screw instrumentation with Mis-TLIF. 10 patients treated with unilateral percutaneous instrumentation plus Mis-TLIF formed Group 1 while the other 10 patients treated with bilateral percutaneous instrumentation plus MisTLIF formed Group 2. Clinical outcomes were graded using the visual analog scale (VAS) and the Oswestry disability index (ODI) scores. Peroperative and 2-year follow-up scores were obtained. Postoperative imaging techniques were used for the assessment of fusion, subsidence and spinal alignment. According to preoperative and postoperative VAS/ODI scores, statistically significant differences were noted in the unilaterally and bilaterally instrumented group. However, a statistically significant difference was not observed between the unilateral and bilateral groups. Radiological evidence of successful arthrodesis was noted in 8 of 10 patients (80%) in the unilaterally instrumented group and in 9 of 10 patients (90%) in the bilaterally instrumented group at the 2 years follow-up. No metal failure, cage migration, vertebral fracture, subsidence or adjacent level disease was experienced.
Mis-TLIF with unilateral percutaneous pedicle screw instrumentation is an acceptable option in the treatment of selected recurrent disc disease patients.

Paper-8
Assessment of Radiologic Parameters that Influence Disc and Facet Degeneration After Stopping Fusion at L3 in AIS: An MRI Study with Minimum 5 Years Follow-up

Sinan Kahraman[1], Meriç Enercan[2], Mutlu Çobanoğlu[3], Sinan Yılar[4], Levent Ulusoy[5], Ayhan Mutlu[5], Erden Ertürer[1], Çağatay Öztürk[1], Azmi Hamzoğlu[1]
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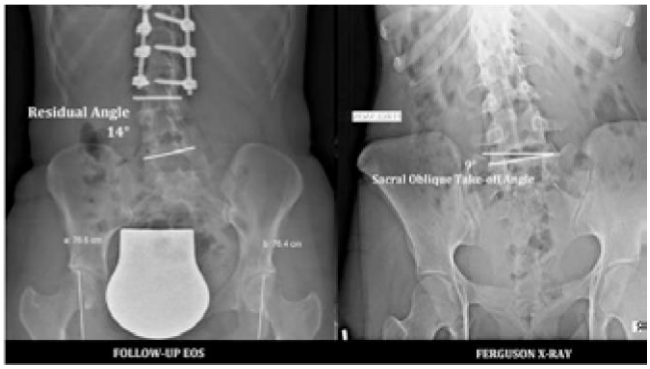
The purpose of this study was to evaluate the disc degeneration (DD) and facet joint degeneration (FJD) of mobile lumbar levels with MRI and to find out which radiologic parameters predicted DD and FJD in minimum 5 years of follow-up.
We reviewed 27 (22F,5M) AIS patients who underwent posterior fusion and whose lowest instrumented vertebra (LIV) was L3. All patients had complete radiographic data with a minimum 5 years follow-up (mean 7,3). Mean age was 14.3 (11-17). They were analyzed with respect to the difference in lumbar DD and FJD grades before the operation and at f/up. The correlations with residual curve magnitude, LIV tilt, disc angulation of L3-L4, sacral oblique take off angle, leg length discrepancy and the difference between all coronal and sagittal parameters were analyzed. All statistical analyses were performed with Spearman correlation test. All DD and FJD grades were significantly different in preop and postop MRIs, except for the concave L5-S1 facet joint. Statistical analyses showed that increased disc angulation in the L3-L4 level is correlated with DD of this level at the f/up (p=0,036).The residual curve magnitude also correlated with f/up FJD at the convex site of L3-L4 (p=0,018).When residual curve is more than 10° it is a risk

factor for L4-L5 DD (p=0.023) and when the disc angulation of L3L4 is more than 5° it is a risk factor for L3-L4 FJD(p=0.016).Sacral oblique take off angle more than 5° is correlated with f/up L5-S1 DD (p=0,006). Also sacral oblique take off angle more than 5° correlated with residual curve more than 10° (81%). At the final f/up SRS score was 4.56(3,82-4,90) and ODI was 4.3(0-14,1).
At the final follow-up, despite a mild difference in radiologic disc and facet deterioration, SRS (4.56) and ODI (4.3) scores did not indicate any clinical complaints or back pain. Disc angulation more than 5° in L3-L4, residual lumbar curve magnitude more than 10° and sacral oblique take-off angle more than 5° were found as risk factors for degeneration, and were associated with L3-L4 FJD, L4-L5 DD and L5-S1 disc degeneration, respectively.

Figure



Paper-9
Epidural Anesthesia in Elective Lumbar Microdiscectomy Surgery: Is It Safe and Effective?

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The aim of this study was to evaluate effectiveness and safety of epidural anesthesia in elective lumbar microdiscectomy surgery. Twenty-seven patients (78%, female), who were admitted for single level simple microdiscectomy surgery between May 2012 and December 2013 in single spine center of a university hospital, were enrolled into the study. Clinical evaluations with demographical and per-operative data were collected prospectively.
Mean age was 60.04 years. Mean weight, height, and BMI of the study population were 77.7 kg, 160.22 cm, 30.26; respectively. Mean operation duration was 45.56 minutes. Mean VAS score for pain was 0.78 at immediate post-op, 0.52 at 4th hour, and 0.35 at post-operative 24th hour. Ramsay sedation scale (RSS) scores steadily decreased from 2.07 in the immediate post-operative time to 1.93 at 4th hour and 1.88 at 24th hour. The only correlation seen between patient demographics and RSS was body weight seen in immediate post-operative period. Improvements for VAS scores for pain at 4th and 24th hours were 28% and 31%; respectively. Three patients had nausea, one of them vomited after the surgery. All patients were satisfied and would consider epidural anesthesia in future similar surgeries. Epidural anesthesia provides a safe and effective method for elective lumbar microdiscectomy surgery.

Paper-10
Early Results of Lumbar Percutaneous Endoscopic Discectomy

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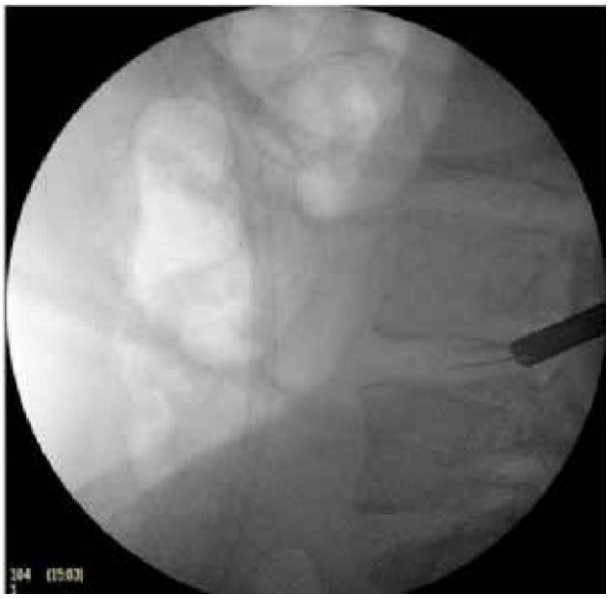
To show early results of lumber percutaneous endoscopic discectomy
Endoscopic disc surgery which allows minimally invasive discectomy is a recently utilized method in our country.
In our study 23 cases were included who have been followed at least 12 months. Average age were 44.3-± 13.5. 73.9% were at L4-5 level, 21.7% were at L5-S1 level and one case was at L3-4 level. According to anatomic localization 47.8% were foraminal, 21.7% were parasantral, 17.4% were extraforaminal and 13% were santral.
Visual analogue scale (VAS) score for leg pain was 1.8±1.4 preoperatively. On the last follow-up, VAS score for back pain was 3.2± 3, VAS score for leg pain was 1.4±1.5. According to Mac Nab criteria, 66.7% of patients have perfect results, 13.3% of patients have good results and, 20% of patients have average results. Recurrence was seen in five cases. 80% of patients specified that they are fully healed. 93.3% of patients reported that they would have been performed the same procedure again.
Percutaneous endoscopic discectomy is a minimally invasive procedure with a high patient satisfaction which is as successful as microscopic discectomy.

Three fixed roentgenographic landmarks of the target vertebra are located using the c-arm:



Percutaneous posterolateral endoscope insertion method using freehand, biplane, c-arm guidance

Paper-11
The Results of Epidural Steroid Injection for Postdiscectomy Pain Syndrome

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The overall rate of unsatisfactory results after discectomy is reported between 5% and 37%. Pain following primary discectomy may be related to multiple etiologies. The purpose of this study was to report the results of epidural steroid injection for post-discectomy pain syndrome. After institutional review board (IRB) approval we prospectively evaluated patients with PDPS who had no response to 12 weeks of conservative treatment between 2008-2011. After these evaluations, 44 patients who did not respond to the 12 weeks of conservative treatments were included in the study. The mean age of the patients was 44.3 years. (range, 28-55 years). Twenty-eight of the patients were female and 16 were male. After radiological diagnostic studies, the diagnoses of the patients were classified as epidural fibrosis (17 patients), recurrent disc herniation (25 patients), and epidural fibrosis with a facet joint arthrosis (2 patients). We performed either an interlaminar or transforaminal epidural steroid injection for all patients depending on the diagnoses and the locations of the reherniations. The two patients who had an epidural fibrosis with a facet joint arthrosis were treated both with steroid injections and facet joint denervation with RF. All patients were evaluated using the 10-point visual analog scale (VAS) and Oswestry Disability Index (ODI) preoperatively and at the post-treatment or postoperative 6th week, 6th month, 1-year, and final followups.

Twelve of 44 patients healed with epidural steroid injection. Other 32 patients had surgical treatment after injection because of the remaining complaints. The patients with recurrent disc herniation who did not respond to steroid injections were treated with re-discectomy first. The patients with a second reherniations and epidural fibrosis were treated with MIS-TLIF surgery. Average VAS score and ODI index before the surgery was 8.1 and 48%. The mean follow-up for the patients who benefited from epidural steroid injection was 25.2 months. (range, 24-32 months) Pre-treatment mean VAS score of the patients who benefited from non-surgical treatments was 7.9. The mean VAS score decreased to 2.1 at the final follow-up. The mean pretreatment ODI was 46%, which decreased to 25.9% at the final follow-up.. The changes in VAS and ODI scores between the pre-treatment period and the post-treatment follow-ups were statistically significant.($P < 0.001$)

Twelve of 44 patients (27%) with PDPS regardless of underlying etiology benefited from epidural steroid injection. An epidural steroid injection application before planning a surgery may prevent patients having unnecessary surgeries.

Paper-12

Safety and Efficacy of Apical Resection Following Growth Friendly Instrumentation in Myelomeningocele Patients with Gibbus: Growing Rod vs. Luque-Trolley

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Thoracolumbar/lumbar kyphosis in myelomeningocele patients is a common and severely debilitating condition, amenable only to surgical correction. Several surgical techniques have been proposed. Growth friendly techniques should be preferred in this patient population due to an already compromised trunk height. The growing rod(GR) and Luque Trolley(LT)with Fackler instrumentation are well-known growth friendly techniques. We compared results and complications in two groups of patients who have undergone kyphectomy and fixation, either with the GR (Group 1) or the LT with Fackler fixation (Group 2) METHODS: Ten patients undergoing growing rod fixation and 5 patients undergoing Luque trolley with Fackler fixation following kyphectomy (vertebral column resection or multiple eggshell) were included. GRs were lengthened every 6 months. Unplanned surgery Group 1 was defined as an unscheduled operation due to complication; all subsequent operations in Group 2 were considered unplanned. Thoracic and local kyphosis and T1-S1 and T1-12 heights were measured pre- and, postoperatively and at final follow-up.

Mean age at initial surgery was 6 years and 6.5 years for Groups 1 and 2, respectively. Mean age at the last follow-up was 12.5 years for Group 1 and 13.1 years for Group 2. Mean follow-up was 72.7m for Group 1 and 68.6m for Group 2. Pre-, postoperative and final follow-up kyphosis angles in that order for group 1 were 72.3º(10º-110º),72.3º(-50º;+55º) and 21.6º(-41º;+97º), and for group2 106.6º(81º-132º), 15.6º(-37º;+50º) and 19.2º(-42º;+38º). Postoperative and final follow-up in that order for mean T1-T12 and T1-S1 heights for group 1 were 14 (11.2-18.7) cm;20.4(19.325.7)cm and 21(17.2-23.2)cm; 31.6(23.6-41.5)cm. Postoperative and final follow-up in that order for mean T1-T12 and T1-S1 heights for group2 were 15.9(14.3-19.7)cm; 20.1(15.5-24.6)cm and 24.4(17.7-27.8)cm; 29.5(25.3-31.3)cm. Growth per year was 1.05 cm and 0.84 for Groups 1 and 2 respectively($p=0.297$). Fourteen vs. 4 unplanned surgeries were performed in Groups 1 and 2 respectively, and an additional 4 implant revisions were done in Group 1 during planned lengthenings.

Both the Luque Trolley and the growing rod system are reasonable alternatives of fixation post-kyphectomy, both of which preserve growth to differing degrees. In this patient population with an already severely stunted trunk height, the surgeon must choose whether the amount of extra growth achieved by the growing rod is worth the risk of an increased number of surgeries.

Table 1: Angular measurements of T2-12 and Local kyphosis, measurements of T1-T12 and T1-S1 heights

	preop	preop	postop	postop	last-followup	last-followup
	GR	LT	GR	LT	GR	LT
Mean T2-12 kyphosis (degrees)	-1(-25 - + 35)	-11.3(-18-+12)	17.4(0-+35)	19.6(-14-+50)	20.5(+6-+45)	35.6(21-46)
Mean local kyphosis (degrees)	72.3(10-110)	106.6(81-132)	16.9(-50-+55)	15.6(-37-+50)	21.6(-41-+97)	19.2(-42-+38)
Mean T1-12 height (cm)			14.0(11.2-18.7)	15.9(14.3-19.7)	20.4(19.3-25.7)	20.1(15.5-24.6
Mean T1-S1 height (cm)			21.0(17.2-23.2)	24.4(17.7-27.8)	31.6(23.6-41.5)	29.5(25.3-31.3)

Paper-13

Effects of Frequency of Distraction in Magnetically-Controlled Growing Rod Lengthening on Outcomes and Complications

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This is a retrospective review of prospectively collected data from a multicentre study of early-onset scoliosis treated by the magnetically-controlled growing rod with a minimum of 2-year follow-up. Higher distraction frequency was associated with an increased incidence of re-operations due to failure of rod distraction but lower rate of implant-related complications. Retrospective review of prospectively collected data.

Magnetically-controlled growing rods (MCGR) are an alternative to traditional growing rods in skeletally immature patients by providing non-invasive, outpatient distractions mimicking a patient's physiological growth. However, the ideal frequency of MCGR distraction is currently not known. This study aimed to determine the effects of distraction frequencies on implant-related complications and re-operations.

Consecutive patients undergoing MCGR treatment with a minimum of 2-year follow-up from 6 centres were included. Clinical and radiographic data were collected prospectively. Thirty patients were included in this study. The mean age at the time of surgery was 7.3 years (range: 4 to 14 years) and the mean follow-up period was 35 months (range: 24 to 61 months). Patients were divided into 2 groups according to their distraction frequency: Group 1 (every 1 week-2 months), and Group 2 (every 3 - 6 months).

There were 14 patients in Group 1, and 16 in Group 2. Patients in Group 1 had more re-operations due to failure of rod distraction (71% vs 25%) and a higher incidence of PJK (21% vs 13%) than Group 2. However, there were fewer incidences of implant-related complications including rod breakage and proximal foundation failure (14% vs 31%) in Group 1 compared with Group 2.

This is the largest series with the longest follow-up to date that examines the effect of distraction frequency in MCGR lengthening. Our study showed more frequent distractions were associated with increased incidence of rod distraction failure and PJK but lower incidence of implant-related complication. Clinicians should be aware of a potential higher risk for re-operation if the interval between each distraction is less than 3 months. Further studies with a larger cohort are required to determine the critical threshold for distraction frequency and reoperations.

Paper-14

The Effects of Dual Growing Rods on the Natural Progress of the Pelvic Incidence in Idiopathic or IdiopathicLike Early Onset Scoliosis

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Sagittal balance along with pelvic parameters has been increasingly cited in the literature as an outcome measure after spine deformity surgery. Although the increases of lumbar lordosis and pelvic incidence (PI) during childhood have been reported, the data on the effect of growing rods surgery to these parameters is scarce. The aim of this study is to evaluate the change in the pelvic incidence during the growing rods treatment in children with idiopathic or idiopathic-like earlyonset scoliosis (EOS).

At two separate institutions, hospital records were utilized to identify patients with idiopathic or idiopathic-like EOS, who had growing rods treatment between Jan 2004-Jan 2013 with more than 2 years follow-up. The sagittal and pelvic parameters including sagittal balance, pelvic incidence (PI), sacral slope, pelvic tilt, thoracic kyphosis (T2-T12), lumbar lordosis (L1-S1) were evaluated. The change in these parameters was be compared to the normal values that were previously published.

24 patients were included to the study (15 girls, 9 boys). The average age at initial surgery was 7.2 years (range 4 to 9). The average follow-up time was 82 months (range 36 to 132). The average L1-S1 angle was 48 degrees preoperatively, 41.5 degrees after initial surgery and 45.4 degrees at the latest follow-up. The average preoperative PI was 45 degrees, while it was 43.2 degrees after initial surgery and 45.9 at the latest follow-up. There was no significant difference for the changes in average T2-T12 angle, L1-S1 angle or PI during follow-up. Also there was no correlation between L1-S1 angles and PI.

The results of this study provide information on the effects on the growing rod surgery on spinal sagittal alignment. The dual growing rod application precluded the normal increase in lumbar lordosis and as a consequence the PI also did not demonstrate the natural progress during follow-up.

Paper-15

Sliding-Growing Rod Technique (SGRT) in the Treatment of Early Onset Scoliosis – More Than 2 Years of Follow-up

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The main goal of treatment in early on-set scoliosis is to obtain and maintain curve correction while simultaneously preserving spinal, trunk, and lung growth. This study introduces a new surgical strategy, called sliding-growing rod technique (SGRT) developed to decrease the number of lengthening procedures and complication rates. The aim of this study is to assess whether self-growing system works or not, determine complication rates and effects on pulmonary functions in patients who had more than 2 yrs f/up. 15 (9F/6M) patients, mean age 6.8 (5-10) were evaluated. Surgical technique included placement of pedicle screws with a musclesparing technique. Following rod placement and correction with cantilever maneuvers using proximal and distal rods, the most proximal and most distal two segments were fixed and fused; the rest of the screws were left with unlocked set screws to allow vertical growth. Proximal and distal rods are connected with side to side connectors (domino) mostly at distal level. Distal rod was fixed to domino connector whereas proximal rod kept loose to allow selfgrowing (Figure). Preop, f/up, final x-rays and pre/postop pulmonary function tests (PFT) were evaluated.
Mean follow-up was 24.8 months (24-32). Mean preop MT curve of 61.1° was corrected to 23,3° with a correction rate of %62.6. Mean TL/L curve of 43,2° was corrected to 15,5° with a correction rate of %68.7. Preop thoracic kyphosis (T2-T12) of 35,1° and lumbar lordosis of 55,3° was maintained at 29,4° and 55,7° respectively. Mean increase in T1-T12 length was 1.14mm/month and 1.28 mm/month in T1-S1 height. No patient had neurological impairments. There were no rod breakages or other implant failure. This modification prevented 42 planned lengthening procedures. Mean preop %predicted FVC of 68.76 improved to 72.43 and mean preop %predicted FEV1 of 67.43 improved to 71.28 at the latest f/up.
In contrast to traditional growing rod systems, SGRT provides a dynamic fixation which allows self-growing of spine with a rate of 1.28 mm per month. SGRT demonstrated low complication rates and improved pulmonary functions at the end of 2 years follow-up.

Figure 1

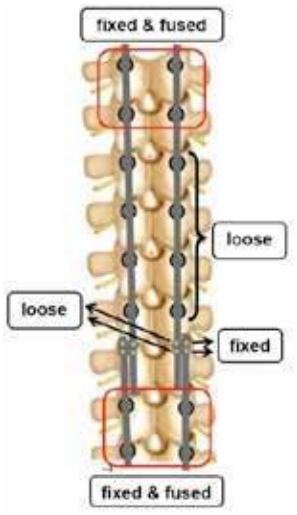
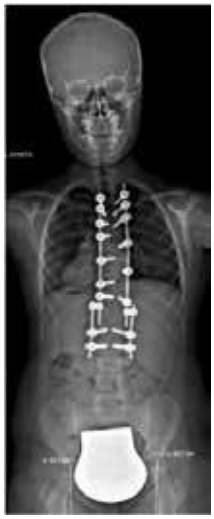


Figure 2



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Paper-16

Choosing Distal Instrumentation Level in Growing Rod Surgery - Where to Stop?

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There is no consensus on the selection of distal instrumentation levels in growing rod surgery. Many surgeons use the stable zone of Harrington, but there is not overwhelming evidence to support this. The aim of this study was to determine the value of bending/traction radiographs in selection of distal instrumentation levels of a growing rod construct in children with idiopathic or idiopathic-like early onset scoliosis (EOS).
Twenty-three consecutive patients with idiopathic or idiopathic-like EOS who underwent growing rod surgery at two separate institutions between 2006 and 2011 were included. Lengthening procedures were performed periodically at six-month intervals. Analyses were done retrospectively for age at index surgery, follow-up period and radiographic measurements. Lower instrumented levels, neutral vertebra, stable vertebrae (SV) and stable-to-be vertebrae (StbV) were identified in the pre-operative radiographs. StbV was defined as the vertebra that was most closely bisected by the central sacral vertical line on traction and/or bending films. Tilt of lower instrumented vertebra (LIV) and LIV+1 and disc wedging under the LIV and LIV+1 were measured on the early post-operative (within 1 month postsurgery) and latest follow-up radiographs.
Average age at index surgery was 83.6 ±24.4 (45-145) months. Mean follow-up period was 68.1 ±25.3 (25-107) months. LIV was the SV in 5 patients, above SV in 17 patients and below SV in one patient. On bending/traction radiographs, LIV was the StbV in 9 patients, proximal to the StbV in 8 patients and distal to the StbV in 6 patients. At the latest follow-up, tilt of LIV+1 exceeded 10° in 7 of the 8 patients which LIV was proximal to the StbV, whereas only in one of 9 patients which LIV was StbV and in none of the 5 patients which LIV was distal to the StbV. The analysis showed that selection of StbV as LIV could save an average of 1.4 vertebral segments compared to selection of SV as LIV. StbV maybe the appropriate distal instrumentation level in growing rod surgery for idiopathic and idiopathic-like curves in EOS. Choosing StbV as the LIV instead of SV saves motion segments while providing good deformity control.

Paper-17

The Effect of Distal Fusion Level on Pelvic Parameter in Adolescent Idiopathic Scoliosis

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Pelvic parameter changing after treatment for adult scoliosis or degenerative spine was reported. Although it was reported that

pelvic insidance was higher in ıdıopathic scoliosis than normal population. There is not enough paper about the effect on pelvic parameter changing after posterior fusion with different distal level. The aim of this study is to investigate pelvic parameter changing with different distal fusion level in treatment of idiopathic scoliosis.

Fiftyone patients with adolescent idiopathic scoliosis operated with only posterior fusion was reviewed retrospectively. Patients were classified in three groups according to distal level of fusion which was determined as L2, L3 and L4. Radiological examination was performed on standart lateral columna vertebralis xray was taken on long cassette. Preoperative and control xray was taken on 6th months or one year was used for measurement. Pelvic insidans (PI), pelvic tilt (PT), sacral slope (SS), Lumbar lordosis (LL) was measured on radiography. Student-t test and ANOVA was used to compare parametric value for statistical analysis. RESULTS: 9 male and 42 female mean age 15 years were operated with posterior fusion. Distal fusion level was L2 in 11 patients, L3 in 16 patients and L4 in 24 patients. In group2 LL was changed from 54+/-8,5 to 43+/-8,9 (p=0,0001), PI was changed from 46,5+/-10,5 to 41+/-7,9 (p=0,051), PT was changed from 10+/-8 to 9+/-9,3 (p=0,7), SS was changed from 34,7+/-6 to 31,5+/-7,2 (p=0,1).İn group 3, LL was changed from 53+/-10 to 42+/-8,2 (p=0,002), PI was changed from 38,8+/-16,4 to 40+/-9,3 (p=0,8), PT was changed from 6,4+/-8,9 to 10,8+/-5,8 (p=0,12), SS was changed from 31,5+/-9,6 to 28,5+/-7,5 (p=0,3). In group1 LL was changed from 52+/-13 to 41,7+/-9,8 (p=0,051), PI was changed from 40,4+/-10,9 to 37,3+/-8,8 (p=0,47), PT was changed from
8,5+/-10,6 to 9,3+/-7,4 (p=0,83), SS was changed from 31,4+/-10,3 to 27,9+/-5,4 (p=0,3)

There is no statistical difference on pelvic parameter changing between where distal fusion level was L2,L3 or L4. Lumber lordosis was statistically significantly decreased.

Paper-18
The Effect of Postoperative Thoracic Kyphosis on Cervical Sagittal Alignment After Long Fusions of Lenke Type 3C and 6C AIS Curves

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Studies about the relationship between postoperative thoracic kyphosis and sagittal cervical alignment in patients with adolescent idiopathic scoliosis (AIS) treated with all pedicle screw constructs is not sufficient in the literature. Our aim in this study was to evaluate this relationship in Lenke type 3C and 6C AIS patients.

A prospective database of 32 patients with AIS undergoing posterior spinal fusion with all segment pedicle screw constructs for Lenke type 3C and 6C curves was reviewed. 13 patients had Lenke 3C and 19 had Lenke 6C curves. Parameters analyzed on pre- and postoperative radiographs were; cervical and thoracic sagittal Cobb angles.

Mean age of the patients was 16.2 (range 13-19). 22 of them were female and 10 of them were male. Mean follow-up time was 14.2 months (range 3-31). Preoperatively, 9 of 32 patients included in the study had noticeable cervical kyphosis (mean angle 14.0°) with mean associated thoracic kyphosis of 21.9°. Postoperatively, cervical kyphosis remained in these patients but decreased to 10.4°, along with mean thoracic kyphosis of 24.6°. Preoperatively, the remaining 23 of 32 patients had neutral to lordotic cervical alignment (mean -12.8°) with mean thoracic kyphosis of 34.2°. Postoperatively, 6 of these 23 patients demonstrated cervical sagittal decompensation (> 5° kyphosis). Mean postoperative thoracic kyphosis was 25.8° in these 6 patients. The other 17 patients had mean postoperative thoracic kyphosis of 36.1°. Cervical decompensation was not seen in these 17 patients.

The sagittal alignment of the cervical spine is related to that of the thoracic spine. Surgical treatment of Lenke Type 3 and 6 curves necessitates long fusions. All pedicle screw constructs that are used in these curves have a strong hypokyphotic effect on the thoracic spine, with a predisposition to decompensation of the cervical spine. If postoperative thoracic kyphosis is excessively decreased, the cervical spine may decompensate into significant kyphosis. To decrease this effect, special care should be given to restore the normal thoracic kyphosis.

Paper-19
New Instrumentation Technique for Growing Rod

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To define a new modification on growing rod technique. The spine is a key factor in the growth of thorax, abdomen, and pelvis. By the age of five, the spine reaches 50% of its adult length. Therefore spinal fusion in a five-year-old child can result in approximately 12.5 cm loss of spinal growth. Disruption of the growth of the spine due to fusion performed in the treatment of early-onset scoliosis leads to thoracic insufficiency syndrome. The ideal technique should maintain the correction of the deformity, allow continued spinal growth, should not require postoperative immobilization, and also should have low complication rates. There are several growing rod techniques which have been defined but none of them fulfill all of these conditions.

10 children have been operated in authors' institution, at average age of 8 (4-9) years. The surgical technique involved short segment instrumentation applied on the convex side of the apex of the deformity. Pedicle screws or hooks were used at stable anchor levels of the concave side of the deformity. Two rods, one proximal and one distal, were fixed to anchor sites and connected by a domino connector. After distracting the concave side, a transverse connector was used between the short segment and the long one, and this connector was compressed to maintain a translational force on the apex of the deformity. The frequency of lengthening procedure is 6-9 months.

The average follow-up was 11 months. The average preoperative coronal plane curve was 46 degree and corrected to 13 degree showing 74 % scoliosis correction after index surgery.

The main goal of the treatment of early onset spinal deformities in children is to correct the deformity while maintaining the growth of the spine. All the described techniques up to now based on distraction of the concave side and the compression of the convex side of the deformity at stable vertebrae. The technique defined in this study, distracts the concave side while applying a translational force at the apex of the deformity by a transverse connector. The authors believe that this new technique will maintain more effective correction. Other advantages include less surgical

dissection so less likely to cause a spontaneous fusion of the spine, shorter operation time, and low risk of surgery-associated complications. Long term outcomes of the treatment by this new technique should be investigated by the means spinal growth, and the correction of the spinal deformity.

Paper-20

Change in Pelvic Sagittal Parameters with Growth in Surgically Treated Adolescent Idiopathic Scoliosis Patients

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Commonly measured spinopelvic parameters (Pelvic incidence, sacral slope, pelvic tilt) have effect on global sagittal balance of the spine. It was shown previously that pelvic incidence increases with growth in children by cross sectional studies. But this change was not demonstrated on longitudinal radiological follow up studies. In this study we aimed to investigate the changes in spinopelvic parameters with growth in surgically treated AIS patients.

Whole body lateral radiographs eligible for spinopelvic measurements, with radiological follow up before and after skeletal maturity of AIS patients treated surgically were evaluated. First evaluations are made on pre-operative radiographs of AIS patients (Risser O or 1). Second evaluations were made on postoperative radiographs taken after skeletal maturity (Risser 5). On whole body lateral radiographs pelvic incidence (PI), sacral slope (SS), pelvic tilt (PT), lomber lordosis between L1 cranial endplate and S1 endplate (LL), and thoracic kyphosis between cranial endplate of T5 and caudal endplate of T12 (TK) were performed using Centricity Dicom software (General Electric). Measurements were made by two observers. Intra- and inter-observer reliabilities were also evaluated by repeat measurements. Intra- and interobserver reliabilities for measurements were evaluated by ICC (intra-class correlation).

171 surgically treated cases for AIS were reviewed. 33 cases had radiological follow up data before and after skeletal maturity with lateral x-rays eligible for spinopelvic parameters measurement. Mean interval between evaluations was 7,49 years. Intra- and inter-observer reliabilities for measurements were accepted as "good" with ICC values between 0,951 and 0,989. A significant increase in PI and SS was observed before and after skeletal maturity (46,03º±11,4 vs. 52,15 º ±11,46 and 38,2 º ±7,55 vs. 43,19 º ±7,44 respectively). Increase in LL was also statistically significant and correlated with PI (54,14 º ±9,42 vs. 62,07 º ±10,05). Change in TK and PT were not significant.

Results were concordant with previous cross-sectional and anthropometric studies regarding increase in pelvic incidence. It's also concluded that overall lumbar lordosis is influenced by pelvic incidence both before and after skeletal maturity. Since sagittal profile changes are well tolerated in adolescents, there was no major change in PT. But concerning long fusions, change in pelvic incidence can have a negative effect on long term.

Paper-21

The Effect of Magnetically Controlled Growing Rod on the Sagittal Profile in Early-Onset Scoliosis Patients

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The is a retrospective review of prospectively collected data from a multicentre study of early-onset scoliosis treated by magneticallycontrolled growing rod with a minimum of 2-year follow-up. Thoracic kyphosis was reduced in patients with pre-operative >40° and the overall sagittal balance improved or returned to neutral in 60% of cases.

Retrospective review of prospectively collected data

Magnetically controlled growing rod (MCGR) has a straight central housing portion that cannot be bent. The proximal and distal portions are contoured intra-operatively according to the desired kyphosis and lordosis. The effects of gradual lengthening on the regional and overall sagittal profile in early onset scoliosis (EOS) are not been well-documented. This study aimed to report on the changes of the sagittal profile after MCGR implantation.

A retrospective review of prospectively collected data from consecutive patients undergoing MCGR treatment with a minimum of 2-year follow-up from 6 centres was carried out. Clinical data and complications were noted. Radiographic measurements including thoracic kyphosis (TK), lumbar lordosis (LL) and sagittal vertical axis (SVA) were analyzed.

Thirty patients were reviewed and twenty-three patients had full radiographic data for analysis. The mean age at the time of surgery was 7.3 years (range: 4-14 years) and the mean follow-up period was 39.2 months (range: 24-61 months). Patients were divided into 3 groups according to their pre-operative TK: group 1 (TK<20°), group 2 (TK 20°-40°) and group 3 (TK>40°). Mean TK did not change in group 1 or 2 during MCGR lengthening but decreased in group 3, and mean LL remained the same in all 3 groups. At final follow-up, global sagittal balance (SB) improved or returned to neutral alignment in 60% of cases, and did not change in 27%, and worsened in 13%. Growth sparing techniques allow coronal curve correction in EOS but its effect on the sagittal profile is not well understood. This study showed that MCGR reduced TK in those with pre-existing TK >40° and had no effect on other regional sagittal parameters. It had a tendency to improve the global sagittal balance. Further studies are required to evaluate fully the effect of MCGR on the sagittal profile.

Paper-22

Lowest Instrumented Vertebrae Selection for Posterior Fusion of Lenke 5C Adolescent Idiopathic Scoliosis: Can We Stop the Fusion at Lower-End Vertebra-1?

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Determination of distal fusion level in thoracolumbar/lumbar (TL/L) adolescent idiopathic scoliosis (AIS) curves is controversial, and it is influenced by many factors. Normally, fusion should include the lower end vertebra (LEV), but occasionally fusion to one level distal to LEV (LEV+1) or one level proximal to LEV (LEV1) can be performed. Our aim in this study was to evaluate the results of the posterior fusion of Lenke 5C curves, in which we tried to stop the fusion as proximal as possible. 27 consecutive patients with TL/L AIS who underwent posterior spinal fusion with pedicle screws at a single institution were included in this study and were prospectively evaluated. Surgical technique consisted of a wide posterior release including ligamentum flavum and facet joints followed by convex rod derotation. Compression, distraction and in situ bending maneuvers were performed if necessary. A level disc below the lowest instrumented vertebra (LIV) was tried to be achieved intraoperatively. Preoperative and postoperative (last followup) radiographs were assessed measuring coronal and sagittal radiographic parameters as well as specific measurements related LIV (LIV tilt, LIV disc angle, LIV translation).

Mean age of the patients was 16.1 (range 13-20). 21 of them were female and 6 of them were male. Mean follow-up time was 6.2 months (range 2-17). In 14 patients LIV was LEV and in 13 patients LEV-1. LEV+1 was not instrumented in any patient. 2 groups occurred (LIV=LEV group, and LIV=LEV-1 group). Mean coronal lumbar curve Cobb angle decreased from 43.8 degrees to 4.2 degrees in LIV=LEV group, and from 45.2 degrees to 6.7 degrees in LIV=LEV-1 group. Preoperative and postoperative lumbar lordosis was measured as 41.5 and 34.6 degrees in LIV=LEV group, and as 46.5 and 33.8 degrees in LIV=LEV-1 group respectively. In LIV=LEV group, LIV tilt, LIV disc angle and LIV translation were measured as 6.4 degrees, 2.4 degrees and 9 mm respectively. In LIV=LEV-1 group same parameters were measured as 6.9 degrees, 3.5 degrees and 12.1 mm respectively. None of the patients developed coronal or sagittal imbalance. For all patients SRS-22 over-all scores improved at last follow-up.

Similar results were obtained in patients with LIV=LEV and LIV=LEV-1. In order to save one more mobile segment in lumbar spine, it seems logical to stop the fusion at LEV-1 if possible. Studies with higher number of patients and longer follow-up times are needed to further clarify these findings.

Paper-23
Mean 2 Years Experiences with a New Titanium Coated Radiolucent TLIF Cage

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PLIF and TLIF are standard treatment methods for many degenerative spinal diseases that result in spinal stenosis or segmental instability. The cage-bone surface has a role in facilitating osteointegration. A significant quality and quantity increase of bone on growth was achieved with the titanium (Ti) coating by vacuum plasma spraying (VPS). This study aimed to evaluate the short-term radiologic and clinical results of the carbon fiber-reinforced PEEK (Carbon/PEEK) interbody fusion cage, coated with VPS-Ti. Materials and methods 42 Patients (47 levels), mean age 59.6, receiving cage treatment were scanned retrospectively. Pre-, post-operative and final follow-up graphs, and clinical information were obtained.

Primary diagnoses were degenerative spinal diseases. Pedicle screws were used in all cases. TLIF and PLIF technique was applied in 28% and 72% of patients. 51% were L4-5, 23% L5-S1, 17% L3-4, and 9% L2-3. Local graft was used in 39 patients, DBM in 2 and BCT in 1 patient. A mean change of 1.38 degrees was observed in the angle of neighboring segment lordosis, and an increase of 0.59 degrees was obtained in the global lumbar lordosis.

Grade 1 fusion (according to the 4 point Bridwell classification) was achieved in 94% of all patients 18 months after the operation (6% Grade 2, 0% Grade 3 and 4). 2 (4.3%) patients underwent operation due to neighboring segment degeneration during the follow-up period. Progression of degeneration in the neighboring segment discs increased by 10.95% between preoperative and final follow-up graphs. In 2 patients, a pedicle screw loosening angle of 2 degrees and/or above was observed, no re-intervention was needed. In the final follow-up at 24 months, the segmental height and foraminal height Mochida index were 5.8 and 3.82, as compared to the early postoperative graph. 87% of the patients had good or perfect results.

Solid fusion was achieved in all but one patient mean 2 years, the complication rate was low. PEEK and Carbon/PEEK increases the formation of surrounding fibrous tissue because of the hydrophobic surface structure. Therefore, Carbon/PEEK was coated with VPS Ti, facilitating osteointegration while remaining its radiolucent properties. The first VPS Ti coated cage proved to be clinically successful and is commonly accepted as a suitable geometrical shape. These findings must be supported with longterm results.

Paper-24
Clinical Results of Cyberknife Radiosurgery for Spinal Metastases

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Primary treatment of spinal metastasis has been external beam radiotherapy (EBRT). EBRT has less than optimal clinical response due to suboptimal dose to the tumor and low tolerance of spinal cord to radiation. Recent advance of technology enables radiosurgery to be extended to extra cranial lesions. Radiosurgery has been used for brain metastases with high success rates for more than two decades. The purpose of this study is to determine the clinical effectiveness and safety of Cyberknife radiosurgery in spinal metastasis.

Between July, 2013 and October 2014, 38 patients with 49 spinal metastases were treated with Cyberknife. Target and critical organ delineation was performed using CT, MR and PET-CT images. Xsight Spine Tracking was used for the accuracy of beam delivery. Most of the patients presented with pain (96%). Spinal metastases involved 12 cervical, 20 thoracic, 15 lumbar and 2 sacral levels.

Using Cyberknife, 12-30 Gy in 1-5 fractions were delivered to spinal metastatic lesions.

Median clinical and radiological follow-up was 8 months (range, 3-18 months). Significant pain relief was seen in 95% of patients. Failure in local tumor control was observed in one patient (2.6%). Radiation-induced myelopathy and worsening in neurological status was not detected in this series.

Cyberknife radiosurgery is clinically effective and safe for spinal metastases. It may be regarded as a primary treatment modality for spinal metastasis without spinal instability and spinal cord compression causing neurological deficits

Paper-25
Benign Spinal Nerve Sheath Tumors

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Benign spinal nerve sheath tumors (BSNST) occur on dorsal nerve roots. These tumors include schwannomas and neurofibromas. Both tumors are benign tumors, with some minor histological differences. The aim of this study is to review clinical and surgical aspects of these tumors.

Forty cases of BSNST were operated between 2008 and 2014. Demographic aspects (age, gender), clinical aspects, type of diagnostic modality, location of tumor, position of tumor with respect to dural sac, position of tumor with respect to spinal cord, the surgical approach, and outcome were reviewed. There were 15 male and 25 female, aged between 29 and 83 (mean 51,6). The main symptom was axial pain and / or radicular pain in all cases. There was neurodeficits in nine cases. The diagnosis was made using MRI in all cases. There were 36 schwannoma and four neurofibroma. BSNST was solitary in 38 cases and associated with neurofibromatosis in two cases. BSNST was located in the cervical spine in seven cases (seven schwannomas, 0 neurofibroma), in the thoracic spine in nine cases (nine schwannomas, 0 neurofibroma), in the lumbar spine in 20 cases (17 schwannomas, three neurofibromas), and in the sacral spine in four cases (three schwannomas, 1 neurofibroma). BSNST was found to be intradural in 23 cases (22 schwannomas, one neurofibroma), extradural in 14 cases (12 schwannomas, 2 neurofibromas), and intra-extradural in three cases (two schwannomas, one neurofibroma). The BSNST was located lateral to the spinal cord in all cases. A midline approach using hemi or total laminectomy was used in 30 cases, a lateral transforaminal approach in 8 cases, and an anterior approach was used in two cases. A single approach was used in 38 cases, and a staged combined approach was used in two cases. Total tumor removal was achieved in 39 cases. There was no neurological deficit after surgery.

BSNSTs are rare tumors affecting neural structures. Position of tumor with respect to dural sac dictates surgical approach. In almost all cases Total tumor removal using micro technique should be aimed in all cases.

Paper-26
3D Model Guided Surgery in the Severe Spinal Deformity Group Patients

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A prospective study of 3D model guided spinal surgery in patients with severe spinal deformity.

To demonstrate the advantages of 3D model guided spinal surgery for the patients and surgeons. And also, to show the importance of the doctor-engineer collaboration.

The advantages of 3D printed models of spinal deformities for patients' information and safety, student and resident education, and surgery planning and guiding has been shown. The engineers were quite willing to cooperate with doctors.

2D CT images of the patient (the patients positioned as in the supine position on the operating table) were converted into 3D-STL format by using appropriate soft-wares. These STL data were used for 3D spine model manufacturing. Direction of pedicle screws and pedicle diameters were determined on the STL images by engineers and surgeons collaboration. 3D plastic models of spine containing pedicle screw access holes and tunnels were printed by using Plastic Modeling Machine (Zcorp / Z650). These models were used as a guide in the operation for surgeon's orientation. And also the advantages of these 3D printed models for the patients, medical students, orthopaedic residents and fellows and the surgeons were questioned in point of to understanding the deformity shape, medical education, surgery planning, and using as a guide in the surgery. Applying of surgical procedures, the surgery times, and the number of scopy and x-ray applications in the surgery were recorded in the similar spinal surgeries with and without using these 3D models. According to our questionnaires and records the 3D models of spinal deformities are very helpful for the patient information about the deformity shape, procedure of surgery, possible complication and patient safety in the OR. It is also very helpful for medical students' education. Finally the surgeons feel so comfortable to use these 3D printed models for preoperative planning and intraoperative guiding.

Paper-27
Local Recurrence and Overall Survival After Surgical Treatment of Sacral Chordoma – An Analysis of Prognostic Variables from AOSpine Tumor Knowledge Forum Primary Spinal Tumor Retrospective Database

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Sacral chordomas are rare, locally invasive, malignant neoplasms. Although, their surgical and oncological therapy has changed significantly over the last few decades, the prognosis is still poor. The objective of this study was to identify factors that have an impact on the overall and local recurrence-free survival of patients with sacral chordoma.

Utilizing the AOSpine Knowledge Forum Tumor multicenter ambispective database, surgically treated sacral chordoma cases were identified. Kaplan-Meier, log-rank and Cox regression modeling was used to assess the effect of several pre-, peri-, and postoperative variables on overall survival and local recurrencefree survival.

A total 167 patients with surgically treated sacral chordoma were identified. The male/female ratio was 98/69 with a mean age of 57 (SD=15) years at the time of surgery (18-89 years). The local recurrence was 35% (n=57), death occurred in 30% of patients (n=50) during the study period (5 days to 16.2 years). The median overall survival was 6 years post-surgery, and local recurrence-free survival was 4 years. In the univariate analysis, age ($p<0.001$) and preoperative motor deficit ($p=0.003$) were significantly associated with poor overall survival, and nerve root sacrifice showed a trend towards significance ($p=0.088$). Previous tumor surgery at the same site ($p=0.002$), intralesional resection ($p<0.001$), and tumor volume ($p=0.030$), were significantly associated with local recurrence. In the multivariate models, age and motor deficit were associated with poor survival while previous surgery and intralesional resection were significantly related to local recurrence.

This study identifies two predictive variables for mortality (age and impaired motor function) and two for local recurrence (previous tumor surgery and intralesional surgery) in surgically treated sacral chordoma.

Paper-28

Which Factors Influence the Surgery vs. Non-Surgery Decision for Adult Idiopathic Scoliosis Patients with Gray Zone (40-55o) Main Thoracic Curves?

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The treatment decision-making process for gray zone adult idiopathic scoliosis (AdIS) patients is controversial. Analysis of 44 non-surgical and 20 surgical consecutive, multicenter patients revealed that decreased function, pain and self-image scores created a predilection towards surgery.

Functional status, pain and self-image play a role in surgical decision making process of AdIS patients.

Retrospective analysis of a multicenter, prospective, consecutive patient series

To analyze the factors that may influence surgical vs non-surgical treatment for AdIS patients within gray zone (40-55°) main thoracic (MT) curves.

A retrospective analysis of a multicenter, prospective, consecutive patient series. Inclusion criteria were: AdIS, ≥18 years of age, major curve to be MT, Cobb between 40 and 55°. Sixty-four patients (44 Non-surgical and 20 Surgical) were included. Nonsurgery group had 34 F and 10 M; mean age: 26.8 (18-47), mean Cobb: 46.9 (40-55). Surgery group had 18 F and 2M; mean age:

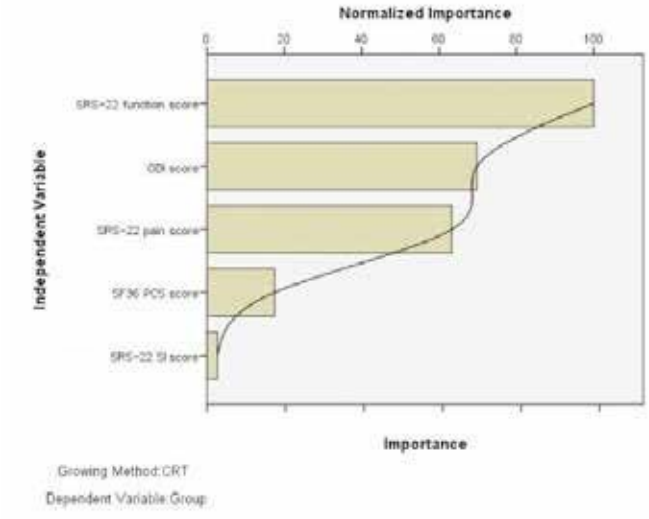
28.0 (18-71), mean Cobb: 49.5 (43-55). All patients completed SF36, SRS-22 and ODI when they were first seen in the clinic. AP and lateral Cobb measurements and sagittal plane parameters were measured. Independent samples t-test was used to compare groups. Using all the demographic, radiographic and patientreported outcome data, a variable importance analysis was done using classification and regression tree algorithm to predict factors that influence surgical decision.

The two groups were matched according to age, sex, MT and Lumbar curve Cobb, coronal balance, trunk shift, shoulder parameters, sagittal Cobb, SVA, pelvic parameters and leg length discrepancy ($p>0.05$). Most important variable that created a tendency towards surgery was SRS-22 functional status followed by SRS-22 pain and self-image scores, ODI and SF-36 PCS.

AdIS patients having a curve magnitude in the gray zone (40-55°) with decreased SRS-22 function, pain, self-image and SF-36 PCS and increased ODI scores had a predilection towards surgery.

Most important variable was SRS-22 function score.

Variance Importance Analysis



Paper-29

Posterior Vertebral Column Resection for the Treatment of Severe Angular Kyphosis

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Retrospective study.

To evaluate the efficacy and safety of posterior vertebral column resection performed on severe angular kyphosis.

The surgical treatment of severe angular kyphosis is a demanding and difficult surgical challenge, of requiring to advanced experience. Seventeen patients with severe angular kyphosis were performed posterior vertebral column resection by authors. Demographical data of the patients, including age, gender, etiology, neurological status and apical kyphosis location were recorded. The mean age of the patients was 17.9 (range, 9-27), preoperatively. Mean follow-up period was 22 (range, 7-52) months. Diagnosis of the patients included congenital kyphosis in 11 patients, post-tuberculosis kyphosis in 3 patients and neurofibromatosis in 3 patients. The parameters (local kyphosis angle, cervical lordosis, thoracic kyphosis, lumbar lordosis, sagittal vertical axis, pelvic tilt, sacral slope and pelvic incidence) were measured in the preoperative and the early postoperative periods and during the last follow-up on the lateral radiographs. Complications were also noted. Preoperative thoracic kyphosis of 123° (range, 95°-150°) in patients with local kyphosis was corrected to 50.4° (range, 10°80°) at postoperatively evaluation. Complications included spinal shock in 4 patients, hemopneumothorax in 3 patients, postoperative infection in 2 patients, dural laceration in 2 patients, neurological deficit in 2 patients and rod fracture in 1 patient. Posterior vertebral column resection provides an efficient and a successful technique on correction of severe angular kyphosis. However, it is a technically troublesome procedure and it may be lead to major complications.

figure 1

Paper-30
Impact of Instrumented Single Level Lumbar Surgical Strategies on Quality of Life

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In this study we examined the effects of single level rigid lumbar transpedicular instrumentation, single level rigid lumbar transpedicular instrumentation + TLIF cage placement, and single level semi dynamic lumbar transpedıcular instrumentation systems on recurrent lumbar disk herniation patients' quality of life. This prospective study compared 3 equal groups of 15 adult males, who underwent lumbar intervertebral discectomy and stabilization for recurrent disc herniation. The patients of each group were randomly selected for short segment lumbar instrumentation (all being one spinal level) and underwent either a rigid lumbar transpedicular instrumentation (Group A), or rigid lumbar transpedicular instrumentation and TLIF cage placement (Group B), or semi dynamic lumbar transpedicular instrumentation (Group C). The mean ages of the patients in Group A is 48 ± 9, Group B is 45 ± 6, and (Group C) 36 ± 5 years, respectively. All patients had detailed radiologic study including magnetic resonance imaging and x-ray before surgery to the latest follow-up observation. For evaluation of life quality, patients filled up quality of life questionnaire, underwent a physical examination utilizing the Oswestry disability index (ODI) and visual analogue scale (VAS). All patients were evaluated after a mean follow-up of 23 ± 2.4 months. In postoperative one-month period, the most dramatic decrease in VAS and ODI scores is observed in one-level lumbar transpedicular instrumentation and TLIF cage placement group ($p=0.021$). In postoperative 1 month to 6 months period the rate of decrease in VAS score was same in both rigid lumbar transpedicular instrumentation and rigid lumbar transpedicular instrumentation + TLIF cage placement groups ($p>0.05$). At the end of 12, 18 and 24 months the rigid lumbar transpedicular instrumentation and TLIF cage group had the lowest VAS and ODI scores in compared to other groups ($p<0.013$).

This comparative study showed that the patients in one level lumbar tarnspedicular instrumentation and TLIF cage placement group have higher quality of life than the one level rigid lumber transpedicular instrumentation and one level semi dynamic lumber transpedicular instrumentation groups.

Paper-31
Modification in Surgical Technique for Posterior Vertebral Column Resection

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To define the modification in surgical technique for posterior vertebral column resection (PVCR)

Surgical treatment of severe and rigid spinal deformities is usually difficult and challenging to perform. In rigid deformities the osteotomies are usually insufficient; vertebral column resection is the only option of treatment. In order to reduce the operation time and complications, a single stage, PVCR is defined by Suk et al. It enables rotational and translational correction of spinal column and provides an opportunity for manipulation of anterior and posterior column simultaneously. In the original PVCR, posterior elements of resection side were removed first and then the anterior part removed and correction was performed. The authors decided to make a modification in PVCR as performing the posterior total laminectomy, facetectomy, and pediclectomy after vertebral body resection. This method has two major advantages;

minimization of the blood loss from epidural veins after laminectomy and protection of the neural elements from direct injury during vertebral body resection.

Eleven patients between three and 63 years of age, diagnosed with severe spinal deformity with limited flexibility, who underwent modified PVCR were reviewed. The average followup was 30 months (12-48months). There were six female and five male patients with a mean age of 18 years. Severe congenital scoliosis was found in 7 patients, congenital kyphosis in 2 patients, neurofibromatosis in one patient, and post-traumatic kyphosis in one patient. The surgery consisted of temporary fixation of vertebral column, resection of vertebral body first then resection of posterior elements, followed by deformity correction and fusion.

The mean estimated blood loss was 1072 ml (350-2000 ml). 39% (33-50) of total blood loss occurred after vertebral body resection, 61% (50-67) occurred after posterior elements removal. The ratio of estimated blood loss to estimated body blood volume was 26% (range 19%-52%). The deformity correction was 60% in coronal plane. No neurological complications were encountered. The PVCR is a complicated, technically demanding procedure with possible risks for major complications. All correction attempts must be performed under direct inspection, palpation of tension in the spinal cord by a highly experienced surgeon. Spinal cord neuromonitoring is a must to prevent neurological injuries. The authors modified the original technique defined by Suk and performed by various surgeons. The authors believe that making vertebral body resection before laminectomy would decrease the blood loss and protect the spinal cord.

Paper-32

Fusionless Percutaneous Pedicle Fixation of Degenerative Spinal Instability in Patients with Associated Co-Morbidities

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Spine surgery is a major intervention, inherently; surgical risk is increase in elderly patients with concomitant co-morbidities. Minimally invasive surgery has become popular in spine surgery in recent years and one of the main purpose of this application is minimize the surgery related potential risks. The purpose of this study is to report the result of non-fusion percutaneous pedicle fixation applications in the risky patients group.

23 patients were included the study whose 55 years old and above with various additional diseases. There were 16 females and 7 males and age distribution ranged from 55 to 82 years old. Two or three levels percutaneous transpedicular screw was applied to patients. Major complaints was back pain mostly due to instability and an additional decompression and fusion has not been applied. Patients with radicular symptoms were excluded from the study. Patients were followed for a mean of 35.3 (13-53) months after surgery. Oswestry (ODI) and Roland-Morris Functional Assessment scale (RMS), SF-36 and VAS scale were used to follow the clinical outcomes of patients. Implant failure was assessed on x-ray imaging with 6 month intervals. Primary diagnosis were 18 degenerative spine, four thoracolumbar fractures and one tuberculous spondylitis with instability or axial spine pain. Main associated co-morbidities were six severe obesity, 13 diabetes mellitus, six coronary artery disease, three cardiac arrhythmia and had four chronic obstructive pulmonary disease (COPD).

There was a statistically significant difference in preoperative and postoperative functional assessment. The mean preoperative VAS scores (7,7 to 2,6), ODI (42.64 to 14.7), RMS (22.5 to 8.9) and scores of SF-36 were improved ($p<0.05$). One implant failure (due to the major trauma) was observed during the study.

In the large majority of the cases, instrumentation and fusion is considered the gold standard for treatment of degenerative and destructive spinal disorders. However, non-fusion surgery with percutaneous posterior fixation improves significantly the clinical finding of patients in current study. Simple and less invasive posterior instrumentation might be a good treatment alternative for sedentary old patients with associated co-morbidities. On the other hand our results showed that implant failure may not be a major problem as expected after these type percutaneous spinal surgery fixations.

Paper-33

A Simple Examination Method for Evaluation of the Curve Flexibility: Modified Adam's Forward Bending Test

Alpaslan Şenköylü[1], Necdet Altun[1], Mustafa İlhan[1], Kenneth Cheung[2], Erdem Aktaş[3], Keith Luk[2]

physical examination methods. Different physical examination methods have been using to assess curve flexibility such as suspension, side bending in standing position. However some of them are not easy to perform like suspension and others do not provide enough information about flexibility. Definition and reliability of a simple physical examination that is a modification of Adam's forward bending test will be aimed for evaluation of the curve flexibility in adolescent idiopathic scoliosis.

A cohort including forty patients with adolescent idiopathic scoliosis has been included in this study. In modified Adam's forward bending test, examiners ask the patient for trying to bend his/her trunk to the both sides during the Adam's forward bending test with a fixed pelvis. Clinical Measurements: Preoperatively, scoliometric measurements will be done during Adam's forward bending test and its Hong Kong modification.

Radiographic Measurements: Standard standing AP - lateral and fulcrum bending long-cassette x-rays will be taken preoperatively. At the postoperative one-week AP and lateral x-ray will be taken again. FBCI will be calculated with these measurements. Mean preoperative scoliometric measurement of rib/loin hump for primary curves during AFBT and mAFBT were 14.4±5.1 and 5.4±5 respectively. Mean postoperative scoliometric measurement of primary curve during AFBT was 6.9±4.5. Regarding the radiographic measurements, mean Cobb's angle measurement of standing, fulcrum bending and side bending X-rays of the primary curve were 57.5±14, 22.1±10.16, 33.4±13, respectively. The mean Cobb's

There are two main methods to assess flexibility: First contains radiological methods such as side bending, fulcrum bending, traction under general anesthesia and second including

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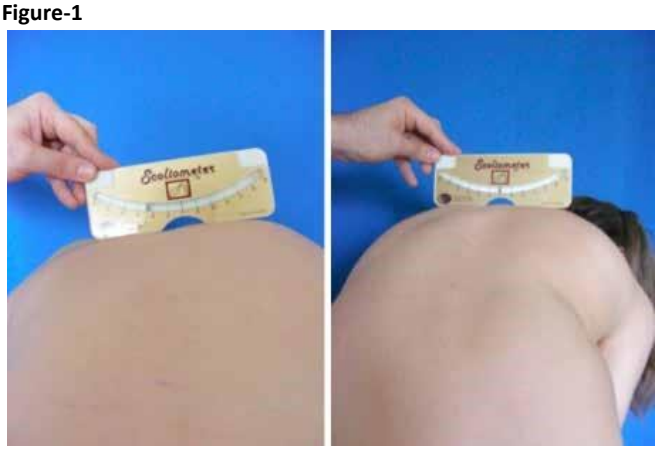
angle measurement of postoperative standing X-ray was 14±8. There are significant correlations between Cobb's angle and AFBT measurements (p=0.005), fulcrum bending and mAFBT (p=0.0001), side bending and mAFBT (p=0,0001), postop Cobb's angle and postop AFBT (p=0.003). ROC Curves drawn by taking reference of FBFI (AUC, p=) and SBFI (AUC, p=) were demonstrated high sensitivity rate in flexible curvatures and this rate gradually was decreasing as the curvature became rigid. It was vice versa for specificity rates of mAFT.

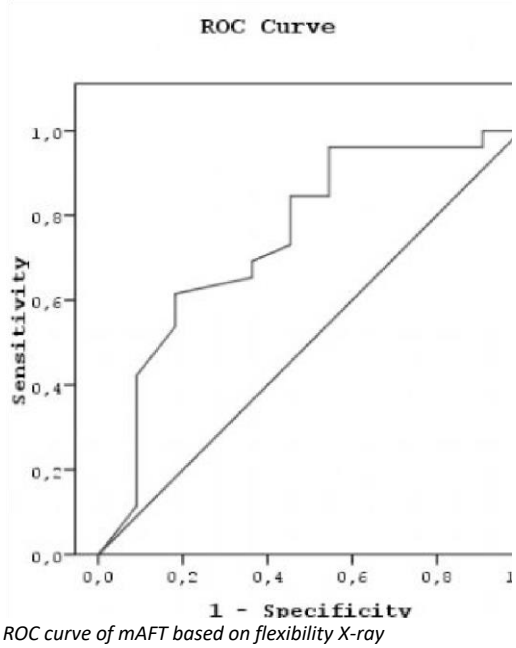
In conclusion, mAFBT has been found as a reliable test for clinical assessment of curve flexibility in AIS with its high sensitivity and low specificity rate in flexible curves. This non-invasive physical examination method can be used for preoperative evaluation of curve flexibility in AIS.

Figure-1



Scoliometer measurement during modified Adam's forward bending test

Figure-2



ROC curve of mAFT based on flexibility X-ray

Paper-34

Vitamin D Deficiency in Patients with Idiopathic Scoliosis: Something to Worry About?

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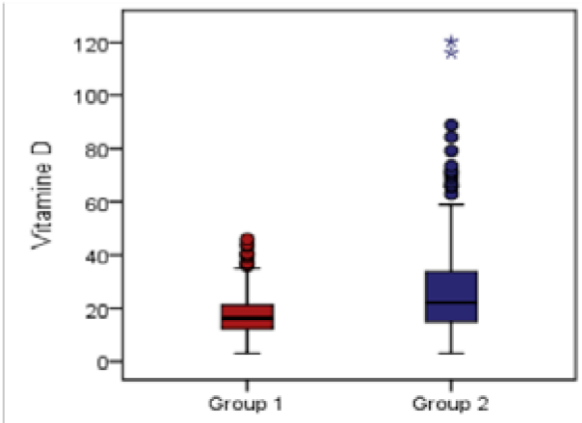
Comparison of serum vitamin D level between idiopathic scoliosis (IS) patients and normal population. Examination of the relationship between serum vitamin D level in IS and gender, Cobb angle, serum Ca, P and ALP values.

Serum Vitamin D (25[OH] D) level of IS with Cobb angle >10 and Ca, P, ALP levels, and Cobb angles were retrospectively analyzed. 279 IS patients (Group 1) and the control group of 251 cases without spinal curve but checked for serum vitamin D level for other reasons (Group 2) were compared. The populations were respectively Group 1 (221 female, 58 male) and Group 2 (165 female, 86 male). Average age of Group 1 was 18.1 ± 8.5 years, and that of Group 2 was 35.3 ± 20.1. Purified from the effect of age, Vitamin D value was found significantly lower with 16.1 ng/ml in average for Group 1, and 29.1 ng/ml in average for Group 2 (p = 0.000). Purified from the effect of gender, Vitamin D was again found significantly lower with 17.6 ng/ml in average for Group 1, and 27.3 ng/ml in average for Group 2 (p = 0.000). Although there was a significant positive correlation between Group 1 Serum Vitamin D values and Ca (p = 0.027); a significant correlation was not noted between Group 1 Vitamin D values and ALP, P and Cobb angle (p >0.05). Group 1 Vitamin D values did not have a significant difference with 17.6 ± 8.1 ng/ml in average for women, and 17.8 ± 7.8 ng/ml in average for men. Comparison of the operated patients due to IS with those not operated did not show a significant difference with average 16.2 ± 6.9 ng/ml Vitamin D values for those operated and average 17.9 ± 8.2 ng/ml for those not operated (p = 0.235). According to our study, serum vitamin D level in IS has been found significantly lower compared to the control group. A positive correlation was observed between serum vitamin D level in IS and CA, whereas a significant correlation was not identified between the age, gender, Cobb angle, P and ALP values. As a result, IS patients must be controlled and followed for Vitamin D deficiency or insufficiency compared to the normal population. Prospective comprehensive studies which examine the causes and relation of low Serum Vitamin D in IS may be beneficial.

Fig 1



Vitamin D value was 17.6 ± 8 ng/ml in average (median 16.2, range 2.9-46) for Group 1 compared to 27.4 ± 18.4 ng/ml in average (median 22.2, 2.9120) for Group 2, thus significantly lower (p = 0.000). Purified from the

effect of age, Vitamin D value was still found significantly lower with 16.1 ng/ml in average for Group 1, and 29.1 ng/ml in average for Group 2 (p = 0.000).

Paper-35

Proximal Junctional Screw Pullout After Long Thoracolumbar Posterior Fusions for Adult Spinal Surgery: When Is Revision Required?

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In a retrospective cohort analysis of 340 patients with adults spinal deformity (ASD), proximal junctional failure (PJF) caused by screw pullout occurred in 12% of patients and were frequently associated with proximal junctional vertebral body fractures. While all do not necessitate a revision surgery, those with screw pullout and pain, proximal junctional kyphosis (PJK)often require surgical correction. All patients with painful proximal junctional screw pullout after ASD surgery require revision.

Retrospective cohort analysis.

Screw pullout at the proximal junction of thoracolumbar fusions for ASD are one cause of post-operative PJK and PJF. We analyze factors associated with revision surgery following screw-pullout after ASD operation.

Consecutive adults who underwent thoracolumbar fusions for ASD (2003-2011) were reviewed. Inclusion criteria included: instrumentation from pelvis to L1 or above, proximal junctional screw pullout, and minimum 2 years follow-up. Peri-operative spinal deformity parameters and proximal junctional screw pullout were assessed. Clinical and radiographic characteristics of those with screw pullout and who required revision were determined. Of 340 eligible patients, 49 (10 males; 39 females; average age; 64.6 ±8.87 SD) had proximal junctional screw pullout. Of these patients, 39 developed PJK (79.5%). Concomitant proximal junctional pathology included: spondylolisthesis (8%) or vertebral body fractures (63.3%). Compared to patients who didn't have pain, patients with pain received a significantly higher surgery advice (80.7 % vs 27 % p<0.01). Of PJK patients, 28% were revised and 59% had pain. These patients with pain, 83% were required revision, 8.7% had spondylolisthesis and 57% had a junctional vertebral body fracture. Revision was also required in patients with pain and no associated PJK (n=2/3; 67%). Those with pain had significantly greater SVAs at final follow-up than those without pain (78vs52mm;p=0.04). Screw pullouts at the proximal junction of long thoracolumbar fusions for ASD occurred in 14% of this cohort and were frequently associated with proximal junctional vertebral body fractures. While all do not necessitate a revision surgery, painful screw pullouts often require surgical intervention.

Paper-36

Evaluation of Safety and Efficacy of a New Interbody Fusion Device Using a Sheep Model

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The purpose of the animal study is to examine the efficacy and safety of the new interbody fusiondevice in the anterior column by examining plain radiographs, CT scans, macroscopic analysis and immunohistological sections in a sheep model; to prove osseointegration of a new ST Line vertebral cage in the spine of the sheep, to compare them with control titanium standard cages, to compare overall bone formation adjacent to vertebral cages on both sides of vertebral endplates and to compare the bone implant contact line between test and control groups.

We have included 24 Merino sheep in the study. We sacrificed one third of sheep (n=8) at the end of postoperative 4th weeks, 8 sheep at the end of postoperative 8th weeks and the remaining 8 sheep at the end of postopereative 12th weeks. Then, 5 of 8 specimens underwent routine histological examination and the remaining 3 of 8 underwent to biomechanical analysis. All sheep were placed into a prone position and then underwent a dorsal mediolateral approach with monolateral fascia incision from L2 to L6. In each sheep, lumbar 5-6 and lumbar 3-4 discectomies were performed. Discectomy defects were placed at one level by a new cage structured titanium (ST) porous coated and at the other level with standard full titatium cages (FT) both filled with bone graft in same sheep. In all cases short pedicle screw instrumentation was performed. During the scarification process, lumbar spines of the sheep will be removed enbloc and plain radiography and CT scans will be performed. Biomechanical cage pullout tests and histological analysis were performed subsequently.

Post sacrifice CT examination indicated a radiographıc fusion rate of 87,5% after 4 weeks and 100% after 8 weeks. Plotted against the direct control cage made of full titatium, the ST cages needed significantly higher pull out forces then the control. Histologic results show a faster bony formation in ST Cages and less connective tissue building. In the ST line we have observed a significant higher radiological bony fusion rates, biomechanical strength and more bone formation compared to FT line cages. Our results indicate a superiortity of porous titatium to full titatium in lumbar interbody fusion. CT scans with radiographic fusion diagnosis, macroscopic analysis and immunohistological sections prove a faster osseointegration of a new ST vertebral cage in the spine of the sheep, compared to FT as standard control cages.

Paper-37

Traction X-Ray Under General Anesthesia (TRUGA): Does It Change the Upper and Lower Fusion Levels Selected Before Surgery?

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[3]Atatürk University

The purpose of this study was to evaluate the effect of traction x-ray under general anesthesia (TRUGA) in the decision making selection of UIV and LIV in AIS pts.

We evaluated 5 senior surgeons UIV and LIV decision changes using preop standing and bending x-rays vs. x-rays with TRUGA in 40 AIS pts. All authors had more than 20 years of experience in spine deformity. At first stage authors selected the UIV and LIV levels with standing-full spine x-rays and bending x-rays. In the second stage, two weeks later they evaluated the same patients UIV and LIV with the same x-rays and also TRUGA. In the second stage the authors were informed about their first stage decisions for each patient to avoid intraobserver variability. All decisions compared for each author before and after TRUGA with Mc Nemar Bowker test

After TRUGA authors changed their decisions with a mean of 11.5%(0-25) for UIV and their decisions for LIV with a mean of 20%(15-25).There was no consistence between authors level decisions for the first and second stage.(Cohen Kappa test). TRUGA changed the decision for both UIV and LIV in patients with Lenke type 3(27%) and type 5(22%) curves more than the other types. Almost all authors selected UIV as T2 at first stage and did not change it after TRUGA for structural proximal thoracic curves. In terms of non-structural proximal thoracic curves; TRUGA changed the UIV in 10.2% of the cases. Selection of LIV in patients with structural lumbar curves changed from L4 to L3 after TRUGA with a mean of 53%(46-63).There was consistence between all authors in terms of changing LIV from L4 to L3(p=0.76)(Table)

TRUGA changed authors decisions with a mean of 11.5% for UIV and with a mean of 20% for LIV.TRUGA mainly changed the UIV decisions in deformities with non-structural proximal thoracic curves and LIV decisions in deformities with structural lumbar curves. This study showed that TRUGA is a helpful decision making tool in order to save more mobile levels for structural lumbar curves and gives additional information to determine the UIV and LIV. **truga table**

	1st Authors	2nd Authors	3rd Authors	4th Authors	5th Authors
UIV change (n=40)	6 (%15)	2 (%5)	10 (%25)	5 (%12,5)	0 (%0)
LIV change (n=40)	9 (%22,5)	6 (%15)	10 (%25)	7 (%17,5)	8 (%20)
Lenke type 3	%27				
Lenke type 5	%22				
UIV change*	%10,2				
LIV change**	%53				

UIV: Upper Instrumented Vertebra; LIV: Lower Instrumented Vertebra
* UIV change in non-structural proximal thoracic curves
** LIV change from L4 to L3 in structural lumbar curves

Paper-38
The Effects of Adult Spinal Deformity Surgery on Total Hip Arthroplasty Acetabular Component Position

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A goal of adult spinal deformity (ASD) surgery is correction of sagittal imbalance by increasing lumbar lordosis (LL). This allows the previously compensated, retroverted pelvis to normalized, evidenced by parameter changes such as decreased pelvic tilt (PT). The resultant restoration of pelvic orientation may alter the position and function of a total hip arthroplasty (THA). We analyzed the effects of ASD surgery on acetabular component position in patients with preexisting THA

To evaluate the effects of changes in LL and PT after ASD surgery on acetabular component position in patients with a previous total hip replacement. Retrospective case series

Adults with spinal deformity who underwent long thoracolumbar fusions

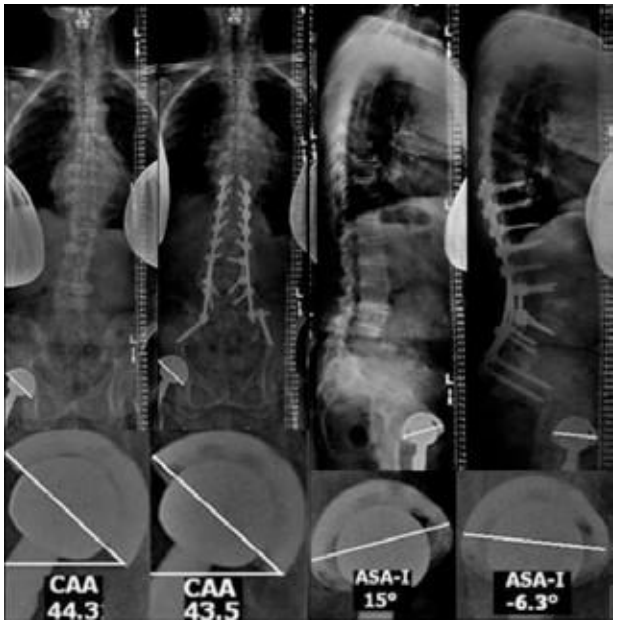
Spinal deformity parameters, including PT, pelvic incidence (PI), sacral slope (SS), LL, lumbopelvic mismatch, thoracic kyphosis (TK), sagittal vertical axis (SVA), thoracic and lumbar Cobb angles. Position of total hip acetabular cup, as measured by the acetabular cup sagittal ante-inclination (ASA-I) and cup abduction angles (CAA).

A retrospective chart review of consecutive patients who underwent thoracolumbar fusions for ASD between 2007 and 2014 at a single institution was performed. Inclusion criteria were: age >18 years, a total hip replacement performed before spinal surgery, instrumentation extending from the pelvis to L1 or above. Radiographic analysis included: pre- and postoperative spinal deformity parameters, ASA-I and CAA. Patients who underwent a 3-column osteotomy (3CO) were compared to those did not have a 3 column osteotomy. ANOVA, student t-tests and Mann-Whitney U test were used to evaluate differences between groups.

Of 988 patients, 27 met inclusion criteria (M:10, F:17, avg age 70±9yrs) (3CO:14; no-3CO:13). For the entire cohort, LL increased 17.8±15.8˚ SD, while there were decreases in PT (-5.5±8˚SD), ASA-I (-6.6±10.1˚ SD) and increase in CAA (- 54.6±70.1mm SD). The magnitude of change was greater in the 3CO: SVA correction (88±71mm vs 19±50mm;p=0.003), increase in LL (27±14˚vs 8±12˚;p=0.001), decrease in PT(9±7˚vs 2±8˚;p=0.048), decrease in ASA-I (11±7˚vs 2±10˚;p=0.024). ASA-I change was significantly correlated with change in PT(r: -0.704, p:<0.001) and LL (r: -0.481, p:0.011). CAA did not change significantly.

THA acetabular component position changes significantly after ASD surgery. Increasing LL via spinal osteotomies results in decreased ASA-I. This functional reorientation may affect tribology, wear, and joint stability. The clinical implications deserve further investigation however, consideration should be given to performing spinal realignment operations prior to THA.

Changes in CAA and ASA-I following 3 column osteotomy



Changes in Cup Abduction Angle and Acetabular Sagittal Ante-Inclination following 3 column osteotomy

Paper-39
Fixation of Dens Axis Fractures Alonzo II in the Old Age Through a Percutaneous Transarticular C1/ C2 Screw Arthrodesis. Outcome and Pittfalls

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Center for Orthopedic and Trauma Surgery University Hospital, Germany

Bony healing in Dens Type II fractures is found in 66 % after operative and 28 % of cases after conservative treatment. Operative treatment of dens Alonzo Type II fractures is considered gold standard and mandatory. Operative generally open fixation techniques comprise (in decreasing order of fixation stability), C1/C2 Fixation utilizing laminar wiring and bone graft, anterior screw fixation (= gold standard), primary anterior C1/C2 fusion, posterior C1/C2 fusion using transarticular screws (TAS) or a screw-rod/plate system (SRS). Comparison of both posterior techniques shows no differences in mortality and neurological injury (0.8% vs 0.6%). A higher incidence of vertebral artery injury (4.1% vs 2.0%) and malpositioned screws (7.1% vs 2.4%) could be demonstrated in the TAS technique. Fluoroscopic controlled fixation of Dens Axis Alonzo Type II fractures in the old age through a percutaneous delivery of transarticular C1/ C2 screws.

Compare percutaneous delivery of transarticular C1/C2 screwarthrodesis with the open dorsal techniques.

Preop. CT-scan and MRI: Evaluation of fracture patterns, C1/C2 joint (dislocation?) and the course and integrity of the vertebral arteries to determine the optimum angle for guide wire insertion. TAS is performed under general anesthesia with the head tightly fixed after fracture reduction using a cannulated self-tapping and drilling screw/trocar-system (Neon-System) with two image intensifiers. Two incisions 2 cm lateral the spinal process at the level Th1/2 and a blunt trocar cannulation to the lamina of C2 are performed. K.-wire is advanced under fluoroscopic control following the C2 pedicle and directed to the center of the lateral mass in a.-p. view. After length determination the screw is brought in over K.-wire. Postoperative CT-scan for evaluation of reduction and screws position.

54 Patients, 35 fractures/19 Dens-non-unions, Gender: 30 females vs 24 males, Mean age: 75.7 (21,3-95.9) years. Mean blood loss: < 40ml, mean operation time: 44 (27-90) min. Image intensifier time: 21-120 sec, radiation load: 32.5- 255. 5 cGy/cm2. No 30 days mortality, no neurological and vascular injury, no liquor leak no infection. CTscan revealed 7 malpositioned uneventful screws, 4 localized in the spinal canal and 5 cases of a subluxated C1/C2 joint with unilateral marginal screw-position.

1. Outcome parameters of percutaneous TAS procedure showed no difference in comparison with the open technique.
2. Uneventful screw malposition occurred. In absence of symptoms no revision was performed
3. Intraoperative conventional lateral view does not allow to judge C1/C2 joint reduction

Paper-40
Urological Improvements After Surgical Release in Patients with Secondary Tethered Cord Syndrome

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Developing neurological symptoms related to spinal cord tethering after untethering of spinal dysraphism is referred secondary tethered cord syndrome (STCS). Following repair of a myelomeningocele it may developed in 10 to 30% of children. Orthopedic and urologic deterioration during follow up are strong indicator for diagnosis of this condition. Operative release is indicated in the patients, clinical symptoms, imaging studies, urodynamic, and somatosensory evoked potentials are consistent with STCS. On the other hand outcome of untethering surgery may not always be predicted. The purpose of current study is present to neurological outcomes of secondary untethering surgery in the patients with the STSC. 12 patients (7 male 5 female) with diagnosis of STSC were included the study. All patients have back pain with various intensity (VAS 6.8). Urologic findings were 12 atonic bladder (10 of them need clear intermittent catheterization), 3 sexual dysfunction. Nine patients also have motor weakness in various severity. All patients have operation history in the first two years of their life (2 days- 2 years) because of spinal dysraphism (myelomeningocele or lipomeningocele). Average age of the patients was 17.91 (7-32) at the final surgery. Average interval between first and last operation was 16.7 years (6-31). Patients were followed average 31.8 month (20-48). After the release, primary back pain and motor weakness markedly improved in all patients (VAS 1.1). Improvement in sexual function are less easy to demonstrate, according to declaration of patients average %80 improvement their erection, ejaculation and fertility were achieved. (two of three patient had baby after the operation). Urological symptoms improved in 85% of the patients with atonic bladder. Postoperative urodynamic studies revealed significant decrease in residual urine volume.

Urological dysfunction is mostly considered a fate, especially in operated pediatric patients with spinal dysraphism. Close urological surveillance remains the most valuable tool in the early diagnosis and follow-up urologic dysfunctions in such cases. Tethered cord release should be considered for patients with STCS. Release of stretching tissues is markedly improved to quality of life. Our study shows that secondary untethering surgery may significantly improve urological outcomes. Ideally, for early diagnoses and operation decision multidisciplinary approach, by neurosurgeons, orthopedic surgeons and urologist is recommended.

Paper-41

Does Pedicule Screw Fixation Under Age Five Cause Spinal Canal Narrowing? A CT Study with Minimum 5 Years Follow-up

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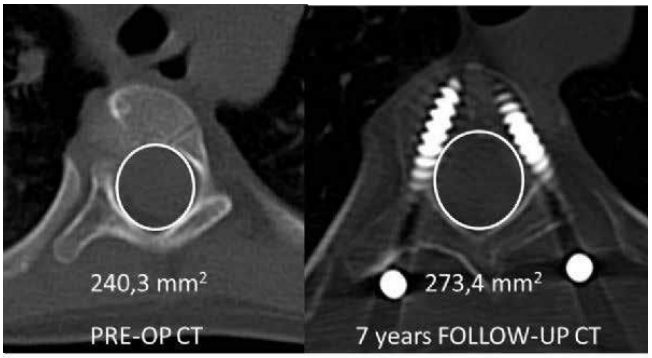
The influence of pedicle screw fixation on canal diameter below age 5 is controversial. Animal studies demonstrated development of canal stenosis after pedicle screw fixation. In contrast to these results, clinical studies demonstrating no spinal stenosis after pedicle screw fixation has been published. The aim of this retrospective study was to evaluate the changes in the canal area in a group of patients who had pedicle screw fixation under age 5 for the treatment of spinal deformity at least 5 year follow-up

11 patients who had been operated due to spinal deformity under age 5 with who had a CT examination due to several reasons at least 5 years after the initial spinal operation were included in the study. All patients had congenital scoliosis and underwent hemivertebrectomy and transpedicular fixation procedures at an average age of 3.18 (range; 2 to 5). All had preoperative CT to evaluate the congenital deformities. Measurements were done at the instrumented vertebrae as well as the uninstrumented ones above and below them to evaluate; anterior vertebral body height (AVBH), posterior vertebral body height (PVBH),cranial end plate length (CrEPL), caudal end plate length (CaEPL),spinal canal area (SCA),anteroposterior diameter of vertebral body (APD) and lateral diameter of vertebral body(LD) of upper instrumented vertebra (UIV),lower instrumented vertebra (LIV),upper adjacent uninstrumented vertebra(UAV) and lower adjacent uninstrumented vertebra (LAV)

The average follow-up was 7,2 (range; 5 to 12) years. 6 of the patients were over age 10 during the final CT examination while 5 were at age 7. Female to male ratio was 7 to 4. Measurement of all the parameters in 22 instrumented and 22 non-instrumented segments showed a proportional increase rather than a decrease at each segment (Figure 1). The percentage of canal area growth at UIV and LIV were 21% and 17.5% respectively.

Pedicle screw instrumentation has no adverse effect on further spinal growth and does not result in iatrogenic spinal canal stenosis.

canal diameter



Paper-42

Which Radiologic Parameters are Associated with Disc and Facet Degeneration in the Lumbar Curve After Selective Thoracic Fusion in AIS: An MRI Study with Minimum 10 Years Follow-up

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The purpose of this study was to evaluate the DD and FJD of mobile lumbar levels in Selective Thoracic Fusion(STF) pts with MRI and find out which radiological parameters affected DD and FJD at least 10 years after the operation.

We reviewed 31(29f,2m)pts with AIS who underwent STF. There were 5 pts with type T1A,11 pts with T1B,14 pts with T1C and 1 pts with T2B.All pts had complete radiographic data with a mean 12.1 years follow-up(11- 18). Mean age was 14(11-16). They were analyzed in terms of the difference between lumbar DD and FJD grades preop and at f/up; and correlation with residual curve, LIV tilt, disc angulation of LIV, sacral oblique take off angle, leg length discrepancy (LLD) and the difference between all coronal and sagittal parameters were assessed. All statistical analyses were made with Spearman correlation test. All FJD grades were significantly different between preop (mean 1,8) and post-op(mean 2,0) except in the T11-T12 and T12-L1 facet joints($p<0.001$). DDs in L4-L5 and L5-S1 were significantly ($p<0.001$) different at preop and f/up, and insignificant in other levels. Statistical analyses showed that increased residual curve more than 10° correlated with L1-L2 concave FJD ($p=0.03$)and sacral oblique take-off angle more than 5° correlated with L5-S1 DD. Also residual curve more than 10° correlated with sacral oblique take off angle more than 5°(%80). The other parameters including disc angulation of LIV, LLD, LIV tilt angle, all sagittal and coronal x-ray parameters were not correlated with any DD or FJD($p>0.05$).At the f/ up SRS score was 4.34(3.74-4.92)and ODI scores was 5.3(0-13.3) Despite a mild difference in radiologic DD and FJD, SRS (4.34)and

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ODI(5.3) scores indicated that there were no patients with back pain and clinical complaints after STF at minimum 10 years f/up. Residual curve more than 10° and sacral oblique take-off angle more than 5° were found as risk factors for degeneration and were associated with L1-L2 FJD and L5-S1 DD respectively.

Paper-43

Global Tilt: A Single Parameter Incorporating the Spinal and Pelvic Parameters Correlates with HealthRelated Quality of Life Parameters

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This study demonstrates that Global Tilt, a novel radiographic measurement, correlates with health-related quality of life (HRQoL) parameters.

Retrospective analysis of a multicenter, prospective, consecutive patient series

Surgical goals and alignment objectives mostly depend on sagittal plane parameters. SVA, C7 tilt and T1 tilt account for spinal balance and PI, PT, SS, PI-LL account for pelvic compensatory mechanism, which are all affected by patient positioning. GT is the angle between the line drawn from the center of C7 to the center of the sacral endplate and a line drawn from the center of the sacral endplate to the center of the femoral head. GT is a single parameter that takes both balance and pelvic compensation into account as a single parameter. GT has been shown to be less affected by patient positioning compared to SVA and PT. Aim was to analyze the correlation of GT with HRQoL parameters and compare to other sagittal plane parameters.

A retrospective analysis of a multicenter, prospective, consecutive patient series. 337 patients (285F,52M) with adult spinal deformity were included, (mean age: 58.2±15.7). Pelvic parameters (PT, PI, SS), sagittal balance parameters (SVA, T1 tilt), GT and lordosis gap(LGap) were measured by using Surgimap. HRQoL instruments included: Oswestry Disability Index(ODI), Short Form-36, SRS-22. Correlation analysis between radiographic pelvic and sagittal balance parameters, GT and LGap was pursued. Kruskal-Wallis test was used to compare GT, SVA and PT for ODI <20, 20-40 and >40 disability groups.

Global tilt significantly correlated with ODI, SRS-22 pain, function, self-image, and subtotal scores and SF-36 PCS ($p<0.01$) similar to SVA, PT and LGap. None of the radiographic parameters correlated with SRS-22 mental health or SF-36 MCS (Table 1). GT was more sensitive in detecting ODI disability groups when compared to SVA and PT ($p<0.01$)

GT has a similar or better correlation with HRQoL domains compared to PT and SVA. This information adds another important feature of this parameter in addition to being a single parameter taking into account both the spinal balance and pelvic compensation and being less affected by patient positioning.

Correlations

	Global Tilt	LGap	LGap Absolute	Pelvic Tilt	Sagittal Balance	Sagittal Balance Absolute
ODI	0.389 (<0.001)	0.271 (<0.001)	0.226 (<0.001)	0.323 (<0.001)	0.410 (<0.001)	0.204 (0.002)
SRS 22 Pain	-0.250 (<0.001)	-0.195 (0.003)	-	-0.203 (0.002)	-0.290 (<0.001)	-
SRS 22 Self Image	-0.294 (<0.001)	-0.148 (0.023)	-0.145 (0.026)	-0.206 (0.001)	-0.300 (<0.001)	-
SRS 22 Function	-0.371 (<0.001)	-0.295 (<0.001)	-0.239 (<0.001)	-0.319 (<0.001)	-0.400 (<0.001)	-0.195 (0.003)
SRS 22 Mental-Health	-	-	-	-	-	-
SRS 22 Satisfaction	-0.156 (0.021)	-	-	-	-0.170 (0.018)	-
SRS 22 SubTotal	-0.325 (<0.001)	-0.199 (0.002)	-0.164 (0.012)	-0.257 (<0.001)	-0.350 (<0.001)	-
SF36 PCS	-0.304 (<0.001)	-0.276 (<0.001)	-0.202 (0.002)	-0.265 (<0.001)	-0.320 (<0.001)	-0.147 (0.032)
SF36 MCS	-0.140 (0.033)	-	-	-	-	-

Paper-44

Posterior Keyhole Foraminotomy for the Treatment of Cervical Radiculopathy

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Cervical radiculopathy caused by either soft herniated disc material or foraminal stenosis is a common problem. Anterior and posteriorsurgical approaches are commonly used to decompress the nerve root. The aim of this work was to evaluate the role of posterior keyhole foraminotomy for the treatment of cervical radiculopathy as compared to the anterior approach for cervical discectomy in means of quality of life. A retrospective study included 32 patients diagnosed with cervical foraminal disc herniation and they were divided into two groups. 20 patients (group 1) had cervical anterior discectomy and 12 patients (group 2) had posterior cervical keyhole foraminotomy. The exclusion criteria were: Multi-level herniation, central herniation and presence of spinal canal stenosis. For the follow-up, Magnetic Resonance Imagings (MRI) were done on the postoperative 1st day, 3rd and 12th months together with the neurologic examinations. Upper extremity motor examination, duration of surgery, Visual analog scale (VAS), recurrence or residual states inMRI, patient comfort and postoperative complications were compared in two groups.

Cervical posterior keyhole foraminotomy (group 2) had much better VAS results than the cervical anterior discectomy (group 1) on the 3. and 12. months but no diffrence in early postoperative period. Patients in both groups had improvement in muscle strength. The postoperative complications including dysphagia and hoarseness were present in group (1) and postoperative hematoma in group (2) which resolved on itself. As compared to cervical anterior discectomy, cervical posterior keyhole foraminotomy is a safe and effective approach for surgical treatment of cervical foraminal disc herniation causing nerve root compression. Posterior keyhole foraminotomy has a less incidence

Paper-45

Radiological and Clinical Outcome of the Operated and Adjacent Segments Following M-6 Cervical Arthroplasty After a Minimum 18-Month Follow-up: A Single Surgeon Experience

Sinan Karaca[1], Mehmet Nuri Erdem[2], Mehmet Aydoğan[3], Mehmet Fatih Korkmaz[3], Selim Mugrabi[4], Mehmet Tezer[3]

were included in this study. Younger patients with radicular pain, with no facet joint arthrosis and with preserved disc height >50% were selected for TDA. Radiological parameters including disc level height at the operated and adjacent levels, global cervical lordosis, segmental lordosis, range of motion, subsidence, facet arthrosis, adjacent segment degeneration (ASD) and heterotopic ossification were analyzed. Clinical results were analyzed with Visual Analog Skor (VAS) Oswestry Disability Index (ODI). All surgeries were done by a single surgeon. All patients had prophylactic meloxicam for 6 weeks after surgery. Av. age was 38,7 (26-49) and av. f/up was 24,7 (18-35) month. Operated levels were C3-4 (%6,2), C4-5(18,7%), C5-6(50 %), C6-7 (%25). All patients had clinical improvement. NDI was improved from 42 to 9. There was a significant improvement in segmental kyphosis, global lordosis and disc height at the operated level with no significant change at the final f/up. There was no radiographic facet joint arthrosis at the index and adjacent levels 1 patient had radiographic signs of ASD at the cranial adjacent level while 1 patient had ASD at the caudal adjacent level. Global cervical lordosis improved from 7.1° to 14.8° and mean range of motion improved from 6.8° to 10.3°. Mean disc height at operated levels improved from 3.3 mm to 5.6 mm. There was no heterotopic ossification. This study demonstrates a satisfactory radiographic and clinical outcome after M-6 TDA with a minimum 18-month follow-up.

Paper-46
Biomechanical Comparison of Traditional Iliac Screw Fixation versus Distal Iliac Screw (DIS) Fixation: A Cadaveric Study

Meriç Enercan[1], Mutlu Çobanoğlu[2], Sinan Kahraman[3], Sinan Yılar[4], Bahadır Gökçen[3], Erden Ertürer[3], Çağatay Öztürk[3], Azmi Hamzaoğlu[1]

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During insertion of the traditional iliac screw, resection of the posterior superior iliac spine in order to avoid implant prominence will result in loss of the cortical bone, which will lead to a decrease in the insertional torques of the iliac screw and its primary stability. In order to overcome problems related with traditional iliac screw fixation, we introduced a new freehand technique “distal iliac screw (DIS)” fixation with a starting point located more distally at the posterior inferior iliac spine, which does not require any decortication or osteotomy for entry point and with a trajectory courses very close to the rigid subcortical bone over the sciatic notch. The aim of this comparative biomechanical study is to evaluate biomechanical properties of evaluate DIS fixation and compare with traditional iliac fixation technique in a cadaveric study.

Eight fresh human (4F, 4M) lumbopelvic spines were tested and each specimen was assigned a traditional iliac screw fixation on one side and DIS fixation on the contralateral side. The insertional torque forces were recorded with a digital torque wrench through placement and the axial pull-out and toggle tests were conducted using a MTS test system (Figure 1). All specimens were radiographed, and 3D images were taken using O-Arm system prior to and after testing. O-Arm images were reviewed for trajectory assessment (Figure 2).

Mean peak insertion torque was 2.48±1.84Nm for traditional and 3.98±2.40Nm for new trajectory ($p<0.008$). DIS fixation achieved a higher maximum axial pull-out force and higher stiffness than traditional iliac screw fixation. At the 1st and 100th load cycle with toggle displacement of 5mm, DIS achieved a higher toggle forces than the traditional iliac screw fixation (Table 1). All screws placed in the new trajectory were longer in length compared to the screws placed in the traditional trajectory without any cortical breech.

DIS fixation technique provided higher insertional torques, stiffness, axial pull-out, toggle forces and longer screw length than traditional iliac fixation. This biomechanical data encourages the clinical application of DIS fixation technique as a valid alternative in primary or revision adult deformity surgery.

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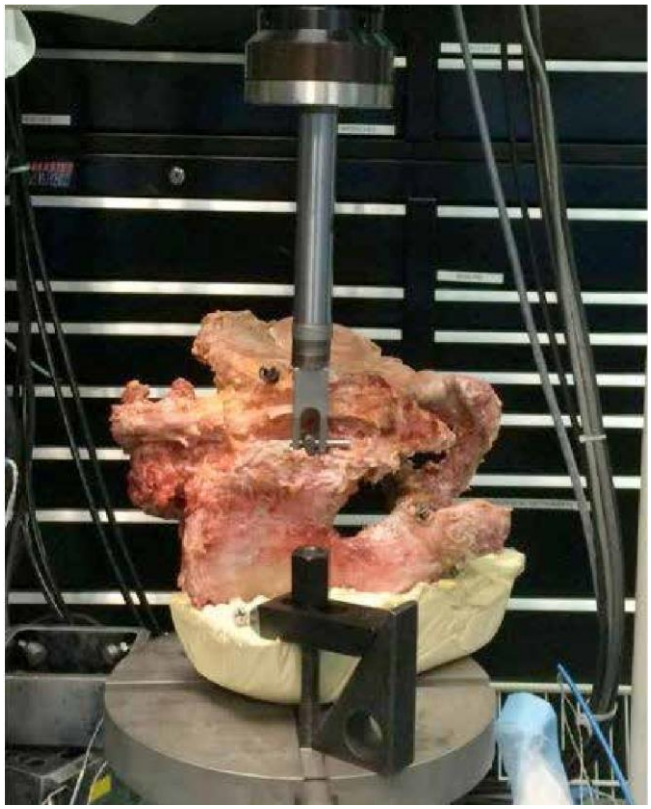
The purpose of this retrospective study was to determine the radiological and clinical outcome of cervical total disc arthroplasty (TDA) using flexible M-6 disc prosthesis after a minimum 18 months follow-up at a single center.

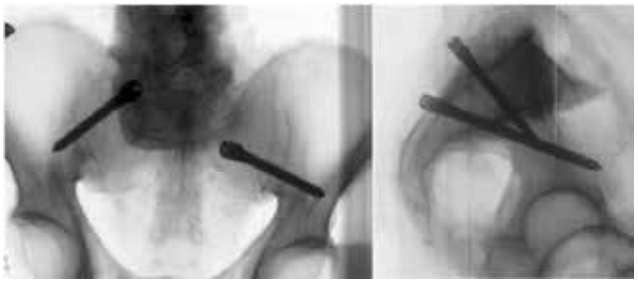
16 levels of 14 (8 M, 6F)cases with minimum 18 month f/up

Figure 1



Axial pullout test of DIS fixation

Figure 2



O-Arm images **Table 1**

	Traditional Iliac Screw Fixation	Distal Iliac Screw Fixation
Peak Insertional Torque (Nm)	2.48 ± 1.84	3.98 ± 2.40
Maximum Pullout Force (N)	1546.3 ± 1660.6	2928.8 ± 2353.2
Stiffness(N/mm)	1411.4 ± 903.8	2323.1 ± 1162.1
Toggle Force in the 1st load cycle at a displacement of 5mm (N)	382.9 ± 71.3	427.8 ± 88.5
Toggle Force in the 100th load cycle at a displacement of 5mm (N)	337.5 ± 63.0	394.4 ± 71.3

Paper-47

Evaluation of Human BoneMarrowMSCs Transplantation in Experimental Spinal Cord Injury

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Traumatic spinal cord injury (SCI) is a devastating problem of health that results in high morbidity and mortality rates. The loss of function after SCI results from both the primary mechanical insult and the subsequent, multifaceted secondary response. The use of stem cells in the treatment of traumatic SCI in recent years has provided promising results. Different source of cells for transplantation have been used, including neural progenitor cells (NPCs), neural stem cells (NSCs), embryonic stem cells(ESCs) or mesenchymal stem cells (MSCs). We evaluated the human Bone Marrow-MSCs transplantation in an experimental spinal cord injury model in animals. All experiments were conducted in the animal laboratory of Baskent

University by the approval of Baskent University Animal Care Ethics Committee. A total of 60 adult male Spraque Dawley rats were randomly divided to six groups. A thoracal 9-10 contusion injury was produced by using modified Allen technique in all groups except control group. No medication was administered to the rats in the trauma group. Parts of the human-induced MSCs treatment groups were composed of trauma. Stem cell treatment of spinal dural layer, showing the degree inflammation and fibrosis in direct the differentiation and functional assessment (BBB, inclined plane) the effect on the results of hyperacute and acute phase were investigated.

Paper-48

The Dosimetric Impact of Implants on the Spinal Cord Dose During Stereotactic Body Radiotherapy

Gözde Yazıcı[1], Sezin Yüce Sarı[1], Fazlı Yağız Yedekçi[1], Altuğ Yücekul[2], Sümeyra Duru Birgi[1], Gökhan Halil Demirkıran[2], Melis Gültekin[1], Pervin Hurmuz[1], Muharrem Yazıcı[2], Gökhan Özyiğit[1], Mustafa Cengiz[1]

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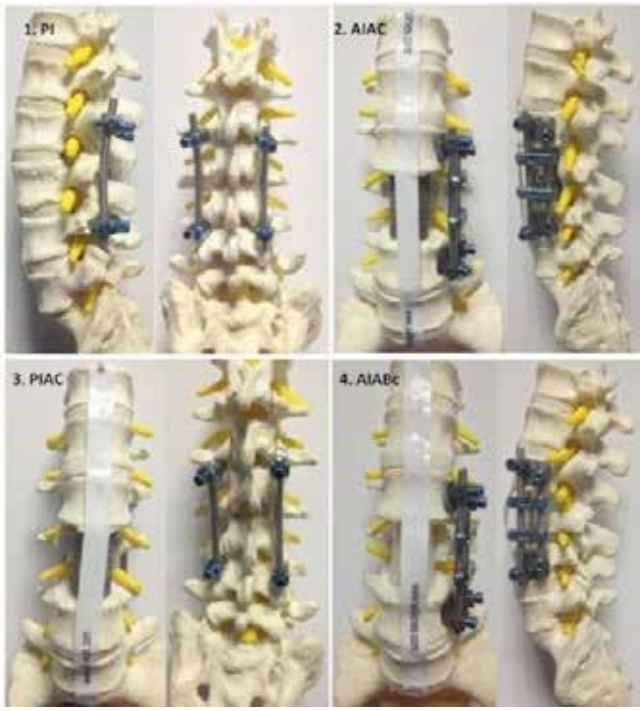
This study aimed to determine the dosimetric impact of spinal implants on the spinal cord dose during stereotactic body radiotherapy.4 different implant models were investigated in order to address the dosimetric issues associated with the most commonly used implantation techniques.

Four different spinal reconstruction techniques were performed using the sawbone lumbar vertebrae model (figure1). All of these models and a sawbone were placed in water to simulate the soft tissue around the vertebrae. A thermoluminescent dosimeter (TLD,LiF:Mg,Ti) was located on the measurement point anterior to the spinal cord. Computerized tomography(CT) images 1.25-mm thick in slice thickness were obtained using a GE High-Speed NX/I CT simulator. MultiPlan(Accuray) inverse software was used for treatment planning.

The target was chosenat L3 vertebra and the spinal cord was delineated as organ at risk (OAR).TLD was defined as a structure with 0.5-mm margin in all directions to make the dose distribution around it homogeneous. The prescription dose was 8 Gy and the treatment was administered using a CyberKnife (Accuray Inc., Sunnyvale,CA,USA) in single fraction. We performed two different treatment plans. In the first plan (Plan A) beam interaction with the rod was not limited. In the second plan the rod was considered a structure of avoidance. All measurements were performed 3 times. TLD measurements were compared with the point dose calculated by the treatment planning system.

The difference between TLD measurement and the dose calculated by the treatment the planning system was 1.7%, 2.8%, and 2.7% for the sawbone with no implant model, PI model, and PIAC model, respectively. For the AIAC model the TLD dose was 13.8% higher than the treatment planning system dose; the difference was 18.6% higher for the AIABc model. In the second treatment plan for the AIAC and AIABc models, TLD measurement was 2.5% and 0.9% higher than the dose calculated by the treatment planning system, respectively(figüre 2).

Spinal implants may be present in the treatment field in patients scheduled to undergo stereotactic body radiotherapy. For the types of implants studied herein it was observed that anterior rod instrumentation resulted in an increase in the spinal cord dose, whereas use of a titanium cage had a non-significant effect on dose distribution. While planning stereotactic body radiotherapy in patients with spinal reconstructions, avoidance of the rod and preventing interaction between rod and beam might be the optimal solution for preventing unexpectedly high spinal cord doses. **figure 1**



Spinal implant reconstruction models on the standard sawbones of lumbar vertebrae. 1. PI: Posterior instrumentation. 2. AIAC: Anterior instrumentation and anterior column reconstruction with use of a titanium cage. 3. PIAC: Posterior instrumentation and anterior column reconstruction with use of a titanium cage. 4. AIABc: Anterior instrumentation and anterior column reconstruction with use of chest tubes filled with bone cement.

figure 2:TLD and TPS doses for each model

Model	TPS dose (cGy)	1st measurement (cGy)	2nd measurement (cGy)	3rd measurement (cGy)	Mean	Difference (%)
No implant	230	233	234	230	234	1.7
PI	245	235	263	258	252	2.8
PIAC	220	207	224	218	216	2.7
AIAC	230	254	264	270	262	13.9
AIAC-Plan B	235	235	255	228	229	2.5
AIABc	350	418	414	413	415	18.6
AIABc-Plan B	240	241	227	236	232	0.9

TPS: Treatment planning system

Paper-49
5-Year Scientific Report of Turkish Spine Society

Ömer Erşen[1], Şafak Ekinci[2], Serkan Bilgiç[3], Erbil Oğuz[4], Serdar Kahraman[5]

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The full-text publications of a society in Pubmed can be accepted as a measure of scientific quality of that society. The aim of this study is to determine the scientific side of our society.

Member list of Turkish Spine Society obtained from the secretary and member names were searched in Pubmed. Articles after January 2010 were evaluated and articles not about spine surgery were excluded. Before further assessment list was controlled for duplications. Articles were classified according to publication year, subjects, journals and impact factors, first authors clinic. After Pubmed search 1551 articles which belong Turkish Spine Society members detected in last 5 years. After removing duplications and non-spine topics 308 articles detected. 252 of these articles were published in journals indexed by Thompson and Reuters. We detected 56 articles in 2010, 55 articles in 2011, 58 articles in 2012, 65 articles in 2013 and 74 articles in 2014. Respectively articles non indexed by Thompson and Reuters were 5, 10,11,16,14 according to years. Average impact factor of the journals was 1,34 (0,169-4,766). Most preferred journal was Turkish Neurosurgery.

There were 209 original articles, 25 review, 49 case reports, 17 case series and 8 other in five-year period. Subjects of articles were general spinal surgery in 38 articles, basic science in 52, deformity in 73, degenerative in 54, cervical trauma in 18, thoracolumbar tauma in 32, spinal infection in 13 and tumors in 28. Affiliation of articles was evaluated according to first author's affiliation. 149 articles were from university hospitals, 71 from research hospitals, 40 from special hospitals, 12 from state hospitals and 35 from foreign hospitals. First author of the articles were neurosurgeons in 143, orthopaedic surgeons in 132 and other in 33 articles.

In this article we try to present milestones the scientific side of Turkish Spine Society in the past five years

Paper-50
Thoracic Spine Growth Re-Visited:

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The knowledge of thoracic spine growth and final height is important to guide treatment in EOS and for the decision of final fusion. Currently pediatric spinal deformity is approached as early onset and late onset with an understanding of the fast growth during the first five years of life. The growth data which supports this classification is often cited but has not been reconfirmed with follow up studies. In this study aimed to identify

How Accurate Is the Dimeglio Data?

Gökhan Halil Demirkıran[1], Kadir Büyükdoğan[1], Özgür Dede[2], Erhan Akpınar[3], Muharrem Yazıcı[1]

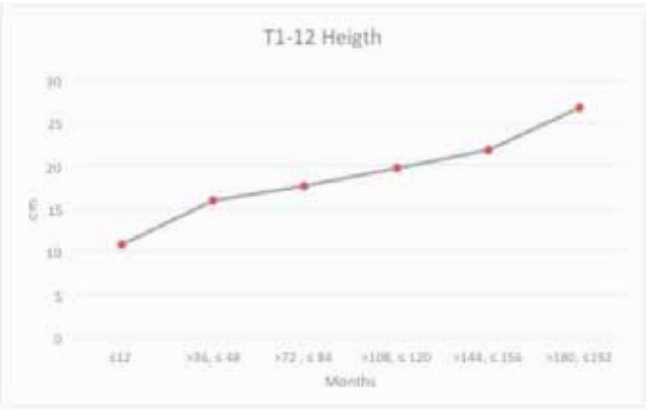
the growth pattern and velocity of the thoracic spine during childhood. Our hypothesis was based on Dimeglio's data, the growth of the thoracic spine is not linear during childhood with the two fast growing phases during the first five years and the adolescence.

Sagittal CT reformations of thoracic vertebrae were examined in children without spinal deformity. The sagittal CT cut at the widest canal diameter was identified and the measurements were performed on this image. The length of the thoracic spine was measured from the posterosuperior corner of T1 to the posteroinferior corner of the T12. The patients between 0-2 years who are falling off from the third percentile according to world health organization (WHO) growth charts and patients between 2-16 years who are less than the third percentile according to Centers for Disease Control and Prevention (CDC) charts were excluded from study.

144 thoracic CT scans satisfied the inclusion criteria. The analysis of the data identified two break points in the growth velocity; one at the end of the 4th year of life and the other at the beginning of the 12th year (figure). Specifically, growth rate between 1-3 years was 1.71cm/yr, between 4-6 years was 0.55cm/yr, between 7-9 was 0.74cm/yr, between 10-12 was 0.69cm/yr and between 1316 was1.61 cm/yr.

The results show that in growing children the thoracic spine demonstrates two major growth spurts. The initial growth spurt is between the birth to the end of the 4th year of life and the second is between the 12-16 years of age. Between 4-12 years there is a steady but slower increase in thoracic height. Although our findings support Dimeglio's data in general, the fastest growth velocity may be limited to a younger age group than previously believed.

T1-T12 heights according to ages



Two break points in the growth velocity; one at the end of the 4th year of life and the other at the beginning of the 12th year

Paper-51
Fear of Undergoing Spine Surgery

Ahmed Hany Mohamed Tawfik Elhessy, Abdul Moeen Baco, Malik Shakil, Hazem Mohamed Nasef

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Prospective analysis of patients' "who are candidates for spinal surgical intervention" understanding of their condition, treatment options and trying to analyze their fears related to undergoing spine surgeries using a special designed questionnaire (Expectations Survey). To preoperatively describe the patients' understanding to their condition, treatment options, expected outcome and fears related to undergoing spine surgery.

Although important components of patient-centered care, few studies have systematically considered patients' understanding to their condition, treatment options, expected outcome and fears related to undergoing spine surgery.

After final assessment in the clinic (History taking, complete physical Exam, Review of images, Discussing treatment options with the patient), the patient will be offered to complete the Expectations survey-with the aid of a trained nurse; which is composed of several items (Demographic, Social, level of understanding, expectations and Fears related to surgical intervention).

All patients who are surgical candidates seen in Orthopedics OPD Annex of Hamad General Hospital over the period of 6 months.

Paper-52
Reliability of Surgeon Dependent Agreement of Classification and Treatment Planning in Adolescent Idiopathic Scoliosis

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Idiopathic scoliosis constitutes about 80% of structural scoliosis, and unknown aetiology. Preoperative planning of scoliosis surgery is a complicated process. 24 female and 3 male, 27 patients who were operated for adolescent idiopathic scoliosis (AIS) between the years 19942014, and had preoperative AP / Lat, left and right bending, AP after traction and postoperative X-rays, were included in the study. 2 professors, 2 assistant professors and a registrar evaluated X-ray series of included patients.

Investigators were asked to assess UEV, LEV, apex, Cobb angle in preoperative PA x-rays; traction, right and left bending x-rays for upper thoracic segment; UEV, LEV, apex, Cobb angle in preoperative PA X-rays; Cobb angle in preoperative traction, right and left bending x-rays for thoracic segment; UEV, LEV, apex, Cobb angle in preoperative PA x-rays; Cobb angle in preoperative traction, right and left bending x-rays for thoracolumbar/ lumbar segment; upper instrumented vertebra (UIV) and lower instrumented vertebra (LIV), measurement of T2-T5, T5T12, T11-L1, T12-S1 sagittal Cobb angles; King Moe and Lenke classifications; choice of implant, implantation methods.

Measurements, classifications and preferred segment for fusion were compared between investigators and the instrumentation actually applied to the patient; and surgical planning was investigated to evaluate agreement0% was 66,6%, rate of agreement below 50% was 11%, and fully mismatched for 1 case. Mean thoracic and lumbar Cobb angles were found 44,62°(±3,1°) and 41,22°(±3,35°) with a good level of interobserver agreement

(ICC=0,764) and (ICC=0,775). UIV and LIV were preferred with a good level of interobserver agreement (ICC=0,714) and (ICC=0,717). When these preferred UIV and LIV were compared with actual postoperative x-rays; more cranial levels for both upper and lower instrumented vertebrae were preferred. King Moe classification between investigators was found at excellent level of reliability. (ICC=0,806). Total agreement for Lenke classification between investigators was 18.5%, rate of agreement above 57%). When all cases are considered, interobserver agreement was good. (ICC=0,754). Agreement between choice of implant and implant construct were intermediate. (ICC=0,533). Mean planned number of fusion segments was 10.58(±2.8), and implant density was 0,94 (±0,06), whereas postoperative fused segments were 9,78(±2,47) with implant density of 0,862 (±0,186), and interobserver agreement was intermediate (ICC=0,533). Our study outlined that agreement between investigators using King Moe and Lenke classifications are respectively excellent and good. Investigators tended to use longer constructs with higher implant density, more often include upper thoracic levels and preserve more levels distally yet intra_investigator agreement remained intermediate. (ICC=0,533).

Paper-53
Cognitive Impairment Following Adult Spinal Deformity Surgery

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Elderly patients undergoing major surgery may experience cognitive deterioration due to lesser plasticity in their brain tissue. This so called postoperative cognitive dysfunction (POCD) syndrome is characterized with non-specific dysfunction in memory, concentration and analysis skills. It is not known whether adult spinal deformity (ASD) surgery is associated with POCD. To analyze the cognitive abilities of older patients undergoing spinal deformity surgery before and after the surgery so as to understand whether ASD surgery is associated with POCD. A prospective longitudinal study was performed on surgical patients older than 50 years enrolled in a prospective multi-centric database. Mini mental state examination (MMSE) was performed to assess cognitive functions in addition to the health related quality of life (HRQOL) tests (SF-36, ODI and SRS-22) at preoperative, post-operative 6th week and 6th month points. Demographics, preoperative health status, comorbidities, surgical characteristics were also analyzed. Descriptive statistics and repeated measures of variance analysis were performed.

A total of 90 patients with a mean age of 67.4±8.2 were enrolled in the study; all had 6th week and 58 had both 6th week and 6th month follow-up MMSE evaluations. Averages (standard deviation) of surgical time, estimated blood loss (EBL), number of screws used and hospital stay were 240.1 (111.9)min, 1621.2 (1058.7)ml, 11.2 (4.4) and 14.2 (11.45)days respectively. On analysis, it was seen that there was even a slight increase in mean MMSE score ($p>0.05$) between time points (Table 1). There was a decrease of >2 points (3 or 4 points) in 6 patients (6.7%) at both time points. Although ASD surgery in older patients is recognized as challenging, this study suggests that it is not necessarily associated with a significant deterioration in the cognitive abilities of patients undergoing it. These results are different compared to those reported for other major surgical interventions. This may be due to the relatively minor influence of ASD itself on the cognitive abilities of the patients involved as well as to the relatively stable hemodynamic conditions obtainable during modern ASD surgery.

Table 1

A	Mean	Std. Deviation	n	P
Preop	26.88	2.691	90	
6th Week	27.17	2.474	90	0.158

B	Mean	Std. Deviation	n	
Preop	26.93	2.815	58	
6th Week	27.34	2.579	58	0.998
6th Month	27.57	2.528	58	0.06

Table 1. MMSE scores of the patients who underwent surgery for ASD; those with a follow-up at 6th week (A); and those with a follow-up at both 6th week and 6th month. No statistical significance between time points was found.

Paper-54
Development of Symptomatic and Radiographical Adjacent-Level Degeneration in Patients with or without Anterior Cervical Plate and Fusion

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The aim of the present study was to determine the incidence of symptomatic and radiographical adjacent-level degeneration (ALD) in patients who underwent cervical arthrodesis with or without plate fixation.

We retrospectively reviewed the charts and the lateral cervical spine radiographs of 47 patients who had solid fusion following an anterior cervical arthrodesis with or without plate fixation (Twenty-five patients with plating and twenty-two patients without plating) for the treatment of a degenerative cervical condition. All postoperative and the two-year follow-up lateral cervical spine radiographs were collected and formatted to occlude the surgical level, blinding the readers as to the procedure performed. Three independent blinded surgeons graded the adjacent level for the degree of ossification according to the Hilibrand Grading Scale. Symptomatic ALD was defined as development of new radiculopathy or myelopathy referable to a motion segment adjacent to the side of a previous anterior arthrodesis of the cervical spine. The data were statistically

analyzed for significant symptomatic and radiographical ALD differences between patients with and without plate.

Symptomatic ALD was observed in 5 out of 25 patients (20%) with plating compared to 4 out of 22 patients (18%) without plating. No significant differences in symptomatic ALD was observed between patients with plate and without plate at the two-year follow-up (P=0.247). Radiographical ALD was seen in 7 out of 25 patients (28%) with plating compared to 6 out of 22 patients (27%) without plating. No significant differences in radiographical ALD was seen between patients with plate and without plate at the two-year follow-up (P=0.358).

Our data conclusively demonstrate that plating during anterior cervical fusion does not affect the incidence of symptomatic and radiographical ALD compared to non-plating anterior cervical fusion.

Paper-55

A Detailed Analysis of the Etiology of Neck and/or Shoulder Pain in Patients with Cervical Spondylotic Myelopathy Based on the Postoperative Change in the Region and Properties of the Pain

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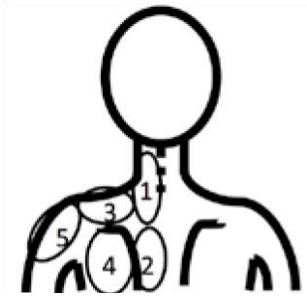
The etiology of neck and/or shoulder pain in patients with cervical spondylotic myelopathy (CSM) has been studied in many reports, however, it has still not been well determined. In this study, we retrospectively evaluated postoperative change in the region and properties of the pain after expansive laminoplasty (ELAP) to elucidate its etiology.

Seventy-one patients with CSM underwent ELAP between 2007 and 2013, and were followed for minimum 1 year. They were 46 men and 25 women (average age 66.2 y/o). Region of the pain which was divided into 5 regions (fig.1) was evaluated in each side (total 10 spots per patient). Intensity and duration of the pain were also evaluated. Patients' clinical and neurological statuses were assessed using Japanese Orthopedic Association Cervical Myelopathy Evaluation Questionnaire (JOACMEQ) and Japanese Orthopedic Association score respectively. Age at the time of surgery, gender, preoperative morbidity period, the number of expanded laminae, and operative time were assessed as clinical parameters. Range of motion and alignment of cervical spine, affected segment (defined as the segment where an intramedullary high signal intensity zone was observed on MRI), and degree of spur formation at Luschka joint were assessed as radiological parameters. Data were obtained before and 1 year after surgery.

At 37 (52.7%) out of 74 spots where the pain was observed preoperatively, the pain disappeared after surgery. Preoperative pain was observed in only 3 regions (region 1, 3, 5). The pain disappeared at 24 (58.5%) out of 41 spots in region 1, 26 (74.3%) out of 35 spots in region 3, 19 (100%) out of 19 spots in region 5. Preoperative QOL domain score of JOACMEQ was significantly lower (p=0.04) in patients whose preoperative pain remained 1 year after surgery compared with patients whose pain disappeared. Intensity and duration of preoperative pain were significantly more severe (p=0.01) and longer (p=0,02), and preoperative QOL domain score of JOACMEQ was significantly lower (p=0.01) in patients who complain neck and/or shoulder pain 1 year after surgery compared with patients who complain no pain 1 year after surgery.

The disappearance rate of preoperative neck and/or shoulder pain in patients with CSM was significantly different depending on the region (p<0.01). The pain in upper arm is considered to originate mainly from neurological factors. However, in other regions, social and psychological factors would be involved in addition to neurological factors for the causes of the pain. **Regions of neck and/or shoulder pain**



region 1: posterior neck, region 2: interscapular region, region 3: suprascapular region, region 4: scapula body, region 5: upper arm

Paper-56

Multiple Regression Analysis of Factors Affecting the Mental Component Score Constituents of SF36 in Adult Spinal Deformity

Selim Ayhan[1], Selcen Yüksel[2], Aslı Niyazi[3], Vugar Nabiyev[1], Ümit Özgur Güler[1], Montse Domingo Sabat[4], Ferran Pellise[5], Ahmet Alanay[6], Francisco Javier Sanchez Perez Grueso[7], Frank Kleinstück[8], Ibrahim Obeid[9], Emre Acaroğlu[1], European Spine Study Group (ESSG)[4]
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As surgical decision-making and preoperative planning for adult spinal deformity (ASD) need strongly be interrelated to health related quality of life (HRQOL), there are multiple studies focusing on factors with an impact on it. Based on the general perception of association between the treatment results and the psychological condition of patients with ASD, analyzing the factors governing the baseline psychological status of this group may be worthwhile. AIM: To develop an understanding of which factors have a greater impact on the SF-36 mental component score (MCS) and to establish a hierarchy of these parameters through multiple regression analysis. Prospectively collected data from a multicentric adult deformity database was analyzed using multiple regression analysis with SF36 MCS designated as the dependent variable and demographic, radiological and the HRQOL parameters as independent variables. The regression model was started with a correlation analysis between SF-36 MCS and all independent variables then conducted by introducing the variables with the highest correlation with SF-36 MCS, sequentially.

A total of 229 patients (181, 47) with a mean age of 49.4 (18– 85) years, were analyzed. A strong correlation between SF-36 MCS and Scoliosis Research Society (SRS)-22, Oswestry Disability Index (ODI), gender, and diagnosis were found (p<0.05). The distribution

graph and results of regression analysis are summarized in Figure 1. The overall R2 of this model was 0.254 (p<0.001).

This study has demonstrated that, among the evaluated parameters, the overall HRQOL (SRS-22 and ODI) as well as thoracic kyphosis (TK) and gender are the most important parameters affecting the mental component summary of SF-36 in ASD population. Although the strong association with SRS-22 and/or ODI was to be expected, less strong associations with TK (as a token of appearance?) and gender (due to different mechanisms of coping with disability?) were less expected and may warrant further consideration in our understanding of the population of ASD.

Figure 1

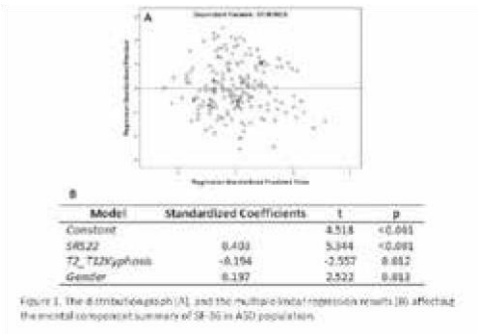

Figure 1. The distribution graph (A), and the multiple linear regression results (B) affecting the mental component summary of SF-36 in ASD population.

Paper-57

The Effect of Fusion Level on the Radiologic and Functional Outcomes in the Surgical Treatment of Adult Deformity in Patients Older Than 65 Years-Old

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In this study, we aimed to demonstrate and compare the treatment outcomes of patients older than 65 years of age with adult deformity surgery and who underwent either short (T10-S1) or long (T2-S1) level fusion.

75 patients, older than 65 years who underwent fusion surgery for adult spinal deformity between 2008-2013 were reviewed. The patients were separated into 2 groups based on their fusion levels. Group 1 included 30 patients (22F,8M) with upper instrumented vertebra (UIV) at T10 and Group 2 included 45 patients (40F,5M) in whom the fusion level was stopped at T2. SRS 22, ODI and VAS were used for clinical evaluation. Radiologic studies included measurement of thoracic kyphosis, lumbar lordosis, pelvic incidence, pelvic tilt, sagital vertical aks, T1 pelvic angle and PJK. Radiologic and clinical results were compared.

Mean age was 70.1 (65-81) and mean follow-up was 36.4 months (24-85) in Group 1 Mean age was 70.4 (65-84) and mean follow-up was 37.3 months (24-88) in Group 2. 6 patients (20%) in Group 1 and 4 patients (8.8%) in Group 2 underwent revision surgery. Indications of revision in Group 1 were development of PJK in 2, implant failure/ pseudoarthrosis in 4 patients. In Group 2 the indications were development of PJK in 1, implant failure/pseudoarthosis in 3 patients. Clinical results assessed at follow-up were significantly better in Group 2. Operative time and amount of bleeding were greater in Group 2. Radiologic evaluation showed that the deformities in all planes were corrected in the early period in both groups. Follow- up measurements showed that the correction could be preserved more in the Group 2. Radiologically, 8 patients (26.6%) had PJK/PJF in Group 1, and 3 patients had PJK in Group 2 (10%).

Despite the application of prophylactic vertebroplasty, the development of PJK was greater in patients with UIV at T10 (26.6%), compared to T2 (10%). The clinical and radiologic outcomes obtained during the early period were similar in both groups, however at the end of a 3 year f/up those patients in whom the fusion was stopped at T2 had higher rates of maintaining the corrections in the sagittal plane and also had better clinical outcomes.

Paper-58

Posterior Vertebral Column Resection (PVCR) for the Management of Sharp Angular Kyphotic Deformity in Adult Population

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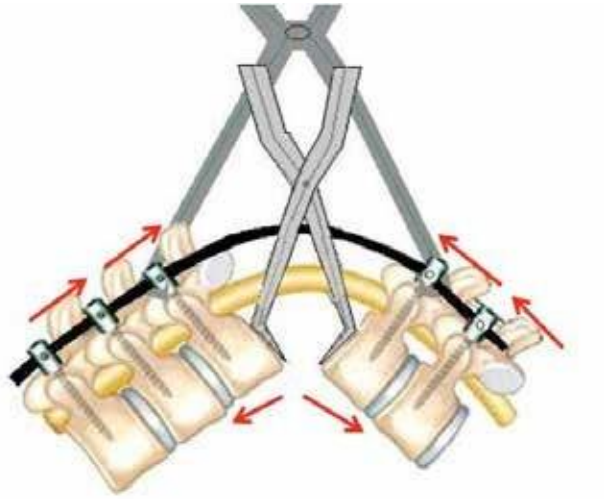
The management of sharp angular kyphosis can be a challenging since correction of rigid deformity is technically difficult and often require combined approaches or major spinal osteotomy. Pain, progressive deformity causing sagittal imbalance and deterioating neurological deficit are major problems. The purpose of this study is to evaluate the results of PVCR in the treatment of sharp angular kyphosisin adult population. 35 patients (21M,14F), mean age 42.1 years (19-74) who underwent PVCR for sharp angular kyphotic deformity were included. Following PVCR, correction technique included anterior column elongation with gradual posterior compression sequentially and placement of an expandable cage anteriorly to prevent any dural buckling. Preop, postop and f/up x-rays were evaluated for radiological data including local kyphosis angle (LKA), sagittal and pelvic parameters. Functional statuses of the patients were assessed by Oswestry score.

Mean follow-up was 47 months (24-120). Etiologies were posttraumatic kyphosis for 24 pts and neglected congenital kyphosis in 11 pts. Osteotomies were grade 5 in 27 patients and grade 6 resections in 8 patients according to Schwab's Classification. Preoop average LKA of 49.52° improved to 7.35° with a correction rate of 89%. Preop SSA of av 118.3° was restored to 132.7°. 18 patients who had preop neurologic deficit (11 ASIA D, 5 ASIA C, 2 ASIA B) had at least one grade improvement at the final f/up. Minor complications included 6 (17%) dural tears, 4 (11%)

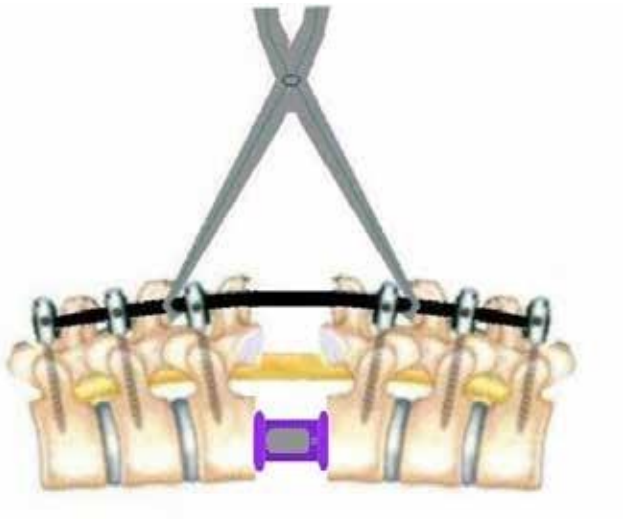
superficial wound problem which responded well to debritment. Oswestry functional scores decreased from a mean of 56 to 16. Solid fusion was achieved in all patients without significant loss of correction in the sagittal plane at the final f/up. Correction of kyphosis and restoring sagittal balance is very challenging in sharp angular kyphosis. PVCR provides spinal cord decompression, improves neurological deficit and quality of life. Anterior column elongation with gradual posterior compression sequentially and placement of expandable cage corrects local angular kyphosis and restores sagittal balance.

Figure 1



Anterior column elongation and simultaneously gradual posterior compression

Figure 2



Placement of expandable cage

Technique: An Alternative Iliopelvic Fixation Technique in Adult Deformity Surgery

Meriç Enercan[1], Sinan Kahraman[2], Bahadır Gökçen[2], Sinan Yılar[3], Mutlu Çobanoğlu[4], Tunay Sanlı[1], Amjad Alrashdan[1], Erden Ertürer[2], Çağatay Öztürk[2], Azmi Hamzaoğlu[1]

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In our clinical practice we start to use a freehand distal iliac screw (DIS) fixation with a more distal starting point (posterior inferior iliac spine) as an alternative lumbopelvic fixation technique in adult deformity surgery which does not require any cortical bone resection for entry and has low profile than traditional iliac and S2AI fixation. DIS fixation demonstrated greater insertional torques, axial-pull out and toggle forces than traditional iliac fixation in our biomechanical comparative cadaveric study. Distal entry point also enables longer screw instrumentation. The main disadvantage of the technique is the additional distal soft tissue exposure for the placement of the screw. The purpose of this study is to evaluate the clinical outcomes of DIS fixation in adult deformity surgery.

61 patients (43F,18M) who underwent a long fusion (more than 5 levels) to the sacrum with DIS fixation were reviewed. Preop, postop, follow-up standing AP/L, pelvis AP were reviewed for radiological data.

Mean age was 61.8 years (47-84), mean follow-up was 28.8 months (24-38). Average instrumentation level was 9.6 levels (5-16). In 42 patients (69%) with BMD<-2.5 T score, cement augmented fenestrated pedicle fixation technique (except S1 and DIS fixation) was performed to augment posterior fixation. Mean iliac screw length was 95.2mm (80-100mm). Iliac screw diameters were 7,5mm in 11 patients, 8,5mm in 26 patients and 9.5mm in 4 patients. In addition to lumbopelvic fixation, interbody fusion for L5-S1 level was performed in 70% (43 pts) of the patients. Posterior instrumentation was augmented with multi-rod fixation in 41 patients (67%). Complications related to DIS were; 6 screws (4.9%) had loosening > 2mm in 3 patients. There was no pseudoarthrosis or implant failure related to lumbosacral joint. ODI showed a significant decrease from 75.6 to 28.4 and VAS scores improved 7.8 to 4.2 postoperatively. Discussion DIS fixation provided the required stability for lumbosacral fusion and demonstrated very low rate of complications even in osteoporotic patients. DIS fixation technique is a good alternative for lumbosacral fixation in adult deformity surgery.

Paper-59
Distal Iliac Screw (DIS) Fixation

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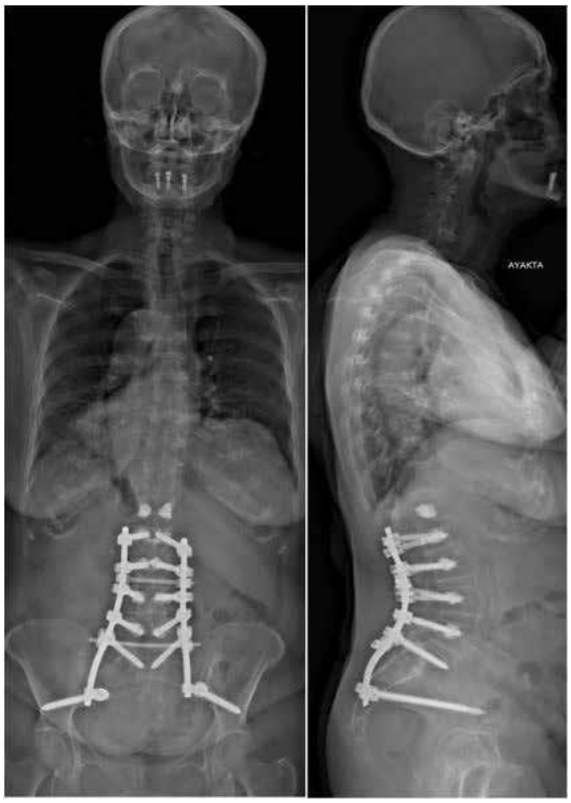
Figure



DIS fixation enables longer screw instrumentation - 100mm in this case.

ranged from 56 to 69 (of 100 years) and demonstrated better final outcomes in the NS group, although this group had also started with higher QALE. There were improvements in overall QALE in both groups but this was significant only in the surgical group (Table 1 b). In addition, in the subgroup of patients with significant baseline disability (ODI>25) surgery appeared to yield marginally better final QALE (Table 1 c).

This study demonstrated that a single best treatment modality for ASD may not exist. Conservative treatment appears to yield higher (up to 6%) QALE compared to surgery, probably secondary to a higher baseline QALE; except in patients with significant disability at baseline. On the other hand, surgery provides a significantly higher increase in QALE and chances of improvement at 1st year are significantly lower with NS treatment.

Table 1

Table 1 a. Pooled outcome probabilities of surgical and non-surgical patients; 1 b. Baseline and final utilities and QALE of surgical and non-surgical patients; 1c. Final utilities and QALE in patients with baseline ODI>25.

Treatment (a) (all patients)	N	Deterioration	No change	Improvement
Surgical	161	11 (9.2%)	44 (36.7%)	65 (54.2%)
Non-surgical	311	54 (13.4%)	311 (77.0%)	39 (9.7%)

Treatment (b) (all patients)	Baseline Utility	Final Utility	P value (baseline vs. final)	Life Expectancy (LE) (default)	QALE (healthy years)
Surgical	0.56	0.60	<0.0001	100	60
Non-surgical	0.65	0.65	0.2692	100	65
P value	<0.0001	0.0038			0.0038

Treatment (c) (patients with baseline ODI>25)	Final Utility	Life Expectancy (LE) (default)	QALE (healthy years)
Surgical	0.57	100	57
Non-surgical	0.56	100	56

Paper-60
Identifying the Best Treatment in Adult Spinal Deformity: A Decision Analysis Approach

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best treatment modality.

To construct a statistical decision analysis (DA) model to identify the optimum overall treatment in ASD.

From an international multicentre database of ASD patients (968 pts), 535 who had completed 1 year follow-up (371 non-surgical – NS), 164 surgical –S), constitute the population of this study. DA was structured in two main steps of: 1) Baseline analysis (Assessing the probabilities of outcomes, Assessing the values of preference – utilities-, Combining information on probability and utility and assigning the quality adjusted life expectancy (QALE) for each treatment) and 2) Sensitivity analysis.

432 patients (309 NS, 123 S) had baseline and 1 year follow-up ODI measurements. Overall, 104 (24.1%) were found to be improved (a decrease in ODI>8 points), 225 (52.1%) unchanged (-8>ODI>8) and 65 deteriorated. Surgery presented with a higher chance of improvement (54.2%) vs. NS (9.7%) (Table 1a). The overall QALE

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Paper-61
Comparison of Changes at Sacropelvic Junction After Surgical Treatment of Short Segment Kyphosis with Sharp Angle (Angular) and Scheuermann Kyphosis

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We aimed to compare the changes at sacropelvic junction on sagittal plane after surgical treatment of short segment kyphosis with sharp angle (angular) and Scheuermann kyphosis. We compared 20 kyphosis patients (7 male, 13 female) who underwent surgery due to short segmental sharp angle kyphosis with the mean age of 30.4, and 20 patients(12 male, 8 female) due to Scheuermann kyphosis, retrospectively. Patients were divided in two groups. Patients with short segment kyphosis with sharp angle were named as SSAK and Sheuermann kyphosis patients were

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Adult spinal deformity (ASD) is a major public health problem. There are pros and cons of the available treatment alternatives (surgical or non-surgical) and it had been difficult to identify the

named as SK. Mean follow up time for SSAK group was 27.4(12-47) and for SK group 43.5(12-81) months. In both groups Thoracic Kyphosis(TK), Lumbar Lordosis(LL), Sacral Slope(SS), Pelvic Tilt(PT), Pelvic Incidence(PI) and Sagittal Vertical Axis(SVA,C7 plumb line) values were measured on orthoroentgenogram preoperatively and postoperatively. Alterations of thoracic, lumbar and sacropelvic parameters on sagittal plane in both groups postoperatively were compared. In SSAK group 10 patients had congenital, 6 traumatic and 4 infectious etiology. Deformity apex was on thoracolumbar in 15, on lumbar in 3 and on low thoracic segment in 2 patients. Proximal instrumentation and fusion beginning point was at 2nd thoracic vertebra for 12, at 3rd thoracic vertebra for 7 and at 1st thoracic vertebra for 1 patient in SK group. And distal instrumentation and fusion end point was detected at 1st lumbar vertebra for 7, 2nd lumbar vertebra for 10 and 3rd lumbar vertebra for 3 patients. Statistically significant difference ($p<0.05$) was detected between the age values of both groups. In SSAK group statistically significant difference was detected only on postoperative TK and LL values compare to preoperative values($p=0,012$ and $p=0,002$ respectively)(Table 1). In SK group statistically significant difference was detected postoperatively between TK, LL, SS and PT values ($p<0.001$; $p<0.001$; $p<0.001$; $p<0.001$ respectively)(Table 2).

In cases with short segmental sharp angle kyphosis the postoperative sagittal balance is achieved both with correction of the relevant segment with kyphosis, and the compensatory change in the thoracic and lumbar regions. However, the lack of change in the pelvic region is thought to be the result of the fixed soft tissue contractures developed in the course of time. Moreover, achieving the sagittal balance in wide angle kyphosis cases such as scheuermann Kyphosis, suggests that in addition to the correction of the kyphosis deformity, the reduction of lordosis deformity in lumbar region and the creation of retroversion in sacropelvic region also play role.

Table 1

Group SSAK	Mean preoperative value	Mean postoperative value	p value
Thoracic Kyphosis (TK)	18.7°	32.4°	0.012
Lumbar Lordosis (LL)	-53.1°	-34.4°	0.002
Sacral Slope (SS)	27.5°	30.2°	0.695
Pelvic Tilt (PT)	9.7°	11.2°	0.618
Pelvic Incidens (PI)	36.2°	41.4°	0.158
Sagital Vertical Axis(SVA) (cm)	10.7	7.25	0.808

Preoperative and postoperative values in SSAK group.

Table 2

Group SK	Mean preoperative value	Mean postoperative value	p value
Thoracic Kyphosis (TK)	76.1°	41.7°	<0.001
Lumbar Lordosis (LL)	(-) 63.1°	(-) 43.1°	<0.001
Sacral Slope (SS)	39.05°	24.9°	<0.001
Pelvic Tilt (PT)	11.15°	25.4°	<0.001
Pelvic Incidens (PI)	50.3°	48.6°	0.354
Sagital Vertical Axis(SVA) (cm)	(-) 2.02	(-) 1.3	0.511

Preoperative and postoperative values in SK group.

Paper-62

Are We Planning the Same? How Does the Classification and Surgical Planning Is Affected When Discussed 4 Weeks Apart?

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Idiopathic scoliosis constitutes about 80% of structural scoliosis with unknown aetiology. Preoperative planning of surgical treatment is a complex process that includes series of decisions and measurement on X-Rays.

27 patients (24 F, 3 M) who were operated for adolescent idiopathic scoliosis (AIS) between years 1994-2014, having preoperative AP/ Lat, bendings, traction and postoperative X-rays, were included in the study. 2 surgeons (>15 years of experience), 2 surgeons (3-10 years of experience) and a registrar (<1 year experience) evaluated X-ray series of patients. Investigators were asked to assess preoperative X-rays (no measurements and markings) and identify vertebrae to measure Cobb angles, apexes, T2-T5, T5-T12, T11-L1, T12-S1 sagittal Cobb angles, define structural/ non-structural curves, classify according to King-Moe and Lenke classifications systems and identify upper instrumented vertebra (UIV) and lower instrumented vertebra (LIV) for their proposed instrumentation.

4 weeks later they were asked to repeat the decision process on classification and selection of fusion levels on measured and marked X-Rays delivered at different order. Mean thoracic and lumbar Cobb angles were 44,62°(±3,1°) and 41,22°(±3,35°) ((ICC=0,764) and (ICC=0,775)). UIV and LIV selections had a good level of interobserver agreement (ICC=0,714) and (ICC=0,717). Compared with actual postoperative x-rays; UIV and LIV were more cranial for both UIV and LIV. K-M classification between investigators was found at excellent level of reliability (ICC=0,806). Total agreement for Lenke classification between investigators was 18.5%, and above 50% was 66,6%: interobserver agreement was good (ICC=0,754). Agreement between choice of implant and implant construct were intermediate (ICC=0,533). Mean planned number of fusion segments was 10.58(±2.8), and implant density was 0,94 (±0,06), whereas postoperative fused segments were 10,37(±1,621) with implant density of 0,852 (±0,2), and interobserver agreement was intermediate (ICC=0,533). Results of second stage evaluation after 4 weeks are shown in table 1. They preferred to stay at the same level of initial planning at UIV and LIV levels in 2962% and 40-59% of the cases respectively. Tendency was towards instrumenting more cranial levels (44-92% of the cases) depending on the surgeons.

Agreement between investigators using KM and Lenke classifications are respectively excellent and good. Investigators tended to use longer constructs with higher implant density, more often include upper thoracic levels and preserve more levels distally yet intraobserver agreement remained intermediate (ICC=0,533). There was a considerable of change in the planning when they were asked to repeat the decision making process after 4 weeks.

Table 1

		UIV	LIV
Inv. 1	Stayed at same level	8	11
	More cranial	15	8
	More caudal	4	8
	Cronbach α	0,893	0,893
	ICC	0,737	0,812
Inv. 2	Stayed at same level	14	13
	More cranial	12	13
	More caudal	1	1
	Cronbach α	0,729	0,869
	ICC	0,494	0,7
Inv. 3	Stayed at same level	17	16
	More cranial	4	8
	More caudal	5	2
	Cronbach α	0,883	0,8,18
	ICC	0,792	0,650
Inv. 4	Stayed at same level	16	12
	More cranial	7	6
	More caudal	4	9
	Cronbach α	0,867	0,652
	ICC	0,769	0,492
Inv. 5	Stayed at same level	9	16
	More cranial	11	6
	More caudal	7	5
	Cronbach α	0,301	0,106
	ICC	0,170	0,002

Paper-63
Mental Health and Self-Image Perception of Non-Disabled Adult Idiopathic Scoliosis Patients Having Mild to Moderate Curves Compared to Normal Population

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76 patients (64F, 12M) met the inclusion criteria. Mean age was 25.9 (18-44), mean MT Cobb was 38.5°(21-55) and TL Cobb was 34.6°(25-44). SRS-22 MH, SI and other domains were similar with SRS normative data (p>0.05). SF-36 MCS and PCS domains for age groups 18-24, 25-34 and 35-44 were not significantly different than normative data (p>0.05). None of the demographic and radiographic parameters were correlated with changes in SRS-22 function, SI, MH and SF 36 MCS, PCS parameters.
AdIS does not affect mental health and self-image in non-disabled patients with curve magnitudes below the surgical threshold.

Paper-64
Paraspinal Muscles and Sagittal Spinopelvic Alignment in Patients with Degenerative Spondylolisthesis

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We compared atrophy and fatty infiltration in lumbar paraspinal muscles, spinopelvic alignment and the relationship between spinopelvic alignment and paraspinal muscles in patients with degenerative spondylolisthesis (DS) who chose to have surgery with those who did not.
This is a retrospective study on prospectively collected data. One hundred four patients (mean age: 63.06±14.33) were included based on the exclusion criteria: BMI>40 kg/m2, diabetes, isthmic spondylolisthesis, Modic 1 degenerative disc disease, scoliosis, osteoporosis, metastatic cancer, neuromuscular disorders, previous spine surgery. Facet joint widening, functional cross-sectional area (fCSA), percentage atrophy and fatty infiltration of multifidus, erector spinae, and psoas muscles were measured on lumbar spine MRIs using OsiriX® free hand technique. Pelvic incidence (PI), lumbar lordosis (LL), sacral slope (SS) and pelvic tilt (PT) were measured to evaluate sagittal spinopelvic alignment on lateral lumbar spine X-rays using Surgimap®.
The groups were similar in age, facet joint widening and spinopelvic parameters. However, the surgical group had significantly higher BMI (p<0.031), more fatty infiltration and bigger paraspinal muscles than the nonsurgical group (p<0.025). LL increased as surgical patients had bigger multifidus, less atrophy in erector spinae and less fatty infiltration in psoas (r=0.27--0.33). Patients with sagittal spinopelvic misalignment (SSM) had significantly more atrophy in erector spinae comparing to those without SSM (p=0.038). Patients with degenerative spondylolisthesis have high PI, unless LL is increased, SSM is unavoidable. Patients with atrophy and fatty infiltration in multifidus and erector spinae muscles could not increase LL and compensate SSM. Patients with higher BMI are also more likely to have surgery.

[1] Fundació Institut de Recerca Vall Hebron

This study that includes patients with curves between 20-55° suggests that the self image and mental status are unaffected by mild and moderate curves if the patient has no disability due to pain. Retrospective analysis of a multicenter, prospective, consecutive patient series
There is little information about the effects of scoliotic curves on self image (SI) and mental health (MH) based on validated questionnaires. Aim was to analyze the effect of scoliosis on MH and SI in a non-disabled adult idiopathic scoliosis (AdIS) population having curves under surgical indication threshold (Main Thoracic (MT) Cobb (≤55°), and Thoracolumbar/Lumbar (TL) curve (≤45°). A retrospective analysis of a multicenter, prospective, consecutive patient series. Inclusion criteria were: nonoperated AdIS, ≥18 years of age, MT Cobb 20-55°, TL Cobb 20-45°, ODI <20, SRS 22 Pain score >4. ODI and SRS22 pain score were used to distinguish patients that have pain and disability from the ones that do not. SRS-22 and SF-36 normative data for different age groups were used for comparison. AP and lateral Cobb measurements, sagittal plane parameters and demographic data were analyzed in terms of correlations with SI and MH parameters.

Paper-65

Effect of Treatment Complications on the Outcomes in Adult Spinal Deformity: A Decision Analysis Approach

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Treatment of adult spinal deformity (ASD) is known to be associated with a fairly high rate of complications whereas the impact of these complications on treatment outcomes is less well known. To analyse the impact of treatment complications on outcomes in ASD using a decision analysis (DA) model.

From an international multicentre database of ASD patients (968 pts), 535 who had completed 1 year follow-up (371 non-surgical – NS), 164 surgical –S), constitute the population of this study. DA was structured in two main steps of: 1) Baseline analysis (Assessing the probabilities of outcomes, Assessing the values of preference – utilities-, Combining information on probability and utility and assigning the quality adjusted life expectancy (QALE) for each treatment) and 2) Sensitivity analysis. Complications were analyzed as life threatening (LT) and non-life threatening (NLT) and their probabilities were calculated from the database as well as a thorough literature review. Outcomes were analyzed as improvement (decrease in ODI>8pts), no change and deterioration (increase in ODI>8pts). Death/complete paralysis was considered as a separate category.

All 535 patients (371 NS, 164 S) could be analyzed in regard to complications. Overall, there were 78 NLT and 12 LT complications and 3 death/paralysis. Surgical treatment was significantly more prone to complications (31.7% vs. 11.1%, p<0.001) (Table 1 a). On the other hand, presence of complications did not necessarily decrease the chances of improvement, surgical patients tending to rate better in this respect (Table 1b). Likewise, QALE was not particularly affected by the presence or absence of complications regardless of the type of treatment (Table 1c). This study has demonstrated that surgical treatment of ASD is more likely to cause complications compared to non-surgical treatment. On the other hand, presence of complications neither has a negative impact on the likelihood of clinical improvement nor affects the QALE at the first year detrimentally.

Table 1

Table 1: a. Number of complications associated with each treatment arm (NLT: non-life threatening, LT: life threatening) (p<0.001), **b.** Distribution of outcomes by complications (NLT, LT: same as above, NC: no change), **c.** Utilities and QALE associated with each treatment arm, complication status and outcome (NLT and LT: same as above).

a. Complication	*Surgical*	*Non-surgical*	*Total*
None	112 (68.3%)	330 (89.0%)	442 (82.6%)
NLT	39 (23.8%)	39 (10.5%)	78 (14.6%)
LT	10 (6.1%)	2 (0.5%)	12 (2.2%)
Death	3 (1.8%)	0	3 (0.6%)
Total complications	52 (31.7%)	41 (11.1%)	535

b. Comp	*Surgical*				*Non-surgical*			
	N	*Deterioration*	*NC*	*Improved*	*N*	*Deterioration*	*NC*	*Improved*
None	112	8 (9.4%)	27 (31.8%)	50 (58.8%)	330	47(17.5%)	184 (68.7%)	37 (13.8%)
NLT	39	2 (7.4%)	13 (48.1%)	12 (44.4%)	39	6 (15.4%)	26 (66.7%)	2 (17.9%)
LT	10	1 (12.5%)	4 (50%)	3 (37.5%)	2	1 (50%)	1 (50%)	0

c. One year outcomes	*N*	*Utility*	*QALE (/100 years)*
Unfavorable outcomes			
Surgery/No complication	8	0.57 (0.41-0.66)	57
Surgery/ NLT complication	2*	0.58 (0.56-0.59)	58*
Surgery/ LT complication	1*	0.38 (-)	38*
Conservative/No complication	47	0.54 (0.33-0.79)	54
Conservative/NLT complication	6	0.40 (0.30-0.54)	40
Conservative/LT complication	1*	0.75 (-)	75*
Intermediate outcomes			
Surgery/No complication	27	0.65 (0.41-0.85)	65
Surgery/ NLT complication	13	0.62 (0.45-0.87)	62
Surgery/ LT complication	4*	0.49 (0.38-0.58)	49*
Conservative/No complication	184	0.68 (0.36-0.97)	68
Conservative/NLT complication	26	0.70 (0.37-0.97)	70
Conservative/LT complication	1*	0.69 (-)	69*
Favorable outcomes			
Surgery/No complication	50	0.62 (0.36-0.88)	62
Surgery/ NLT complication	12	0.63 (0.40-0.89)	63
Surgery/ LT complication	3*	0.61 (0.59-0.64)	61*
Conservative/No complication	37	0.62 (0.40-0.89)	62
Conservative/NLT complication	7	0.61 (0.40-0.85)	61
Conservative/LT complication	-*	-	-*

Paper-66

How Reliable Is the Surgeon's Ability to Differentiate Between Idiopathic and Degenerative Deformity in Adults; What Parameters Help Them Decide?

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Adult spinal deformity (ASD) may be classified as idiopathic (I) or degenerative (D) (or other) based on classifier's perception, the reliability of and factors inherent to which remain unknown. To evaluate the inter and intraobserver reliability of surgeons' perception in differentiating I from D ASD and to identify the determinants of it.

From a multicentric prospective database, 179 patients were identified with the diagnosis of I (n=103) or D (n=76); no previous surgery; and a lumbar coronal curve > 20°. Standing AP and lateral X-Rays were sent to five experienced spine surgeons to be identified as D or I (or other); followed by a second round after reshuffling. Weighted Kappa statistics was used, after which the patients were stratified by number of agreements as perfect (10/10) and very good (≥8/10); these were further compared for additional radiological parameters.

Four observers completed both rounds while the 5th did only the first (a total of 10 observations/pt including the record). Agreement levels were moderate to good for intra but fair to moderate for interobserver comparisons (Table 1). There were 42 perfect and 80 with very good agreements for I patients but only 6 perfect and 17 very good agreements for D. Upon comparison of

these, it was seen that they were different for some coronal parameters such as lumbar Cobb angle (larger in I, p<0.001), CSVL modifier (C more common in I, p=0.007) and presence of rotatory subluxation (less common in D, p=0.017) but very different for sagittal parameters (lumbar lordosis, sagittal vertical axis, T2-sagittal tilt, pelvic tilt, sacral slope and global tilt; increased sagittal imbalance in D, all p≤0.001).

Surgeons in this study demonstrated reasonable intraobserver agreement but only fair agreement amongst them. These findings suggest that especially in patients with significant coronal curves, determination of curve etiology with only radiological data may not be accurate. In patients with good agreement, the most consistent radiologic determinant appeared to be the presence of sagittal imbalance.

Table 1

Table 1: Intraobserver and interobserver reliability of differentiation between idiopathic and degenerative deformity in adults

a) Intra observer agreements calculated for each observer

1st observer	2nd observer	3rd observer	4th observer
Weighted Kappa-Se	Weighted Kappa-Se	Weighted Kappa-Se	Weighted Kappa-Se
0.566-0.059	0.600-0.058	0.601-0.102	0.638-0.061

b) Inter-observer agreements among observers for 1st stage

	Weighted Kappa-Se	Weighted Kappa-Se	Weighted Kappa-Se	Weighted Kappa-Se	Weighted Kappa-Se
Database	0.466-0.064	0.308-0.065	0.235-0.053	0.462-0.063	0.263-0.055
1st observer		0.293-0.059	0.167-0.042	0.434-0.059	0.146-0.045
2nd observer			0.298-0.065	0.518-0.066	0.306-0.064
3rd observer				0.247-0.065	0.611-0.094
4th observer					0.284-0.066

c) Inter-observer agreements among observers for 2nd stage

	Weighted Kappa-Se	Weighted Kappa-Se	Weighted Kappa-Se	Weighted Kappa-Se
Database	0.351-0.067	0.444-0.062	0.170-0.047	0.349-0.062
1st observer		0.333-0.060	0.144-0.041	0.346-0.057
2nd observer			0.251-0.066	0.609-0.063
3rd observer				0.337-0.067

Paper-67

Efficiency of Intraoperative Halofemoral Traction for the Treatment of Scoliosis over 70 Degrees

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Severe scolisis has been defined as Cobb angle > 70 degrees by Lenke. The management of severe scoliosis has still remained a challenge to spine surgeons. Surgical options for severe scoliosis are combined anterior - posterior surgery, posterior transpedicular osteotomy, apical vertebra resection and preoperative halo-gravity traction. Instrumentation, correction and achievement of coronal and sagittal balance remain major difficulties of these surgical treatments options of severe scoliosis. The primary goal of this study was to evaluate the efficacy and safety of intraoperative halofemoral traction in the treatment of adolescent idiopathic scoliosis which the curve is greater than
70º.

A total of 12 adolescent idiopathic scoliosis patients with ≥70° curves (average 80.7°; range 75°–90°) with a minimum 2-years follow-up who underwent spinal instrumented fusion using intraoperative halo–femoral traction were analyzed. The mean age was 17,8 years (average 15-25). AP-lateral and supine bending vertebral column X-Rays, cervical dynamic X-Rays to rule out any cervical instability and whole spinal column MRI to rule out intraspinal abnormality were examined. Traction is started with 10 kg (4 kg on the head, 3 kg on each leg). Weight is gradually increased and total weight should not exceed 40 % of total body weight. Neuromonitorisation must be used. All level pedicle screw instrumentation and correction are performed.

The average follow-up was 33.1 months (average 24-44). The pre-operative major curve of 80,7° (75-90) was corrected to 11,8° (0-25) at the most recent follow-up, showing a correction of 82.3%. The most cranial screws were placed to T2 vertebra in all patients. The lowest screws were placed to L3 vertebra in 11 patients and L4 in one patient. Nice coronal and sagittal balance were achieved and shoulder levels were equalized. There was no complication such as pseudoarthrosis, infection, neurological deficit or implant related complication.

Intraoperative halo-femoral traction has been found safe and effective method for the treatment of severe scoliotic curves over 70 degrees. It provides many advantages; decreases the risk of neurological compromise associated with combined spine procedures, provides gradual and final good correction and balance and no excessive corrective forces need to be applied by the instrument.

Paper-68

Metallurgical Analysis of Broken Pedicle Screws

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Currently, there is no validated and reliable disease specific outcome tool available for spine trauma patients. This contributes to the present lack of consensus and the wide variation in the evaluation and optimal treatment of different types of spine injuries. Therefore, the AOSpine Knowledge Forum Trauma started a project to develop such an instrument using the International Classification of Functioning, Disability and Health (ICF) as its basis. The current study aimed to identify the most common problems and impairments in functioning and health experienced by adult spine trauma patients, using the ICF as a reference.

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There is no specific outcome measure available for spine trauma patients to apply in comparative effectiveness analyses, which contributes to the present lack of consensus and ongoing controversies regarding the optimal treatment and evaluation of many types of spine injuries. Therefore, the AOSpine Knowledge Forum Trauma initiated a project to develop and validate such an

Pedicle screws may be broken due to several reasons such as production conditions, eccessive torque during implantation, or corosion. The aim of this study is to find out metallurgic changes seen in broken pedicle screws.

This study includes 11 thoracolumbar pedicle screws, implanted between 2010 and 2013 in different centers, which were broken over time. The removed screws were examined in Materials Research Laboratory by Scanning Electron Microscope (SEM). In preoperative evaluation, two patients were instrumented for two levels (4 screws, 2 rods), five patients for three levels (6 screws, 2 rods), one patient for four levels (8 screws, 2 rods). Seven of 11 broken screws of eight patients were at the left side and four were at the right side. Three patients had bilateral broken screws and five patients had unilateral broken screws. Only at one of eight patients, the upper screws were broken; all the others had the lower screws broken. The shortest of the removed screws was 5,5 x 45 mm, and the longest one was 5,5 x 55 mm. Pre- and 1 year postoperative VAS scores of the patients were also examined. The average 1 year postoperative VAS scores of 8 patients were 2,87. The SEM analysis has shown that the primary defect tended to be increasing due to fatigue and all the fractures were ductile type.

Fatigue related signs were detected at each broken screw. It was supposed that a single crack due to material defect, starting at one point, tend to increase due to daily loads and cause the fracture of the screw. The production defects of implants affect the surgery directly.

Paper-69
Towards Developing a Specific Outcome Instrument for Spine Trauma - An Empirical Cross-Sectional Multicenter ICF-Based Study by the AOSpine Knowledge Forum Trauma

Said Sadiqi[1], Mechteld Lehr[1], Cumhur Öner[1], AOSpine Knowledge Forum Trauma[2]

An empirical cross-sectional multicenter study was conducted. Adult spine trauma patients (≥18 years of age) within 13 months post-trauma were recruited from nine trauma centers in seven countries, representing four AOSpine International world regions. Poly-trauma patients (Injury Severity Score>15), patients with complete motor paralysis at discharge/transfer from hospital (ASIA impairment grade A or B), and patients with active psychiatric conditions were excluded. Health professionals collected the data using the general ICF Checklist, which consists of a selection of 128 ICF categories that are most relevant for general clinical purposes. The presence of problems was denoted for each ICF category of the components *body functions*, *body structures* and *activities and participation*. Categories related to *environmental factors* could be either a facilitator or a barrier. The responses were analyzed using frequency analysis. Possible differences between the world regions were analyzed using descriptive statistics and Fisher's exact test.

187 patients were enrolled. In total, 38 (29.7%) out of 128 ICF categories were identified as relevant for at least 20% of the patients. Categories experienced as a difficulty/impairment were most frequently related to *activities and participation* (n=15), followed by *body functions* (n=6), and *body structures* (n=5). Furthermore, 12 *environmental factors* were considered to be a facilitator in at least 20% of the patients. Analyses of the responses according to each world region revealed that, in general, patients from North America experienced the greatest number of impairments/difficulties and endorsed environmental factors most strongly.

38 out of 128 ICF categories of the general ICF Checklist were identified as relevant. Loss of functioning and limitations in daily living seem to be more relevant for spine trauma patients, rather than pain, during this time frame. This study creates an evidence base to define a core set of ICF categories for outcome measurement in adult spine trauma patients.

Paper-70
Towards the Development of an International Disease Specific Outcome Instrument for Spine Trauma – Results of an International Consensus Meeting

Said Sadiqi[1], Mechteld Lehr[1], Cumhur Öner[1], AOSpine Knowledge Forum Trauma[2]

The research perspective was covered by a systematic literature review, which aimed to identify outcome measures focusing on the functioning and health of spine trauma patients, and to link their content to the ICF using established linking rules. The expert perspective was explored through an international crosssectional web-based survey among spinal surgeons from the five AOSpine International world regions. The patient perspective was investigated in an international empirical cross-sectional multi-center study.

Out of 5117 screened references, 245 were included in the systematic review, and 17 frequently used outcome measures were identified. The content was linked to 57 different first or second level ICF categories. A total of 150 AOSpine International members participated in the expert survey, identifying 13 out of 143 enquired ICF categories as 'definitely relevant' by ≥80% of the participants. The empirical study, including 187 patients from 9 trauma centers in 7 countries, yielded 38 out of 128 included ICF categories as the most important for ≥20% of the patients. Combining these results, 157 different ICF categories at the first or second level were presented at a consensus meeting. Eleven experts from 6 countries attended the consensus meeting. Ultimately, a core set of 25 ICF categories was selected for outcome measurement in adult spine trauma patients: 9 categories from the component *body functions*, 14 from *activities and participation*, and 2 from *environmental factors*.

A formal consensus process integrating evidence and expert opinion led to a core set of ICF categories for outcome

instrument. The International Classification of Functioning, Disability and Health (ICF) is used as the basis for the patient reported outcome. The preparatory phase focused on identifying all potentially meaningful ICF categories for spine trauma patients, excluding complete paralyzed and poly-trauma patients, from three different perspectives: research, expert, and patient perspective. The results of these studies created the necessary background for a consensus meeting during which a selection of core categories was decided.

measurement in spine trauma patients. In future studies the patient reported outcome under development will be subjected to further validation and cross-cultural adaptation.

Paper-71
The Value of Bone Biopsy During Percutaneous Vertebroplasty in Treatment of Presumed Osteoporotic Vertebral Compression Fractures

Bahadır Gökçen[1], Meriç Enercan[2], Sinan Kahraman[1], Sinan Yılar[3], Mutlu Çobanoğlu[4], Erden Ertürer[1], Çağatay Öztürk[1], Azmi Hamzaoğlu[2]

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The most common cause of vertebral compression fractures (VCF) is osteoporosis. Malignant conditions (metastasis, multiple myeloma (MM),lymphoma) also may be responsible for vertebral fractures. We have reviewed the biopsy results of patients treated via percutaneous vertebroplasty (PV). The aim of this study is to determine the value of performing a routinely applied bone biopsy during PV.

Between 2009-2013, 136 patients older than 50 years old were included. Biopsies were performed during PV procedure. Preoperative imagings were evaluated second time by a radiologist with the pathological results of the biopsies. Six patients with diagnosis of osteoporotic VCF presenting with abnormal blood tests were consulted with hematologist and the biopsy specimens of these patients were re-analyzed with CD-138 marker by the same pathologist.

187 biopsies were obtained from 136 patients (85F,51M). The mean age was 70.1 (50-96). In 17 patients (12.5%) pathologic process underlying the fracture was MM, metastasis and lymphoma. MM was diagnosed in 13 patients (9.5%). In 6 of 13 (46%) patients with osteoporotic biopsy results, MM was diagnosed by re-analyzing the specimens with CD-138 marker. Metastasis was found in 3 patients (2.2%). Lymphoma was found in 1 patient (0.7%).

Bone biopsy in presumed osteoporotic vertebral compression fractures treated via percutaneous vertebroplasty plays a significant role in the diagnosis of etiology. This study found a 12.5% incidence of malignancy (mostly MM) in patients with presumed osteoporotic VCF. Even the pathologic result is normal in 46% of MM pts (6 of 13) at initial evaluation, consulting patients with abnormal blood test with hematologist and re-analyzing the pathology specimens with CD-138 marker diagnosed MM. We believe that routine vertebral body bone biopsy can play a significant role to assist in initiating concurrent medical treatment especially patients with multiple myeloma and metastasis. As a result, we recommend routine obtainment of bone biopsy during every PV procedure and also analyzing the biopsy specimens with CD-138 marker for MM.

Paper-72
Towards the Development of an Outcome Instrument for Spine Trauma – An International Survey of Spinal Surgeons

Said Sadiqi[1], Mechteld Lehr[1], Cumhur Öner[1], AOSpine Knowledge Forum Trauma[2]

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There is no universally accepted outcome instrument available that is specifically designed or validated for spine trauma patients, which contributes to the controversies related to the optimal treatment and evaluation of many types of spine injuries. Therefore, the AOSpine Knowledge Forum Trauma aims to develop and validate specific outcome instruments for spine trauma patients, which include both the patients' and health professionals' perspective. The International Classification of Functioning, Disability and Health (ICF) is used as the basis for the development of the patient reported outcome. The current study aimed to identify the most relevant aspects of human function and health status from the perspective of health care professionals involved in the treatment of spine trauma patients, using the ICF as a reference.

An international cross-sectional web-based survey was conducted among spine surgeons from the five AOSpine International world regions. They were asked to give their opinion on the relevance of a compilation of 143 ICF categories for adult spine trauma patients on a three-point scale: 'not relevant', 'probably relevant', or 'definitely relevant'. The responses were analyzed using frequency analysis. Possible differences in responses between the five world regions were analyzed with descriptive statistics and the Fisher's exact test.

Out of the 895 invited AOSpine International members, 150 (16.8%) participated in this study. Of the 143 ICF categories included in the survey, 13 (9.1%) were identified as 'definitely relevant' by more than 80% of the participants. Most of these categories were related to the ICF component *activities and participation* (n=8), followed by *body functions* (n=4) and *body structures* (n=1). None of the ICF categories in the component *environmental factors* reached a consensus of 80%. Analyses of the responses according to each world region revealed only some minor regional differences in the pattern of answers.

More than 80% of an international group of spinal surgeons experienced in the clinical care of adult spine trauma patients, indicated 13 out of 143 ICF categories as 'definitely relevant' to measure outcomes after spinal trauma. The minor differences in the responses between the five world regions support the universal applicability of the ICF and the outcome instrument under development. This study creates an evidence base to define a core set of ICF categories for outcome measurement in adult spine trauma patients.

Paper-73
Does the Minimal Invasive Dorsal Stabilization Technique in Spinal Fracture Fixation Affect the

Ligamento-Muscular-Stabilizing System of the Spine? An EMG Consideration of the Supraspinous Ligament-Muscular Reflex

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Ligaments have only a minor mechanical role in maintaining spine stability and muscular co-contraction of anterior and posterior muscles is the major stabilizing mechanism of spine. A variety of sensory receptors are present in the spinal ligaments. One receptor situated in the supraspinous ligament, recruits multifidus muscle force to stiffen one to three lumbar motion segments and prevent instability. Open dorsal instrumentation damage the multifidus muscle and destroys the afferent pathway of this muscle-reflex.
Intraoperative electrical stimulation of the lumbar supraspinous ligament while recording electromyography on the multifidus muscle in 20 patients with thoracolumbar compression fractures stabilized through a percutaneous dorsal instrumentation. To determine if supraspinous mechanoreceptor reflex in the human spine, recruiting multifidus muscle force to stabilize the lumbar spine, could be preserved using the percutaneous stabilization technique.
The experimental protocol and purpose of the study were approved by the Institutional Review Board. 20 patients with thoracolumbar compression fractures without neurological damage underwent bisegmental percutaneous dorsal Instrumentation under Anaesthesia without using paralyzing agents so that reflexive muscular activity would not be inhibited. Intraoperatively the supraspinous ligament was electrically stimulated by bipolar needle electrodes one level above the fracture. Electromyographic discharges were recorded bilaterally from the multifidus muscle at the fracture level and at adjacent segments above and below at two steps of the operation, in the beginning, after blunt muscle dissection (Step 1) and at the end, after delivery of the internal fixator (Step 2) by needle electrodes. 20 patients, 9 males/11 females, mean age 55.4 [15-87] years with 1 Th10, 4 Th12, 8 L1, 6 L2 and 1 L3 AO-A3 fractures. In the free (Step 1) and immobilized (Step 2) conditions electromyograms from multifidus muscle were recorded bilaterally in all patients at the fracture, one level above the fracture and in 14 patients, one level below the fracture. In the remaining 6 patients, electromyographic discharge from multifidus muscle was recorded one level below the fracture only unilaterally (Step 1 and Step2). The largest and first appearing electromyographic discharge was present in the level of the ligament stimulation.

1. Electrical stimulation of supraspinous ligament recruits multifidus muscle response in more than one lumbar motion segment.
2. Careful soft tissue preparation during dorsal percutaneous spine stabilization could preserve the function of this spinemuscle-reflex-arc.
3. The percutaneous dorsal stabilization technique compared to the open technique does not alter the major stabilizing mechanism of spine.

Paper-74

The Efficacy of Percutaneous Vertebroplasty and Kyphoplasty in Osteoporotic Vertebral Body Fractures: A Comparative Study

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vertebroplasty (PV) and kyphoplasty (KP) in the treatment of pain and verebral height loss due to osteoporotic vertebral body fractures (OVBF).
119 PV and KP procedures were performed at our clinic between year 2008 and 2014. 38 patients who could be reached personally in addition to their available preoperative and postoperative data were included in the study. Preoperative and 24-hour postoperative visual analogue scale (VAS) pain scores, preoperative and 24-hour postoperative midline sagittal anterior (a), middle (b) and posterior (c) vertebral body height measurements were recorded for both PV and KP groups. Results were compared by using SPSS statistics program. Preoperative and postoperative 24-hour VAS scores for PV group was 7.61±0.49 and 3.33±0.57 ($p<0.005$) respectively. Preoperative and postoperative 24-hour VAS scores for KP group was 7.23±0.56 and 3.41±1.06 ($p<0.005$) respectively. For PV group, preoperative midline sagittal anterior (a), middle (b) and posterior (c) vertebral body height measurements were 17.54±5.35 mm, 13.07±3.99 mm and 20.35±4.12 mm respectively. Postoperative measurements for the same group were (a) 18.69±5.35 mm, (b) 14.39±3.90 mm and (c) 21.35±4.40 mm. There was a statistically significant difference between all of the preoperative and postoperative vertebral body height measurement points for PV group ($p<0.05$). For KP group, preoperative midline sagittal anterior (a), middle (b) and posterior (c) vertebral body height measurements were 16.46±6.97 mm, 11.78±5.15 mm and 18.91±3.99 mm respectively. Postoperative measurements for KP group were (a) 17.99±6.29 mm, (b) 13.38±5.09 mm and (c) 20.32±3.71 mm. There was a statistically significant difference between all of the preoperative and postoperative vertebral body height measurement points for KP group ($p<0.05$) (Table-1).
Both percutaneous vertebroplasty and kyphoplasty appeared to be similarly effective in the treatment of pain and vertebral body height loss due to osteoporotic vertebral body fractures.

Paper-75

Comparison of Two Segment Combined Spinal Fusion versus Three Segment Posterior Spinal Fusion in Thoracolumbar Burst Fractures; A Randomized Clinical Trial with 10 Years Follow-up

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The aim of this RCT is compare the clinical and functional outcomes between combined anterior and posterior two-segment spinal fusion and posterior three segment spinal fusion in thoracolumbar burst fractures carrying the risk of posttraumatic kyphosis without neurological deficit.
27 patients with thoracolumbar burst fracture, >20 of kyphosis/50% collapse and posterior ligament injury, without neurological deficit were randomly assigned into posterior and combined groups. Posterior treatment was three segment (one lower and two upper levels) posterior spinal fusion. Combined treatment group was one upper and lower level posterior spinal fusion, followed by anterior corpectomy, cage and bone grafting. Patients were followed with a mean of 117.7±8.7(98-132) months. At the final follow-up, groups were compared about clinical and functional means by using degree of kyphosis, VAS, Roland-Morris and Oswestry. There were 27 patients with a mean age of 38.5±2.4(18-68) years. 14 patients were treated with combined approach and 13 were treated with posterior approach. Age (40.0±10.3 vs 37.0±14.2; p=.54), sex (3F:10M and 5F:9M; p=.67), etiology (p:.71), fractured levels (p:.10), and preoperative kyphosis (19.3±6.2 vs 20.3±5.9; p=.65) were similar between groups. 14.2° of correction was achieved in posterior group and 16.9° in combined group (p=.60). Loss of correction at the last follow-up visit was 2.1° with a final kyphosis of 7.2° in posterior group and 1.2° with a final kyphosis of 5.5° in combined group. Correction of kyphosis (p:0.60) and final loss of correction (p=.31) between treatment groups were not significant. At the final follow-up VAS (16.4±14.8 vs 17.6±16.6;p=.84), Roland-Morris (27.2±27.3 vs 29.6±20.5; p=.79) and Oswestry scores (15.0±13.1 vs. 17.7±11.5; p=.56) were similar between groups.
Both treatment methods are similar in terms of clinical and functional outcomes.

Paper-76
Does the Location of Cement in the Vertebral Body Affect Disc Degeneration after Prophylactic Vertebroplasty? An MRI Study

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aim of this study was to determine whether bone cement caused disc degeneration due to its location in the vertebral body in instrumented patients.
83 patients (55f,26m) with osteoporosis due to various etiologies and who underwent posterior instrumentation and fusion with prophylactic vertebroplasty in the levels adjacent to the upper instrumented vertebrae were evaluated. The patients were divided into three groups based on the location of the cement in the vertebral body: superior (18pts), central (44pts), and inferior (21pts). Preoperative and f/up disc degeneration grades in the groups were assessed with Phirmann classification by two radiologists. Mann-Whitney-U test was used to measure the preoperative and f/up difference between the three groups. Mean age was 68(54-82) and length of follow-up was 3.8(210) years. Mean DD grade in the superior group was 2.5(1-4) before the operation and 2.7(1-4) at f/up. The central group had a mean DD grade of 3.1(1-5) before the operation and 3.4(25) at f/up. The inferior group had a mean DD grade of 3.2(2-5) before the operation and 3.5(2-5) at f/up. There were significant differences between the preop and f/up disc degeneration grades in all three groups ($p<0.05$). Although the inferior group had more disc degeneration than the central and superior groups, comparison of the three groups with respect to the difference between preoperative and postoperative disk degeneration did not reveal significant results ($p>0.05$).
The results of this study showed that there was no relationship between degeneration of the disc adjacent to the upper instrumented level and the location of the cement in the superior-central or inferior parts of the vertebral body.

Paper-77
Proximal Junctional Vertebral Fractures After Adult Deformity Surgery: Which Are Neglected? Which Necessitate Operation?

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A retrospective cohort analysis of 340 patients with adult spinal deformity (ASD) demonstrated that prognosis of junctional vertebra fractures in adult spinal surgery is mainly dictated by patients' symptoms, particularly pain. In this cohort patients with PJK, a proximal junctional fracture, and pain were more likely to have early reciprocal thoracic kyphosis changes and deterioration of SVA than the cohort with asymptomatic junctional vertebral body fractures.

Revision surgery for proximal junctional fractures after ASD operation is dictated by pain and sagittal imbalance.
Retrospective cohort analysis.
Proximal junctional vertebral body fractures after thoracolumbar fusions for ASDmostlyresult in junctional kyphosis. We sought to evaluate the factors associated with revision surgery following these fractures.
Consecutive adults who underwent thoracolumbar fusions for ASD (2003-2011) were reviewed. Inclusion criteria: instrumentation from pelvis to L1 or above, development of a junctional vertebral body fracture and minimum 2 years follow-up. Pre- and postoperative radiographic and clinical characteristics were compared between patients with pain. Of 340 eligible patients,

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Due to the thermal effect of the cement, PV may injure the blood supply to the end plate, and may lead to disc degeneration. The

125 (M: 26, F: 99; average age 65±9yrs) had proximal junctional fractures. Fractures more commonly occurred after fusions that terminated in the lower thoracic spine (41% vs 24%; p(<0.01). Concomitant proximal junctional pathology included: spondylolisthesis (n=14; 11%) and screw pullout (n=31; 24.8%). After the fracture, 54 patients (46 PJK, 8 Non-PJK) had pain. Compared to patients who didn't have pain, patients with pain had a significantly higher surgery advice (74% vs 14% r0.623 p<0.01), revision rate (51.9% vs 11% r0.435 p<0.01), greater thoracic kyphosis after the index operation (16vs9˚; p=0.04), worsening SVAs between the immediate postoperative and latest follow-up (29vs5mm; p=0.03), and a greater SVA at final follow-up (70vs48mm;p=0.04). There were no differences in pre- and post-op LL, PI, SS, lumbopelvic mismatch, and PT between painful and non-painful groups. Prognosis of junctional vertebra fractures in adult spinal surgery is mainly dictated by patients' symptoms, particularly pain. In this cohort patients with PJK, a proximal junctional fracture, and pain were more likely to have early reciprocal thoracic kyphosis changes and deterioration of SVA than the cohort with asymptomatic junctional vertebral body fractures.

Paper-78

The Relationship Between Posterior Ligamantous Complex and the Force Required for the Occurrence of Vertebral Fracture – A Biomechanical Study

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In this biomechanical experimental study; the relationship between each structure of the posterior ligamentous complex and the force required for the occurrence of vertebral fracture was aimed.

Same sex, same age, 15 sheep spine, lumbar and thoracic regions were dissected to remain. Dual spine segment model was used in this experiment. The study was carried out in 4 groups.

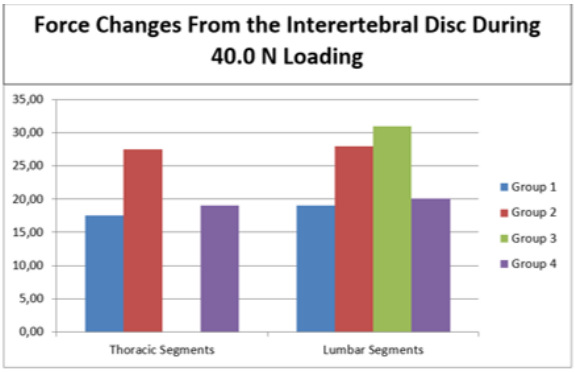
Group 1: Normal
Group 2: Supraspinous ligament interrupted(SS)
Group 3: Interspinous ligament and ligamentum flavum interrupted(IS+LF)
Group 4: Facet joint capsule interrupted(FJC)

Dual spine segments divided into groups were frozen into aluminum containers with giving low exothermic reaction general-purpose polyester. Force values required for the fracture of the spine segment were measured using ELE brand compression machine with 20.0 N / s load speed. The force required for the fracture of the spine segment was determined reached the highest compression forces. Lowest compression forces were measured 40.5 N and 43.0 N in the lumbar and thoracic spine, respectively. Whereupon force changes from the intervertebral disc during 400 N loading were measured using Interlink Electronics Force-Sensing Resistor - 0.25'' Circle - FSR - PL – 2727.

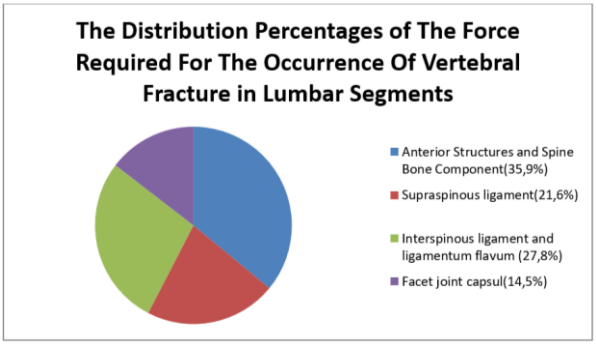
Measurements were made to separate such as thoracic and lumbar spine groups. Pre and post anterior vertebral body heights, the highest compression force, vertebral segment weights, vertebral corpus surface area, resistance force ((N/mm2), force changes from the intervertebral disc during 40.0 N loading, interspinous distance length and width were measured in the both groups. Each posterior ligamentous complex structure in terms of resisting the flexion forces in the thoracic and lumbar spine were found to be significantly and different degrees. Interspinous ligament and ligamentum flavum association was found the most effective structure to resist the flexion forces. The effect of the supraspinous ligament was found to be similarly to the interspinous ligament and ligamentum flavum association effectiveness. It was observed that the minimum effective structure had been facet joint capsule.

Flexion forces were significantly increased in the intervertebral discal region as a result of the disruption of the posterior ligamentous complex structures effectiveness. As a comment; we can say patients who have posterior ligamentous complex disruption after spine trauma can carry an increased risk in terms of posttraumatic disc herniations.

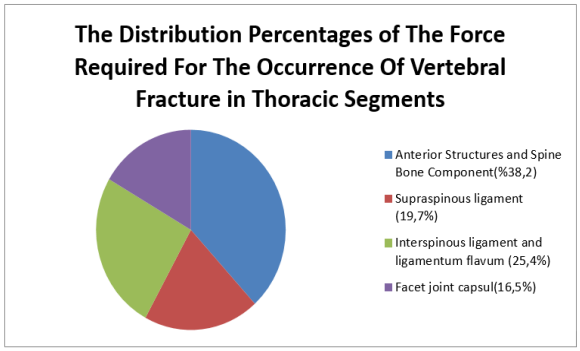
Force Changes From the Interertebral Disc During 40.0 N Loading



The Distribution Percentages of The Force Required For The Occurrence Of Vertebral Fracture in Lumbar Segments



The Distribution Percentages of The Force Required For The Occurrence Of Vertebral Fracture in Thoracic Segments



POSTER PRESENTATIONS

Poster-1
Spinal Stenosis Incidence in Total Arthroplasty Patients

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Spinal stenosis can be a challenging problem for total joint replacement patients and usually degenerative process affect more than one joint at the same time. In this study we want to evaluate spinal spinosis incidence in total joint arthroplasty patients.

Patients with history of primary total arthroplasty were retrospectively evaluated for spinal stenosis between May 2010 and June 2013. Total knee and total hip arthroplasty patients who had at least one year follow up were included in the study. Patients with residuel low back pain after 2 weeks of conservative treatment were investigated for spinal stenosis. X-ray evaluation and magnetic resonance imaging were performed for these patients.

176 patients were included in this study. 83 patients (47 female, 36 male) were in hip replacement group, 93 patients (54 female, 39 male) were in knee replacement group. The mean age was 63,2 in hip group and 62,9 in knee group. Total 31 patients (18 hip, 13 knee) suffered of low back pain. After conservative treatment 17 continued. X-rays showed 6 patients with lumbal degenerative scoliosis. After MRI 13 patients were diagnosed as spinal stenosis. 6 patients (4 hip, 2 knee) with spinal stenosis needed surgical treatment.

Degenerative arthritis usually affects more than one joint. Before considering a joint replacement treatment one should evaluate

possible artritis of other joints and that could change surgical treatment order.

Poster-2
Relation Between Pes Planus and Low Back Pain

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Low back pain is a common complaint of pes planus patients. Beside this low back pain isa common complint and its relation with pes panus deformity is undetermined. Also effect of pes planus on lumbar region is unstudied.
The aim of this study is to evaluate low back pain complaints and lumbar radiologic measures of pes planus patients.
Sixty-one male patients who admitted to our clinic for administrative purposes included in the study. After clinical examination patients divided into two groups with or without low back pain. Lateral weightbearing foot graphies and anteroposterior and lateral lumbar x-rays evaluated. Calcaneal pitch, talometatarsal angle, Lumbar scoliosis and lordosis, sacral slope, pelvic incidence, pelvic tilt evaluated and patients asked to fill oswestry disability index.
There were 36 patients in low back pain group and 25 in control group. Average age was 22,1in LBP group and 24,3 in control group. No statistical difference in foot measurements and lumbar measurements found between the groups. Oswestry scores were 39,8 (14-74) and 26,5 (0-58).
This study aimed to determine lumbosacral effect of pes planus deformity and its relation to low back pain. Scores between the groups were similar and no relation between low back pain and pes planus deformity was found

Poster-3
Multiple Osteoporotic Vertebral Fracture

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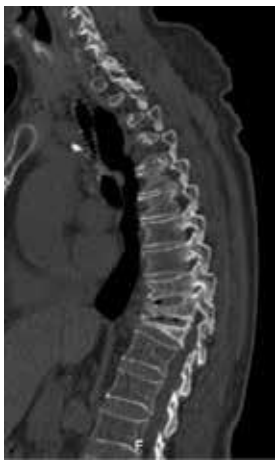
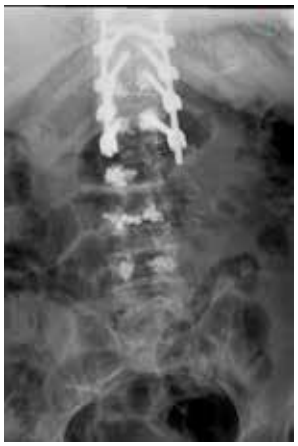
We aimed to evaluate the results of both posterior instrumentation treatment with canulated cemented polyaxial screws and prophylactic vertebroplasty treatment in patient who had consecutive traumatic multiple levels osteoporotic vertebral fracture related kyphotic deformity and more than one comorbidity. 61 years old female patient applied with persistent crick and kyphotic deformity complaints which occurred after a simple fall two months ago. In her history we detected that she has prednisolone (5 mg. per day) and methotrexate (2,5 mg. per day) treatment for rheumatoid arthritis in last ten years, and pramipexole dihydrochloride monohydrate (15 mg. per week) treatment orally for Parkinson disease in last five years. In physical examination patient could mobilize with support and had kyphotic deformity at inferior thoracic spine. Tenderness with palpation was detected on spinous processes only at inferior thoracic spine segment. There was no pathological finding at neurological examination. Secondary osteoporosis and osteoporotic collapse fractures were detected at 9th, 10th and 11th thoracic vertebral bodies in radiological examination of thoracic and lumbar spines. Patient was hospitalized for evaluating the comorbidity and surgical intervention. While inpatient follow up radiological examination was repeated because of the new pain complaints at back and hip of the patient. New collapse fracture at 3rd lumbar vertebral body and vertical fracture lines with callus tissue at ala of sacrum were detected. Surgical intervention for 9th, 10th and 11th thoracic and 3rd lumbar vertebral bodies' fractures and conservative treatment for ala of sacrum fracture were planned. Posterior instrumentation and fusion procedure was performed with canullated cemented polyaxial screws between 8th-12th thoracic vertebras. At the same time vertebroplasty procedure was performed for 3rd lumbar vertebra as theuropathic and for 5th, 6th, 7th thoracic and 1st, 2nd, 4th lumbar vertebras as prophylactic treatment. There was no complication after surgical intervention. One day later surgery patient was mobilized without any support. All complaints of patient were recovered at 12th month follow up visit.
Posterior instrumentation with canullated cemented polyaxial screws is a good choice for long term corticosteroid medication caused secondary osteoporosis related consecutive multilevel vertebra fracture treatment. And we think that prophylactic vertebroplasty is an important part of this treatment to avoid new osteoporosis related fractures at contiguous vertebras.

Figure 1



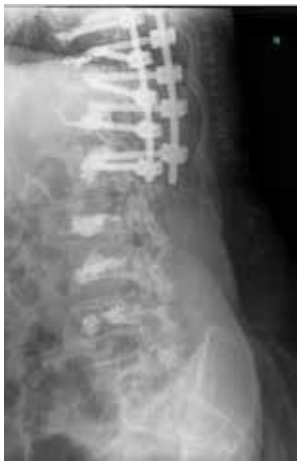
Lateral radiological examination of thoracic spine prior to surgical intervention. Decreased bone mineral density is obvious. Consecutive three thoracic vertebral fracture (9,10 and 11) causes kyphotic deformity.

Figure 2



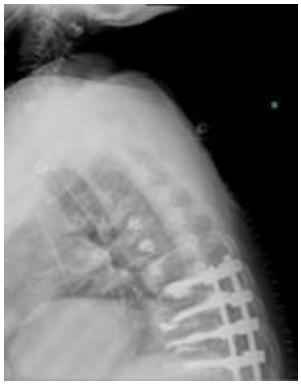
Anterior-posterior radiological examination of lumbar spine after surgery. Posterior instrumentation with canullated cemented polyaxial screws and theuropathic and prophylactic vertebraplasty for contiguous vertebras.

Figure 3



Lateral radiological examination of lumbar spine after surgery. Posterior instrumentation with canullated cemented polyaxial screws and theuropathic and prophylactic vertebraplasty for contiguous vertebras. Kyphotic deformity was reduced after surgery.

Figure 4



Lateral radiological examination of thoracic spine after surgery. Posterior instrumentation with canullated cemented polyaxial screws and prophylactic vertebraplasty for contiguous vertebras

Poster-4
Should We Measure Pelvic Incidence via Manually or Computer Assisted?

İsmail Oltulu[1], Melih Malkoç[1], Mehmet İşyar[1], Sercan Yalçın[1], Tuğrul Örmeci[2], Ali Akın Uğraş[3]

To show superiority of computer assisted measurement of pelvic incidence over measurement made by manually.

Standing anteroposterior and lateral radiograph of entire spinal colon of 30 patients aged between 20-40 years-old included in the study. Sacral slope, pelvic incidence and pelvic tilt were evaluated to measure sagittal balance. The measurements were done by both computer assisted and manually by two spinal surgeons and one orthopedic surgeon. Statisticaly, Intraclass correlation coefficent method is used.

Almost perfect agreement is found between surgeons by computer assisted measurements. It was found to be moderate to strong agreement by manual way.

The use of computer assisted programs will improve accuracy of measurement especially in measurements which is difficult to calculate such as sagittal balance.

Poster-5
An Unusual Complication of Vertebroplasty: Urinary Incontinence

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Case report

We aimed to present an unusual complication, urinary incontinence, which was developed following a vertebroplasty under local anesthesia and sedation in an osteoporotic patient with lumbar burst fracture.

A computerized tomography was planned because of suddenly developed post-operative urinary incontinence. Retropulsion of posterior wall of fracture due to cement effect was demonstrated. Emergency laminectomy, reduction of retropulse fragment, and instrumentation with a pedicle screw were performed to the patient.

The neurologic condition of the patient recovered within the 24 hour after surgery.

Conclusions. Surgeon should be careful about the risk of retropulsion in burst fractures. Neurogenic bladder should be kept in mind as a complication. Urgent decompression is a good treatment option in such patients.

Poster-6
Posterior Fusion in Adolescent Scoliosis Patient with Down Syndrome

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mobilised with boston brace on postoperative second day. 1 week later patient was discharged without any complications. Repeated radiographs showed preservation of the correction in the curve.

Management of the scoliosis patients with down syndrome is not well defined since literature on this subject is poor and studies

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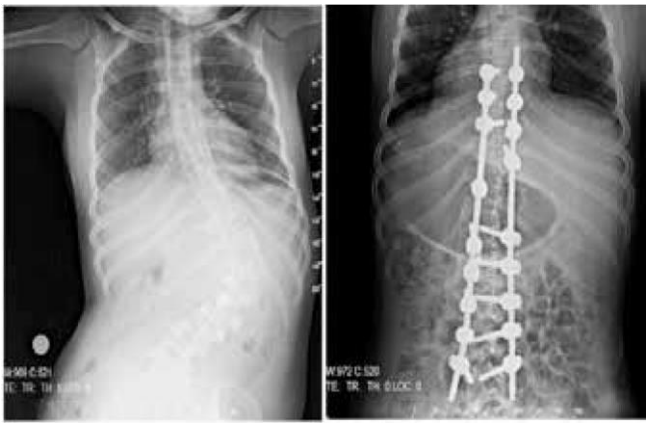
We aimed to evaluate results of posterior fusion in adolescent scoliosis patient with down syndrome.

Eventhough occipito atlantoaxial instability, one of the most important orthopedic manifestations of down syndrome, is well defined, literature about scoliosis in this population is limited [1].

showing alternative treatment methods are very few. Krompinger and Renshaw reported that patients under 35 degrees of scoliosis can be followed with brace [4], but Todd and Milbrandt reported brace treatment as ineffective, also reported 57% of complications in correction of curve with modern segmental instrumentation even it is effective [1]. This rate of complication is close to the cervical fusion surgery [1]. If we take the litearture reporting low effectiveness of brace into consideration, these patients may be appropriate candidates for scoliosis surgery despite high complication rates.

Figure1



Poster-7
The Effect of Shoulder Balance on Patient Satisfaction After Scoliosis Surgery

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To investigate the effect of shoulder balance on satisfaction of surgically treated scoliosis patient.

Twenty three patients (18 female, 5 male) with mean age of 14.8(11-24) had been treated with posterior instrumentation and fusion for scoliosis were evaluated retrospectively. The mean follow up time was 15.4 (4-67) months. Evaluation of shoulder balances were analyzed with the measurements of first rib angle (FRA), shoulder height (SH) and shoulder angle (SA) on the anterior-posterior orthoroentgenographic views. Visual Analogue Scores (VAS), were calculated for the functional and psychological wellness assessment. Additionally, the correlation between patient's satisfaction and shoulder balance values were evaluated. Twenty one patients were diagnosed as idiopathic adolescent scoliosis as well as 2 patients were evaluated as congenital scoliosis. In all patients proximal instrumentation and fusion process were ended at 2nd thoracic vertebra level. However, distal instrumentation and fusion process were ended at various levels; 12th vertebra for 2, at 1st lumber vertebra for 6, at 2nd lumber vertebra for 1, at 3rd lumber vertebra for 9 and at 4th lumber vertebra for 5 patients. Interbody fusion was was performed in all patients. The mean values were 3 (0-10) degrees for FRA, 6 (0-14) mm for SH and 2 (0-5) degrees for SA. In patients contentment criteria, mean scores were assessed as 3.81 (2.8-4.8) for pain scores, 3.76 (2.8-4.8) for image score, 3.66 (2.6-4.8) for functional score, 3.27 (2.4-4.8) for psychological wellness score 3.71 (1.5-5) for satisfaction score, 4 (3-5) according to VAS. There were no statistically significant correlation between the patient's contentment values and shoulder balance values (Table 1). Achieving shoulder balance is one of the major components of scoliosis surgery. In conclusion, imbalance at RSH up to 15 mm and at FRA up to 10 degrees, and difference between the each shoulder's SH values up to 5 degrees do not affect patient satisfaction.

Table 1

	Pain Score	Image Score	Functional Score	Psychological Wellness Score	Satisfaction Score	VAS
First Rib Angle	r=0.375 p=0.078	r=0.115 p=0.601	r=0.391 p=0.65	r=0.167 p=0.447	r=(-)0.073 p=0.740	r=(-)0.033 p=0.900
Shoulder height	r=0.071 p=0.748	r=0.082 p=0.709	r=(-)0.048 p=0.826	r=(-)0.086 p=0.696	r=(-)0.259 p=0.233	r=(-)0.183 p=0.482
Shoulder angle	r=0.005 p=0.982	r=0.154 p=0.483	r=(-)0.049 p=0.823	r=(-)0.023 p=0.916	r=(-)0.181 p=0.409	r=(-)0.062 p=0.814

Statistical results of relationship between pain, image, functional, psychological wellness, satisfaciton, visual analogue scores and FRA, SA, SH values.

Poster-8
Endoscopic Discectomy After Adjacent Segment Disease

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Translaminar interbody fusion (TLIF) technique is an effective way for successful fusion and has satisfactory results. But degenerative changes of adjacent segments are suppose to be the complication of this technique because of overloading of adjacent mobile segment. In this case we aim to represent acute deterioration of the adjacent segment after TLIF procedure for spondilolisthesis of L4-5 level.

60 year old female patient admitted to our hospital with lumbar back pain radiating to right thigh which was started 6 months ago. With flexion and extension her symptoms worsen and feeling numbness on her right toe. On clinical examination; her right leg raise at 400 was positive, no motor or sensory nerve dysfunction were exist. On her magnetic resonance imaging (MRI) findings there were spondylolytic changes and at L4-5 level there were grade I spondylolisthesis which compresses dural sac and the nerve roots anteriorly. At L5-S1 level posterosantral protruded disc herniation were exist. By these findings we have deciced to make

Todd et al. Reported 8.7% prevalance of scoliosis in down syndrome [1]. Even supportive data in literature is limited, brace is reccomended up to 35 degrees [2]. Relatively higher incidence of complications is reported in surgical treetment [3]. In this case we aimed to evaluate results of posterior fusion in adolescent scoliosis patient with down syndrome. Posterior instrumentation and fusion of T4- l4 was applied to the progressive scoliosis patient (T8-L4 74°) (figure 1) with down syndrome by posterior approach. Postoperative radiographs showed that cobb angle less than 10 degrees whilst it was 74 degrees preoperatively. Patient was

TLIF procedure for L4-5 level. After immediate postoperative period she was pain free which radiates to her right thigh. She has gone through physical therapy and medication of gabapentine. On her sixth week follow up her clinical symptoms started to deteriorate and she had motor weakness of toe extension. MRI revealed postoperative changes at L4-5 level and at L5-S1 level protruded disc herniation which compresses nerve roots extraforaminally predominantly at right hand side. By these findings we have decided to perform endoscopic discectomy. She has been gone through endoscopic discectomy at second day of her deterioration of her symptoms. After surgery at her follow up she showed no symptoms of pain nor findings of radiculopathy. TLIF procedure is a good way of spinal fusion which allows 3600 of fusion. But adjacent segment disease is a well known complication of this procedure. This is due to overloading of adjacent non fused segment. But in our case there was acute deterioration of clinical and MRI findings which was 6 weeks after surgery. It should be noted that degenerative spinal disease is complicated issue in addressing the exact pathology of clinical symptoms. So the patient should be carefully examined and the pathology of the symptoms should be identified and also potential risks should be evaluated before surgery. As in our case prophylactic discectomy could have been considered during TLIF procedure which would prevent patient performing multiple surgical procedures.

Poster-9
Intraspinal Anomalies in Adolescent Idiopathic Scoliosis: Is Routine Use of MRI Necessary?

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The purpose of this study was to document and analyze the incidence and types of intraspinal abnormalites in patients with the different types of adolescent idiopathic scoliosis.
A total of 124 patients with a diagnosis of adolescent idiopathic scoliosis underwent posterior instrumentation and fusion in our clinic between the years 2012 and 2014. All patients were neurologically and physically intact. Clinical records of all the patients were retrospectively reviewed to ascertain the proportion having a neural abnormality on preoperative magnetic resonance imaging (MRI) scan.
Mean age was 15.2 (10-20) years, female to male ratio was 95 to 29. According to the Lenke classification, 61 of the patients were type 1, 4 were type 2, 7 were type 3, 1 was type 4, 33 were type 5 and 14 were type 6. Eleven of 124 patients (8.8 %) were diagnosed with an unexpected intraspinal anomaly on routine preoperative MRI scan. MRI revealed isolated hydromyelia-syringomyelia in 8 patients, tethered cord in 1 patient and Chiari malformation in 1 patient. 5 patients with intraspinal pathology were Lenke 1, one was Lenke 3, two were Lenke 5 and three of them were Lenke 6. Of the 11 patients, 1 underwent a neurosurgical procedure because of tethered cord, 1 because of the Chiari malformation and 1 because of the syrinx cavity. Patients who had intraspinal anomaly but did not need neurosurgical operation, did not have abnormal SSEP and MEP values during their operations.
The routine use of MRI in adolescent idiopathic scoliosis remains controversial, and current indications for MRI in idiopathic scoliosis vary from study to study. To prevent potential neurological complications, intraspinal malformations need to be addressed before the treatment of scoliosis, so MRI may be beneficial for patients with idiopathic scoliosis even in the absence of neurological findings.

Poster-10
The Effect of Surgical Treatment on Pulmonary Functions in Adolescent Idiopathic Scoliosis

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To determine the rate of improvement in pulmonary function after the surgical treatment of AIS.
This study consisted of 126 patients with AIS. There were 95 female and 31 male. Mean age was 14.5(10-20). Cobb angle of the structural curves, T5-T12 thoracic kyphosis angle and pulmonary function values (FVC and FEV1) were measured preoperatively and postoperatively at last follow-up. All pedicle screw instrumentation and fusion was performed to all patients. Patients completed the sf-36 form before and after the surgery.
Mean preoperative Cobb angle of the structural curves was 48.6 degrees, and decreased to 11.8 degrees postoperatively. Preoperative and postoperative T5-T12 kyphosis angles were measured as 36.4 degrees and 29.3 degrees respectively. Preoperative mean FVC was 2.85 l/sec and improved to 3.14 l/ sec at last follow-up. Pre- and postoperative mean FEV1 values were 2.07 l/sec and 2.41 l/sec respectively. Physical and mental components of SF-36 score improved at last follow-up.
One of the surgical goals in AIS surgery is to imptove pulmonary capacity. Patients with AIS who have preoperative reduced pulmonary functions achieve increased lung capacity after surgical correction of their deformities.

Poster-11
A Rare Complication of Spine Surgery: Case Report of Peripheric Facial Paralysis

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During spine surgery, patients are placed in positions that are not physiologic and that may lead to complications. Perioperative peripheral nerve injury is a rare complication related to patient positioning during spine surgery. Ulnar neuropathy is the most common one. Brachial plexus injury, radial nerve injury,median nerve injury and loss of vision may also be seen, but as far as we know facial nerve paralysis after spine surgery has not been reported in the literature before. Our aim is to report this rare complication.
28 year-old male patient underwent general anesthesia for posterior Scheuermann kyphosis surgery. Patient lied down on prone position and the operation lasted approximately 3 hours.

Torachal sagittal Cobb angel was 75 degrees and there was no intraspinal pathology. Immediately after the operation the patient developed unilateral facial weakness. No other neurological deficit was observed. Cranial CT and MRI were taken and there was no central nervous system pathology, so the situation was attributed to patient positioning and compression of the facial nerve. The patient was treated by intravenous corticosteroids and vitamin B, improvement was observed at postoperative third day.

Awareness of the potential complications of patient positioning during spine surgery is essential for improved care and reducing the likelihood of occurrence of such complications. Postoperative facial paralysis due to mechanical stress during general anesthesia has been described and is a rare complication attributed to direct compression or stretching of the nerve. Digital pressure behind the mandible or excessive pressure exerted by the facemask also can cause a traumatic lesion of the facial nerve. Although this is an extremely rare complication of spine surgery, to avoid all complications about positioning, surgeons should have clear communication with the perioperative staff while positioning patients in the operating room.

Poster-12
Chronic Coccyx Osteomyelitis Sequelae Associated with Sacral Dermal Sinus: A Pediatric Case Report

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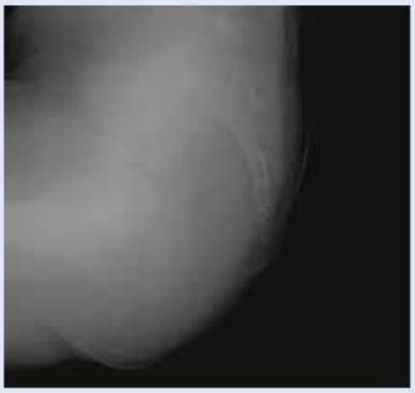
Congenital dermal sinus can be seen in the midline, in an area reaching to lumbosacral region from the cranium, as a skin lesion concomitant to spinal dysgraphia. The incidence of it as sacral dermal sinus is 1/100 000. It may predispose to local infection, sacral abscess and even recurrent meningitis. In general surgical treatment should be planned in order to overcome this situation. We aim to present our approach to a case in which patient had coccyx osteomyelitis sequela caused by sacral dermal sinus without neurological signs.

9-year-old female patient had been followed up for 1 year in pediatric clinic with recurrent fever and frequent urinary tract infections and grade 3 vesicoureteral reflux diagnosis. On physical examination, sacral dimple had been detected. She was referred to us due to suspicious coccyx findings on MRI. Sacral dimple was present at birth and there was no discharge. On the physical examination vertical trending sinus orifice with 2.5x0.5 cm dimensions were determined in the sacrococcygeal region. There was no tenderness by palpation. The patient's lower extremity both flexor and extensor muscle strength was 5/5. There were no sensory defects. Leukocyte count was 10 000, CRP was 9 and sedimentation was 10. In the radiological assessment of MR imaging, at the level of the coccyx right paramedian region there was a sinus tract which started under the skin and reached the end of the coccyx. There was a significant sclerosis segment of 2, 3, 4 coccyx. The patient was taken to the outpatient followup because of the lack of clinical symptoms, such as pain and discharge, the lack of relationship with spinal canal and dermal sinus tract and thought to be associated with recurrent attacks of fever and vesicoureteral reflux.

During the 1 year clinic follow up with 3 months intervals, patient did not suffered any pain and discharge.

Sacral dermal sinus as a skin lesion often recognized by pediatricians and it may be accompanied by spinal dysraphia. In the rare cases where the dermal sinus associated with osseous structures may require orthopedic evaluation. Sinuses asociated with dural sac can lead to recurrent meningitis and usually need surgery to avoid this situation. However in situations like this case that had no clinical symptoms and had sequela of chronic osteomyelitis at the coccyx, close follow up without surgical intervention is considered as the right approach.

coccyx lateral radiograph

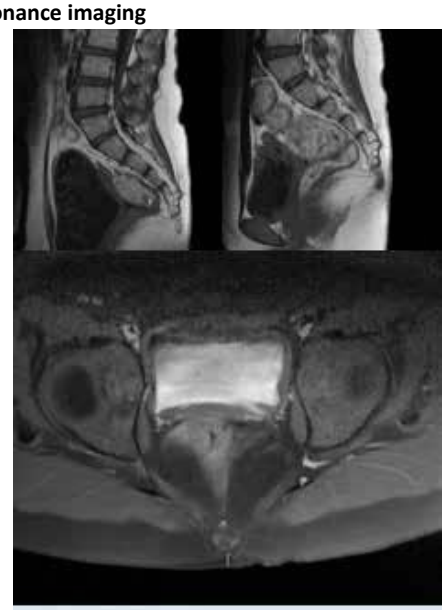


Resim 1 : Koksisks makro-lateral grafi

dermal sinus in the sacral region

Resim 2 : Sakral bölgedeki dermal sinüs

image compatible with coccyx osteomyelitis on the magnetic resonance imaging



Resim 3 : MR görüntülemede kokiskste osteomyelit ile uyumlu görüntü

Poster-13
Treatment of Osteoporotic Vertebral Compression Fractures with Percutaneous Vertebroplasty Under Local Anesthesia; Clinical and Radiological Results

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Percutaneous vertebroplasty (PV) is a commonly used method for the treatment of osteoporotic vertebral fractures (OVF). The aim of this study is to analyze retrospectively the efficacy of PV in symptomatic osteoprotic spine fractures.

Patients with symptomatic osteoporotic spine fractures were included in our study. Visual analog scale and demographic characteristics were used for clinical examination, local wedge angle and the central height of the vertebral body were measured preoperatively and postoperatively.

95 patients (72 female, 23 male) were included and 118 level vertebroplasty were performed. There was statistical significance in the differences of preoperative VAS scores compared to postoperative first day, first month and sixth month. The radiologic assessment of the mean local wedge angle correction at the postoperative sixth month, was 13,9° and mean increase of mid height of vertebral body was 7,9 mm, but it was not statistically significant.

VP is at an important point as a minimally invasive method, that provides rapid pain relief in acute symptomatic osteoporotic vertebral fractures and that prevents the patient being beddependent. It is a reliable surgical method, being an alternative to open surgery with minimal complications in patients with comorbidities, which can be a rapidly applied and decreases the potential spinal deformity after the fracture and prevents the progression of deformity.

Poster-14
Primary Bone Non-Hodgkin Lymphoma of the Thoracolomber Spine: A Case Report

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Primary bone lymphoma is a rare type of lymphoma that constitutes 3% of all malignant tumors, 2% of all bone tumors and 5% of all extranodal lymphomas. Femur and pelvic involvement is common (50%) and spine involvement (1.7%) is very rare. In this case report it's aimed to present a patient's diagnosis and treatment plan; for who had non-Hodgkin's lymphoma in the thoracolumbar region.

84 year-old female patient admitted to our clinic with complaints of back pain for 3 months with increasing lower extremity muscle weakness and inability to walk in the last 2 weeks. At physical examination, according to MRSC bilateral iliopsoas, muscle strength was 2/5, right quadriceps muscle strength was 3/5 and left was 2/5, bilateral peroneal muscle strength was 2/5. There were no sensory deficits. Sphincter function was normal. Patient was evaluated as ASIA-C. The patient's radiographs revealed a decrease in the T12 vertebral height. In magnetic resonance imaging, a mass with extension into the intramedullary canal that commonly holds left paraspinal muscles was determined. In addition, skip lesion that doesn't affect the medullary canal was seen in the L4 vertebra. Serum protein electrophoresis was normal. Wright test were negative.

Open biopsy was performed for diagnostic purposes. Histopathological examination of preparetes were evaluated in favor of lymphoma on second day after the biopsy.While procedures were performed for determination of the subtype patient was operated immediately after devolopement of an acut paraplegia. T10-L2 posterior instrumentation and T11-L1 laminectomy was performed.Medulla spinalis in the intramedullary canal was decompressed after laminectomy seen as being compressed by the mass. Histopathological examination of the preparetes postoperatively were consistent with diffuse large B-cell lymphoma. Postoperatively 16mg methylprednisolone was applied and reduced after 3 days, 5 days were cut. On the 5th day of patient physical examination bilateral muscle sterength of iliopsoas was 2/5, right quadriceps muscle strength was 3/5 and left was 2/5, bilateral peroneal muscle strength was 3/5 according to MRSC. Sensory deficit and sphincter dysfunction were not detected. Systemic chemotherapy and local radiotherapy were started.

Spine primary bone lymphomas are diffucult to diagnose due to low incidence and lack of specific radiologic findings. Today, the standard treatment is systemic chemotherapy and radiotherapy. On the other hand, surgical treatment seems to be the right approach in the presence of pathologic fractures and spinal involvement that leads to neurological deficits.

Poster-15

Results of Surgical Treatment of Vertebral Tuberculosis: A Retrospective Analysis of 26 Patients

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Historically, the first identified infectious agent in spinal infections is tuberculosis. According to current literature, one third of the world's population is infected with tuberculosis. Patients with skeletal involvement constitute 1-3 % of patients who are treated with tuberculosis diagnosis. Spinal tuberculosis is the most common type of skeletal tuberculosis (30-50%). In this study, we planned to review the results of the patients who underwent surgical treatment at our clinic with a diagnosis of vertebral tuberculosis.

In our study, patients who were operated with a diagnosis of spine tuberculosis between January 2000 and June 2014 were analyzed retrospectively. Patients were operated via only posterior or combined approach. Pediatric patients who were followed conservatively were excluded from study. Patients were evaluated in terms of the first complaint, neurological status, the affected vertebral levels, vertebral deformity at presentation, previous surgery, postoperative deformity and postoperative complications.

In the specified time period, 34 patients had been operated with a diagnosis of vertebral tuberculosis in our clinic. Eight patients were excluded from the study due to lack of records. The mean age of 26 patients (13Male/13Female) who were included in the study was 61 years. While 20 patients admitted to our clinic with complaints of pain, 4 patients had difficulty walking due to neurological deficits and 1 patient admitted with complaint of deformity. As a surgical treatment to patients; anterior corpectomy with cage posterior instrumentation combination (13 patients), only posterior instrumentation (7 patients), anterior corpectomy with structural autograft and posterior instrumentation combination (6 patients) were performed. In the postoperative evaluation, the average improvement of kyphotic angulation in the affected region, was detected as 19.4 degrees. Fusion was achieved in 19 patients without any complications and successful results were obtained with the medical anti-tuberculosis treatment. In 3 of 4 patients preoperative neurological deficits resolved postoperatively. Two patients underwent revision surgery due to pseudoarthrosis secondary rod breakage. Likewise 1 patient underwent revision surgery due to pull out development in the lower pedicle screws. Two patients underwent repair of the duramater due to intraoperative duramater damage.

Only posterior instrumentation can be performed in patient without deformity. Combined posterior approach and anterior radical surgery provides good results in patients with moderate or heavy deformity. The goal of the surgical treatment of vertebral tuberculosis is achive fusion, prevention of kyphosis progression, improving existing deformity, short immobilization period, shorter hospital stay as well as in our study.

Poster-16
Lumbar Disc Herniation as a Rare Cause of Stump Pain

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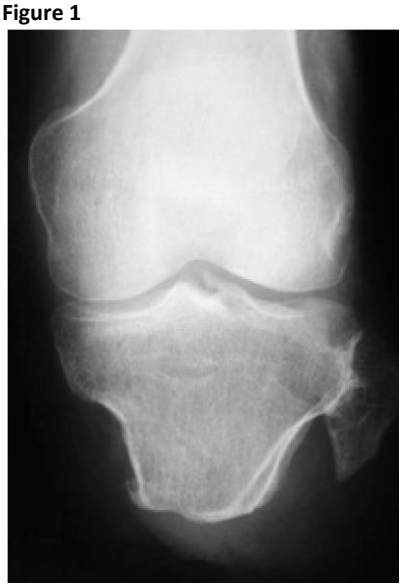
Most amputees frequently feel pain in their stumps or in the area of the missing limbs. The two most commonly used terms include phantom pain and stump pain. The origin and pathophysiology of both types of pain are not clearly defined.

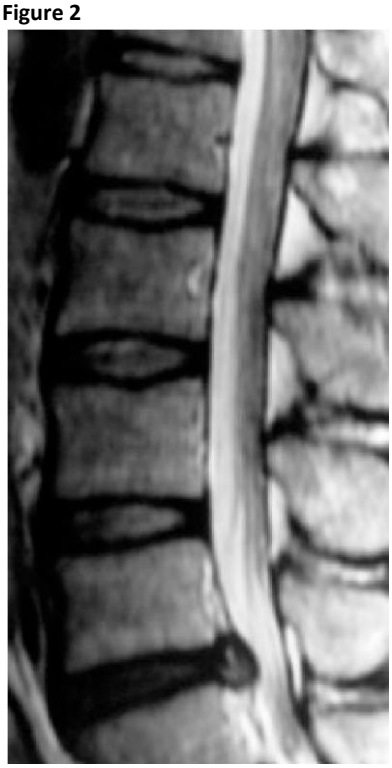
A 41-year-old man who had undergone amputation was admitted to our department with the complaint of severe stump pain lasting for 15 days. His burning-type pain radiated to his left hip, and as a result he was unable to use his prosthesis. He did not describe any low-back pain, numbness, or tingling. Two years prior to presentation he had been involved in a motor vehicle accident and had undergone an emergency left-leg amputation below the knee. Physical examination of the stump did not show any remarkable findings such as infection, tissue necrosis, hematoma, wound breakdown, or edema. Except for a positive Laseque's test, the neurological examination was unremarkable. X-ray studies of the stump did not reveal any pathological entity. (Figure 1) A local anesthetic, lidocaine, was injected into the stump, but it did not have a significant effect in relieving the pain. Lumbar MRI revealed an L4–5, mid left paracentral extruded disc herniation.(Figure 2,3) Microdiscectomy was performed. The patient's stump was pain free and he was able to wear his prosthesis postoperatively. Up to 80% of amputees experience phantom and/or stump pain. Stump pain is located in the stump itself and is often described as either pressing, throbbing, burning, or squeezing. However phantom pain, usually described as burning, aching, or cramping is experienced in a part of the body that no longer exists. Stump pain originates in damaged nerves near the site of injury, whereas the pathophysiology of phantom pain is not clearly defined. However, both peripheral and central neural mechanisms have been described with superimposed psychological mechanisms. Phantom pain typically remains unchanged or improves gradually. If symptoms of phantom pain increase in severity or present after long periods of time after amputation, the differential diagnosis must be evaluated. There are well-defined causes, which may increase stump and/or phantom pain such as changes in the weather or autonomic stimulation, for example, infection, tissue necrosis, hematoma, wound breakdown, bone spurs, neuroma, postherpetic neuralgia, and metastatic cancer. Radiculopathy due to lumbar disc herniation must also be kept in mind in differential diagnosis of the cause of stump pain.

Figure 1



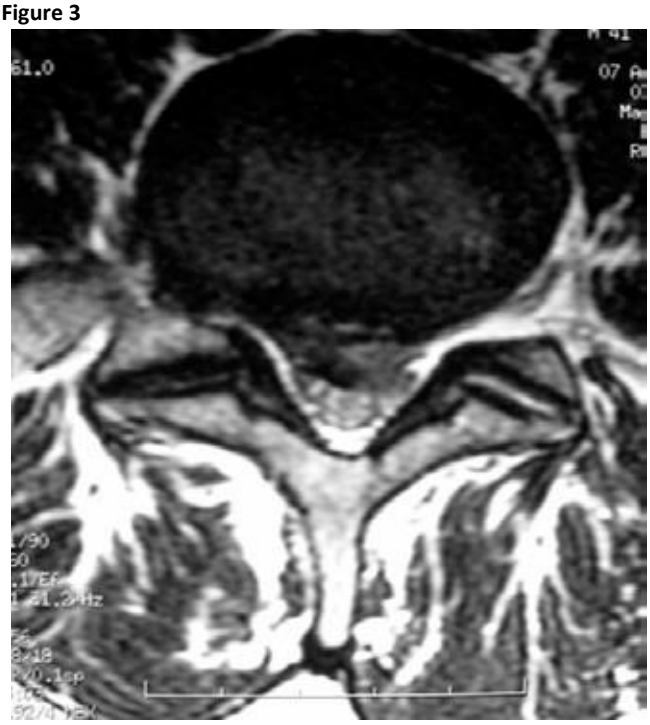
X-Ray of the stump (AP view)

Figure 2



Sagittal T2 Weighted MRI showing an extruded disc hernation at level L4-5

Figure 3



Axial T2 weighted MRI showing central-left paracentral extruded disc herniation at level L4-5

Poster-17
Development of Lumbar Disc Herniation Following Percutaneous Vertebroplasty

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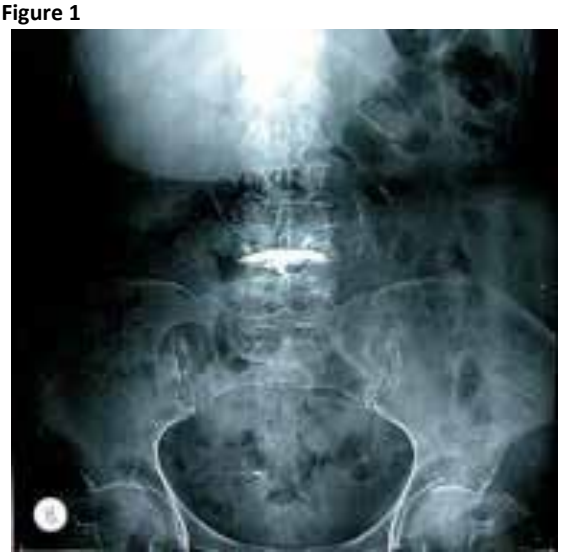
Intradiscal cement leakages are frequently seen during vertebroplasty operations. They are generally asymptomatic. To the best of authors' knowledge, this is the first case describing development of lumbar disc herniation after percutaneous vertebroplasty (PVP) complicated with intradiscal cement leakage. A 74-year-old woman with the 2-week history of percutaneous vertebroplasty of L4 vertebrae was admitted to our emergency unit. (Figure1,2) She was suffering from an excruciating low back pain radiating to her right leg. Neurologic examination and lumbar MRI revealed right L5 radiculopathy due to a sequestrated disc fragment. (Figure 3,4,5) She underwent microlumbar discectomy. Free disc fragment on the L5 root was removed. She was pain free and her neurologic deficit immediately improved after surgery.

Cement leakage is one of the main complications during PVP.It occurs in 30 to 65% of osteoporotic compression fractures. The cement may exit the vertebral body through the deficiencies of vertebral body or by injection of cement into the vertebral venous plexus. Epidural, foraminal, intradiscal, and paravertebral areas are the most frequent regions. Cement leakages are generally asymptomatic. However, epidural leakage associated with neurologic deficit needs urgent surgical decompression. Experimental and computational finite element studies have demonstrated that cement augmentation of a vertebral body increases the stiffness of the motion segment and induces a major pressure increase in the nucleus pulposus of the disc. These biomechanical changes may also be related to the fracture of the

adjacent vertebral body. Influences of bone cement on intervertebral disc cells have not yet been clearly identified. However, it has been claimed that PMMA significantly decrease cell number in nucleus pulposus cell cultures, change expression of anabolic genes and a decreased transcription of matrix building components leading to accelerated degeneration. We speculate that cement augmentation of the L4 vertebral body and the early mobilization of the patient after vertebroplasty, increased the pressure of the nucleus pulposus of the L4–L5 disc. Intradiscal PMMA increased the intradiscal pressure by itself as a space occupying lesion and accelerated the existing degenerative process. A thermal effect of PMMA could also contribute to this degenerative process. Both increased intradiscal pressure and accelerated degenerative process are suspected mechanisms for the sequestration of the disc material after PVP complicated with intradiscal cement leakage. Although extremely rare, intradiscal cement leakage during percutaneous vertebroplasty may promote development of lumbar disc herniation.

Figure 1



Postvertebroplasty AP X-Ray revealing cement leakage into the L4-5 disc.

Figure 2

Postvertebroplasty Lateral X-Ray revealing cement leakage into the L4-5 disc.

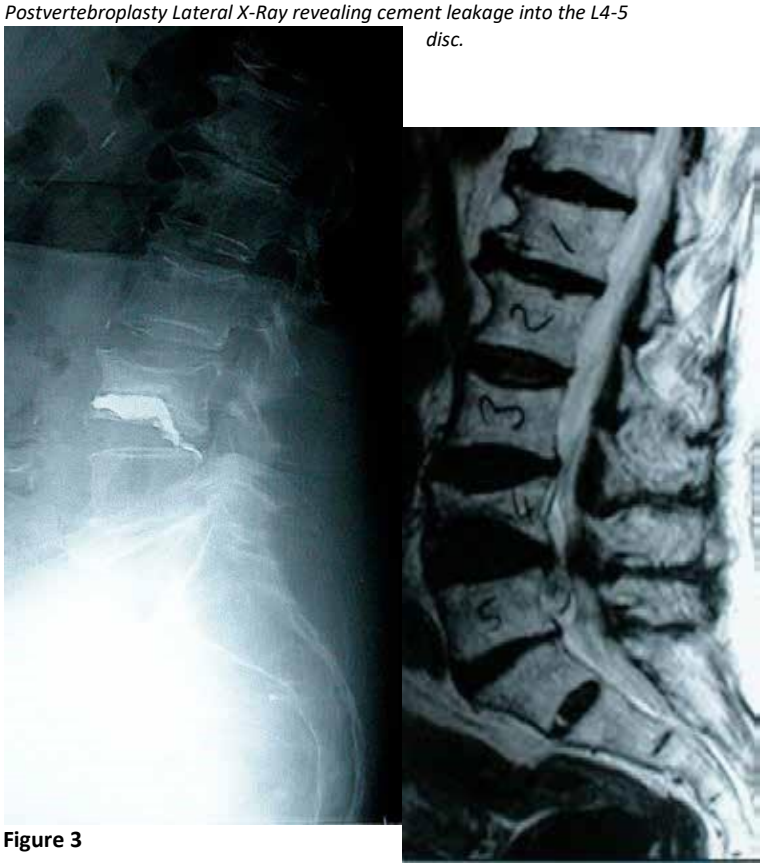
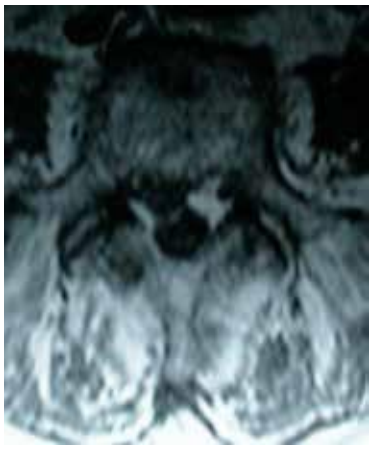


Figure 3

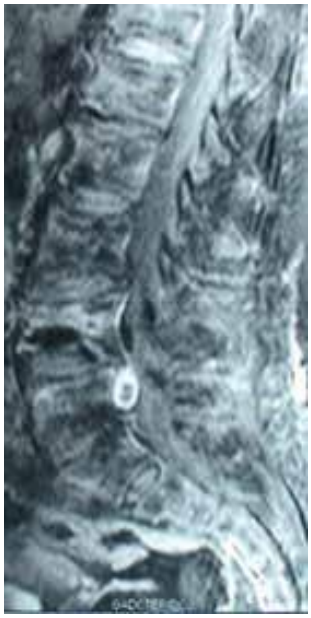
Sagittal T2 weighted MR image showing an inferiorly sequestrated disc material compressing the right L5 root.

Figure 4



Axial T2 weighted MR image showing an inferiorly sequestrated disc material compressing the right L5 root.

Figure 5



Postcontrast sagittal MR image showing an inferiorly sequestrated disc material compressing the right L5 root.

Poster-18
Brown Tumor of the Thoracic Spine: First Manifestation of Primary Hyperparathyroidism

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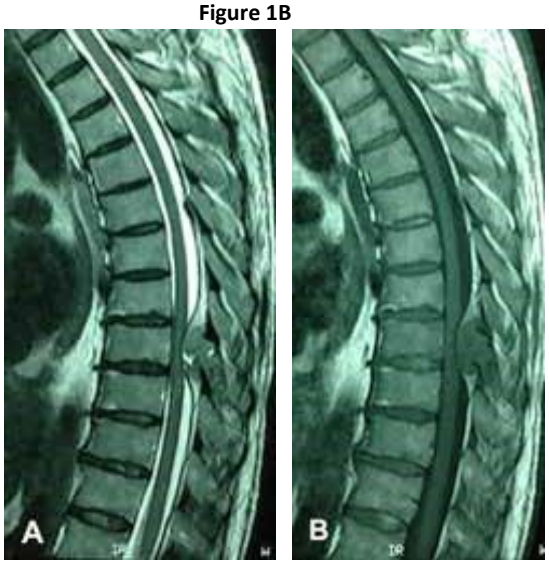
Brown tumors also called as osteoclastomas, are rare nonneoplastic lesions that arise in the setting of primary or secondary hyperparathyroidism. The authors report a very rare spinal Brown tumor case, arisen as the initial manifestation of primary hyperparathyroidism that leads to acute paraparesis.

A 50-year-old man was admitted to our neurosurgery department with the chief complaint of difficulty in standing and walking due to leg weakness for nearly 2 days. Neurological examination demonstrated paraparesis with impaired anal sphincter tonus. He had no history of trauma or any systemic illness. Thoracic MRI and CT revealed expansile mass lesion that was compressing the spinal cord at T9 level. Homogenously enhancing mass lesion was found to originate from the anterior portion of the spinous process and both laminas of T9 vertebra.(Figure 1) Routine blood tests were uneventful except a calcium value of 14,3 mg/dl (8,410,2). As blood parathormone (PTH) test also revealed a very high value of 547,45 pg/ml (15-68,3), endocrinology consultation was ordered to rule out primary hyperparathyroidism. Parathyroid USG did not show any cystic or solid pathologic lesion compatible with adenoma. However, a few nodules were seen on thyroid USG. Parathyroid scintigraphy with Tc-99m MIBI revealed focal activity retention on the inferior portion of the right thyroid lobe. Abdomen and thorax CT were uneventful. Endocrinology department insisted for the urgent parathyroidectomy in order to minimize hypercalcemia-related complications. So, patient with the diagnosis of primary hyperparathyroidism underwent surgery for parathyroidectomy first. Pathological parathyroid tissue was found and excised. The day after parathyroid surgery blood calcium and PTH levels decreased to 10,2 mg/dl and 10,42 pg/ml, respectively. Patient underwent spine surgery. Tumor was excised in piecemeal fashion. Wide posterior decompression was followed by T8-T10 posterior instrumentation and fusion.(Figure 2) Paraparesis resolved postoperatively. Pathology reports were consistent with the parathyroid adenoma and spinal Brown tumor.(Figure 3)

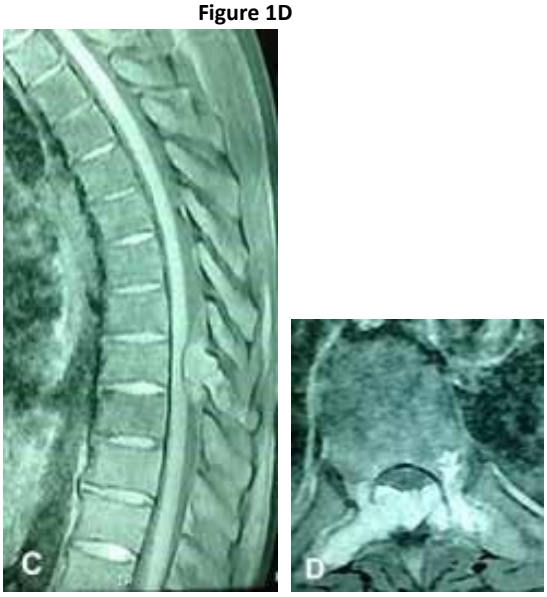
Most of the patients with the diagnosis of primary hyperparathyroidism present with kidney stones or isolated hypercalcemia. However, nearly one third of patients are asymptomatic and hypercalcemia is found incidentally. Skeletal involvement such as generalized osteopenia, bone resorption, bone cysts and Brown tumors are seen on the late phase of hyperparathyroidism. The symptoms include axial pain, radiculopathy, myelopathy and myeloradiculopathy according to their locations. Plasmocytoma, lymphoma, giant cell tumors and metastates should be ruled out in the differential diagnosis of BTs. Treatment of BTs involve both the management of hyperparathyroidism and neural decompression.

Figure 1A **Figure 1B**



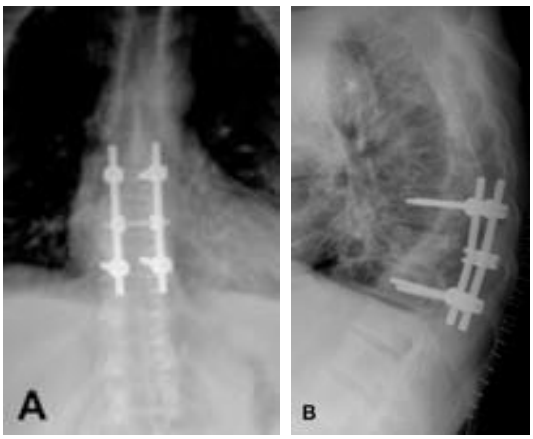
Sagittal T2 weighted MR image *Sagittal T1 weighted MR image*

Figure 1C **Figure 1D**



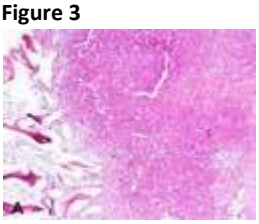
Sagittal postcontrast T1 weighted MR image *Axial postcontrast T1 weighted MR image*

Figure 2A **Figure 2B**



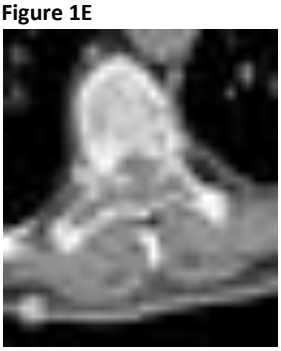
AP X-Ray *Lateral X-Ray*

Figure 3



Histopathological examination

Figure 1E



Axial CT image

Poster-19

Comparison of High-Intensity Laser Therapy and Ultrasound Treatment in the Patients with Lumbar Discopathy

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The aim of the present study was to evaluate the efficiency of high intensity lasers and ultrasound therapy in patients who were diagnosed with lumbar disc herniation and who were capable of performing physical exercises. 65 patients diagnosed lumbar disc were included in the study. The patients were randomly divided into three groups: Group 1 received 10 sessions of high intensity laser to the lumbar region, Group 2 received 10 sessions of ultrasound, and Group 3 received medical therapy for 10 days and isometric lumbar exercises. The efficacy of the treatment modalities was compared with the assessment of the patients before, at the end of the theraphy and in third month after the therapy. Comparing the changes between groups, it was observed statically significant difference in MH (mental health) parameter before treatment between Group 1 and 2, in MH parameter and VAS score in third month of the therapy between Group 2 and 3. However, the evaluation of the patients after ten days of treatment did not show significant differences between the groups compared to baseline values We found that HILT, ultrasound and exercise were efficient therapies for lumbar discopathy but HILT and ultrasound had longer effect on some parameters.

Poster-20

Complications of Growth-Sparing Surgery in Early Onset Scoliosis

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Previous reports have indicated high complication rates associated with non-fusion surgery in patients with early-onset scoliosis. This study was performed to evaluate the clinical and radiographic complications associated with growing-rod treatment.
This is a retrospective study of 12 patients from our clinic with progressive spinal deformities undergoing growing rod surgery who had a minimum of 2 years follow-up. Inclusion criteria were growing rod treatment for early-onset scoliosis (idiopatic, neuromusculer, kongenital…) and a minimum of two years of follow-up. Complications were categorized as wound, implant, alignment, and general (surgical or medical). Surgical procedures were classified as planned and unplanned.
The mean age at the initial surgery was 6.8 years, and the mean duration of follow-up was 42 months. Growing-rod lengthening was performed on an average at 5.8-month intervals.
Complications noted in this series include 3 incidences of wound infection,10 incidence of implant complications, one curve

decompantation and one pulmonary complication. 4 patients within study group have reached definitive fusion.
Regardless of treatment modality, the management of early-onset scoliosis is prolonged; therefore, complications are frequent and should be expected. Complications can be reduced by delaying initial implantation of the growing rods if possible, using dual rods, and limiting the number of lengthening procedures.

Poster-21

An Unusual Complication of Lumbar Spine Surgery: Case Report

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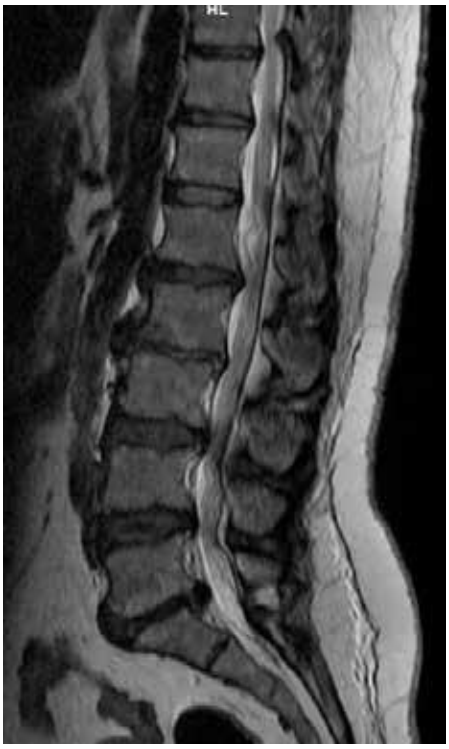
Lumbar spine surgeries are linked with a wide range of complications including wrong level surgeries, nerve root lesions, failure of pain relief, recurrence of pain, vascular injuries and dural tears. In the presence of recurrent back pain, recurrent disk herniations, epidural scar formations, infections and dysfunction of the instrumentations should be considered. In this report, we present a rare complication of lumbar spine surgery which can cause recurrent back pain in the postoperative period.

[1] Department of Neurosurgery, Ceyhan State Hospital, Adana, Turkey

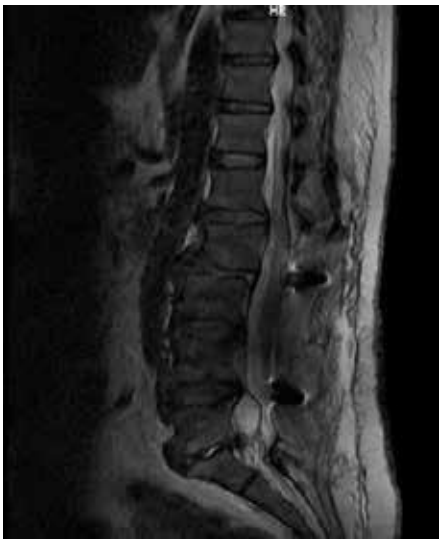
52 year old woman presented with a 2 year history of back pain and bilateral leg pain. Her neurological examination revealed severe neurogenic claudication with lumbar radiculopathy corresponding to the level of stenosis. Lumbar magnetic resonance imaging was performed and lumbar multisegmental degenerative disk disease and spinal stenosis was determined (Fig. 1). She underwent operation and posterior decompression, discectomies and instrumentation between L2 and L5 levels were performed. The surgery was successful and the patient's symptoms decreased prominently. She was discharged at the fourth day of the postoperative period.

Figure 1



Lumbar magnetic resonance imaging revealing lumbar multisegmental degenerative disk disease and spinal stenosis

Figure 2



Lumbar magnetic resonance imaging revealing the formation of a cystic lesion placing between L5 vertebra corpus and thecal sac

After five days from the discharge, she was hospitalized again with severe back pain which wasn't responding any medication. Lumbar spinal computed tomograghy scan was performed with the suspicion of dysfunction of the instrumentation. But there wasn't any problem with the instrumentation. Lumbar spinal magnetic resonance imaging was performed and that revealed the formation of a cystic lesion placing between L5 vertebra corpus and thecal sac (Fig. 2). There wasn't any cystic lesion in the preoperative imaging techniques. She underwent reoperation and the cystic lesion was excised. The content of the lesion was serohemorrhagic. After the second operation, her back pain resolved prominently and she was discharged without any problem at the third day of the postoperative period.
We presented a case report including a rare complication after lumbar spine surgery. Imaging techniques should be performed and examined carefully in the presence of recurrent back pain after lumbar spine surgeries.

Poster-22

Clinical Results of Cocyx Excision with Denervation of the Stump Using Electrocoutery

Tolga Ege[1], Erbil Oğuz[1], Doğan Bek[1], Ömer Erşen[2], Engin Yalçın[1]
[1]Gulhane military medical academy department of orthopedics and Traumatology
[2]Erzurum military hospital

There are several treatment choices for chronic cocygodinia. Coccyx excision is one of the preferred treatment methods. Our hypothesis is that denervation of the stump circumferentially with electrocoutery after coccyx excision improves clinical outcome.
This retrospective study consisted of 38 patients who were undergone cocyx excision between 2007 and 2014 for traumatic cocygodina in our clinic treated with the same surgeon. Before the surgery, all of the patients had cocygeal pain at least 6 months irresponsive to the conservative treatment. There were 9 female and 29 male patients. In 20 patients, periosteum around the stump was denervated circumferentially with electrocoutery after excision of the unstable cocygeal segment. In the other 18 patients wound closure was performed routinely. After the surgery patient satisfaction and pain scores were evaluated with sf36 and VAS. Patients were evaluated at 1, 2, 6, 12 months and annually.
The mean follow-up was time 1.4 years (1-3 years). There was no wound complications after the surgery. The mean VAS score in patients whose stump denervated with electrocoutery was greater at 1,2 and 6months after the surgery (VAS: 6,4, 5,2, 5,1 vs 4.1,3, 1). Furthermore the same group had lower sf36 scores compared to the other group (SF3682,85,88 vs 90,94,98). At 1 year follow-up, in both group patients were symptom free and and there was no statistically significant difference between VAS and sf36 scores in two group. Cocyx excision is a reliable treatment method for chronic cocygodina if conservative treatment choices fails. However we do not recommend denervation of the stump with electrocoutery as it causes more pain at short term follow up.

Poster-23
Comparison of Scheuermann's Kyphosis Correction by Combined Anterior-Posterior Fusion versus Posterior-Only Procedure

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Department of Orthopeadic Isfahan University of medical sciences, Isfahan,Iran

Prospective clinical and radiological review.
To evaluate kyphosis correction, correction loss, sagittal balance, and clinical parameters such as Oswestry disability index (ODI) and scoliosis research society questionnaire-30 (SRS-30)in the two groups of combined anterior spine fusion- posterior spine fusion (ASF/PSF) surgery and PSF-only procedure.
Conventional treatment of rigid kyphosis in the Scheuermann's disease in young patients includes a preliminary anterior release and fusion. However, controversy remains regarding the outcome of the two procedures (ASF/PSF vs. PSF-only procedure). Thirty patients who had undergone surgery for their Scheuermann's kyphosis were reviewed.
Group A:anteroposterior technique (n:16) and group B:posterioronly procedure(n:14)were followed for at least 2 years (average:57.6 months).The two groups were well matched for the following four criteria; average age(20.9±5.3 vs. 19.3±2.7,P=0.304),flexibility status (87.5% rigid type vs. 85.7%,P=0.65),posterior fusion levels (11.9 vs. 12.5,P=0.1), and preoperative Cobb's kyphosis(83.7º±8.1 vs. 81.9º±9.4, P=0.59). The Operation time and blood loss were recorded and radiographic parameters were evaluated before and after surgery and at the final follow up.SRS-30and ODI scores, as clinical parameters, were recorded before surgery and at the final follow up. RESULTS: In group A, primary thoracic Cobb's kyphosis, immediate post-operative kyphosis, and final follow up kyphosis were 83.7º, 41.4º, and 43º respectively, (P=0.001) with a 50.5% correction rate and 1.6º±2.4 correction loss.In group B, the values obtained for the corresponding parameters were 81.9º, 40.1º,and 43.2º respectively, (P≤ 0.001) with a correction rate of 51% and correction loss of 3.1º±2.5. The two groups were not significantly different with regard to the correction rate (P=0.91) and correction loss (P=0.12).SRS-30 and ODI scores in group A were averaged 68.5 and 21.3 preoperatively and128.7 and 6.25 at the final follow up, respectively. In group B, the corresponding values were 64and 23.2 preoperatively and 133.5 and 5.8 at the final follow up, respectively. Comparison of the two groups with regard to the score obtained from final SRS-30 (P=0.21), ODI (P=0.93), and sagittal balance outcomes(P=0.45) showed no significant difference,while preoperative and postoperative comparison of these criterias were valuable in each group separately.(P<0.05)., The rate of complications observed in group A was 37.5% (6/16), while it was 7.1% for group B (1/14) (P=0.03).
Preliminary anterior release and fusion is not recommended when possibility of deformity correction with a posterior column Ponte osteotomy and pedicle screw construct is possible. This kyphotic deformity can be corrected by posterior- only approach in most of the patients.

Poster-24
Length of the Left Chord and Pedicle at the Level of 12. Thoracic Vertebra

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[1]Dicle University School of Medicine, Departman of Neurosurgery
[2]İnönü University School of Medicine, Departman of Orthopedics and Traumatology
[3]İnönü University School of Medicine, Departman of Neurosurgery

To describe gender-related differences in the length of the left chord and pedicle at the level of 12. thoracic vertebra and appropriate length of the screw to be applied so as to decrease the perforation risk of anterior cortex of the corpus and preventable injury of major vascular vessels.
Axial bone window CT images of T12 vertebral pedicles of 60 patients (30 male, 30 female, age > 25 years) without any sign of spinal trauma were obtained and morphometric data were analized. The length of the left pedicle and the left chord of T12 vertebras were measured. As statistical methods Student-t test and Pearson correlation analysis were used.
Because of its small size and closeness to neurovascular structures, screw fixation of thoracic pedicle has a narrow safety margin. Pedicular morphometric characteristics differ between genders. Significant differences and correlations exist between the left pedicle and the left chord in male and female patients and patients with different ages. Screw fixation of thoracic pedicles is frequently performed under fluoroscopy. If possible, preoperatively,

acquisition of computer-assisted morphometric analysis is recommended so as to refrain from unwanted complications and also plan placement of the implant and determine its appropriate dimensions. The data obtained can be used as a guide to determine the implant size and intraoperatif management of T12 vertebral pedicle.

Poster-25

Distance from Thoracic 12 Vertebrae to Thoracic Aorta Computed Tomographic Evaluation

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[2]Dicle University School of Medicine, Departman of Neurosurgery
[3]İnönü University School of Medicine, Departman of Neurosurgery

The aim of this study is to highlight the thoracic vertebra 12 determined using computed tomography data of the appropriate screw length.

The study of spinal pathologies in the thoracolumbar junction of the most frequently seen T12 vertebrae screw the anterior corpus with the entry point examined the distance of the thoracic aorta and is thought to help in selecting the most appropriate screw length of these data.

T12 screw entry point left-aorta distance between males (47.12 ± 3,38mm) (40.01 to 54.00) and women (43.70 ± 3,00mm) (37.99 to 49.26) comparison, statistical p = 0.001 (P0.05), a significant difference was found. Age (31.93 ± 3.91) (25-40 years) with left screw entry point-aorta distance (45.41 ± 3.61) (37,99-54,00mm) between statistical P = 0.105 (p 0.05) as were not significant. T12 corpus-aorta between men (1.77 ± 0.55 mm) (0.78 to 3.16) and in women (1.94 ± 0,52mm) (1.02 to 3.56) compared statistically at p sex sting 0.05 (p = 0.212) did not differ significantly. Age (31.93 ± 3.91) and the closest distance between the aorta-corpus (1.85 ± 0.54) (0,78-3,56mm) statistical significance (P = 0.7) were not considered statistically significant. left screw entry point-aorta distance (45.41 ± 3.61) (37,99-54,00mm) with the closest distance between the aorta-corpus (1.85 ± 0.54) (0.78 to 3, 56mm) in a statistically significant p = 0.731 (P0.05) were found.

T12 vertebra left with an important entry point between men and women aged from thoracic aorta (p = 0.001) were different. This also evaluate the preoperative computed tomographic sections of the patients, it is essential to avoid inappropriate complications and appropriate screw selections.

Poster-26

The Intradural Cordoma of an Eighteen Year Old Adolescent Girl that Is Localised to the Lomber 5 Root and Appearing as an Imitation of Perineueral Cyst: Case Presentation and Literature Overview

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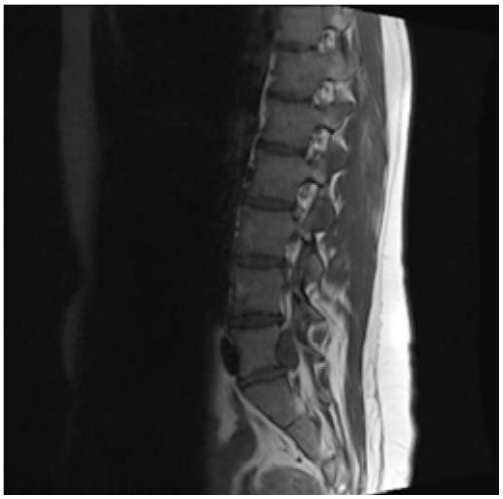
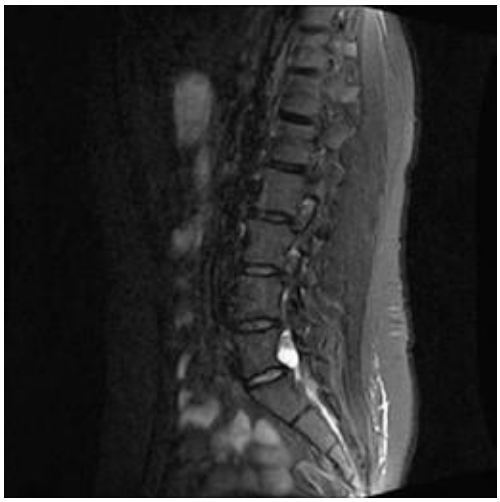
Cordomas are a result of primitive notocord and they are primary extradural tumors. Morever, they are mostly seen in the clivus part of cranium and often in the sacrocoxigeal area of the spinal cord. Cordomas, observed mostly in the servical area of the mobile spinal cord, appear as cysts that expanse the bone and expand throughout the soft tissue. As a result of the radiologic examinations made on an eighteen year old adoloscent girl; the perineural cyst origined from the left L5 root was identified and surgecially intervened with. The cyst was identified as intradural during the surgery. Furthermore, laminatomy and foraminatomy procodures were conducted on the left L4. The intradural cyst resulted within the foramende localized cystic left L5 was grosstotally extracted. The result was report as intradural cordoma after the pathologic evaluations and the immuno-histochemical tests. The goal was to discuss our treatment methods because there were no similar cases to ours in the literature and this particular patient was diagnosed in the adolescent phase.

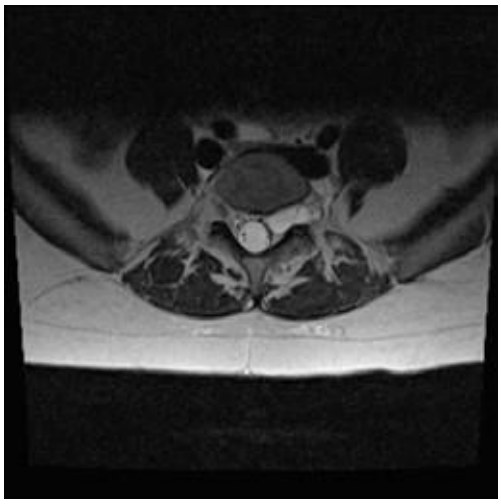
Cordama 2



Cordoma 1



Cordoma 3



Poster-27
2-Year Results of NUBAC™ Disc Arthroplasty System Implanted for the Treatment of Lumbar Disk Herniation

Erkin Sönmez[1], Cem Yılmaz[1], Fatih Aydemir[2], Engin Fidancı[1], Salih Gülşen[1], Nur Altınörs[1]
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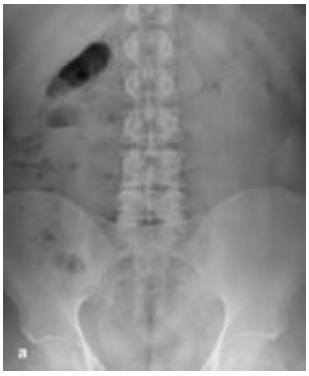
[2]Department of Neurological Surgery, Baskent University Training and Research Hospital, Adana, Turkey

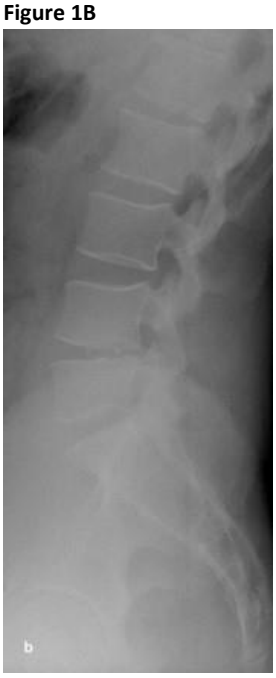
To assess the 2 year results of lumbar disc herniation patients treated with NUBAC™ disc artroplasty system.
10 patients (<45 years), with large disc herniation, otherwise relatively well preserved disc who presents with recalcitrant leg pain refractory to conservative treatment were included to the study. NUBAC™ disc arthroplasty was performed via standard posterior approach. Peroperative and 2 year follow-up scores (VAS, ODI) were obtained. Plain X-rays were performed on the postoperative first day and 6, 12 and 24 months after surgery while MRI and dynamic X-Rays were performed on the postoperative 24 months. Furthermore, adjacent disc degeneration were evaluated on the T2-weighted midsagittal MR images according to Pfirrmann classification 5 of 10 patients were male. Average patient age at the time of surgery was 32,3. Statistically significant difference was observed in the radicular pain group ($p<0.05$) while the difference was not significant in terms of low back pain ($p>0.05$) 2 years after surgery. Lumbar MRI's performed 2 years after surgery did not show any additional degenerative changes on the adjacent discs. Any vascular and/or neurological complication did not occur. NUBAC™ is a promising device which may help surgeons to reduce pain while restoring motion and protect adjacent discs.

Figure 1A



AP Lumbar X-Ray

Figure 1B



Lateral Lumbar X-Ray

Poster-28
Are We Protected from Radiation? The Answer Is "No"

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In 1902, the first canser case due to x-radiation was published. After this case, the effects of x-radiation have began to be investigated. The results of this investigations, it was recognized that all physical agents allowing us to obtain medical images carry a power that may cause biological damage.
The aim of this study was to discuss the effects of the X- radiation and detect our mistakes when using it.
Measurements of dose–area product (DAP) and entrance skin dose (ESD) were carried out in a sample of 107 adult patients who underwent different x-ray examinations such as double contrast barium enema (DCBE), single contrast barium enema (SCBE), barium swallow, endoscopic retrograde cholangiopancreatography (ERCP) and percutaneous transhepatic cholangiography (PTC), and various orthopaedic surgical procedures (including spine surgery and miscellaneous fracture treatment surgery).
Dose measurements were made separately for each projection, and DAP, thermoluminescent dosimetry (TLD), film dosimetry and tube output measurement techniques were used. Staff doses were measured simultaneously with patient doses for these examinations, with the exception of barium procedures.
The calculated mean entrance skin dose (ESD) was 172 mGy for the orthopaedic surgical studies. Maximum skin doses were measured as 324, 891, 1218, 750, 819 and 1397 mGy for barium swallow, SCBE, DCBE, ERCP, PTC and orthopaedic surgical procedures, respectively. In orthopaedic surgery; entrance skin dose and related exposure parameters were measured for each projection of various fracture treatment and spine surgery. Skin dose values were highest during the spine surgery. Also skin dose values were higher for femur surgical treatment than tibia surgical treatment.

It should be noted that there are very few studies in the literature giving dosimetric results for orthopaedic examinations. The values found in this study for similar orthopaedic surgeries were 6.51 (0.38– 17.60) min and 197.40 (10.14–1397.20) mGy. Higher ESD can be attributable to a number of factors, including the different experience of surgeons, the complexity of the procedure and the output of the x-ray systems. In this study, we observed that radiation greatly reduced when we had taken simple precautions. Briefly, these precautions can be analyzed below six topics; understanding and use of the concept of collimation, avoiding the leakage of radiation source, reducing the radiation source power, reducing the working time with the help of radiation, the distance between the surgeon and fluoroscopy and shielding.

Poster-29
Anterior and Posterior Stabilization of Traumatic Unilateral C5-C6 Facet Joint Fracture-Dislocation and Odontoid Fracture

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Unifacet and bifacet dislocations of lower cervical region are common injuries. Dislocations along with fractures increase the risk of neurologic deficit and vertebral artery injuries. It is important not to overlook concomitant dislocations and fractures of cervical spine in high energy traumas. In this paper it was aimed to point out diagnose and treatment process of a case with C5-C6 facet joint fracture-dislocation due to motor vehicle accident and a concomitant nondisplaced odontoid fracture.

A 43 years old male admitted with severe neck pain and numbness on the first and second fingers of his left hand after a MVA. In physical examination, it was noted that cervical movements was severely painful and parestesia was present on his first two fingers of left hand in accordance with C6 dermatome. Computed tomography (CT) scans and magnetic resonance imaging (MRI) revealed that left C5-C6 facet joint fracturedislocation and concomitant odontoid fracture was present. It was detected that left C6 nerve root and vertebral artery were compressed. Odontoid fracture fixated with a screw and C5C6 microdiscectomy followed by demineralized bone matrix (DBM) filled peek cage application to the disc space by anterior approach and then mass screw stabilization for C4 and C6 on left and C4,C5 and C6 on right side also with C5 facet axcision and laminectomy by posterior approach. During posterior approach, it was detected that C6 nerve root was compressed by fractured and dislocated facet joint but the root was intact. It was observed that the root compression was removed after facet excision and nerve conduction velocity of C6 was improved in neuromonitorization. In postoperative first day, it was detected that the parestesia on left C6 dermatome was relieved and pain was diminished. Vertebral artery and nerve root decompression were evident and anatomic cervical lordosis was established in x-rays and CT scan. In the 6. month follow-up, interbody fusion were complete and the patient was functionally recovered without any sequel.

Upper cervical injuries concomitant lower cervical injuries in high energy traumas should be kept in mind. Overlooking this types of injuries may cause life threatining complications during intraoperative manipulations for reduction of facet joint fractures and dislocations. Preoperative appopriate planning has critical importance in such multipl level cervical spine injuries. Primarily treatment of upper cervical patology and subsequently treatmant of lower cervical patology together with 360 degree of fusion is an effective way of preventing possible complications

Poster-30
Low Pedicle Screw Density Gives Similar Results with High Pedicle Screw Density in the Treatment of Adolescent Idiopathic Scoliosis

Alpaslan Şenköylü[1], Metin Özalay[2], Erdem Aktaş[3], Mehmet Çetinkaya[1], Mustafa İlhan[1]

patient satisfaction, decreased operative, intraoperative fluoroscopy time, and decreased risk of screw malposition which is known to vary between 1% to 14%.

The aim of the study is to determine the effect of high and low pedicle screw density constructs on curve correction and clinical outcomes in the treatment of adolescent idiopathic scoliosis. 69 AIS patients with minimum 2-year follow-up were enrolled in the study and underwent posterior spinal fusion with pedicle screw constructs. Patients were divided in 2 groups according to the density of the implant used, which is defined as the number of screws used per spinal level fused. Group-1 consisted of lower than 75 % screw density whereas Group-2 consisted of higher than 76 % screw density of fusion levels. Radiographic assessment included preoperative and postoperative Cobb's angle measurement of main curves and curve flexibility. Clinical outcome was evaluated using Scoliosis Research Society-22 questionnaire. Statistical analysis was done by using ManWithney-U Test.

Mean curve flexibility index of Group-1 and 2 were 61 and 56, respectively. Difference between two groups was not statistically significant ($p>0.05$). Preoperative and postoperative radiological and clinical parameters were compared after dividing both groups as flexible and rigid curves. There was no significant difference between flexible and rigid subgroups of two groups. Current study showed that there is no need for high number of screw placement for the surgical treatment of AIS since the clinical and radiological results similar with the construct consisted low pedicle screw density.

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Pedicle screw constructs have become popular in the treatment of adolescent idiopathic scoliosis (AIS). Although compared to traditional hook and hybrid constructs, pedicle constructs have been shown to improve coronal and axial curve correction, decrease number of fusion levels and reduce revision rates, the optimal implant density, the number of screws per level to ensure a stable fusion and maintain optimal clinical results have not been determined. A minimal density screw pattern may be associated with favorable radiological outcomes with comparable correction as found with high-density construct, increased

Poster-31

Biomechanical Comparison of Effects of the Dynesys and the Coflex Dynamic Stabilization Systems on Range of Motion and Loading Characteristics of Lumbar Spine: A Finite Element Study

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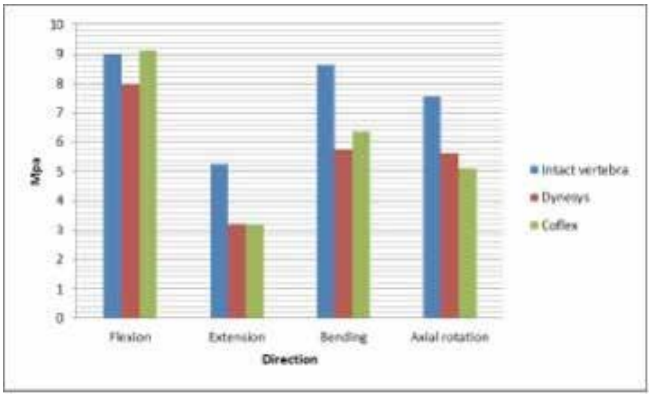
Gazi University

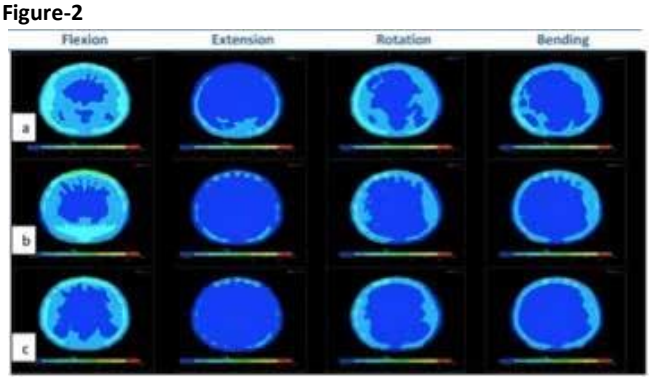
Primary purpose of dynamic stabilization is to preserve normal range of motion (ROM) by restricting abnormal movement in spine. Our aim was to analyze effects of two different dynamic stabilization systems using finite element modeling (FEM).
Coflex and Dynesys Dynamic devices were modeled, and implanted at L4-L5 segment virtually using FEM. A 400 N compressive force combined with 6 N flexion, extension, bending and axial rotation forces was applied to L3-4 and L4-5 segments. ROM and disc loading forces were analyzed. Von Mises Stress images are used to visualize Von Mises Stress field patterns, which represent a scalar field quantity obtained from the volume distortion energy density and used to measure the state of stress. Stresses are color coded, ranging from blue (the lowest) to green, yellow, orange, and red (the highest).
Both systems reduced ROM and disc loading forces at implanted lumbar segment with the exception of the Coflex interspinous device, which increased ROM by %19 and did not change discloading forces in flexion.There was an increased load stress at anterior annulus of the disc in flexion in the Coflex model compared with the intact and the Dynesys models. Additionally, compared with the intact model, both devices decreased the load stress in extension.
The current study focused on two issues about posterior dynamic stabilization systems: 1. Could they preserve the ROM? 2. Could they “share” the load at intervertebral disc and facet joints? In conclusion, we observed that the Coflex device might prevent excessive disc loading while increasing the ROM abnormally in flexion. Both devices were not sufficient at motion preservation and load sharing in other directions of the lumbar motion.Both devices were not sufficient in motion preservation and load sharing in other directions.

Figure-1



The Von Mises Stress concentration values with various surgical models in flexion, extension, lateral bending, and axial rotation

Figure-2



Von Mises Stress distribution on the disc in all directions of lumbar motion. A. Intact vertebra, B. Coflex device, C. Dynesys Dynamic Stabilization System.

Poster-32

Who Is Being Cultured in Revision Spinal Surgery?

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Revision spine surgery is indicated for many diagnoses including recurrence of the index disease, infection, painful hardware, hardware loosening, pseudarthrosis, and adjacent segment disease, among others. The indications for obtaining cultures in the setting of a revision surgery are unclear in the absence of definitive pre-operative clinical markers of infection (wound drainage, fevers, elevated ESR/CRP/WBC). We aim to report the culturing patterns in the setting of revision spine surgery to identify which patients are most likely to be cultured. We retrospectively reviewed 492 patients who underwent 595 revision surgeries between 2008 – 2013 at one institution and performed a detailed record review. Descriptive statistics were displayed as frequencies and percentages whereas continuous variables were displayed as means +/- standard deviations. The association between culture (y/n) and categorical variables was assessed with chi-squared tests. Differences in continuous variables with culture (y/n) were assessed with Mann Whitney U tests.
Operative cultures were obtained in 129 (21.7%) cases and were found to be positive in 61/129 cases (47.3%). The average number of intra-operative cultures obtained was 5.6 (range 1-14). The most common revision surgical diagnosis was recurrent index disease (41.8% cases) followed by pseudarthrosis (20.8%) and adjacent segment disease (17.8%). Pseudarthrosis was the most common revision diagnosis where cultures were obtained (43.5%). Patients who had intra-operative cultures had significantly different revision surgical diagnoses than those patients that did not have cultures ($p<0.0001$) and pseudarthrosis was strongly correlated with intra-operative culturing. Longer time between index surgery and revision surgery was strongly associated with likelihood of being cultured ($p<0.0001$). Patients who had had prior instrumentation ($p<0.0001$), were obese ($p<0.0001$), and were having revision lumbar spine surgery ($p<0.0001$) were significantly more likely to have cultures obtained. Age at revision surgery, sex, diabetes, smoking, history of prior injections, anti-coagulation, and medicare insurance were not significantly different between the cultured and uncultured groups ($P>0.05$). The mean length of stay

was not statistically different between the two groups (p=0.308) In our series, cultures were not taken in all cases. When they were taken, a large proportion of the cultures were positive, demonstrating that our surgeons showed considerable judgment. Cultures were most often taken in the case of pseudarthrosis, history of prior instrumentation, lumbar spine surgery, obesity, and extended time between index diagnosis and revision surgery. These findings were statistically significant and reflect the high-risk nature of these conditions for infection.

Poster-33
A New Laminoplasty Technique For Spinal Tumor

Erdal Coşkun[1], Mevci Özdemir[1], Murat Kocaoğlu[1], Özkan Çeliker[1], Abdullah Topçu[1], Esat Kıter[2]
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[2]Pamukkale University, Faculty of Medicine, Department of Orthopedy and Traumatology

The purpose of this study is to describe a new technique for laminoplasty without translaminar screws thorough the all spine. A retrospective study of the patients who had treated with the laminoplasty without translaminar screw for spinal tumor was performed. From January 2005 to December 2014, total 35 patients were operated with double open-door laminoplasty without translaminar screws. The operation was performed in the cervical spine in 5 patients, thoracic spine in 2 patients, in the lumbar spine in 24 patients, in the thoracolumbar junction in 4 patients. Radiologic evaluations of the spine included direct radiography at postoperative 0, 3, 6 months after surgery to assess for curvature of the spine, and 3-dimensional computed tomography scans at 12 months after surgery to assess for dimension of the spinal canal. Magnetic resonance imaging was performed at 12 months after surgery to assess for residual tumor. There was one lordosis loss due to additional laminectomy because of tumor extension, no cerebrospinal leak and any additional procedural complication.
Laminoplasty and stabization has been greatly accepted as a major treatment alternative for spondylotic myelopathy, spinal tumor etc. and many different type of laminoplasty technique have been reported. But in this paper the authors described a new laminoplasty technique without translaminar screws. Some advantages of this new technique are, short operation time, protect from graft and screw complications and absence of instrumentation artifact so we believe it is an alternative surgical technique especially spinal tumors.

Figure 1

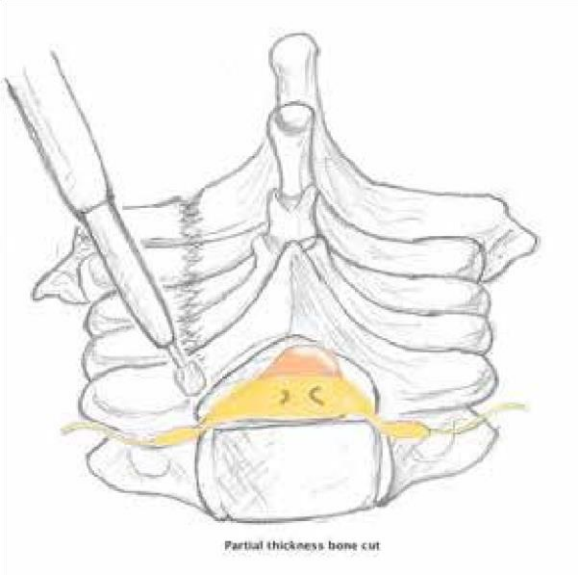
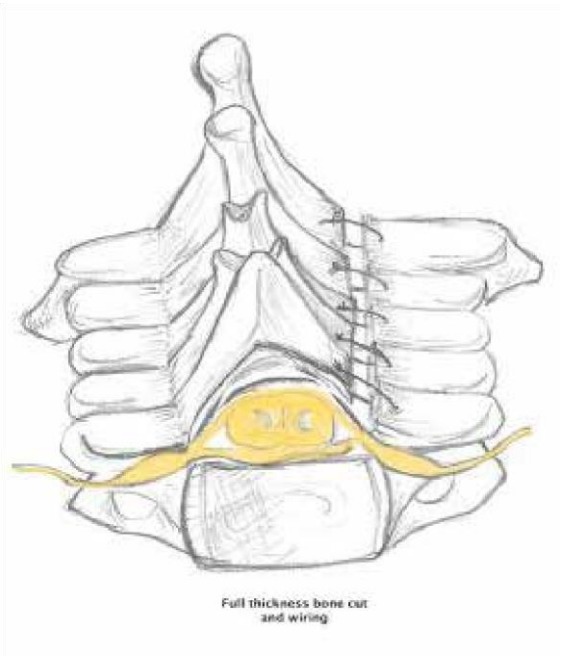


Figure 2



Poster-34
Does Adolescent Obesity Affect Surgical Presentation and Radiographic Outcome for Patients with AIS?

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Obesity remains a significant public health burden and a growing epidemic. Prior studies have been inconclusive with regards to any adverse effect of increased body mass index (BMI) on surgical AIS patients. Consequently, we sought to examine pre-surgical curve features and evaluate radiographic surgical outcomes in overweight and normal weight subjects. We reviewed an Adolescent Idiopathic Scoliosis (AIS) database collected prospectively from 2007-2013 at a single institution of patients with at least one year of radiographic follow-up. Subjects were stratified by BMI into overweight (BMI% ≥85) and normal weight (BMI% <85) groups. Radiographic measurements were completed before surgery, immediately post-surgically at first standing, and at latest follow-up at least one year after surgery. 191 patients met inclusion criteria and were examined at an average of 2.3 +/- 1.1 years of radiographic follow-up. There were 24% (46/191) in the overweight cohort. The normal weight group was older (15.0 vs 13.5, p<0.001); demographics were otherwise similar between the groups. Overweight subjects presented with larger major curves (58˚ vs 53˚, p=0.008), resulting in larger curves at latest follow-up (21˚ vs 18˚, p=0.019). A similar relative surgical correction was achieved in both groups (65% vs 64%, p=0.70). Overweight individuals presented with increased presurgical T5/T12 thoracic kyphosis (27˚ vs 22˚, p=0.013). Following surgery, no significant difference was noted in thoracic kyphosis between groups (18˚ vs 16°) However, overweight subjects had more T5/T12 kyphosis (21˚ vs 18˚ p=0.028) at latest follow-up. The findings suggest larger and more kyphotic curve presentations for overweight individuals. This resulted in an increased major curve and greater kyphosis for overweight patients at latest post-surgical follow-up. This would suggest a lower threshold for earlier and perhaps more frequent imaging in overweight patients with AIS. A greater post-surgical thoracic kyphosis suggests a worsening sagittal profile for these patients in the post-surgical phase. We believe further investigation with a longer stud periods is warranted, as overweight adolescents may be at greater risk for loss of overall sagittal balance and proximal junctional failure.

Radiographic Curve Characteristics of Overweight vs Healthy Weight Adolescents

Table. Overweight vs normal weight radiographic curve characteristics

		BMI < 85%	BMI ≥ 85%	p
	n	145	46	
	% Female	74	76	NS
	Age	15.0 ± 1.6	13.5 ± 1.7	<0.001
	BMI	19.1 ± 2.3	26.2 ± 3.1	<0.001
	Levels Fused	11.1 ± 2.2	11.7 ± 1.8	NS
	Years of Follow-up	2.3 ± 1.2	3.5 ± 1.4	NS
Major Curve	Pre-op (˚)	53 ± 12	58 ± 13	0.008
	Post-op (˚)	15 ± 6	19 ± 10	0.003
	Latest Follow-up (˚)	18 ± 7	21 ± 12	0.019
	Surgical Correction (%)	65 ± 17	64 ± 16	NS
Thoracic Kyphosis	Pre-op (˚)	22 ± 13	27 ± 14	0.013
	Post-op (˚)	16 ± 8	18 ± 7	NS
	Latest Follow-up (˚)	18 ± 10	21 ± 10	0.028

This table compares pre- and post-surgical characteristics of healthy weight and overweight individuals with AIS.

Poster-35
Cervical Disc Prosthesis; A Review of 12 Cases

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Cervical disc prosthesis is a motion preservation technique following anterior discectomy and prevents adjacent segment degeneration. A cervical disc prosthesis was placed with the anterior microdiscectomy technique in 12 patients between 2011-2014 at our neurosurgery department. There were 2 female and 10 male cases with an age range of 23-44 (mean 32) years. The disc hernias were at the C5-6 and C6-7 levels in 2 cases, C5-6 in 8 cases and C6-7 in 2 cases. The symptom duration was 1 to 6 months. None of the cases responded to conservative treatment. There was sensorial and motor disturbance in 12 cases, DTR defect in 10 cases and radicular test positivity in 12 cases. A pathological reflex was not found in any case.

All the cases who had a surgical treatment were healed after the operation Visuel Analog Score (VAS) and Neck Disablity Index Scale (NDI) at the 1st and 2nd year follow-up of the patients were showed marked improvement regarding both radiologically and clinically (Table 1). Subsidence of prosthesis and adjacent segment degeneration at superior or inferior level were not seen during follow-up period.

There were two approaches in the literature regarding the aftermath of cervical discectomy surgery until the 2000's. The first approach was to place put anything in the space. The advocates of this approach said that the clinical results of the patients where nothing was put in the space were the same as patients who had undergone fusion. The second approach was to place a bone graft or cage to preserve the space. The advocates said that the foramen height was protected in this way and radicular signs were prevented. Fusion develops in the space in the end with both approaches. Fusion prevents motion at the operated cervical segment. Early disc degeneration in the upper and lower space, disc herniation, spondylolisthesis and pseudoarthrosis development can be encountered. Hilibrand et al reported a 2.9% of adjacent segment disease development risk following anterior cervical discectomy and fusion. That's why the surgeons prefer motion preservation technique to avoid from this complication in feasible cervical cases. Good clinical results have been reported with cervical disc prosthesis manufactured under various names in the literature. We also had a good results similar to the literature. The quality of life of the cases showed a marked improvement following surgery and adjacent segment degeneration was not observed in any case till present.

Table 1

Gender	Age	Preop VAS	Postop 1st year VAS	Postop 2nd year VAS	Preop NDI	Postop 1st year NDI	Postop 2nd year NDI
F	23	10	2	2	70	18	16
F	25	9	1	1	80	36	34
M	30	9	2	2	56	36	34
M	31	8	1	2	80	38	34
M	32	8	1	2	72	20	20
M	24	10	2	1	72	38	34
M	27	9	2	2	60	30	32
M	44	9	1	1	60	20	18
M	40	10	2	2	70	18	16
M	39	8	3	2	68	24	22
M	35	9	2	1	70	20	20
M	34	10	2	2	60	20	18
Mean	32	9	1.75	1.6	68	26.5	24.8

The VAS and NDA scale results at the 1st and 2nd year follow-up in patients

Poster-36
Investigate the Etiology and Diagnosis

Methods of the Craniocervical Junction Trauma

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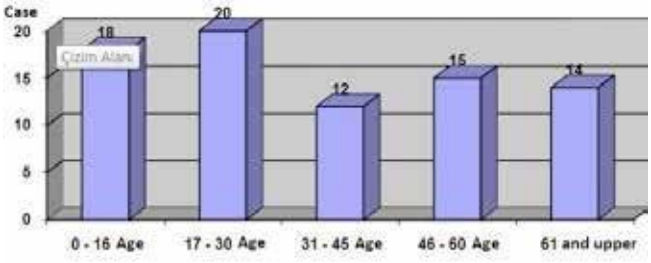
Our aim is find clues whether the upper cervical spine lesions in the trauma patients of emergency room and is to present our experience in diagnostic procedures.
In our study, we have researched 79 of 412 patients who were the craniocervical trauma cases in terms of the etiology, epidemiology and diagnosis in Izmir Ataturk Training and Research Hospital between 1995 and 2005.
The majority of our 79 patients with post-traumatic neck pain, we found that the young adults (Figure 1). It is also the combined fractures, as well as isolated fractures in our patients, we have found that this often. Direct radiography is valid still in diagnosis and directing the treatment of craniocervical trauma. Also, Including the cranium base of cranial cervical region thin sections BT was found to be important to the diagnosis of the upper cervical trauma.
The patients with head or spine trauma to presenting emergency department should be followed by cervical collar, because of possible upper cervical spine trauma until obtained that direct radiography and thin-section CT. If there is a possible craniocervical region will be protected from neurological trauma measures taken in this way.

Graph 1



The age distribution of cases

Poster-37
Total Health Expenditure and Total Spine Related Procedur Eexpenditure in a Five-Year Period (2008-2012) in Turkey

Sait Naderi[1], Özlem Nihal Naderi[2]

health expenditure, and spine related procedure expenditure performed between 2008 and 2012 were analysed. Total health expenditure increased by 32% between 2008 and 2012. In the same time period total health expenditure per person increased by 25.6% in Turkish Lira and decreased by 10.2% in US Dollars. The rate of total health expenditure per person was found to be decreasing. It decreased from 6.1% in 2008 to 5.4% in 2012. Total spine related procedure expenditure increased by 79.3% between 2008 and 2012.
It is conluded that total health expenditure increases steadily, and gross domestic product decreases. Similarly, the number and expenditures of spine related procedures increase. However, due to many reasons, the increase in the expenditures of spine related procedures has been more prominent than increase in the total health expenditure.

Poster-38
Looking at the Future of Motion Preservation Surgery in the Lumbar Spine with the Experience of the Past

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University and City Hospital Careggi, Florence, Italy

A wide range of non-fusion techniques has been proposed in the last decade. In particular, interspinous devices have been developed in the case of mild stenosis in order to provide spinal stabilization while still allowing motion at the instrumented level. Although some failures occur, which can be more likely due to bone resorption around them or even fractures of the spinous processes. To solve these problems we have developed and introduced into clinical practice for more than 7 years a new motion preservation device not interspinous but interlaminar. The IntraSpine® device (Cousin Biotech, France), is manufactured in medical silicon 65 shore coated by an adherent pure polyester terephtalate sleeve and the frontal extremity is further covered by a silicone film that prevents adhesion to the neural structures in cases of surgical bone or soft tissue removal. The fundamental feature of IntraSpine® is the difference in compression ratio between the anterior and the posterior parts of the device: the anterior part, “the nose”, is rigid and designed to distract and reopen the neuroforamina.
The indications are:

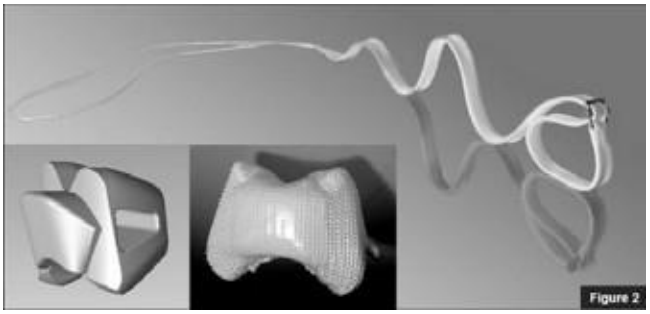
1. Chronic low back pain in black disk with facet-syndrome (preoperative evaluation with dynamic X-rays and block tests of the facet joints)
2. Soft and/or dynamic and foraminal stenosis
3. After operations for big expelled disc hernias in young patients so as to prevent the collapse of the disc and the subsequent CLBP.
4. Insufficiency of the supra-spinal fibrous complex
5. Topping of
6. After operation for synovial cyst
7. Kissing spine

We present the results showing the pre and post/op pictures of various cases treated with minimum follow-up of 4 years. The absence of major complications, the minimally invasive surgical procedure and the good clinical results allow us to say that with a correct patient selection we can have a “new arrow in our bow” for the treatment of the lumbar DDD.

[1] Department of Neurosurgery, Ümraniye Teaching and Research Hospital [2]Üsküdar State Hospital

Total health expenditure may vary due to a variety of factors. The aim of this study is to analyse many parameters including total health expenditures, its rate per gross domestic product, health expenditures paid per person, and total spine related procedur expenditure. Based on statistics of Turkish Satistics Administration and Social Security Administration, many parameters including total

IntraSpine



The mean angle of all patients

	pre-operative	after first operative	last follow up
Cobb Angle (Degree)	63.6(40-90)	33,3(22-48)	38,8(15-85)
kyphosis Angle(Degree)	46,3(16-90)	36,3(20-60)	39,6(7-110)
Lordosis Angle (Degree)	32,1(18-52)	26,6(8-38)	30,5(14-57)
T1-S1 measure (cm)	24,3(18,5-32)	28,0(21,0-34,4)	32,0(19,5-38,6)

The mean Cobb angle values for the patients whom reached the final fusion operation

	pre operative	after first operation	before final fusion operation	after final fusion operation
Cobb angle(Degree)	63,9 (40-90)	34,3 (24-48)	40,4 (27-64)	31,0 (15-50)
kiphosis angle(Degree)	43,7 (16-66)	35,2 (20-52)	35,3 (11-58)	30,0 (7-42)
lordosis angle(Degree)	33,0 (18-48)	26,3 (8-38)	32,2 (21-50)	28,2 (14-48)
t1-s1 length	24,1 (18,5-32)	28,1 (21,2-34,4)	32,2 (26,8-36,7)	33,3 (26,9-38,6)

Poster-39

The Results of Pediatric Scoliosis Patients Treated with Posterior Enstrumentation and Growing Rod Technique

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Retrospective assessment of the clinical and radiological results of dual growing rod treatment of early onset scoliosis.
16 patients diagnosed as early onset scoliosis and treated with dual growing rod technique between february 2006 and may 2009 were studied. One patient lost to follow up was excluded. At the end, eleven patients had the final fusion operation. Cobb, kyphosis, lordosis angles and T1-S1 height was measured during the follow up.
At the first surgery time, the mean age of the patients 6,3 ±2,5 years (distribution: 3-10), mean follow-up period was 88,2 ± 9,3 months. The patients had 6,9 ± 2,6 (distribution: 2-10) rod lengthening operation and the time between the operations was 8,2 ± 2,6 months (distribution: 3-16). The final fusion mean age was 13,02 ± 3,6 (distribution: 10-14). Mean Cobb angle was measured as 63,6°, 33,3°, 38,8° preoperatively, after the first operation and final fusion respectively. Kyphosis angles was measured as 46,3°, 36,3° and 39,6° and lordosis angles was measured as 32,1°,26,6° and 30,5°. T1 – S1 height was determined as 24,3 cm pre-operatively, 28,0 cm at early postoperative period and 32,0 cm after final fusion. The Cobb angles of the patients reached the final fusion operation noted a significant amount correction. The mean Cobb angle values for the patients whom reached the final fusion operation were 63,9°, 34,3°,40,4° and 31° preoperatively, early postoperative period, before final fusion and after final fusion operation respectively. Kyphosis angles were 43,7°, 35,2°, 35,3°, 30,0° and lordosis angles were 33,0°, 26,3°, 32,2°, 28,2°. Preoperatively, early postoperative period, before final fusion and after final fusion operation. T1 – S1 length was measured as 24,1 cm, 28,1 cm, 38,2 cm and 33,3 cm.
Dual growing rod technique is an effective technique for the early onset scoliosis, overwhelming the problems like correction of the deformity, lengthening of the vertebra and respiratory system development. However patient compliance with regular and frequent follow-up, obstacles and complications experienced throughout the procedures are stil challenging problems.

Poster-40

Diagnosis and Treatment of Diseases of the Spine Operated

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Despite the obvious advantages and good immediate results, you discectomy, reoperation rate reaches 25%. The purpose of the Exploration was to investigate the causes of recurrence of pain, fuss-penitent after discectomy and validation methods for treating recurrence of pain. We studied 141 patients aged 27 to 67 years with recurrent pain occurring after removal of hernias in intervertebral discs. Analysis of the results of research until room that causes postoperative pain may be in Repeated or completely deleted herniated discs, non-stability of the spine, acquired spinal stenosis and intervertebral foramen, epidural fibrosis. In recurrent pain syndromes after decompressive surgery question of stabilization of the operated spinal segment is important because the narrowing of the spinal canal, reherniation intervertebral disk and segmental instability pathogenetically closely linked. However, when choosing a second surgical techniques st preference is often given to intervention less traumatic and more simple technically decompressive-stabilizing operator-talkies. 92 patients were performed various types of surgical BME-vention: decompressive and decompressive-stabilizing operations. The emergence of new surgical techniques and implants WHOexpanded possibilities surgeons to conduct decompression and stabilization operations on the spine, while reducing their invasiveness. 84% of patients positive results.

Poster-41

University of Mersin Experience of the Surgical Treatment of Adolescent Idiopathic Scoliosis

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In this retrospective study we aimed to evaluate AIS(adolescent idiopathic scoliosis) operated at our instutition.
29 operated cases of AIS who were treated by Posterior instrumentation, correction and fusion during (PICF)the period of 2007-2014 were recruited for this study. 24(%82.7) were female, and 5(%17.3) were male. Mean age was 14.7years. All cases had MRI evaluation preoperatively. The flexibility of the curves was assessed by traction under anesthesia. The postoperative evaluation was mainly achieved by SRS-22r form. Of the cases 18 were Lenke Type1,3 Type3, 7 Type V and 1 was Type VI. Mean correction ratio in the frontal plane was 68.89%, and the loss of correction was 3.4%. The mean apical vertebral rotation correction was 40.7%.The frontal plane balance was 5.24mm, while the sagittal balance was -15.4mm. The mean number of vertebral levels fused was 10.93. The mean lowest instrumented vertebra was L2-3. One pseudoarthrosis and one junctional kyphosis cases were present. Shoulder imbalance was seen in 2 patients, pelvic tilt was present in 1 patient. No neurological deficit or adding on was present. According to the SRS-22r form mean pain score was 3.96, mean function and activity score was 4.11, self image score was 3.47, mental health score was 3.45. The treatment of AIS when the Cobb angle is > 45 degrees, when progression and physiological and/or psychological problems are noted is surgery. In accordance with the literature, PICF was the preferred method of treatment at our instutition. According to Lenke et al. mostly Lenke Type1 curve is observed as in our study. The corrections and balance achieved which were parallel with the literature were due topedicle screw application at each level. The lowest scores observed in mental health and self image parameters were due to the local social and cultural factors. PICF as applied at our instutition renders good correction of the
AIS curves

Poster-42
For Diagnosis and Treatment of Spondylitis

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The aim of this work was to study and compare the data cus's technical and MRI studies in patients with traumas spine. Studied the results of the survey and treatment of 67 patients, with the effects of compression fractures thoracic bodies and lumbar vertebrae. In 57.5% of patients with pain covered the whole-duced damaged segment of the spinal column. In 37% of cases it spread cranial or caudal to the level of damage to the former. The absence Vova pain-alone and occurs only in the vertical position of the victim, was often associated with a particular position or posture

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The aim of the study was to determine the diagnostic and surgical treatment of patients with non-specific and specific spondylitis. The study included 67 patients with purulent-inflammatory diseases of the spine, caused by compression of the spinal cord and spinal nerve roots. Using MRI (MR-myelography) and MSCT spine reveals purulent spondylitis, which helps to timely diagnose correctly and differential treatment. 36 patients underwent surgical treatment with the use of IP-hydroxyapatite (CollapAn) and carbon implant, front and rear access. Intraoperative Draeneition of the spinal canal with purulent epidurit enabled ETS-lat active aspiration and washing the residual content and the introduction of antibiotics and proteolytic enzymes (trypsin, chymotrypsin). Syntax-productivity of the drainage of the spinal canal was an average of 7 days., And determines the nature of wound.
Surgical intervention should be performed as soon as possible after the verification of the diagnosis. Access should ensure the adequacy of sanitation of purulent focus and the simultaneous use of hydroxyapatite with carbon implant and pedicle fixation segment. Optimal use of active drainage of the spinal canal with constant irrigation purulent focus antiseptic solutions through mikroirrigator helps cleanse the wound. You must use proteolical enzymes to cleanse purulent focus and local immunomodulating action.

Poster-43
Microsurgical Treatment of Herniated Disks

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Although there are different ways of surgical interventions for herniated disc, including methods for the front and rear DEKOM press neural structures, a common approach to defining the scope of indications and choice of intervention is not. The methods nucleolysis, mikrohirurcal and percutaneous discectomy. Among these methods, microsurgical discectomy in practice occupies a leading position on the frequency of use and the results of treatment. Poorly understood problems of surgical tactics in hernias drives against various posttraumatic, degenerative bone changes and abnormal spinal canal, such as stenosis channels facet hypertrophy and strain, and the roots of the spinous processes, the narrowing of the intervertebral foramen. We observed 613 patients with herniated discs intervertebral lumbar spine between the ages of 23 to 66 years. The objective of surgical treatment was the removal of disc herniation with the liquidation of the relevant root compression, radicular artery or all of the dural sac to eliminate of the conflict in the spine. Arkotomiyu performed after

of the patient in 41.6% of patients. Dysfunctional spine was observed in 31.4% of cases. Spinal instability manifested in the fact that the patient could not be in a vertical position without external immobilization and often (in 27.8% of cases), spinal instability combined with its function-national insolvency. In 36 of 57 patients with a clinical picture compression radiculopathy MRI detected more pronounced pa-a pathological changes in the spine with large rear prolapse degenerated titles in the lumen of the spinal canal by 4-7 mm, with varying degrees of compression of the dural sac and the lumen

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partial removal of the yellow ligament resection margins produced adjacent vertebral arches (which includes the removal of the lateral- osteophytes and foraminotomy) and discectomy was performed with the use of microsurgical techniques rd and an operating microscope. Evaluation of results-ing surgical procedures performed on the basis of orthopedic and neurological criteria, taking into account the biomechanics of the spine, regression of neurological symptoms and rehabilitation (VAS and Oswestry index). Good results were observed in 88% of patients.

Poster-44
MRI and Clinical Parallels with the Consequences of Vertebral Injuries Thoracolumbar Localization

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of the channel overlap. Although there is a definite correlation between the severity of clinical symptomatic and MRI data, in some cases (15-20%) occurs and dissociation between them. The signal intensity of disc herniation is usually the same as the rest of the disk - in 65.3% of patients. In severe disc degeneration T1 signal intensity decreases hernia, which is why it is difficult to differential of the posterior longitudinal ligament and liquor. In this case, effectively T2-weighted image, sagittal sections when well-defined relationship with hernia of the posterior longitudinal ligament, the dura-span of the location and the epidural space. Subligamential herniated disc Ogre nichena behind a strip of low signal intensity - the posterior longitudinal ligament, which remains intact. The signal intensity of a hernia in this re-bench can vary, often the coupling of hernia by the disk. Sagittal T2-weighted image reveals the often expanding epidural venous plexus around herniated-disc.

Poster-45
Orthopedic Consequences of Compression Fractures of Vertebral Bodies in the Thoracolumbar

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The aim is to increase the effectiveness of surgical treatment of vertebral fractures of the lower thoracic and lumbar-time by processing the indications for use of pedicle clamps. Results of examination and treatment of 171 patients with the effects of compression fractures of the lower thoracic and bodies of the lumbar vertebrae. MP-developed tomographic diagnostic criteria for the damaged bonetion and disco-ligamentous structures of the lower thoracic and lumbar vertebral in. Based on these data the surgeon is able to select the correct indications for a certain type of dorsal fixation. The obtained results of surgical treatment of patients allow recom-mended application in clinical practice pedicle systems developed taking into account the evidence. The main method of restoring function-national activity of patients had physiotherapy (physical therapy).

TPF is a method of surgical treatment, allowing prolime effective reduction of body broken vertebra, eliminate all components of traumatic strain and stably fix the damaged segment of the spineduced 2) On the basis of the functional method of early activation of the complex of therapeutic exercises with the possibility of exercise and physical activity in surgical stabilization damaged segment.

Poster-46
Polysegmental Osteochondrosis of the Lumbar Spine

Alim Abdukhalikov[1], Haydaraliev UA[2], Abduhalikov AK[2],
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to extinction treugolnoy. Epidural fat and replacing it with sclerosing fibrous tissue compresses the dural sac and in addition, the choroid plexus, venous and arterial supply and interface-transmitting the spinal roots. All patients were operated on-mi by applying minimally invasive discectomy posterior approach. Foraminotomiya was an integral part of operations. Evaluation of the results surgacal interventions made on the basis of orthopedic and neurological criteria, taking into account the biomechanics of the spine, regress pain and rehabilitation. Good results were observed in 82.3% of patients. This group of persons in control wasps Motril marked pain - not sharp, episodic lumbar or radicular nature. All of these patients retained the ability to work, some of them with certain limitations of physical activity. In 14.1% of patients rated as satisfactory result. In this group of patients, the pain in the lumbar region or radicular nature often disturbed, but were considerably weaker intensity than before the surgery. Patients were forced to go to the light work, or make a group of disability.

Poster-47
Results of Treatment of Spondylitis

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The material for this study was an analysis of 234 observations polysegmental hernias lumbar intervertebral discs. All patients before surgery were examined by standard methods with the use of MR myelography. In the presence of degenerative changes stenosis spinal channel exacerbates the disease and symptoms. The form of the spinal channel with an increase in severity of the disease is close

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Many spine surgeon uses the posterior cervical transpedicular screwing techniques. However, these methods have some

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The goal was to identify prognostic factors of surgical treatment of purulent nonspecific diseases of the spine insulated on long-term results. We have operated on 43 patients with purulent nonspecific diseases of the spine. Spondilodiscit was observed in 72.2% of patients; spondylitis - at 7.6%. Epidurit diagnostic at 63.4%, including isolated - in 11.7% of patients of 45.5% - combined with spondylitis and / or spondylodiscitis. Good immediate results of surgical treatment was 63.7%, satisfactory - 27.1%, poor - 9.2%. Long-term results were evaluated on a scale of quality of life Rankin, in terms of discharge of 2.4 ± 0.5 years. Using formula S. Kullback at p <0.05 were identified factors influencing favorable or unfavorable forecasts surgical letion. By anamnestic factors that influenced the favorable treatment outcomes were classified as: seeking primary care in power in the first 10 days of onset (OR 15,54), primary Nye hospitalization in hospitals during the first 7 days of illness (OR 11,2), the correct diagnosis of the guide to a specialized hospital (OR 1,3), the presence of distant foci of infection in the body (OR 1,23). Among de demographic factors play an important role male gender (OR 1,57) and the patient's age to 30 years (OR 27,32). It may be noted that, for the prediction of the outcome of surgical treatment of purulent nonspecific diseases in vertebral matter patient age, sex, duration of disease, the presence of neurological disorders before enrolling in health care facilities, wasps complications, reoperations.

Poster-48

Analysis of Cervical Spine Imaging with Computed Tomography in Turkey Population

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problems related with reliability. In this study, we aimed to examine the reliability of posterior cervical screw technique, to understand the surgical anatomy to reduce the pedicle penetration and to estimate the suitability of the pedicle. 60 patients (30 females, 30 males), who applied to emergency service and CT taken, with non-cervical pathology were included in the study. 300 vertebraes in cervical spines from C3-C7 were evaluated on 60 CT. Transverse pedicle angle (TPA), interpedicular distance, the distance between foramen transversariums from C3 to C7 was measured up via analyzing gender and age differences, respectively. Pearson correlation test was used.

The correlation was observed between age and pedicle transverse angles on the left side of C4, C5, C6, C7, and right side of C5, C7; distances between foramen transversariums of the C4, C5, C6, C7; interpedicular distances of the C3 (p0,05). Transverse pedicle angles on the right side of the C3, C6; C6, distances between foramen transversariums of the C7; Interpedincular distance of the C7 was found to be correlated with the gender (p0,05). Transverse pedicle angles of the both sides of the C3, C4, C5, C6, C7 were found to be correlated (p0,05). Transverse pedicle angle on the right side of the C3 (p = 0.011), transverse pedicle angle on the right side of C6 (p = 0.003), interpedincular distance of the C7 (p = 0.026), distance between foramen transversariums of the

C4 (p = 0.068), distance between foramen transversariums of the C5 (p = 0.056), distances between foramen transversariums of the C6 (p = 0.033) and C7 was found to be statistically significant (0,001) in terms of gender.

Transpedicular screw fixation of the cervical spines seems anatomically promising.

However, this procedure requires precise information about the anatomy of the cervical spine due to major neurovascular injury risk. Measurement of the cervical pedicle on CT gives accurate and valuable information for preoperative planning of cervical pedicle screw placement.

Poster-49

An Incidentally Detected Sacral Agenesis and Associated Anomalies: Case Report

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anoverflow incontinence. Gluteal flattening and disappearance of the gluteal cleft were found

Sacrum's agenesis level and the dysfunction degree of organ systems which are together with it determine the morbidity level. In our article, we have presented the case that was brought by the family to the pediatrics clinic with the symptoms of recurrent urinary system infection and intractable constipation.

Further examinations and evaluations should be made for the babies in the physical examination during neonatal period of whom sacral dimple, gluteal line abnormality and gluteal flattening, recurrent urinary system infection and constipation are detected. The severity of the pathology should be detected via spinal diffusion-weighted MRI, VCUG, antenatal and postnatal ultrasonography, urodynamic tests. In the cases with early diagnosis, we think that the surgical operations and rehabilitation made by the related branches increase life quality meaningfully.

Poster-50

Ramoplasty; Intramedullary Cement Augmentation Technique for Insufficiency Fracture of Pubic Ramus

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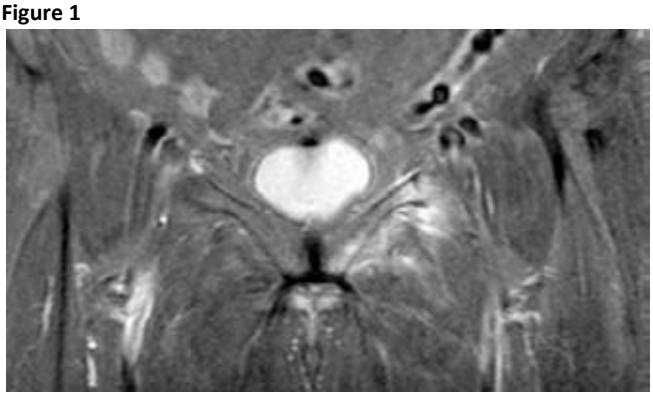
Sacral agenesis, being a part of caudal regression syndrome, consists of total or partial underdevelopment of sacrum which can be accompanied by lumber spinal defects and neurologic problems. It is a congenital spinal defect with unknown etiopatogenesis. It is thought to be caused from a developmental problem occurred at the early phases of gestation. Besides especially the genitourinary system, musculoskeletal system and gastrointestinal system can also be affected. Together with it, cardiac and respiratory defects can be found.

The general health condition of the one year old female patient brought to treatment for resistant constipation and recurrent urinary system infection was at a sufficient level. Her neuromotor development was behind her coevals. She could sit without any support, but there were not crawling, sequencing and walking. Deep tendon reflex was normoactive and anocutaneous reflex was negative. Urination was thought to be abnormal as

Insufficiency fractures are not rare entity, occurs weakened bone especially in elderly patients. Pubic rami and the sacrum are most commonly affected regions. They are traditionally regarded as "benign", despite causing significant mortality and morbidity in elderly patients. Classic treatment of pubic ramus insufficiency is bed rest and medication. But for many patients, even under strong analgesics, early mobilisation often is not possible or insufficient and hospitalisation becomes necessary. Besides this, prolonged bed rest is always a problematic condition for aged people that may lead vascular and pulmonary co-morbidities. Cement augmentation of pubic bone is promising alternative to gain immediate pain relief and ambulation in such cases. 81-year-old woman admitted to our department with inability to bear weight and pain (VAS 10) in the left lower extremity, groin and hip. Previous lumbar MRI revealed that two level healed compression fracture. In another clinic, picture is misdiagnosed and vertebroplasty has been offered. But left pubic ramus insufficiency fracture was diagnosed by new hip MRI. (Figure 1) Ramoplasty was applied to the patients. Immediate pain relief was achieved (VAS 2) as vertebroplasty.

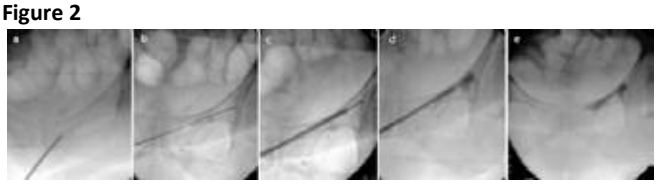
Patient were positioned on the radiolucent OR table in the supine position. She was prepared in sterile fashion and sedated with intravenous midazolam and fentanyl. Under C-arm fluoroscopic control, entry cannula was placed one cm lateral of the symphysis pubis (Figure 2a). Before the advancing in the bone, hand tilted 40° to the opposite side and 20° to caudally. Entry cannula is advanced ~two cm in the pubic medulla and 1.6mm K-wire introduced through entry cannula to the iliopubic junction and cannula is withdrawn (Figure2b). Intramedullary position is confirmed by inlet and outlet pelvic fluoroscopic view. Bended working cannula is inserted on K-wire (Figure2c) before K-wire removed. Procedure is finalized with cement injection to the whole intramedullary cavity (6 cc in the current case) during drawing back (Figure 2d,e). Ramoplasty procedure is similar to percutaneous vertebroplasty in that similar, but curved trocars and cement delivery devices are used. In literature there are several report on cementing of pubic fracture with CT guidance at fractured area. But ramoplasty is a different technique that allow to cementing intramedullary and lengthwise of pubic bone with curved instruments.

Figure 1



Hip MRI revealed isufficiency fracture in left pubic ramus

Figure 2



Steps of procedure (see text)

Poster-51
Investigation of Neuroprotective Effects of Topiramate in Experimental Spinal Cord Injury Model

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This study was realized to research neuroprotective impact of topiramate, that has antioxidant effects, in spinalcord injury in rats. The experimental study was performed 40 rats. The study was planned as 5 main groups.

Group I– Control (n=8): Laminectomy (+), Traumatic damage (-), Treatment (-)

Group II– Trauma (n=8): Laminectomy (+), Traumatic damage (+), Treatment (-)

Group III- Salin (n=8, 30mg/kg): Laminectomy (+), Traumatic damage (+),Salin (+)

Group IV–Methyl prednisolone (n=8, 30 mg/kg): Laminectomy (+), Traumatic damage (+), Methyl prednisolone (+) Group V– Topiramate (n=8, 30mg/kg): Laminectomy (+), Traumatic damage (+), Topiramate (+)

The trauma performed in the study was through clipping spinal cord by Yaşargil aneurism team (Aesculap FE 721 K). Motor functions of rats were evaluated using inclined plane test at the 1st day after spinal cord injury. Catalase, SOD, GPO, MDA values in the tissue were measured at the 1st day after spinal cord injury for biochemical assessment.

Topiramate was considered to be neuroprotective and to be used for the spinal cord treatment in spinal cord injury. However, more studies are needed for clinical use.

Poster-52
Polymethylmethacrilate Augmentation of Strategic Vertebrae in the Surgical Treatment of Osteoporotic Spine

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A 13-year-old-girl underwent dorsal hemivertebra resection at the level T10 for congenital kyphoscoliosis. We used pedicle screws from T7 to L4. Preoperatively radiographs showed 40° local kyphosis (apex T10), 40° thoracic and 40° lumbar scoliosis.

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Pedicle screws with PMMA (Polymethylmethacrylate) cement augmentation have been shown to siginificantly improve the fixation strength in a severely osteoporotic spine. However, the use of this technique also causes an increase in complications due to cement use. To present the results and the complications of patients requiring spine surgery due to degenerative patologies who were treated with using the cement application to only strategic vertebrae instead of all instrumented levels.
Twentynine osteoporotic patient who had spinal surgery with the use of pedicle screws and the augmentation of the PMMA in strategic segments retrospectively examined. 14 patients, whose clinical and radiological data were accessible and whose post-operative follow up period was over 2 years, were included in this study. Bilateral pedicle screws were placed in all instrumented levels, however the cement was augmented in only the strategic vertebrae. Strategic vertebrae was determined as both the uppermost and the most distal instrumented vertebrae, as well as the mobile proximal and distal vertebrae adjacent to these instrumented levels. The average follow-up period was 41.2 months (range, 26-61). The average age was 67.2 years (range, 57-80). In 14 patients (12 female, 2 male), a total of 100 pedicle screws was applied. Twentyeight of the 100 pedicle screws were placed with PMMA (%28). With the prophylactic vertebroplasties, PMMA augmentation was applied to the 38 segments. Cement extravasation and embolism or thermal neurological damage were not detected. Additionally, during the follow-up proximal or distal fracture of the adjacent segments, implant failure, nonunion or loss of correction were not seen either.
In osteoporotic patients requiring spine surgery due to degenerative spinal pathologies, cement augmentation in the strategic segments increases the fixation strength and stability of the instrumentation and decreases the complication risk associated with cement use.

Poster-53
Proximal Junctional Kyphosis Following Dorsal Hemivertebra Resection in a Child With Congenital Kyphoscoliosis: A Case Report

Metin Özalay[1], Mustafa Çağrı Avcı[1], Mustafa Uysal[2], Vahit Erdal Battal[1] After resection, local kyphosis angle (LKA) corrected to 17° (23° correction), thoracic and lumbar scoliosis corrected to 16° and 28° respectively. Global kyphosis angle (T4-12) (GKA) corrected from 62° to 46°. At the last follow-up LKA was 19° and GKA was 50°. The patient had good sagittal and coronal balance after the operation. At the 1-year follow-up, we detected 8° degrees of proximal junctional kyphosis (PJK), at the 2, 3, 4-year follow up's, angle was 14°, 18° and 22° respectively. At the final follow-up's, PJK angle didn't change and she was asymptomatic, pleased with her posture, had good coronal and sagittal balance and didn't need revision The probable cause of PJK in this case may be stopping the instrumentation at mid-thoracic area. The prevalence of PJK in children is about 27%. Like in our case, most of the patients with PJK are asymptomatic and do not require revision.

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Poster-54
Operative Treatment Results in Junctional Kyphosis with Neurologic Deficit

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Decompression – instrumentation and fusion are increasingly being used in degenerative lumbar disease. An important complication of this treatment method is Junctional kyphosis especially in elderly patients. The aim of this paper to evaluate the efficiency of operative treatment in junctional kyphosis with neurologic deficit.
The patients who had neurologic deficit due to junctional kyphosis after old spinal instrumentation included the study. All patients went to proximal instrumentation and laminectomy if necessary. T1- Pelvic angle (TPA) was measured before first surgery, after first surgery and after second surgery. Preoperative and postoperative Oswestry (ODI) scores and neurologic status according to Frankel scale were evaluated.
There were 8 patients in study group. Mean age was 75,6 years. The mean interval between first and second operation was 8,5 months. T1- Pelvic angle before first surgery, after first surgery and after second surgery were 36-24-25 degree respectively. Mean ODI score was 88 preoperatively and 52 postoperatively. Before second surgery there were 3 Frankel B and 5 Frankel C patients. After second surgery there were 3 Frankel D and 5 Frankel E patients. Proximal instrumentation and laminectomy is useful method in neurologic deficits which dependent on junctional kyphosis. This treatment improves the ODI score and enhances the Frankel scale.

Poster-55
Lumbar Full Pedicle Screw Placement and Decompression for Correction of Lumbar Degenerative Scoliosis

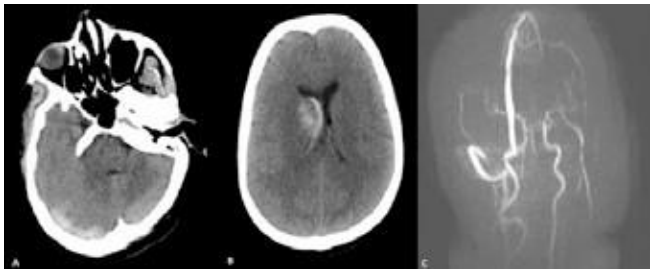
Sinan Karaca[1], Mehmet Nuri Erdem[2], Mehmet Aydoğan[3], Mehmet Fatih Korkmaz[4], Yener Erken[5], Mehmet Tezer[3]
To analyze clinical and radiological outcomes of posterior-only (post-only) surgical techniques consisting of full lumbar pedicle screws, osteotomies, transforaminal lumbar interbody fusion. Degenerative scoliosis is a slow progressing type of scoliosis resulting from the disc and fascet joint degeneration and is usually seen among adults aged ≥40 years. Low back pain aggravated by movement is the typical clinical manifestation of the disease; however other neurological symptoms may be present as well. The Surgical treatment of the degenerative scoliosis is an issue of debate. When patients are considered for surgical treatment, evaluation of existing comorbidities and the use of proper surgical

A retrospective analysis of surgically treated patients with adult lumbar degenerative scoliosis.

technique are of crucial importance. 23 patients who have undergone surgery for lumbar degenerative scoliosis between 2010 and 2012 have been evaluated retrospectively. There were 18 female and 5 male patients respectively with a mean age of 57 (46-82) years. Low back pain and neurologic claudication were the most common clinical complaints. Radiological data are based on full-length standing spine x-rays, dynamic lumbar x-rays, computerized tomography scans and magnetic resonance imaging. All patients underwent bone densitometry measurement. For the patients with a T-score lower than -2.5, cement augmented pedicle screws were considered.. Radiographic findings, clinical results, and short-term outcome data were obtained by using the Modified Scoliosis Research Society outcome instrument, Visual Analog Score and the Oswestry Disability Back Pain Questionnaire. The mean follow-up time was 34.7(25-60) months, preoperative cobb angle was measured with a mean of 47 (22-71) degrees when postoperative was 6 (0-15) degrees. Cement augmentation was used in nine patients. In 15 patients, distal screws were placed to iliac wings. The mean VAS score was 7.8 (7-9) preoperatively, which decreased to 2.4 (0-4) postoperatively. The mean ODI score was 46% (35-64) preoperatively, which was reduced to 22% (18-34) postoperatively. Restoration of coronal and sagittal balance, or improvement thereof, was achieved in all the patients with balance problems. There was significant improvement in all outcome domains. Overall, all of the patients were satisfied with the surgery. One major complication occurred in patients required additional surgery. There was one minor complication. Surgery for adult idiopathic scoliosis using full pedicle screw instrumentation technique provides significant clinical improvement, scoliosis correction, maintenance of sagittal alignment, and patient satisfaction, with an acceptable complication rate in adequately selected patients.

wound was intact and her neurological status was normal. She readmitted 5 days after discharge with severe back and leg pain. On MRI, CSF collection was present in the operative field. Revision surgery was planned for the next morning. In the midnight she had severe headache. CT showed venous infarction in bilateral thalamus, basal ganglia and hemorrhagic area in right caudate nucleus head. Superior sagittal sinus, right transverse sinus, right sigmoid sinus and sinus rectus thrombosis was seen on MR angiography. She was immobilized; IV hydration and analgesics were started. Anticoagulation with low molecular weighted heparin was initiated, however heparin related thrombocytopenia was observed and she was switched to direct factor Xa (Rivaroxaban) inhibitor. Her status resolved slowly. She had minimal residual deficits. Her further hematological tests showed Factor V Leiden mutation. Six-month rivaroxaban oral regimen was scheduled. High clinical suspicion with specific signs and symptoms will accelerate the diagnosis of CVT with available radiological tools.

Figure 1



A) Right transverse sinus is hyperdense which corresponds to venous thrombosis. B) There is hemorrhagic infarction area in the right caudate nucleus head, which opened into lateral ventricle. C) MR venography depicts no venous flow through right sigmoid sinus, right transverse sinus and right sinus rectus.

Poster-56
Cerebral Venous Thrombosis After Adult Spinal Deformity Surgery in a Patient With Factor V Leiden Mutation

Zafer Orkun Toktaş[1], Murat Şakir Ekşi[2], Baran Yılmaz[2], Deniz Konya[1]

pre-operative laboratory values were within normal range.

T10-S1 posterior spinal fusion was performed in the surgery. While performing laminectomies, an accidental L4 dural tear happened, which was repaired primarily. After 3 days bed rest and full mobilization thereafter, she was discharged at post-op 5th day. Her

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Cerebral venous thrombosis (CVT) is a devastating event leading to high mortality (8.3%) and morbidity states (5.1%). CVT after cerebrospinal fluid (CSF) leakage in adult spinal deformity has not been described in the literature.

A 51-year-old woman admitted due to low-back and lower limb pain. There was hypoesthesia over bilateral L3-L5 dermatomes and bilateral neurogenic claudication. She was not using any medication and her BMI was 26.2. On radiological assessment, we observed spinal stenosis at multiple levels. The patient's

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Poster-57
Surgical Treatment of Scoliosis in Crisponi: A Case Report

Sinan Karaca[1], Mehmet Nuri Erdem[3], Mehmet Aydoğan[3], Mehmet Fatih Korkmaz[4], Tuncay Kaner[5], Mehmet Tezer[3]

underwent a posterior spinal arthrodesis with pedicle screw and rod instrumentation and autologous graft, supplemented by allograft bone. A good correction of both scoliotic curvatures to 25° and 10° and a balanced spine in both the coronal and sagittal planes was achieved. Follow-up to skeletal maturity (2 years

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[5] Department of Neurosurgery, İstanbul Medeniyet University School Of Medicine

Crisponi syndrome is a rare genetic condition associated with scoliosis. There is limited information in the literature on the treatment of scoliosis and the surgical outcome in patients with this condition. Characteristic feature of the syndrome is hypothermia and may complicate the surgical treatment of patients.

We present the case of an 11-year-old girl with Crisponi syndrome who developed a severe, progressive thoracic and lumbar scoliosis measuring 85° and 80°, respectively. She had no cardiac or renal anomalies. Brace treatment was unsuccessful to prevent deterioration of the scoliosis. Both curves were rigid on supine maximum side-bending and traction radiographs. Our patient

postsurgery) showed no loss of deformity correction, no detected pseudarthrosis and a good clinical outcome.
Patients with Crisponi syndrome can develop a severe scoliosis that may require surgical treatment. Congenital hypothermia and severe perspiring can affect the surgical outcome following spinal arthrodesis and need to be taken into consideration. To our knowledge this is the first case demonstrates that surgical correction of the deformity can be performed safely on this group of patients, with a good outcome and an uncomplicated postoperative course.

Poster-58
Natural History of Post-Discectomy Pain Syndrome. The Effectiveness of Non-Surgical Treatments, ReDiscectomy and Minimally Invasive Transforaminal Lumbar Interbody Fusion. A Retrospective Clinical Study

Mehmet Aydoğan[1], Yener Erken[2], Mehmet Nuri Erdem[3], Mehmet Fatih Korkmaz[4], Sinan Karaca[5], Mehmet Tezer[1]
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The purpose of this study was to report the results of patients with post-discectomy pain syndrome who were treated with various treatment options with a minimum 2 Year follow-up. We retrospectively evaluated 54 of 75 patients with PDPS who had no response to 12 weeks of conservative treatment between 2008 and 2011. Fifteen of 21 patients with re-herniation who did not respond to non-surgical treatments benefited from re-discectomy. Twenty-seven patients eventually underwent MIS-TLIF surgery and 12 patients, who had no need for surgery, responded well to the non-surgical treatments. All patients were evaluated using the 10-point visual analog scale (VAS) and Oswestry Disability Index (ODI) preoperatively and at the posttreatment or postoperative follow-ups.
Pre-treatment mean VAS score of the patients who benefited from non-surgical treatments was 7.9. The mean VAS score decreased to 2.1 at the final follow-up. The mean pre-treatment ODI was 46%, which decreased to 25.9% at the final follow-up. Preoperative mean VAS score of the patients who were treated with MIS-TLIF surgery was 8.1. The average VAS score decreased to 1.8 at the final follow-up. The mean preoperative ODI was 48%, which decreased to 24.2% at the final follow-up.
Twelve of 54 patients with PDPS regardless of underlying etiology benefited from non-surgical treatments. Fifteen of 21 patients with re-herniation benefited from re-discectomy. MISTLIF is found as a highly effective procedure for the relief of post-discectomy pain that is resistant to non-surgical treatment options and for patients who had a second re-herniation.

Poster-59
Scoliosis Secondary to Paravertebral Ganglioneuroma

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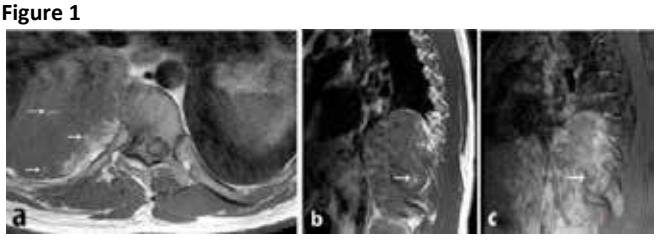
Ganglioneuroma is a benign; mature, slow growing tumor originating from primordial neural crest cells. Ganglioneuroma is composed of Schwann cells, ganglion cells, and nerve fibers. Scoliosis secondary to ganglioneuroma has rarely been described in the literature. We present two cases of scoliosis secondary to ganglioneuroma.
In the first case, a 33-year-old male patient admitted to our clinic with long-standing right upper back pain. His neurological examination was intact. His medical history was inconclusive for any infection or trauma. On thoracic CT, we observed a right paravertebral mass extending between T6 and T11 levels. In the second case, an 8-year-old girl was admitted to clinic due to left lower limb 1/5 weakness and muscle atrophy. On imaging, there was a contrast enhanced mass both intradural extramedullary and extraspinal mass extending through L2-3, L3-4 and L4-5 intervertebral foraminas. Both patients had scoliotic curves less than 40o degrees.

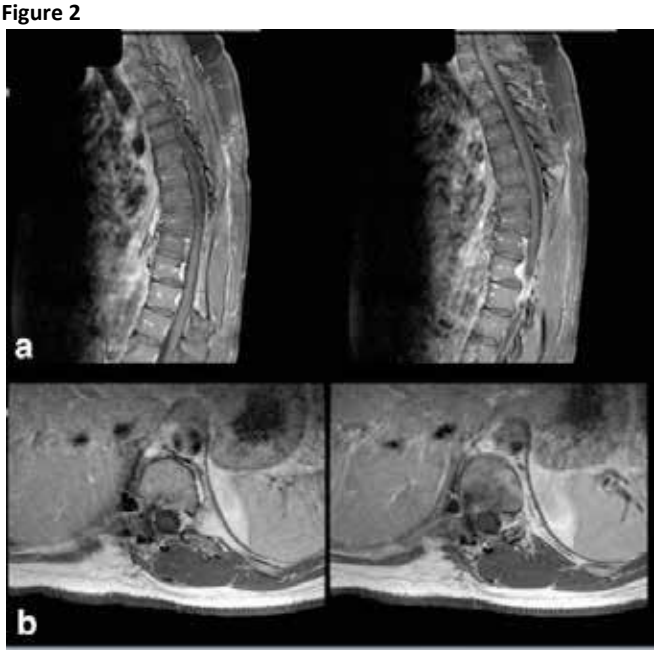
In the first case due to huge size of the tumor, en bloc tumor resection and tumor sampling for histopathological diagnosis was performed by a posterior midline incision that ended in the right paramedian region enabling right thoracotomy. On gross inspection, tumor was 15 cm in its largest axis. Its cut surface was tan in color with disseminated zones of calcifications. Histologically, the tumor was composed of mature ganglion cells, Schwann cells and mature adipose tissue. Immunohistochemical analysis demonstrated positivity of S-100 protein for Schwann cells, positivity of synaptophysin and neurofilament protein (NFP) for mature ganglion cells. Post-operative course of the patient was uneventful. In the second case, we made L2-4 laminoplasties and resected the tumor en bloc. Histopathological diagnosis was ganglioneuroma. We applied brace for both patients' scoliosis and followed the clinically.
Underlying pathologies should be searched for scoliosis patients to be defined as adult idiopathic scoliosis. Interdisciplinary approach can facilitate en bloc resection with minimal morbidity. Long-term follow up is necessary for local recurrence risk.

Figure 1



Unenhanced axial (a) and sagittal (b) T1-weighted MR images show a right posterior mediastinal paravertebral mass with high signal intensity areas (arrows). Fat-suppressed contrast-enhanced T1-weighted MR image (c) shows loss of hyperintense signal intensity of the mass compatible with a fat containing lesion (arrow).

Figure 2



Postoperative MR images: sagittal (a), axial (b).

Poster-60
Surgical Repair of Cervical Cerebrospinal Fluid Fistula, Causing Spontaneous Intracranial Hypotension, in The Same Session with Subdural Hematoma Evacuation

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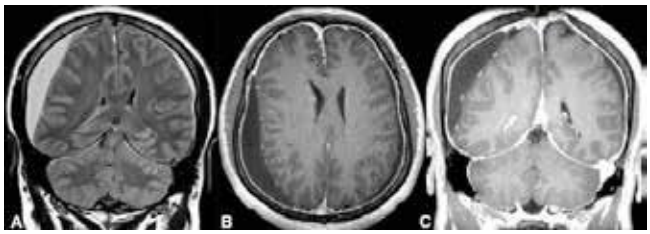
Spontaneous intracranial hypotension is a clinical syndrome, which is characterized with caudal displacement of pain sensitive structures in the cranium, or vasodilation of pain sensitive blood vessels. We describe a patient with spontaneous intracranial hypotension and cervical cerebrospinal fluid leakage, which was managed surgically with concomitant subdural hematoma. A 39-year-old man admitted to our clinic for an ongoing 3 months' headache, which was being exacerbated by sitting up or standing, and relieved by lying down. The pain had become more persistent in character in the last one month, and had been accompanied with nausea and vomiting. He had had a traffic accident 1 year ago. His neurological exam was intact.

Cranial MRI depicted bilateral subdural collections; more prominent on the right side and downward displacement of the brain with diffuse pachymeningeal enhancement. Magnetic resonance myelography depicted cerebrospinal fluid fistula at C2 level with another suspicious zone just superior to L4 spinous process. We drained right-sided subdural collection through burr-holes, however it recurred. In the second operation, both hematoma evacuation and repair of cerebrospinal fluid fistula were accomplished. Patient's complaints subsided postoperatively.

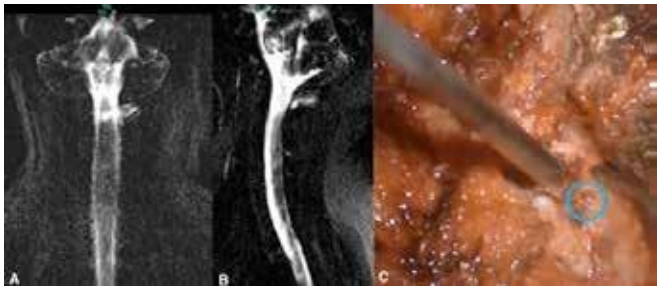
Searching for any spinal cerebrospinal fluid leakage should be conveyed for SIH cases, especially in suspicious circumstances with a trauma history. Although surgery is not the first step for treatment, it can be the most suitable one for directly closure of fistula site in where additional surgery is deemed necessary for subdural hematoma evacuation.

Figure 1



Coronal FLAIR MR image demonstrates bilateral fronto-parietal subdural collections (A). Contrast enhanced axial and coronal T1-weighted MR images demonstrate diffuse dural thickening and enhancement (B, C).

Figure 2



Coronal and sagittal unenhanced MR myelography images with maximum intensity projections show cerebrospinal fluid leakage and retrospinal fluid collection at C1-C2 level (A, B). Dural tear is present at C3 nerve root sleeve (C-blue circle).

Poster-61
Combination of Distraction-Based and Growth Guidance Techniques by Using Magnetically Controlled Growing Rod: A Modified Growth Friendly Technique

Çağlar Yılgör[1], Ulaş Yener[2], Hamit Aytar[3], Serdar Özgen[1], Ahmet Alanay[1]
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This is a case report presenting a modified technique of growth friendly instruments. A combination of distractionbased and growth modulating techniques was performed successfully by using a magnetically controlled growing rod.

Case report

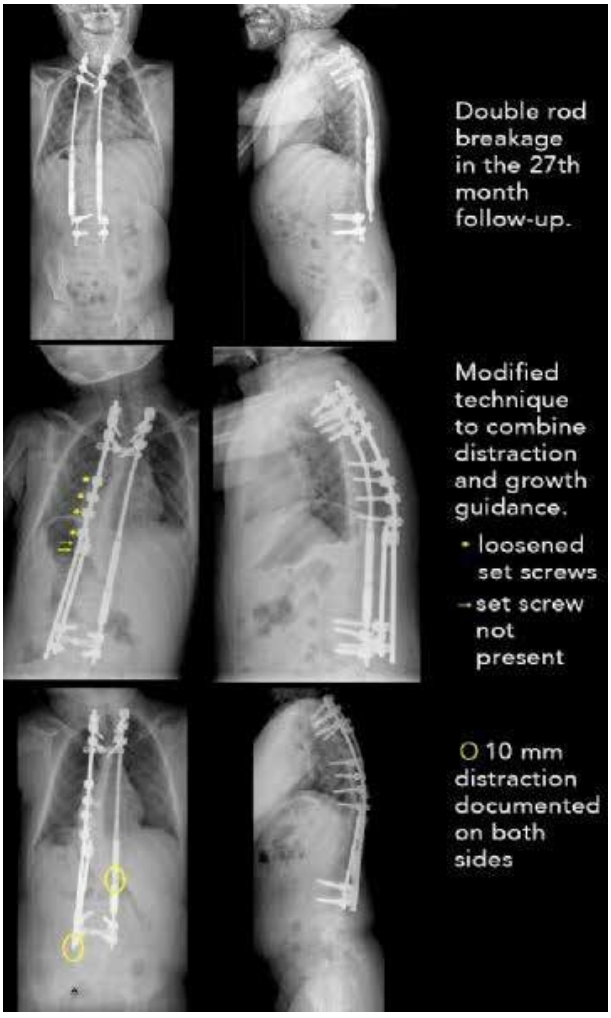
Management of early-onset scoliosis requires controlling the deformity while allowing maximum growth of the spine, lungs, and thoracic cage by using growth friendly techniques. Growth friendly techniques were recently classified as posterior distraction-based (DB), compression-based, and growth guidance (GG) systems. The aim of this report is to present a case where a posterior DB and a GG technique is combined by using MCGR.

A 9 years-old boy who had 4 revision surgeries of MCGR due to proximal anchor failure(1), infection(1) and rod breakage(2) in 39 months of follow-up applied with a double rod fracture. A modification was decided to control apex of the deformity, increase stability and decrease the expense of 2 new MCGR rods. A new MCGR was placed on the concavity. Percutaneous pedicle screws were placed to the convex apex without fusion. Two rods were placed on the convex side and connected by a domino

connector. The set screws at the convex apex screws were left loose and the set screws of the domino connector at the side of proximal rod were not placed to allow for sliding of the proximal rod. MCGR was connected to both convex rods by using 2 transverse connectors to increase stability and allow for simultaneous lengthening(Fig 1). He had 4 distractions of 3 mms with an interval of 3months. After 1 year follow -up he had 1 cm of lengthening in both rods and a significant improvement in coronal balance. 2 of the loose set screws dislodged but the rod remained inside the screws. Improvement in the main curve size was from 34 to 25.

Combination of DB technique with GG may help overcome the disadvantages of both GG (less longitudinal growth/year) and DB (lack of apical control) techniques. Using MCGR helps decrease the number of repeat surgeries and using single MCGR rod with a combination of GG technique decreases the expenses of surgery.

Case Presentation



Poster-62

Is Radiographic Control Necessary After Every Lengthening of Magnetically Controlled Growing Rod?

Çağlar Yılgör[1], Ulaş Yener[2], Hamit Aytar[3], Serdar Özgen[1], Ahmet Alanay[1]

were diagnosed by routine x-rays(XR). Retrospective analysis of consecutive patient series

A well-accepted imaging follow-up protocol to confirm the amount of lengthening, and check for the curve and the status of the implants for MCGR is not yet established. AP-lateral XR after each lengthening (usually every 2-3 months) is suggested. The aim of this study was to find out whether radiation exposure after every lengthening can be justified or not.

A retrospective analysis of 14 consecutive patients (12F,2M) with EOS of different etiologies treated by MCGR. Mean age was 7 (310). Examination of the back in terms of implant prominence was done carefully after each lengthening. Lengthening interval was 2-3 months. Patients had pre- and post-lengthening AP-lateral XR in every visit in the beginning of experience and this was subsequently changed to only AP post-lengthening XR. The XR were analyzed for the presence of failure to lengthen, collapse between 2 procedures and incidental mechanical failures such as rod breakages, hook/screw pullout.

Mean preop coronal Cobb of 69.6° (38-101) was corrected to 39.1° (16-76) at the final follow-up. Average followup was 24 months (6-52). A total of 101 lengthenings were performed. 173 pre- and post-lengthening XR (110 AP, 63 lateral) were taken. There were a total of 5 mechanical failures in 2 pts. 4 were rod or substance breakages and 1 was hook dislodgement. All 5 were diagnosed in a non-planned control with the patient applying for either prominence of implants and/or history of trauma or unremitting pain. No other incidental mechanical failures were noted in any routine XR.

Routine XR taken before and after each lengthening procedure of a MCGR is not likely to reveal any significant findings. Postlengthening AP XR with a decreased frequency (every 6 months) and AP-lateral XR only after a significant complaint or clinical findings should be considered.

Poster-63

Reliability Analysis of Shoulder Balance Measurements in Scoliosis Patients

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Aim of this study is evaluating reliability of 4 different measurement methods that are used for shoulder balance in scoliosis patients.

Full-lenght spine x-rays obtained in the standing position was evaluated for 40 patients that are followed and treated for scoliosis. Rib Shoulder Height Difference (RSH), Clavicular Angle (CA), First Rib Angle (FRA), T1 Tilt Angle (TTA), Chest Cage Angle

The results of this study suggest that the radiation exposure after every lengthening of magneticallycontrolled growing rod (MCGR) is not justified since none of the implant related problems

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Difference (CCAD) methods used respectively for evaluating the shoulder balance. The four measurement methods were assesed twice by 3 spine surgeons and 1 orthopaedic surgery research assistant in all x-rays. RESULTS: Both TTA measurements showed considerably reliable results (CCI=0.833, %95CI (0.748-0.898) and CCI=0.805, %95CI (0.71-0.881)) while other measurements did not show significant consistency. Intraobserver reliability showed significant consistency in all TTA measurements.
TTA is a reliable measurement method for evaluating the shoulder balance in scoliosis patients.

Poster-64
Comparison Between the Magnitude of Scoliotic Curve and Subjective Visual Vertical Perception in Adolescent Idiopathic Scoliosis

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The aim of this study was to compare magnitude of scoliotic curve with subjective visual vertical perception (SVV) in the patients with Adolescent Idiopathic Scoliosis (AIS).

Thirty-nine female subjects with AIS were included in this study. People were divided into three groups in terms of scoliotic deformity severity according to Cobb angle. Curves that were measured between 10° and 20° were classed as group one (10 girls, 14,9±1,4 years); whereas group two was considered to be those measuring from 21° to 30° (13 girls, 14,7±1,7 years) and more severe curves were measured more than 30° Cobb angle in third group (16 girls, 13,9±1,7 years). SVV was examined by seating subjects in a chair and instructing them to adjust laser line projections in the directions of vertical, horizontal and at the angles of 30°, 45°, and 60° in a dark room. The performance, expressed as the deviation from each real line (measured in degrees), was calculated by the examiner. And total SVV score was noted as a total deviation which express collection of all deviations. Average Cobb angles were 15,7±3,2 for the first group, 26,5±2,8 for the second group and 37±4 for the third group. Total SVV scores which means deviation from real line were 39,5±12,5 for the first group, 52,8±8,4 for the second group and 45,7±14,7 for the third group. The only significant difference was observed between first and other groups. ($p < 0.05$). SVV was better in the first group than other two groups.
This pilot study indicates that the deviation in subjective visual verticality perception increase when the scoliotic curve is more than 20° Cobb angle in patients with Adolescent Idiopathic Scoliosis.

Poster-65
The Effect of Growing Rod on Sagittal and Spinopelvic Parameters in EarlyOnset Scoliosis Patients

Kerim Sarıyılmaz[1], Turgut Akgül[2], Okan Özkunt[1], Fatih Dikici[1], Murat Korkmaz[3], Cüneyt Şar[2], Ünsal Domaniç[2]

neuromuscular scoliosis in 2 patients. 8 patients were treated with dual- growing rod and 15 patients were treated with single- growing rod. Mean follow-up time was 36.5 months. Preoperative and postoperative thoracic kyphosis, lumbar lordosis, pelvic tilt, pelvic incidence and sacral slope was measured and compared. Student-t test and ANOVA was used to compare parametric value for statistical analysis.
Preoperative mean thoracic kyphosis was 27.4 degrees, mean lumbar lordosis was 35.2 degrees, mean pelvic tilt was 7.5 degrees, mean pelvic incidence was 43.8 degrees and mean sacral slope was 33.8 degrees. Postoperative mean thoracic kyphosis was 28.3 degrees, mean lumbar lordosis was 28.06 degrees, mean pelvic tilt was 7 degrees, mean pelvic incidence was 41.4 degrees and mean sacral slope was 35.2 degrees.
The growing rod technique, in our patients, did not significantly effect the sagittal and spinopelvic parameters before and after the surgery.

Poster-66
Correlation of Postoperative Correction Ratios and Shoulder Balance in Primary Thoracic Scoliosis

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Correction of primary thoracic curves with posterior spinal instrumentation is improved by the development of metallic instruments and implant designs. Although great correction ratios can be achieved with segmentary thoracic transpedicular screw implantation, frontal and sagittal balance problems are reported. The aim of this study is to investigate the correlation of correction ratios of posterior surgery and shoulder balance in primary thoracic curves.
42 adolescent idiopathic scoliosis patients (38 female, 4 male) with primary thoracic curve treated with posterior surgery were included into the study. Patients were divided into two groups such as all-pedicle screw (n=29) and selective segmented screw (n=13). Preoperative standing PA and lateral, supine right and left bending and postoperative early (first 8 weeks) and mid-term (12 to 24 months) PA and lateral standing x-rays were evaluated. Thoracic

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The aim of this study is to evaluate the sagittal and spinopelvic parameters of growing rod technique in early-onset scoliosis. Twenty-three patients (9 male-14 female) with a mean age 7.5 which were operated for early onset scoliosis with growing rod technique were evaluated retrospectively. The etiologies were, infantile idiopathic scoliosis in 9 patients, juvenile idiopathic scoliosis in 2 patients, congenital scoliosis in 10 patients and

Cobb angle, lumbar Cobb angle, sacral central vertical line–C7 distance, apical vertebral rotation and translation, shoulder balance parameters (clavicle angle, T1 tilt angle, first costoclavicular angle), thoracic kyphosis and lumbar lordosis were measured on preoperative standing images, and thoracic and lumbar Cobb angles were measured on bending x-rays. Same measurements except side bendings were obtained from early and mid-term postoperative images. Measurements were evaluated with Friedman variation analyses and Wilcoxon tests. Thoracic Cobb angle correction was significantly higher in allpedicle screw group than selective segmented screw group (p=0.001). There were no statistically significant differences at shoulder balance parameters between two groups (p=0.217). However, while patient's right shoulders were higher at preoperative stage, left shoulders were elevated or become neutral at postop x-rays in both groups. In all-pedicle screw group, left shoulder elevation was almost same and the shoulders are neutral at early and mid-term films but in selective segmented screw group left shoulder elevation was more prominent in early films. In this group left shoulder elevation was decreased at mid-term x-rays and it was correlated with mild lumbar curve progression.

All-pedicle screw group showed a better frontal correction and shoulder balance at early postop x-rays while their shoulder balance was mildly afflicted at mid-term period. Left shoulder elevation at early postop period may be corrected with adaptive lumbar curves in thoracic scoliosis. The correlation of progressive lumbar curves and shoulder balance problems should be investigated.

Poster-67
Relationships Between Surgical Outcomes of Laminoplasty and Postoperative Range of Motion of the Cervical Spine in Patients with Cervical Spondylotic Myelopathy

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Japan Community Health care Organization Saitama Medical center

Several factors related to neurological recovery after expansive laminoplasty (ELAP) for cervical spondylotic myelopathy (CSM) have been reported. However, an impact of postoperative range of motion (ROM) of cervical spine on surgical outcomes has not been addressed. This study was retrospectively conducted to elucidate relationship between postoperative cervical ROM and surgical outcomes of ELAP for CSM.

Between 1993 and 2011, 163 patients with CSM were operated and followed for at least 1 year. To exclude surgery-related factors and other factors unrelated to this disease which might affect surgical outcomes, patients with CSM whose symptoms were improved or unchanged after surgery were included into analyses (130 patients).

Japanese Orthopedic Association score (JOA score), recovery rate (RR: (postoperative JOA score - preoperative JOA score) / (17 - postoperative JOA score) x 100), age at the time of surgery, gender, preoperative morbidity period, ROM of cervical spine, diminution rate of ROM (DR: 100 - postoperative ROM / preoperative ROM x 100), alignment of cervical spine, level of affected segment and antero-posterior diameter at affected segment, number of segments where compression of spinal cord was observed on MRI were assessed. Parameters were assessed before and 1 year after surgery.

Preoperative mean JOA score of 9.8 ± 2.7 points improved to 13.8 ± 2.3 points at 1 year after surgery. Mean RR was 50.6 ± 32.0 %. Significant correlation with RR was observed in age ($p<0.001$), preoperative morbidity period ($p=0.04$), postoperative ROM ($p=0.02$), and DR ($p=0.006$). Significant difference in RR was not observed in any categorical parameters. Multilinear regression analysis using parameters which have significant correlation with RR revealed that age, preoperative morbidity period and DR were associated with RR ($p<0.001$, $R2=0.21$).

Recently, preservation of ROM of cervical spine after ELAP has been preferred to prevent development of postoperative axial pain and to minimize ADL disturbance. However, results of this study suggest that the mobility of cervical spine could impair postoperative neurological recovery. It has been reported that the degree of the diminution of ROM after various ELAPs depended on the period and the mode of postoperative external immobilization. Therefore, the importance of the postoperative external immobilization should be reconsidered to obtain the maximum postoperative neurological recovery.

Poster-68
The Quality of Spinal Surgery Consent Forms; Do We Tell Our Patients All Risks and Benefits Associated with Their Surgery?

Salam Ismael, Alex Gibson
The Royal National Orthopaedic Hospital

Informed consent is an essential part of surgical practice. Patients who undergoing surgery need to be fully informed of the risk and benefits associated with their surgery in order to develop informed decision and sign the consent form. It helps in minimising the risks of post-operative litigations against the physician in case of any complication arising from the proposed therapy. Objective was to evaluate the practice of informed consent in patients undergoing spinal surgery in the royal national orthopaedic hospital.

Retrospective study designed and conducted at the spinal surgery unit at the royal national orthopaedic hospital. We reviewed randomly selected 80 consent forms of operations performed at the same department between January and May 2014. We used the international spinal society information sheet guidelines on risks and complications of surgery combined with items mentioned in spinal surgery consent form from University of Virginia Health system. Level of consent performer, benefits of surgery, type of surgery and complications mentioned recorded and compared to the list in our comparable tools.

A total of 80 patients consent were surveyed in this study. 79% consents carried by registrars while 12.5% carried by consultants and only 8.7% consented by senior house officer. Only 26% of surveyed patients received their copies of the consent form. Surprisingly, no risk of spinal cord injury and nor risk of dura tear recorded in 11% and 75% of surveyed consents respectively. The majority of cases were involving fusion; however 22.5% and 39% of the forms did not include pseudoarthrosis and non-union as risks respectively. One third of our cohort not been informed about the risk of metal work failure. 35% of the consents mentioned risk on life and pain as possible complications. 12% of consented patients

risks of anaesthesia mentioned to them. Hardly any of the patients informed of the risks of haematoma, blindness, bone graft complication or revision surgery.
The quality of existing spinal surgery informed consents at our hospital is less than ideal. There is a great need to develop comprehensive spinal specific consent forms that include all possible risks and benefits using agreed international tools and guides. Also important to educate doctors regarding the importance of patients' right to informed decision based on accurate complete knowledge of possible risks and benefits.
NO CONFLICT OF INTEREST / NO FUNDING RECEIVED

Poster-69
The Effect of DistractionBased Growth-Sparing Spinal Instrumentation on Growth in EarlyOnset Scoliosis

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Department of Spine and Arthtoplasty, Baltalimani Metin Sabanci Bone Diseases Training and Research Hospital, Istanbul, Turkey

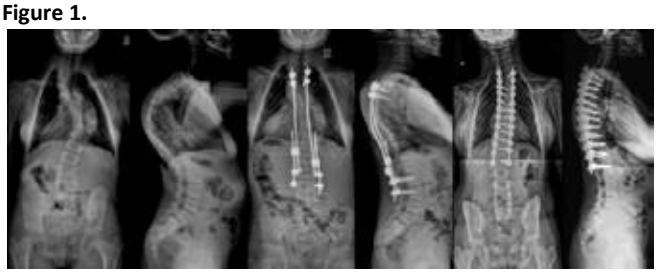
Retrospective case series.
Inspection of the distraction-based growth-sparing spinal instrumentation (GSSI) on the spine, thoracic growth, and deformity correction, and the problems encountered.

GSSI, its benefits and drawbacks have been reported as a result of the developments in the treatment of the early-onset scoliosis (EOS). Nevertheless, detailed studies are currently required on the impacts of the growing rod (GR) treatment on children suffering from EOS with respect to their coronal, sagittal plan deformities, spine growth, and the related problems.

We retrospectively reviewed data from our EOS database. Seventeen patients who underwent GSSI surgery with minimum 2-year follow-up were included in the review. The mean number of lengthenings was 3, initial surgery age was 108.1 ± 30.2 months and follow-up was 40.6 ± 16.6 months. Spinal height (T1-S1 and T1-T12), space available of lung (SAL), major Cobb angle for scoliosis, maximum thorasic kyphosis (TK), lumbar lordosis (LL), humeral and pelvic balance, and coronal and sagittal balance were assessed preoperatively and during the latest follow-up.

There was a significant decrease both in Cobb angle for scoliosis and TK latest control. There was a significant increase in spine height (T1-S1 and T1-T12) and SAL. Shoulder-pelvic balance and sagittal-coronal balance were unchanged during the treatment period. Proximal junctional kyphosis (PJK) was the most commonly observed problem.
On EOS, GSSI provided a significant correction on scoliosis and TK degree. GR resulted in a significant increase in spine height and SAL (Convex and Concave). In GSSI treatment, the most commonly observed complications were proximal anchor problems (76.4%). Particularly PJK was observed in 58.8% of the cases. Treatment with GSSI provided an evident increase in spine height and SAL, and a significant decrease in scoliosis and TK; meanwhile, PJK is the most commonly observed problem in EOS. In the treatment of GR, the excessive TK correction should not be made to avoid PJK.

Figure 1.



EOS with cleidocranial dysplasia (12 y, F). C-EOS; S3(+)P1. Discharged with fusion as a result of three lengthenings. Follow up period is 33 months. PJK developed (25°) during GR application, PJK regressed during early postfusion period (9°).

Poster-70
A New Corrective Technique for Adolescent Idiopathic Scoliosis

Bekir Yavuz Uçar[1], Yılmaz Mertsoy[2], Ramazan Atiç[2], Celil Alemdar[2], Mehmet Akif Çaçan[2]
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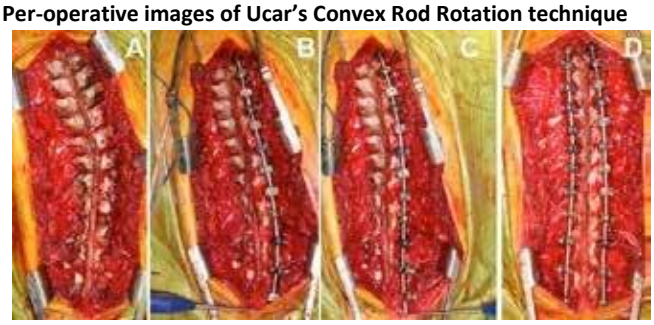
Prospective single-center study.
To analyze the efficacy and safety of a new technique of global vertebral correction with convex rod rotation performed on the patients with adolescent idiopathic scoliosis. Summary of Background Data: Surgical goal is to obtain an optimal curve correction in scoliosis surgery. There are various correction techniques. This report describes a new technique of global vertebral correction with convex rod rotation.
A total of 22 consecutive patients with Lenke type I adolescent idiopathic scoliosis and managed by convex rod rotation technique between years 2012 and 2014 having more than 1 year follow-up were included. Mean age was 14 (range = 12-17 years) years at the time of operation. The hospital charts were reviewed for demographic data. Measurements of curve magnitude and balance were made on 36-inch standing anteroposterior and lateral radiographs taken before surgery and at most recent follow up to assess deformity correction, spinal balance, and complications related to the instrumentation.
Firstly the pedicle screws were inserted on convex side. Secondly the screws were connected with a rod contoured to the shape of the deformity. Plugs were applied between the screws and the rod but not tightened. The rod was now rotated towards the convexity of the curve. After tightening the plugs on convex side we inserted screws on concave side easily. Second contoured rod was replaced to the concavity of the curve. Before tightening the plugs direkt vertebral rotation manoeuvre was done for all instrumented levels. Finally the rods secured to the screws (Figure 1). All surgeries were performed under motor-evoked potential monitoring and additionally wake up test was applied. Preoperative coronal plane major curve of 64° (range = 50°-73°) with flexibility of less than 30% was corrected to 10° showing a 80% scoliosis correction at the final follow-up. Coronal imbalance was improved 74% at the most recent follow-up assessment. No complications were found.

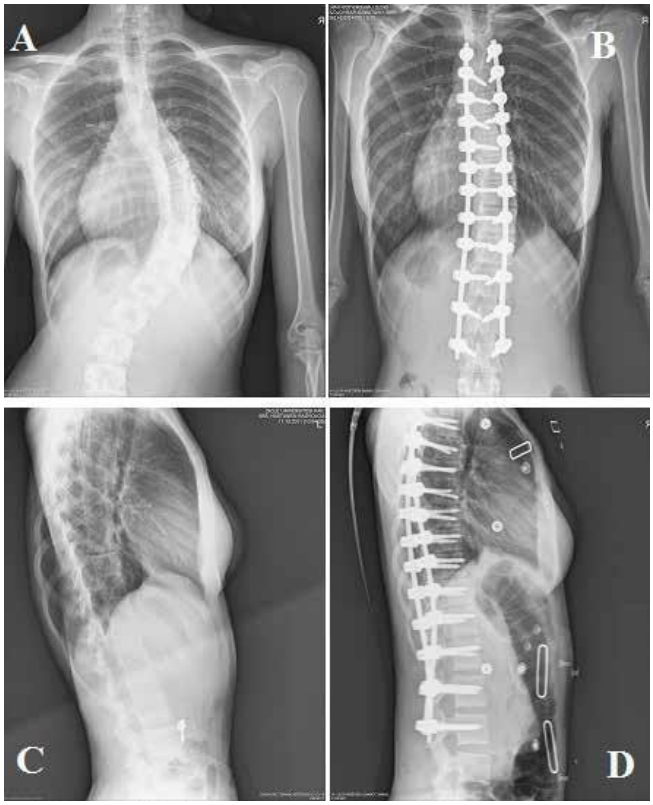
The new technique of global vertebral correction with convex rod rotation is an effective technique. The most important difference of our technique was inserting the pedicle screws to the convex side firstly. While the screws were inserting to concave side firstly in all surgical techniques, in our technique the screws were inserted to convex side as a priority. When convex rod rotation maneuver was done concave side was screwed more easily. Whereby it could be considered to shorten the surgery time.

Per-operative images of Ucar's Convex Rod Rotation technique



A. Before screwing B. A contoured rod is applied to the convexity of the curve after screwing the convex side. C. The rod is rotated towards the convexity of the curve. D. Second contoured rod is applied to the concavity of the curve after screwing the concave side.

X-rays of the case 2



A. Pre-operative X-ray (AP) B. Post-operative X-ray (AP) C. Pre-operative X-ray (Lateral) D. Post-operative X-ray (Lateral)

Poster-71
Increased Lumbar Lordosis Is Associated with Less Spontaneous Lumbar Correction After Selective Thoracic Fusion of Lenke 1C and 2C Curves

Benjamin T Bjerke[1], Rehan Saiyed[2], Zoe B Cheung[2], Grant D Shifflett[3], Jeffrey G Stepan[1], Matthew E Cunningham[1]

surgery 3) at latest available follow-up at least one year postsurgically. Additional demographic and clinical data were collected for all patients. A rank order test was used to assess statistical dependence of variables. STF was defined as a lower instrumented vertebra above L2 for Lenke 1C and 2C curves. 27 patients were identified meeting these criteria (20 with Lenke 1C and 7 with 2C curves). Average follow-up was 2.21 ± 1.21 years. Main thoracic (Tm) curves were 54° ± 8° pre-surgically and 23° ± 8° at latest follow-up, a mean correction of 58%. In our cohort, the unfused thoracolumbar/lumbar (TLL) curve decreased from 42° ± 7° pre-surgically to 22° ± 10° at latest follow-up, achieving an average correction of 48%. Of all pre-surgical variables, only increased pre-surgical lumbar lordosis, measured in the sagittal plane from L1-S1, was strongly associated with less correction of the TLL curve (Figure 1. R=0.57, p=0.002). The extent of surgical correction of the main thoracic curve was additionally associated with more spontaneous lumbar curve correction (R=0.44, p=0.023).

The findings suggest sagittal profile can be predictive of spontaneous lumbar spine correction in the coronal plane following STF. Knowledge of which lumbar curve is more likely to correction spontaneously could influence both candidate and level of fusion selection in STF. Further investigation validating such results in a larger cohort and other clinical centers is warranted.

Pre-surgical Lumbar Lordosis vs Spontaneous Lumbar

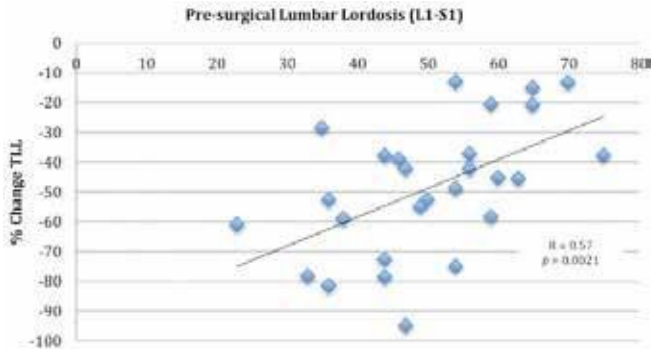
[1] Hospital for Special Surgery
[2] Weill Cornell Medical College

There remains contention with regards to the surgical approach of spinal fusion surgery for Lenke curves 1C and 2C in adolescent idiopathic scoliosis (AIS). A selective thoracic fusion (STF) is associated with overall lower cost and less morbidity. However, STF may result in less overall correction, coronal decompensation, distal adding-on, and lumbar curve progression. To better identify patients suited for STF, we sought to identify pre-surgical radiographic curve characteristics that could be suggestive of improved spontaneous lumbar correction in selectively fused AIS patients.

There were 211 AIS patients treated with posterior arthrodesis from 2007-2013 from a single institution with complete radiographic follow-up of at least one year. Sagittal and coronal profiles were characterized radiographically 1) presurgically (along with bending films) 2) within one week after

[3] Hospital for Special Surgery

Correction



This graph demonstrates the spontaneous lumbar correction versus the pre-surgical lumbar lordosis. It demonstrates a significant effect for patients with increased lordosis to achieve less overall spontaneous correction.

Poster-72

Post-Surgical Predictors of PJK Following Arthrodesis for AIS

Benjamin T Bjerke[1], Rehan Saiyed[1], Zoe B Cheung[2], Grant D Shifflett[1], Evan Sheha[1], Matthew E Cunningham[1]

to cephalad endplate of two vertebral levels proximally. Abnormal PJK was defined according to the definition set forth by Glattes et al. 2005, satisfied by a proximal junctional angle greater than 10° with a change post-surgically equal to or exceeding +10° from the pre-surgical measurement.

We noted an PJK incidence of 24% (51/211) at an average of 2.3 years follow-up in our cohort, consistent with prior values (26-35%). There was no significant difference in final proximal junctional angle in constructs with a screw UIV compared to a hook UIV (8.6° vs. 8.3°, p=0.79). There were no significant differences between groups in age, gender, number of levels fused, hybrid vs allpedicle screw construct, or pre-surgical proximal junctional angle.

Pre-surgical characteristics found to be associated with a significantly increased risk for PJK included a T5/T12 kyphosis of >30° (OR 3.18, 95% CI 1.64-6.18, p<0.001) and BMI > 25 (OR 2.47, 1.10-5.58, p=0.03). A surgical correction of the T5/ T12 kyphosis greater than 20° led to an elevated risk for the development of PJK (OR 3.27, 1.25-8.58, p=0.016). There were no differences between pre-surgical and immediate post-surgical sagittal balance, however final sagittal balance was significantly more negative for patients with PJK (-1.5 vs 0.4cm, p=0.016).

This cohort represents a large single consecutive series of patients with intermediate followup from a single institution. Although the long-term significance of PJK is unknown, in severe cases it may have negative consequences, including proximal junctional failure. Obesity, pre-surgical thoracic kyphosis, and significant kyphosis correction of over 20° were all found to be risk factors for PJK in this cohort. Recognition of the aforementioned risk factors may assist the treating surgeon in UIV selection and sagittal plane correction. However, long-term investigations of PJK are needed to better evaluate any potentially adverse clinical outcomes associated with PJK for patients with AIS.

Overall Cohort Characteristics

Overall

	Overall	PJK	non PJK	p
n (%)	211	51 (24)	160 (76)	
Age		14.7	14.4	0.48
Levels Fused		11.6	11.2	0.28
BMI		21.9	20.4	**0.012**
Male (%)		8 (16%)	44 (27%)	0.13

This table demonstrates overall characteristics of our patient cohort.

Proximal Level Kyphosis

Proximal Level Kyphosis (Degrees)

	Overall	PJK	non PJK	p
Pre	**3.4** +/- 5.8	**3.3** +/- 4.3	**3.4** +/- 6.1	0.99
Post	**8.5** +/- 7.3	**17.4** +/- 5.1	**5.8** +/- 5.4	--
Change	**5.2** +/- 6.7	**14.2** +/- 3.8	**2.3** +/- 4.8	**0.016**

This table demonstrates pre- and post-surgical proximal level kyphosis as well as overall kyphosis correction.

Sagittal Balance

Sagittal Balance

		PJK	non PJK	p
Pre	avg	**-15.3** +/- 33	**-5.4** +/- 35	0.073
Post	avg	**6.8** +/- 40	**6.3** +/- 4.9	0.933
Latest f/u	avg	**-14.7** +/- 27	**-4.2** +/- 27	**0.016**

This table shows the overall sagittal balance for pre-surgical, post-surgical, and latest followup.

Poster-73

Evaluation the Effects of Scoliosis Surgery on Patient's Functional Status and Qality of Life

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[2]Pamukkale University, School of Physical Therapy and Rehabilitation, Denizli, Turkey

This study was conducted to investigate the effect of fusion surgery on functional status and quality of life in the patients with AIS.

Eighteen patients, [16 female (%88,9) and 2 male (%11,1)] whose mean age (17-60 year) 44.5 ± 14.6 years and have had fusion surgery due to scoliosis deformity were included the study. New York Posture Rating Test, Oswestry Low Back Pain and Disability

[1] Weill Cornell Medical College

Proximal Junctional Kyphosis (PJK) following arthrodesis for Adolescent Idiopathic Scoliosis (AIS) has been a topic of much conversation in recent literature. The long-term significance of this is unclear, although it may be a factor for revision surgery, maintenance of overall sagittal balance, and cosmesis.

There were 211 AIS patients treated with posterior arthrodesis from 2007-2013 from a single institution with complete radiographic follow-up of at least one year. The proximal junctional angle was measured as the angle between the caudal endplate of the upper instrumented vertebrae (UIV)

İndex, DASH-T, Short Form 36 (SF-36), SRS-22 questionnaire was applied to the patients.
Patient's posture was (X=48,77±5,88) "very good" level and according to Oswestry Low Back Pain and Disability Index (X=14,66±17,61) back pain doesn't cause a significant problem in patients daily life. According to DASH-T score (X=40,27±15,84) upper extremity function were found to be affected in medium level. Patient's quality of life was at intermediate level and according to SRS-22 score pathology affect the patient's life moderately.
Patient pathology affect the patient's life medium level after scoliosis surgery.

1. Ulusal Omurga Cerrahisi Hemşireliği Sempozyumu
2 Mayıs 2015 Sheraton Hotel Çeşme - İzmir

SÖZEL BİLDİRİLER

SS-01
Vertebra Cerrahisi Uygulanan Hastalara Klinikte Bakım Verenlerin Bakım Yükünün ve Etkileyen Faktörlerin Belirlenmesi

Özlem Bilik[1], Özgül Karayurt[1], Ayşegül Savcı[1], Hale Turhan[1], Rüya Keskin[2], Serap Acar[2], Bahriye Okyar[2], Berrin Çakıroğlu[2]
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[2]Dokuz Eylül Üniversitesi Hastanesi, Ortopedi ve Travmatoloji Kliniği, İzmir

Vertebra ameliyatlarından sonra iyileşme dönemi uzun olabilmekte ve hastalar bir süre yatağa bağımlı kalabilmektedir. Ameliyat sonrası hastalar şiddetli ağrı yaşamakta, günlük yaşam aktivitelerini yerine getirirken yardıma gereksinim duymakta ve özbakımlarını yerine getirememektedirler. Tüm bu nedenlerle hastaların bakım desteği gereksinimlerini gidermek için çoğunlukla hasta yakınları bakım verme sorumluluğunu üstlenmektedirler. Hastalarına bakım veren bireyler çeşitli düzeylerde güçlükler yaşamakta, bu güçlükler fiziksel, ruhsal ve sosyal yaşantılarını olumsuz etkileyebilmektedir.
Araştırma; Ortopedi ve Travmatoloji Servisinde majör vertebra cerrahisi uygulanan hastalara klinikte bakım verenlerin bakım yüklerini ve etkileyen faktörleri belirlemek amacıyla yapılmıştır. Tanımlayıcı ve kesitsel olan çalışma Dokuz Eylül Üniversitesi Hastanesi Ortopedi ve Travmatoloji Kliniğinde yatan 13 hasta ve 13 hasta yakını ile yapılmıştır. Örnekleme alınan hastalardan, "Hastalara Yönelik Tanıtıcı Özellikler Formu", "Barthel Günlük Yaşam Aktiviteleri İndeksi" ve bakım verenlerden, "Bakım Veren Bireyler İçin Tanıtıcı Özellikler Formu", "Zarit Bakım Verme Yükü Ölçeği" kullanılarak veriler toplanmıştır. Kurum izni, etik kurul ve hasta yakınlarından onam alınmıştır.
Araştırmaya katılan hastaların yaş ortalaması 39.07±26.05 (min:11, max:75) olup, %84.60'ı kadın, %53.90'ı ilköğretim mezunudur. Hastaların %84.60'ına Posterior Spinal Enstrumantasyon ameliyatı uygulanmış olup,%46.20'si ek bir hastalığa sahiptir. Araştırmaya katılan bakım verenlerin yaş ortalaması 41.30±9.21(min:28, max:59) olup, tamamı çalışmamaktadır. Bakım verenlerin %30.80'ni kronik hastalığa sahiptir. Bakım verenlerin %53.80'i hastanın annesi, %23.10'u kızıdır. Bakım verenlerin %69.20'si fiziksel, psikolojik ve maddi olarak, %23.10'u ise sadece fiziksel destek verdiklerini belirtmiştir. Hastaların %76.90'nın ileri düzeyde bağımlı, %23.10'nun ise orta derecede bağımlı olduğu saptanmıştır. Bakım verenlerin %61.50'sinin hastalarını hafif düzeyde yük algıladıkları %23.10'unun ise hastalarını yük olarak algılamadıkları saptanmıştır.
Vertebra cerrahisi uygulanan hastaların dörtte üçü ileri derecede bağımlı olmasına rağmen, bakım verenlerin üçte ikisinin hastalarını hafif düzeyde yük olarak algılaması dikkat çekicidir. Bakım verme sorumluluğunu büyük bir çoğunlukla kadınlar üstlenmektedir. Bakım verenlerin çoğunluğu fiziksel, psikolojik ve maddi açıdan

destek vermektedirler. Bakım verenlerin güçlendirilmesine ve eğitilmesine yönelik stratejilerin oluşturulması önerilmektedir.

SS-02

Skolyoz Ameliyatından Sonra Beni Nasıl Bir Yaşam Bekliyor? Kalitatif Bir Çalışma

Özlem Bilik[1], Özgül Karayurt[1], Hale Turhan Damar[1], Ayşegül Savcı[1], Meryem Karasaç[2], İlknur Nalbantoğlu[2]
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[2]Dokuz Eylül Üniversitesi Hastanesi, Ortopedi ve Travmatoloji Kliniği, İzmir

Skolyoz ameliyatlarının amacı; eğriliğin ilerlemesini durdurmak, gövde deformitesini düzeltmek ve solunum komplikasyonlarını önlemektir. Yaşam kalitesini olumlu yönde etkileyen skolyoz ameliyatları sonrasında yaşanan şiddetli ağrı ve fiziksel hareket kısıtlılıkları hastaların konforunu bozmaktadır. Hastalar bir yandan ameliyattan olumlu sonuçlar beklerken, bir yandan da sorunlarının artmasından korkmaktadırlar. Hastaların ameliyattan sonra neler yaşadığının belirlenmesi onların bakım süreçlerinin iyileştirilmesinde rehberlik edebilir.

Araştırmanın amacı, skolyoz ameliyatı sonrasında hastaların neler yaşadıklarını ve gelecekle ilgili düşüncelerini anlamaktır.

Niteliksel araştırma yöntemlerinden fenomenolojik araştırma tasarımı kullanılmıştır. Araştırmanın örneklemini, Dokuz Eylül Üniversitesi Ortopedi ve Travmatoloj Kliniği'nde skolyoz tanısıyla ameliyat olan hastalardan ölçüt örnekleme ile seçilen 10 yaş üzerindeki çocuk ve yetişkin altı hasta oluşturmuştur. Etik kurul ve hasta onamı alınan araştırmanın verileri içerik analizi yöntemiyle değerlendirilmiştir.

Hastaların yaş ortalaması 14 olup, tamamına PSE ameliyatı uygulanmıştır. Verilerin içerik analizinde "Annemi istiyorum!" gibi ifadelerle "Yoğun bakımda çocuk hasta olmak", "bayağı ağrım oldu" ifadesiyle "Ameliyat sonrası şikâyetler", "Ne zaman okul çantamı sırtıma alacağım?" ifadesiyle "Gelecek Kaygısı", "Eve gitmek istiyorum!" ifadesiyle "Hastane ortamından kurtulma isteği", "Yaşasın boyum uzadı" ifadesiyle "Beden imajı" temalarına ulaşılmıştır.

Skolyoz ameliyatları; hastaların yaşam kalitelerinin artacağına olan inançları nedeniyle olumlu beklentiler içinde oldukları bir ameliyattır. Ancak ameliyat sonrası hastaların yaşadıkları şikayetler ve kısıtlılıkların yanı sıra yoğun bakım hastası olmak gibi bir takım zorluklar onların bu süreçte desteğe gereksinimlerini arttırmakta, bu destek en yakın kişi olan anneden beklenmektedir. Hastaların skolyoz ameliyatından beklenti ve tepkileri bulundukları gelişimsel dönemle de ilişkili olup, beden imajına olan olumlu etkisi görülmektedir. Özellikle çocuk ve genç erişkin hastalara uygulanan skolyoz ameliyatları hemşirelerin gelişimsel dönem özelliklerini göre girişimde bulunmasını gerektirmektedir. Hemşirelerin bu açıdan güçlendirilmesi hastaların bu olumsuz süreç ile baş etmelerini kolaylaştırabilir. Konuya hemşirelik eğitiminde de yer verilmesi önerilmektedir.

SS-03

Omurga Cerrahisi Uygulanan Hastaların Ağrı, Anksiyete ve Depresyon Düzeylerinin Belirlenmesi

Özgül Karayurt[1], Özlem Bilik[1], Ayşegül Savcı[1], Hale Turhan Damar[1], Serap Sayar[2], Selviye Kurtulan[2], Suzan Yusuf[2]
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Son yıllarda omurga cerrahisi giderek artan sayıda uygulanmaktadır. Amerika'da 2007 yılında 350.000 omurga cerrahisi uygulanmıştır. Ülkemizde ise 2009 yılında 92.843 omurga ameliyatı yapılmıştır. Omurga cerrahisi uygulanan hastaların ciddi düzeyde ağrı yaşadıkları belirlenmiştir. Ameliyat öncesi yaşadıkları fiziksel ve psikolojik problemler nedeniyle ameliyat sonrasında da fiziksel, psikolojik sıkıntılar yaşayabilmektedirler. Araştırma omurga cerrahisi uygulanan hastaların ağrı, anksiyete ve depresyon düzeylerinin belirlenmesi amacıyla yapılmıştır. Çalışma tanımlayıcı ve kesitsel bir araştırmadır. Dokuz Eylül Üniversitesi Uygulama ve Araştırma Hastanesi Ortopedi ve Travmatoloji Kliniği'nde Aralık 2014-Mart 2015 tarihleri arasında 23 hastaya ulaşılmıştır. Veriler; Hasta Tanıtıcı Bilgi Formu, Kısa Ağrı Envanteri, Hastane Anksiyete Depresyon Ölçeği kullanılarak toplanmıştır. Kurum izni, etik kurul ve hasta onamı alınmıştır. Yaş ortalaması 38.37±23.02 (min:11, max:76) olan hastaların %60.90'u kadın, %52.20'si ilköğretim ve %26.10'u lise mezunu olup, %91.30'nun sosyal güvencesi vardır, %73.90'nı çalışmamaktadır. Hastaların %60.90'nı skolyoz, %13'ü LDH tanısı ile hastaneye yatmış olup, %73.90'ına Posterior Spinal Enstrumantasyon (PSE) ameliyatı uygulanmıştır. Hastaların anksiyete ve depresyon puan ortalamaları sırasıyla 7.73+4.12 ve 6.04+4.18'dir. Hastaların %56.50'sinin anksiyete yönünden, %13'nün depresyon yönünden risk altında olduğu belirlenmiştir. Ağrı şiddeti ile ağrının fonksiyonel duruma etkisi arasında orta pozitif yönde ileri düzeyde anlamlı bir ilişki saptanmıştır (r=0.57, p=0.004). Anksiyete puan ortalaması ile depresyon eğilimi arasında orta pozitif yönde ileri düzeyde anlamlı ilişki bulunmuştur (r=0.63, p=0.002). Yaş, cinsiyet, eğitim durumu, ameliyat tipi ile ağrı şiddeti, ağrının fonksiyonel duruma etkisi arasında istatiksel olarak anlamlı bir fark bulunmamıştır (p=0>0.05).

Hastaların üçte ikisinin skolyoz tanısı olup, çoğunluğuna PSE uygulanmıştır. Hastaların depresyona göre anksiyete yönünden riski daha fazla olup, anksiyetenin depresyona eğilim oluşturduğu

SS-04

Hemşirelerde Bel Ağrısı Görülme Sıklığı ve Etkileyen Faktörlerin Belirlenmesi

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Bel ağrısı çok sık rastlanan bir semptom olup, fonksiyonel yetersizliğe sebep olarak kişilerin yaşam kalitesini olumsuz yönde etkilemektedir. Hemşirelerin çalışma ortamı ve bakım rolleri nedeniyle mekanik, fiziksel olarak zorlanmaları bel ağrıları yaşamalarına sebep olmaktadır.

Çalışmada, hemşirelerde bel ağrısı görülme sıklığı ve etkileyen faktörlerin belirlenmesi amaçlanmıştır.

Tanımlayıcı ve kesitsel olarak yapılan çalışmanın evrenini Denizli il sınırları içinde bulunan Pamukkale Üniversitesi Araştırma ve Uygulama Hastanesi (n=520) ve Denizli Devlet Hastanesi'nde (n= 716) çalışan hemşireler oluşturmaktadır. Hemşirelerin sosyodemografik verilerin yer aldığı "Tanıtım Formu" ve "Oswestry Bel Ağrısı Ölçeği" kullanılarak veriler toplanmakta olup, çalışmaya katılmayı kabul eden 139 hemşire araştırmaya dahil edilmiştir. Araştırmaya katılan hemşirelerin yaş ortalaması 34.8±8.7 olup, %88.5'i kadın, %69.8'i evli, %54.7'i lisans mezunudur. Hemşirelerin meslekte çalışma süreleri ortalama 12.77±9.11, ortalama haftalık çalışma saatleri 43.74±6.1 saat, ortalama ayakta kalma süreleri 7.78±2.6saattır. Hemşirelerin BKI' leri ortalama 24.28±3.8 olup, % 63.3'ü klinik hemşiresidir. Hemşirelerin %78.5'i gündüz-gece ya da nöbet-vardiya şeklinde çalışmaktadır. %70.5'i vücut mekaniklerine dikkat etmediklerini, %75.5'i ise bel ağrılarının mesleğe başladıktan sonra başladığını belirtmişlerdir. Hemşirelerin %23.7'sinin orta derecenin üzerinde bel ağrısı şikayeti olduğu belirlenmiştir. Yapılan istatistiksel değerlendirme sonucunda; çalışma şekli, bel bölgesine travma almış olma, iş memnuniyeti ve ayakta kalma süresi ile bel ağrısı puan ortalamaları arasındaki fark istatistiksel olarak anlamlı bulunmuştur ($p < 0.05$).

Hemşirelerin çalışma koşullarının ayakta kalma süreleri açısından ve iş yoğunluğu açısından gözden geçirilerek planlama yapılması yararlı olabilir. Vücut mekaniklerine dikkat edilmesi konusunda hizmet içi eğitimler planlanarak, bel bölgesinin travma almasının önlenmedi sağlanabilir.

görülmektedir. Ağrı düzeyi arttıkça hastalar fonksiyonel açıdan olumsuz etkilenmektedirler. Hemşirelerin anksiyeteyi ve ağrıyı tanılaması ve kontrol altına alması için gerekli stratejilerin oluşturulması önerilmektedir.

SS-05

Yirmi Yıllık Bir Yolculuk: Lomber Disk Hernisi Olan Olgunun Ameliyat Olma Süreci

Yasin Aksoy
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lomber disk herniasyonu

Yaşam süresinin uzamasıyla birlikte artan spinal omurga hastalıklarının başında lomber disk hernileri (LDH) gelmektedir. Nucleus pulposus normal yerleştiği yerden herhangi bir nedenle herniye olabilmektedir. Bel ve bacak ağrısı, siyatalji, radikülopati, alt ekstremitelerde ilgili sinir kökünün inerve ettiği alanda motor, duyu ve/veya refleks değişiklikleri (uyuşma, güçsüzlük, hipoestezi, kas gücünde azalma, DTR bozulma), nörojenik klodikasyon, azalmış mesane duyusu ve inkontinans gibi belirti ve bulgular görülmektedir. Konservatif tedavi yeterli olmadığında disk fıtıklaşmasına bağlı sinir kökleri üzerinde oluşan basıyı ve omurlar arasındaki aşırı hareketliliği gidermek amacıyla ameliyat yapılmaktadır. Genellikle hastalar ameliyatlardan çeşitli riskleri bulunan bu kaçınmaktadırlar. Bu derlemede Dokuz Eylül Üniversitesi Hastanesi nöroşirurji kliniğinde LDH tanısıyla ameliyat planlanan hastanın ameliyatı erteleme ve ameliyat olmaya karar verme nedenleri ile hemşirelik bakımı tartışılmıştır. Altmış altı yaşındaki olgunun 15 yıldır diyabetus mellitus, altı yıldır hiperlipidemi ve 20 yıldır LDH tanısı bulunmaktadır. Hastaneye sol bacakta belirgin ağrı, ayaklarda uyuşma, inkontinans, zaman zaman his kayıpları, geceleri yaşadığı bacak krampları ve uyku problemi şikayetleriyle başvurmuştur. Hasta sakat kalma özellikle de felç olma korkusu, ameliyat sonrası aktivitelerinin kısıtlanması endişesi, çevresindeki kişilerin geçmiş deneyimleri sonucu "çok ağrıyor, geçmedi, ayağımı hissetmiyorum" gibi ifadeleri sıkça duyması nedeniyle

ameliyat olmaktan yıllarca kaçınmıştır. Bu süreçte diğer birçok hastanın yaptığı gibi yatak istirahatinin yanısıra tuvalet, banyo ve yemekte zorlayıcı aktivitelerden kaçınma, hekim kontrolünde analjezik ve miyoreleksan ilaç tedavisi gibi konservatif tedavi uygulamıştır. Ameliyat öncesinde ameliyata ilişkin bilgi eksikliği, anksiyete, sol bacakta ağrı, alt ekstremitelerin duyu fonksiyonunda bozulma, inkontinansa bağlı idrar yolu enfeksiyonu riski, bacak kramplarına bağlı uykusuzluk sorunları başlıca hemşirelik tanılarını oluşturmuştur. Ameliyat sonrasında ağrı; fiziksel harekette bozulma; kanama, BOS kaçağı, alt ekstremitelerin duyu ve motor fonksiyonlarında bozulma, abdominal distansiyon, düşme ve enfeksiyon riski tanıları ele alınmıştır. Bu doğrultuda hastaya kanıta dayalı rehberler doğrultusunda ağrının giderilmesi, yara bakımı, duyu ve motor fonksiyon izlemi, idrar çıkışı kontrolü, egzersiz; konstipasyon, enfeksiyon, düşme ve venöz tromboemboli riskini önleme girişimleri uygulanmıştır.

POSTER BİLDİRİLER

1. Ulusal Omurga Hemşireliği Cerrahisi Sempozyumu

PP-01

Skolyoz Cerrahisi Geçiren Hastalarda Skolyozun Görsel Algısının Benlik Saygısı ve Anksiyete Üzerine Etkisi

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Skolyoz cerrahisi geçiren hastalarda cerrahi sonrası visual olarak postür algılarının benlik saygısı ve anksiyete bulguları üzerine etkisini değerlendirmek için planlanmıştır.

Ortopedi ve Travmatoloji kliniğinde, Ocak 2005-Haziran 2014 tarihleri arasında skolyoz deformitesi nedeni ile füzyon cerrahisi geçiren 16'sı kadın (%88,9), 2'si erkek (%11,1) olmak üzere toplam 18 hasta çalışmaya dahil edilmiştir. Hastaların yaş ortalaması (17-60 yıl) 36.64±14.73 yıldır. Çalışmaya dahil edilen hastaların Hasta tarafından algılanan spinal deformiteleri Trunk Apperance perception scale (TAPS) ve Walter reed visual assessment scale (WRVAS), benlik saygısı Rosenberg Benlik Saygısı Ölçeği ve anksiyete durumları Beck Anksiyete Ölçeği kullanılarak değerlendirilmiştir.

Hastaların ortalama benlik saygısı ve anksiyete düzeyi ortalamaları sırasıyla 20,66±6,10, 10,88±10,91 olarak bulunmuştur. TAPS skoru ortalama X=4,42±0,96, WRVAS skoru ortalama X=10,72±4,57 olarak saptanmıştır. Hastaların benlik saygılarıyla WRVAS düzeyleri ve Beck anksiyete düzeyleri arasında istatistiksel olarak negatif anlamlı ilişki bulunmuştur (sırasıyla r=-0,652, p=0,003 ve r=-0,783, p=0,000).

Skolyoz cerrahisi geçiren hastaların hafif düzeyde anksiyetik semptomlar gösterdiği ve orta özsaygı düzeyine sahip oldukları saptandı.

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PP-02
Spinal Tümörler ve Hemşirelik Bakımı

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Santral sinir sistemi tümörlerinin yaklaşık %15'i oluşturan spinal tümörler malign ya da bening olabilmektedirler. Malign olanların çoğunun sekonder kemik invazyonu ile ekstradural yerleşen tümörler olduğu, bening olanların ise invazyondan ziyade nöral yapılara bası ile klinik tablo gösterdiği belirtilmektedir. Spinal tümörler cinsiyet farkı gözetmeksizin en sık 20 ile 60 yaş arası bireylerde ortaya çıkmaktadır. Spinal tümörler üç grupta incelenebilirler;

- Spinal ekstradural tümörler; spinal kemik yapıda ya da epidural mesafede yerleşen tümörlerdir.
- Spinal intradura ekstramedüller tümörler; dura içinde, ancak medullayı harekete geçirmeyecek şekildeki oluşumlardır.
- İntramedüller tümörler ise; tamamı medulla içinde olabildiği gibi zamanla ekstramedüller alana da yayılabilirler.

Spinal tümör tanısı alan ya da şüphelenilen kişinin değerlendirilmesi öykü alma işlemi ile başlar. Sonrasında nörolojik muayene, olası mesane ve bağırsak disfonksiyonu varlığı, ağrı

değerlendirmesinin yapılması gerekmektedir. Tümörün yerleşim yerine göre belirti ve bulgular farklılık gösterse de genel olarak; duyu kaybı, vertigo, anormal refleksler, parestezi gibi belirtiler karşımıza çıkmaktadır. Spinal tümörlerin tedavisi; cerrahi tedavi, radyoterapi, kemoterapi ile yapılmaktadır.

Ameliyat öncesi hemşirelik bakımında; hasta ve ailesinin korku, anksiyete düzeyi ve eğitim gereksinimleri belirlenerek bakımları planlanmalıdır. Ameliyat sonrası hemşirelik bakımında; ağrı kontrolü sağlanmalıdır. Öncelikle hastada gelişebilecek solunum ve dolaşım sistemine yönelik komplikasyonlar takip edilmeli gerekli önlemler alınmalıdır. Diğer hemşirelik girişimleri arasında; enfeksiyon riski, konstipasyon riski, aktivite yetersizliği, doku bütünlüğünde bozulma riski ve bireysel bakımın devamlılığını sağlamada yetersizlik gibi hemşirelik tanılarına yer verilmelidir.

PP-03
Ülkemizde Bel Ağrısına Yönelik Kültürel Uygulamalar

Akgün Yeşiltepe
Dokuz Eylül Üniversitesi, Halk Sağlığı Hemşireliği Anabilim Dalı,İzmir

Bel ağrısı çağdaş toplumlarda işlevsel yetersizlik ve sakatlık yapan önemli sebeplerden biri olarak bilinmektedir. Bel ağrısı uluslararası düzeyde bir sağlık sorunudur. Soğuk algınlığından sonra en büyük işgücü kaybına sebeb olan durumdur. Dünya Sağlık Örgütü insanların yaşamı boyunca %80'inin bel ağrısı yaşadığı belirtmiştir. Ülkemizde yapılan 2004 Yılı Hastalık Yükü Çalışmasına göre; kas-iskelet hastalıkları ikinci sırada yer aldığı belirtilmiştir. Ayrıca ülkemizde bireylerin bel ağrısını azaltmak için tıbbi tedavilerin yanı sıra geleneksel, kültürel uygulamalara çok sık yöneldiği bilinmektedir.

Bu derlemede ülkemizde farklı bölgelerde bel ağrısını tedavide uygulanan kültürel uygulamaları tartışmak amacıyla planlanmıştır. Literatür taraması yapılmıştır.

Ülkemizde bel ağrısını azaltmak için genellikle toplum bitkisel uygulamalardan; zeytinyağı ile masaj, sabun köpüğü ile zeytinyağı karıştırılıp bele sarılmasını tercih etmektedir. Türk Halkı özellikle keçi veya koyun derisi ile beli sarma, çiğ balık bağlama, bele kemer bağlama gibi yöntemleri de sık tercih etmektedir. Tiftikten veya yünden yapılan kuşak ile bel ağrısını engellemek için kullanılmaktadırlar. Aynı zamanda bele sülük salma, bel çektirme, bele kupa çekme, veya bel çiğnetme, çuvaldız iğnesiyle bel dikilmesi gibi yaklaşımlar bel ağrısını azaltmak için kullanılmaktadır. Anadolu´da "bardak çekme", Avrupa ve Amerika´da cupping-terapi veya vakum terapi diye bilinmektedir. Bu yöntemde, sırt veya bel ağrısı var olan kişiler yüzüstü yattıktan sonra bu işlemi uygulayan kişi, ağzı geniş bir çay bardağı veya su bardağının içine alev ile tutuşturulmuş bir kağıt parçası koyduktan sonra bardağı kişilerin ağrı duyduğu yerin üzerine koyar.

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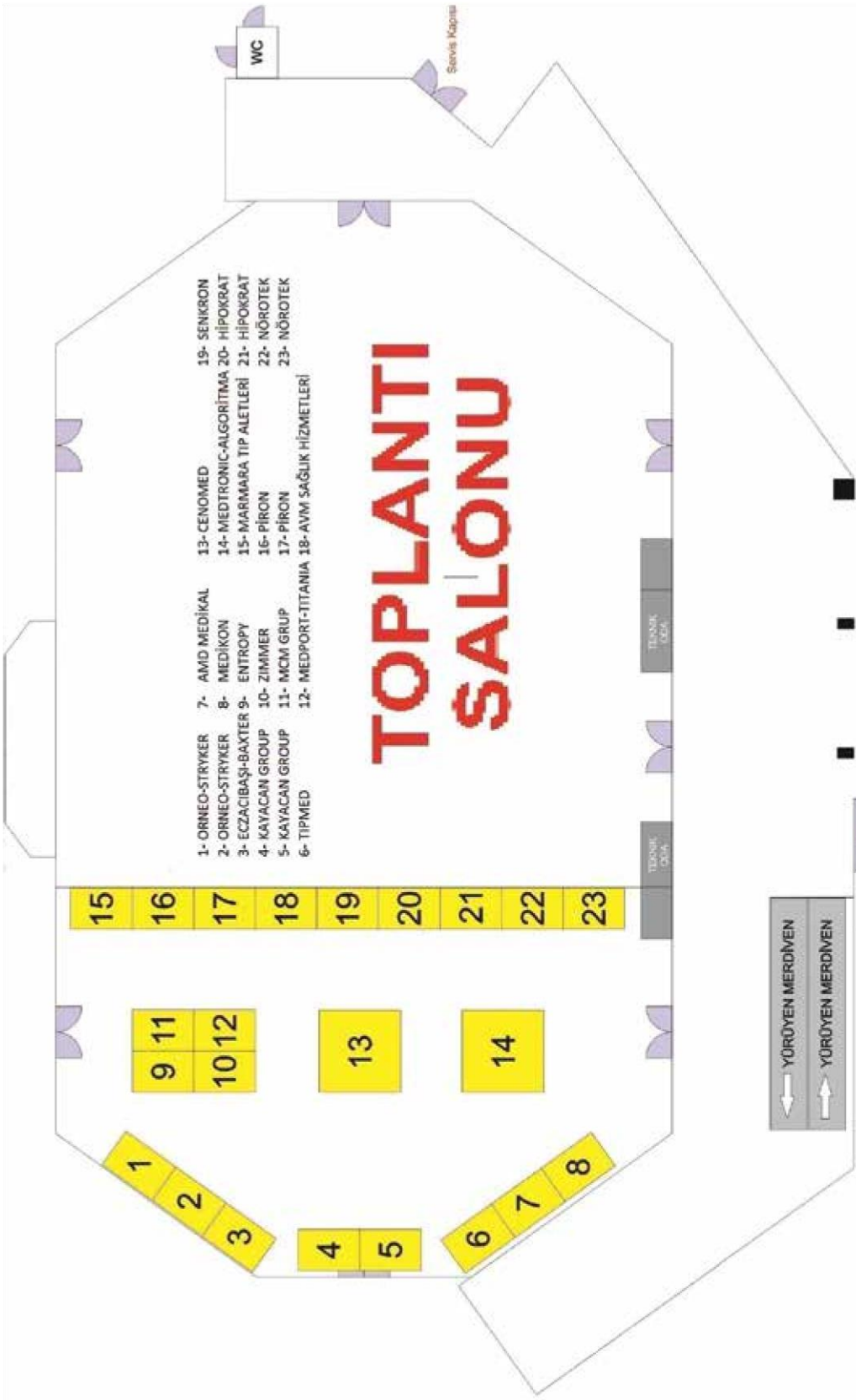
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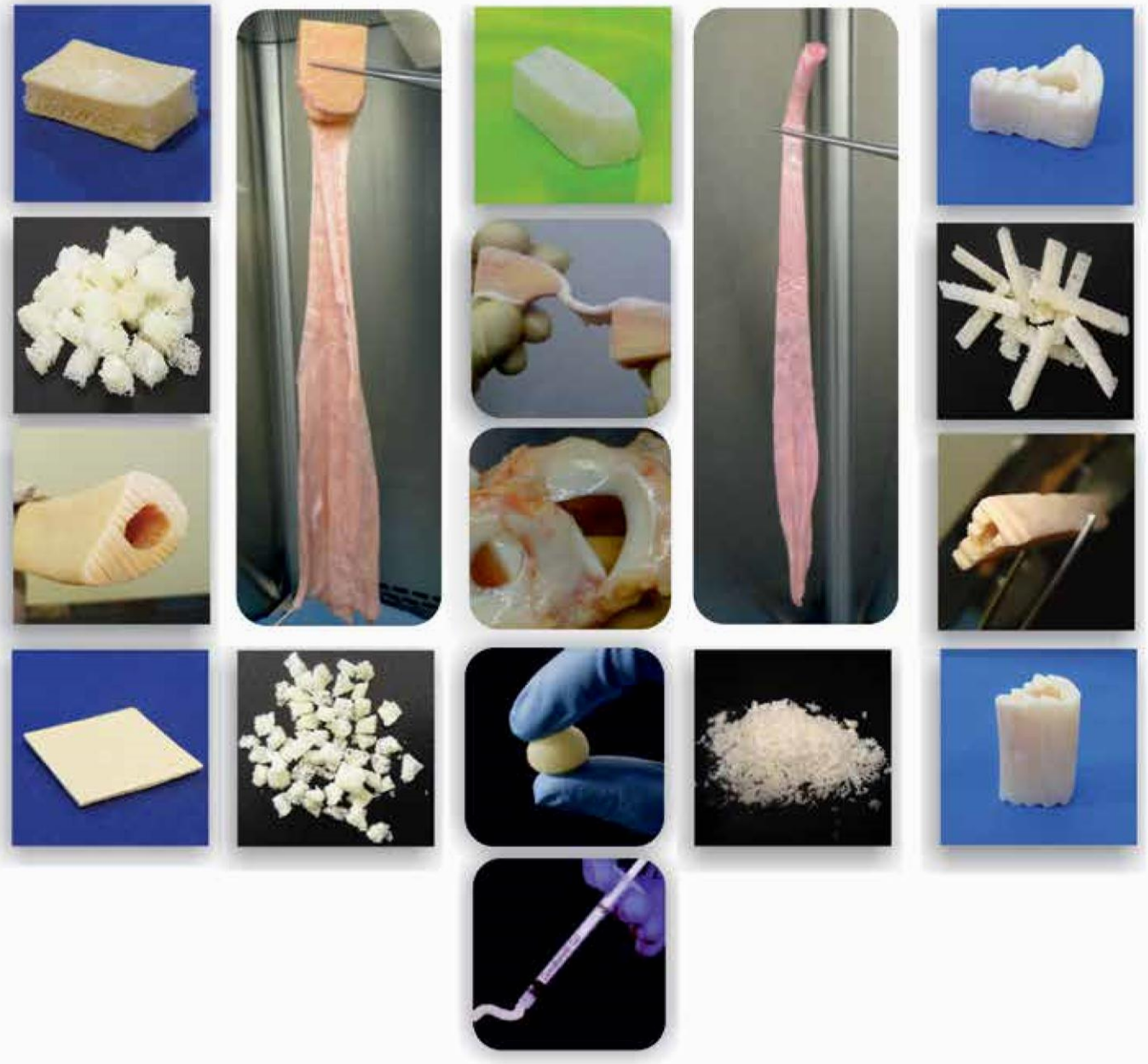

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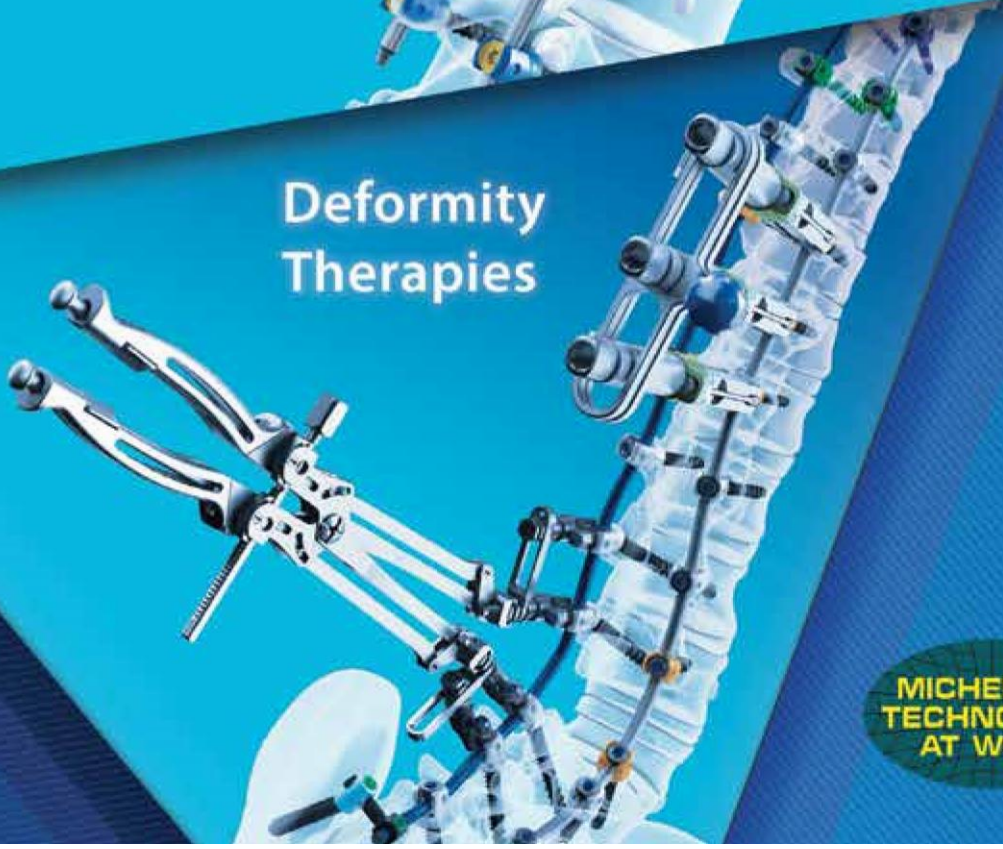

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