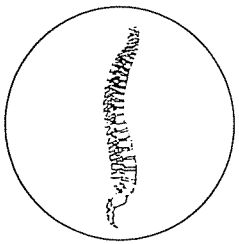

IV.
INTERNATIONAL
CONGRESS
ON
SPINE
SURGERY
MAY 26 - 30, 1996
İZMİR
TURKEY

We appreciate to all the following mentioned parties for their support to the **4th International Congress on Spine Surgery.**

- **Hipokrat**
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- **United Expo**
- **Yeni Asır Gazetesi**

Dear Colleague,

It is really a pleasure, on behalf of the Turkish Society of Spine Surgery to host you at the 4th International Congress on Spine Surgery on May 26-30, İZMİR-TURKEY.

Izmir is the third largest city in Turkey. Known in Turkish as "The pearl of the Aegean" situated on the shores of the Long Aegean bay. Social and cultural life is very active in Izmir. The city contain our country's most respected universities, conservatories, theaters, concert halls, many hotels with convention halls.

The orjinal city was established in the third millenium, B.C. The Seven Churches of the Apocalypse, mentioned by St. John in Book of Revelations each formed a seperate and distinct community and are all found in Turkey (Smyrna, Ephesus, Laodicea, Philadelphia, Sardis, Thyatira, Pergamum).

Homeros, the author of Odyseus and Iliad called Turkey "The land of Dreams." Turkey has been named with many other titles like "East Meets West". "Bridge Between the Orient and the Occident" or "A Land of Timeless Treasures." We belive that you will find "A unique Paradise" in Turkey.

Besides of the scientific programme, there will be an excellent social programme and excursions with the traditional warm Turkish hospitality.

This year our Congress is accredited by the Accreditation Council of Turkish Medical Association for Continuing Medical Education. Turkish Medical Association designates this continuing medical education activity for 21.0 credit hours.

It is an honour for us to welcome colleagues from all over the world to our country.

Sincerely Yours,

Prof. Dr. Emin ALICI
President of
Turkish Society of Spine Surgery

ORGANIZING COMMITEE

Honorary President

Rıdvan EGE MD.

President of Congress

Emin ALICI MD.

Vice Presidents

Haluk AĞUŞ MD.

Halit ÖZYALÇIN MD.

General Secretaries

Haluk BERK MD.

Cansunar EGE MD.

Erhan SESLİ MD.

Member

Vasfi KARATOSUN MD.

Congress Secretariat C/O United Expo

1391 Sokak No : 9/4 35220

İzmir - Turkey

Tel : (232) 464 27 41 - 463 82 26

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SCIE OMMITEE

Interr Members

Daniel C. ORIN (France)

Jean-Pierre C. FARCY (USA)

Eduardo LUQUE (Mexico)

Ensor E. TRANSFELDT (USA)

Mark WEIDENBAUM (USA)

Robert B. WINTER (USA)

Turkish Members

Emin ALICI (İzmir)

Haluk AĞUŞ (İzmir)

Mehmet ALTINMAKAS (Ankara)

Ufuk AYDINLI (Bursa)

Nafiz BİLSEL (İstanbul)

Ali BİÇİMOĞLU (Ankara)

İlker ÇETİN (Ankara)

Derya DİNÇER (Ankara)

Ünsal DOMANİÇ (İstanbul)

Mahir GÜLŞEN (Adana)

Osman GÜVEN (İstanbul)

Azmi HAMZAOĞLU (İstanbul)

Zeki KORKUSUZ (Ankara)

Halit ÖZYALÇIN (İzmir)

Adil SURAT (Ankara)

Yücel TÜMER (Ankara)

Tarık YAZAR (Ankara)

SOCIAL PROGRAMME

26 MAY 1996	: OPENING CEREMONY	16.30 hrs.
26 MAY 1996	: WELCOME COCKTAIL	18.30 hrs.
27 MAY 1996	: CITY SIGHTSEEING	10.00 hrs.
28 MAY 1996	: GALA DINNER	20.30 hrs.
29 MAY 1996	: EPHESUS TOUR	11.00 hrs.
29 MAY 1996	: 1001 TURKISH NIGHTS SHOW	20.30 hrs.
31 MAY 1996	: PAMUKKALE TOUR	08.30 hrs.

OPENING CEREMONY

The opening ceremony of the congress will be held at Auditorium on Monday, May 26, 1996 at 16.30 hrs. All participants and accompanying persons are invited to attend.

WELCOME COCKTAIL

The congress welcome cocktail will be held at Ephesus Garden between 18.30 - 20.00 hrs. on monday, May 26, 1996 after the opening ceremony. All participants and accompanying persons are invited to attend.

INFORMATION TO THE PARTICIPANTS

Chairmen, lecturers, speakers and accompanying persons are color coded such as :

Red : President Chairman
Green : Lecturers
Yellow : Speakers
Pink : Accompanying persons

CITY SIGHTSEEING

The city sightseeing tour will explore the most interesting and well-known cultural and other tourist attractions in İZMİR.

GALA DINNER

The Congress Gala Dinner will be held at Efes Hall on tuesday, May 28, 1996.
All registered participants and accompanying persons are invited to join the evening.

EPHESUS TOUR & 1001 TURKISH NIGHTS SHOW

Departure from your hotel at 11.00 hrs. You will visit the House of Virgin Marry and Ephesus. One of the Seven Churches of Asia Minor. Lunch at Sultanköy.
Following the tour you will continue for Turkish Nights show at the former places of Ottoman Caravansarail. While having a dinner, top belly dancers, folklore dance groups will perform, followed by live dance music till midnight. Return to İzmir at 23.30 hrs.

PAMUKKALE TOUR

The cotton castle one of the most spectacular sites. Full day tour will be held at friday, May 31, 1996. Price per person 80- USD.

PROGRAMME OUTLINE

Scientific Programme Timetable

	May 26, 1996	May 27, 1996	May 28, 1996	May 29, 1996	May 30 1996
7.30			Business Meeting	Business Meeting	
8.30		Presidential adress	Lecture 7	Lecture 15	Lecture 26
8.45		In Memoriam			Lecture 27
9.00		Prof.	Lecture 8	Lecture 16	Session X
9.15		Güngör Sami		Session VII	
9.30		ÇAKIRGİL	Lecture 9		
9.30					
9.45	***REGISTRATION***				
10.00					
10.30		**Break**	**Break**	**Break**	**Break**
10.45		Lecture 1	Session IV	Lecture 17	Lecture 28
11.00		Session I		Lecture 18 Session VIII	Lecture 29 Session IX
12.40		**Lunch**	**Lunch**	**Lunch**	**Lunch**
14.00		Lecture 2	Lecture 10	Lecture 19	Lecture 30
14.15				Lecture 20	Lecture 31
14.30		Lecture 3	Lecture 11	Lecture 21	Lecture 32
14.45			Lecture 12	Lecture 22	Session XII
15.00		Lecture 4	Session V	Lecture 23	
15.15		Session II		Lecture 24	
15.30				Lecture 25	
16.00		**Break**	**Break**	**Break**	
16.20	**OPENING CEREMONY**	Lecture 5	Lecture 13	Session IX	
16.35		Lecture 6	Lecture 14		
16.50		Session III	Session IV		
17.00					Adjourn

LECTURES

MAY 27 1996

Lecture 1	Mark WEIDENBAUM MD Internal biomechnanics of the lumbar intervertebral disc.
Lecture 2	Robert B WINTER MD Neurofibromatosis
Lecture 3	Jean-Pierre C. FARCY MD Late complications of thoracolumbar fractures
Lecture 4	Emin ALICI MD Video Assisted Thoracoscopic Surgery
Lecture 5	Nafiz BİLSEL MD Late Pott paralegia
Lecture 6	Mustafa CANİKLİOĞLU MD Iatrogenic complications in spinal surgery

MAY 28 1996

Lecture 7	Robert B WINTER MD Congenital kyphosis
Lecture 8	Eduardo LUQUE MD Neuromuscular scoliosis
Lecture 9	Daniel CHOPIN MD Selection of the fusion levels in adolescent idiopathic scoliosis
Lecture 10	Ensor E. TRANSFELDT MD Instability and myelopathy of upper cervical spine
Lecture 11	Adil SURAT MD Instrumentation without fusion in immature spine.
Lecture 12	Azmi HAMZAOĞLU MD The importance of traction X-Ray in recognition and treatment of upper curve in idiopathic scoliosis and its role in selection of fusion area.
Lecture 13	Emre ACAROĞLU MD Salvage procedures in neglected congenital deformities
Lecture 14	Halit ÖZYALÇIN Conservative treatment of scoliosis

MAY 29 1996

Lecture 15	Stefano BORIANI MD Treatment of primary tumors of the spine
Lecture 16	Mehmet ALTINMAKAS MD Metastatic tumors of the spine

Lecture 17	Osman GÜVEN MD Failed back surgery syndromes. A different aspect of treatment.
Lecture 18	Tarık YAZAR MD Lumbar instability
Lecture 19	Ufuk AYDINLI MD Treatment algorithm in thoracolumbar fractures
Lecture 20	Mehmet Ali TÜMÖZ MD Posterior approach in the treatment of thoracolumbar fractures
Lecture 21	Ünsal DOMANİÇ MD Posterolateral decompression of the thoracolumbar vertebral fractures
Lecture 22	Derya DİNÇER MD Anterior and posterior decompression and stabilisation in the treatment of thoracolumbar fractures.
Lecture 23	Necdet Ş. ALTUN MD Controversies in the treatment of thoracolumbar burst fractures
Lecture 24	A. Kadir AKBAŞ MD Treatment of osteoporotic fractures of the spine
Lecture 25	Haluk AĞUŞ MD Conservative treatment of the thoracolumbar fractures

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Lecture 26	Mahir GÜLŞEN MD Surgical management of ankylosing spondylitis
Lecture 27	Muharrem YAZICI MD Surgical management of myelodysplastic spine deformities
Lecture 28	Çetin ÖNDER MD Classification of spondylolisthesis
Lecture 29	Erol YALNIZ MD Degenerative spondylolisthesis
Lecture 30	İ. Teoman BENLİ MD Animal models in spine research
Lecture 31	Feza KORKUSUZ MD Recent advancements in spinal biomechanics
Lecture 32	Erhan SESLİ MD Scheuermann disease

SCIENTIFIC SESSIONS

MAY 27 1996

Session I	Basic science
Session II	Techniques in spine surgery
Session III	Spinal infections and complications

MAY 28 1996

Session IV	Adolescent idiopathic scoliosis
Session V	Spinal instrumentation
Session VI	Congenital spinal disorders
	Techniques in spine surgery

MAY 29 1996

Session VII	Spinal tumors
Session VIII	Degenerative spine disorders (1)
Session IX	Spinal trauma (1)

MAY 30 1996

Session X	Spinal trauma (2)
Session XI	Degenerative spine disorders (2)
Session XII	Spinal trauma (3)

SCIENTIFIC PAPERS

MAY 27 1996

8.30-8.45	Presidential Address Emin ALICI MD (Turkey)	
8.45-10.00	In Memoriam : Prof. Dr. Güngör Sami ÇAKIRGİL	
Chairmen:	**Rıdvan EGE MD** **Derya DİNÇER MD**	
	8.45-9.14	Rıdvan EGE MD
	9.15-9.30	İlker ÇETİN MD Spondylolisthesis
	9.31-9.45	Ali BİÇİMOĞLU MD Pott's disease
	9.46-10.00	Cem GÖKÇE MD Cervical fractures
10.00-10.30	Break	
Chairmen:	**Mark WEIDENBAUM MD** **Feza KORKUSUZ MD**	
10.30-11.00	Lecture 1	Mark WEIDENBAUM MD (USA) Internal biomechanics of the lumbar intervertebral disc
Session I	**Basic science**	
11.00-11.07	#1	KOROVESSIS P., STAMATAKIS M., SPILIOPOULOU I., BAIKOUSIS A. (Greece) Ig G and IgM concentration in prolapsed human intervertebral disc and their significance for the etiology of sciatica
11.08-11.14	#2	KOROVESSIS P., STAMATAKIS M., KONSTANTINOU D., PARTHENI M. (Greece) Spinal bone mineral density changes following immobilization with Halo for cervical trauma
11.15-11.18	Discussion	Mahir GÜLŞEN MD

11.19-11.25	#3	ATİLLA B., YAZICI M., KOPUZ C. (Turkey) The shape of the lumbar vertebral canal in newborns
11.26-11.32	#4	ÖZLÜ S.. AKALIN S., BENLİ İ.T.. KIŞ M., ÇELİK N., BAZ A.B. (Turkey) Radionucleid and histopathological evaluation of combined allograft and autogenous graft application in anterior and posterior spinal fusion.
11.33-11.39	#5	ALICI E., AKSEKİ D., BOZKURT M., ERDURAN M. (Turkey) Biomechanical investigation of the strength of costal and iliac grafts in the thoracolumbar junction of the calf spine.
11.40-11.44	Discussion	Osman GÜVEN MD
11.45-11.51	#6	UTKAN A., TÜMÖZ M.A. (Turkey) Effects of autoclaving on mechanical strength of ALICI spinal rods and transpedicular screws. (Improved mechanical experiment 2)
11.52-11.58	#7	ANTER M., AYDINGÖZ Ö., ERDOĞAN F., BİLSEL N., ÜÇIŞIK H. (Turkey) The comparison of pull-out strengths of the pedicle hooks of different spinal instrumentation systems on human cadaver spines
11.59-12.05	#8	KUNT M., BULUT O., ÜNSALDI T., ŞAVK Ö. (Turkey) Endurance of posterior spinal system against torsional forces in burst fractures.
12.06-12.10	Discussion	Mark WEIDENBAUM MD
12.11-12.40	**Floor discussion**	
12.40-14.00	**Lunch**	

Chairmen: **Jean-Pierre C. FARCY MD**
Osman GÜVEN MD

14.00-14.30	Lecture 2	Robert B. WINTER MD (USA) Neurofibromatosis
14.31-15.00	Lecture 3	Jean-Pierre C. FARCY MD (USA) Late complications of thoracolumbar fractures
15.01-15.15	Lecture 4	Emin ALICI MD (Turkey) Video Assisted Thoracoscopic Surgery

Session II **Techniques in spine surgery**

15.16-15.21	#9	GÜLŞEN M., TOĞRUL E., HERDEM M., SARPEL Y., ÖZBARLAS S. (Turkey) Combined fusions in spine surgery.
15.22-15.28	#10	AYDINLI U., BİLGEN Ö., KARAEMİNOĞULLARI O., TİŞYAKA K. (Turkey) One stage simultaneous and sequential anterior and posterior spinal surgery
15.29-15.35	#11	HAMZAOĞLU A., TALU U., ŞAR C., ŞENGÜL M. (Turkey) Salvage and reconstructive spinal surgery
15.36-15.42	#12	GÜVEN O., YALÇIN S., KARAHAN M., YILDIRIM Y. (Turkey) Egg-Shell procedure in the various spinal deformities
15.43-15.48	Discussion	**Ünsal DOMANİÇ MD**
15.50-16.00	**Floor discussion**	
16.01-16.30	**Break**	

Chairmen : **Zeki KORKUSUZ MD**
Ali BİÇİMOĞLU MD

16:30-16:45	Lecture 5	Nafiz BİLSEL MD Late Pott paralegia

16:46-17.00	Lecture 6	Mustafa CANİKLİOĞLU MD Iatrogenic complications in spinal surgery
Session III	**Spinal infections and complications**	
17.01-17.07	#13	Battarjee KA (Saudi Arabia) Tuberculosis of the spine
17.08-17.14	#14	BENLİ İ.T., AYDIN E., KIŞ M., AKALIN S., TÜZÜNER M., BAZ A.B. (Turkey) The results of anterior instrumentation in vertebral tuberculosis
17.15-17.21	#15	KAPICIOĞLU M.İ., ARAZİ M., YEL M., KUTLU A. (Turkey) Chemotherapy and surgical intervention on treatment of spine tuberculosis
17.22-17.28	#16	ALPARSLAN B., OKUR A., KARSAN O., KESKİN D. (Turkey) Evaluation of kyphosis angles in the case to whom anterior spinal fusion was applied
17.29-17.33	Discussion	Nafiz BİLSEL MD
17.34-17.40	#17	LAZENNEC JY, LAVILLE C., KONE B., GUERIN - SURVILLE H., ROY-CAMILLE R., SAILLANT G. (France) Postoperative infections of the spine: Technique, indications and the results of the surgical treatment. A retrospective study about 90 patients.
17.41-17.47	#18	KAVAKLI B., TECİMER T., YEDEK İ., KILIÇKAP C. (Turkey) Correction loss after posterior spinal instrumentation in thoracal and lumbar spine fractures.
17.48-17.54	#19	COŞKUNOL E., SESLİ E., ÖZCAN Z., KAYALAR M. (Turkey) Treatment of pressure sores in paralegic patients with gluteal perforator based flap
17.55-17.59	Discussion	Emin ALICI MD
18.00-18.30	**Floor discussion**	

MAY 28 1996

7.30- 8.30	Business Meeting	
Chairmen :	**Ufuk Aydınlı MD** **Haluk Berk MD**	
8.30-9.00	Lecture 7	Robert B. WİNTER MD (USA) Congenital Kyphosis
9.00-9.30	Lecture 8	Eduardo LUQUE MD (Mexico) Neuromuscular scoliosis
9.30-10.00	Lecture 9	Daniel CHOPIN MD (France) Selection of the fusion levels in adolescent idiopathic scoliosis
10.00-10.30	**Break**	
Session IV	**Adolescent idiopathic scoliosis**	
Chairmen :	**Robert B WINTER MD** **Yücel TÜMER MD**	
10.30-10.36	#20	ACAROĞLU E, ALANAY A., AKSOY C., SURAT A. (Turkey) Selection of fusion levels in right sided thoracic adolescent idiopathic scoliosis
10.37-10.43	#21	CANİKLİOĞLU M, GÜNGÖR H., KARAMEHMET-OĞLU M., BAYMAN A., TÜREL Ş.(Turkey) Balance and fusion levels in right sided thoracic adolescent idiopathic scoliosis
10.44-10.50	#22	EBERLE F., ALANDER D. (USA) Maintanence of three dimentional correction of idiopathic scoliosis
10.51-10.55	Discussion	Osman GÜVEN MD
10.56-11.02	#23	DOĞAN M., DİNÇER D., US K. (Turkey) Five years results of CDI in surgical treatment of idiopathic scoliosis

11.03-11.09	#24	LIN HSI-TING, GER CHENG-CHUNG, SHIN CHIN-MIN, CHEN PO-QUANG (Taiwan) CDI for adolescent idiopathic scoliosis: A 2 to 8 years follow-up study
11.10-11.16	#25	ZARZYCKI D, ZARZYCKA M., CIUPIK L.(Poland) Pedicle screw fixation in the lumbar spine of patients with idiopathic scoliosis King Type I, II
11.57-11.21	Discussion	Eduardo LUQUE MD
11.22-11.28	#26	TRANSFELDT E. E, KAYGUSUZ M. A, ANTER M., KOS P. (USA) Association of spondylolisthesis and scoliosis in the same patient
11.29-11.35	#27	KOROVESSIS P., STAMATAKIS M., PAPANASTASIOU D. (Greece) Scoliosis in beta thalassemia, prevelance, etiology
11.36-11.42	#28	BERK H, AKÇALI Ö., GÜL Ö., ALICI E. (Turkey) The effect of anterior spinal instrument derotation on the sagittal contour of the scoliotic spine.
10.51-10.55	Discussion	Daniel CHOPIN MD
11.48-11.54	#29	SOLAKOĞLU C. ALTINMAKAS M., AYDOĞAN N., ŞEHİRLİOĞLU A., MOLLA G. (Turkey) Preoperative and postoperative vertebral rotations in idiopathic scoliosis
11.55-12.01	#30	LEITNER J., GIBSTEIN R. (Israel) Charleston night time bracing vs TLSO for stabilization of scoliosis
12.02-12.08	#31	ERDOĞAN F, AYDINGÖZ Ö., BİLSEL N., HEYBELİ N. (Turkey) Side shifting exercises in the treatment of adolescent idiopathic scoliosis
12.09-12.13	Discussion	Emin ALICI MD
12.14-12.40	**Floor discussion**	
12.40-14.00	**Lunch**	

Chairmen : **Daniel CHOPIN MD**
Emre ACAROĞLU MD

14.00-14.30	Lecture 10	ENSOR E. TRANSFELDT MD (USA) Instability and myelopathy of upper cervical spine
14.31-14.45	Lecture 11	Adil SURAT MD (Turkey) Instrumentation without fusion in immature spine
14.46-15.00	Lecture 12	Azmi HAMZAOĞLU MD (Turkey) The importance of traction X-Ray in recognition and treatment of upper curve in idiopathic scoliosis and its role in selection of fusion area

Session V **Spinal Instrumentation**

15.00-15.06	#32	MELLINGER P. A, PUNO R, BYRD A., WINTER R. B. (USA) Biomechanical evaluation of the Synergy® Spinal System
15.07-15.13	#33	PARISINI P., GREGGI T., CASADEL R., DI LIDDO M., NERI M.P., MONTANARI A. (Italy) Treatment of spinal deformities with Colorado system
15.14-15.20	#34	LUQUE E. (Mexico) GDHL in the lumbar spine
15.21-15.27	#35	US K., KINIK H., YAZAR T., ÖĞÜN T. (Turkey) İbni Sina posterior instrumentation technique and early results.
15.28-15.34	#36	ZARZCKI D., CIUPIK L. (Poland) DisCom-new spinal instrumentation for anterior stabilization of thoracolumbar spine.
15.35-15.40	Discussion	ENSOR E. TRANSFELDT MD
15.41-16.00	**Floor discussion**	
16.00-16.30	**Break**	

Chairmen: **ENSOR E. TRANSFELDT MD**
ÜNSAL DOMANİÇ MD

16.30-16.45	Lecture 13	Emre ACAROĞLU MD (Turkey) Salvage procedures in neglected congenital deformities.
16.46-17.00	Lecture 14	Halit ÖZYALÇIN MD (Turkey) Conservative treatment of scoliosis
Session VI	**Congenital spinal deformities Techniques in spine surgery**	
17.01-17.07	#37	YAZICI M., ASHER M. (USA) Surgical treatment of spine deformities in patients with spina bifida cystica
17.08-17.14	#38	ACAROĞLU E., ALANAY A., LEBLEBİCİOĞLU G., SURAT A. (Turkey) Analysis of risc factors associated with corrective surgery in congenital scoliosis with tethered cord
17.14-17.21	#39	MRABET A., JEMEL M., SLİMA N., KHALDİ M., DAGHFOUS M.S. (Tunusia) Occult spinal dysraphism our experience in Tunusia
17.22-17.26	Discussion	Azmi HAMZAOĞLU MD
17.27-17.33	#40	LUQUE E (Mexico) Spinal shortening procedures
17.34-17.40	#41	VERDIEV V.G., FISHENKO V.Y. (Azarbaijan) New methods of elevational thoraxoplastic by the scoliosis
17.41-17.47	#42	CANİKLİOĞLU M., MİRZANLI C., AZAR N., KUTLU H., KARAMEHMETOĞLU M. (Turkey) Controlled release with dynamic external fixator before fusion in rigid kyphoscoliosis
17.48-17.54	#43	DOMANİÇ Ü., ŞAR C., ÇETİNKAYA S., ESENKAYA İ. (Turkey) Posterior total wedge resection osteotomy for surgical treatment of rigid kyphosis.
17.55-18.00	Discussion	Jean-Pierre C. FARCY MD
18.01-18.30	**Floor discussion**	

MAY 29 1996

7.30- 8.30	Business Meeting	
Chairmen:	**Stefano BORIANI MD** **Mehmet ALTINMAKAS MD**	
8.30-9.00	Lecture 15	Stefano BORIANI MD (Italy) Treatment of primary tumors of the spine.
9.01-9.15	Lecture 16	Mehmet ALTINMAKAS MD (Turkey) Treatment of metastatic tumors of the spine.
Session VII	**Spinal Tumors**	
9.16-9.22	#44	VERDIEV V. G., SADYKHOV L.G (Azarbaijan) Surgical treatment of nonmalignant and tumor like defects of the spine
9.23-9.29	#45	ERALP L., ŞAR C., HAMZAOĞLU A.,ŞENGÜL M. (Turkey) Methods of surgical treatment for primary tumors of the spine
9.30-9.36	#46	POSTALCI L., ORTAESKENAZİ H., KEPOĞLU Ü. (Turkey) Spinal meningiomas
9.37-9.40	Discussion	Stefano BORIANI MD
9.41-9.47	#47	BORIANI S., BIAGINI R., DeIURE F., BANDIERA S. CAMPANACCI L., DiFIORE M., SICCARDI G. (Italy) Diagnostic and therapeutic strategy for bone tumors of the spine above sacrum
9.48-9.50	Discussion	Emin ALICI
9.49-10.10	**Floor Discussion**	
10.10-10.30	**Break**	

Chairmen: **Adil SURAT MD**
Necdet Ş. ALTUN MD

10.31-10.45	Lecture 17	Osman GÜVEN MD (Turkey) Failed back surgery syndromes. A different aspect of treatment
10.46-11.00	Lecture 18	Tarık YAZAR MD (Turkey) Lumbar instability
Session VIII	**Degenerative spine disorders (1)**	
11.01-11.07	#48	KEPOĞLU Ü., ŞENTÜRK İ., TUTKAN İ., ARSLAN B., TATARLI N., ORTAESKENAZİ H., BİLGİÇ S., ORAL Z. (Turkey) Cervical discopaties and degenerative disease
11.08-11.14	#49	GÜLŞEN M., ÖZBARLAS S., HERDEM M., BAYTOK G., KAYASELÇUK U., ÖZDEN C. (Turkey) The posterior cervical lateral mass plate technique
11.15-11.21	#50	GÜVEN O., YALÇIN S., KARAHAN M., SEVİNÇ T. (Turkey) Lumborasacral fixation problems
11.22-11.26	Discussion	Tarık YAZAR MD
11.27-11.33	#51	EGE C., KIZILAY C., KUTLUAY E. Posterolateral fusion and instrumentation of spondylolisthesis
11.34-11.40	#52	BAZ AB., BENLİ İ T., KIŞ M., AKALIN S., GÜRSES L., BAVBEK M. (Turkey) Posterior instrumentation in the treatment of vertebral instabilities due to post neurosurgical procedures
11.41-11.46	Discussion	Zeki KORKUSUZ MD
11.47-11.53	#53	EREL N., ÇAYKIR Y., KIZILAY C., GÖRE T., SEBİK (Turkey) The treatment of spondylolisthesis with posterior lumbar interbody fusion

11.54-12.00	#54	ŞAR C., DOMANİÇ Ü., TALU U., ÇETİNKAYA S. (Turkey) Surgical treatment of spondyloptosis
12.01-12.07	#55	SESLİ E., ÖZYALÇIN H., ÖZSOY H. (Turkey) The surgical treatment of degenerative spondylolisthesis
12.08-12.12	Discussion	Yücel TÜMER MD
12.13-12.40	**Floor discussion**	
12.40-14.00	**Lunch**	
Chairmen:	**Emin ALICI MD** **Abdülkadir AKBAŞ MD**	
14.00-14.15	Lecture 19	Ufuk AYDINLI MD (Turkey) Treatment algorithm in thoracolumbar fractures.
14.16-14.30	Lecture 20	Mehmet Ali TÜMÖZ MD (Turkey) Posterior approach in the treatment of thoracolumbar fractures
14.31-14.45	Lecture 21	Ünsal DOMANİÇ MD (Turkey) Posteolateral decompression of the thoracolumbar vertebral fractures
14.46-15.00	Lecture 22	Derya DİNÇER MD (Turkey) Anterior and posterior decompression and stabilization in the treatment of thoracolumbar fractures
15.01-15.15	Lecture 23	Necdet Ş, ALTUN MD (Turkey) Controversies in the treatment of thoracolumbar burst fractures.
15.16-15.30	Lecture 24	A. Kadir AKBAŞ MD (Turkey) Treatment of osteoporotic fractures of the spine
15.31-15.45	Lecture 25	Haluk AĞUS MD (Turkey) Conservative treatment of the thoracolumbar fractures
15.45-16.00	**Floor Discussion**	

16.00-16.30	**Break**	
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16.31-16.37	#56	IŞIKLAR Z.U., LİNDSEY R. W. (USA) Low velocity civilian gunshot wounds of the spine in an urban setting
16.38-16.44	#57	ŞAR C., HAMZAOĞLU A., DOMANİÇ Ü., ÇETİNKAYA S. (Turkey) Surgical treatment for fractures of the cervical spine.
16.45-16.51	#58	EREL N., KUTLUAY E., EGE C., GİLİM E., SEBİK A. (Turkey) The treatment of thoracolumbar burst fractures by anterior procedure
16.52-16.56	Discussion	Ufuk AYDINLI MD
16.57-16.56	#59	YAZICI M., ATİLLA B., TEPE S., ÇALIŞIR A. (Turkey) Spinal Canal remodelling in burst fractures of the thoracolumbar spine.
16.57-17.03	#60	SERİN E., KARATOSUN V., KÖSEOĞLU H.C., BALCI C., ERSOY H.H. ÜLKÜ Ö. (Turkey) Canal encroachment and neurologic deficit relation in thoracolumbar spine fractures
17.04-17.10	#61	BİLSEL N., HANCI M., AYDINGÖZ Ö., ERDOĞAN F., GÖKÇE A (Turkey) Comparison of different methods in the surgical treatment of burst fractures
17.18- 17.22	Discussion	Haluk BERK MD
17.22-18.00	**Floor discusion**	

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Chairmen:	**Azmi HAMZAOĞLU MD** **Teoman BENLİ MD**	
8.30-8.45	Lecture 26	Mahir GÜLŞEN MD (Turkey) Surgical management of ankylosing spondylitis
8.46-9.00	Lecture 27	Muharrem YAZICI MD (Turkey) Surgical management of myelodysplastic spine deformities
Session X	**Spinal trauma (2)**	
9.01-9.07	#62	LAZANNEC JY, SAILLANT G., SAIDI K., ROY-CAMILLE R., LAVILLE C. (France) Traumatic lessions of cervical spine in ankylosing spondylitis. Our experience about 16 cases.
9.8-9.14	#63	SAPKAS G., EFSTATHIOU P., BADEKAS A., LAMBRINAKOS P. (Greece) Operative treatment of unstable lower cervical spine injuries
9.15-9.21	#64	KOROVESSIS P., BAIKOUSIS A., STAMATAKIS M. (Greece) Is the use of the TSRH instrumentation effective when treating thoracolumbar spine trauma?
9.22-9.28	#65	STAREV P., STOCOV L. (Bulgaria) Dorsal stabilization in fracture dislocations of the thoracolumbar spine
9.29-9.35	#66	EFSTATHIOU P., SAPKAS G., MAKRIS A., KYRATZOULLIS J. (Greece) Thoracolumbar burst fractures: Correlation between post traumatic spinal canal stenosis and initial neurologic deficit
9.36-9.41	Discussion	Emin ALICI
9.42-10.00	**Floor discussion**	
10.00-10.30	**Break**	

Chairmen: **Eduardo LUQUE MD**
Mahir GÜLŞEN MD

10.30-10.45	Lecture 28	Çetin ÖNDER MD (Turkey) Classification of spondylolisthesis
10.46-11.00	Lecture 29	Erol YALNIZ MD (Turkey) Degenerative Spondylolisthesis

Session XI **Degenerative spine disorders (2)**

11.01-11.07	#67	MANKİN M. (Israel) Reduction of dorsal lumbar angulation
11.08-11.14	#68	LAZANNEC JY., SAILLANT G., DAOU E., LAUDET CG., HAMMA A., LAVILLE C. (France) Posterior fixation of the cervico thoracic hinge. A biomechanical and clinical study about 48 cases
11.15-11.21	#69	ALICI E., BAKTIROĞLU L., KARAKAŞLI A., BOYA H., ÖZCAN C. ŞENSES İ. (Turkey) Biomechanical comparison of two versus three screw plate fixation for the lumbo-sacral fixation.
11.22-11.26	Discussion	Derya DİNÇER MD
11.27-11.33	#70	KOROVESSIS P., STAMATAKIS M., REPANTI M., BAIKOUSSIS (Greece) The aging process within the lumbar intervertebral disc
11.34-11.39	#71	RASHEED M. I. (Saudi Arabia) Laser discectomy for lumbar disc prolapse
11.40-11.46	#72	PAVLOVCIC V. (Slovenia) Repair of lumbar spondylolysis and grade I spondylolisthesis with a hook screw.
11.47-11.51	Discussion	İlker ÇETİN MD
11.52-11.57	#73	BATERJEE K.A., RASHEED M. I. (Saudi Arabia) Lumbar spine instability and failure, success of operative treatment

11.58-12.04	#74	Cheng-Chung GER, Hsi-Ting LIN, Chih-Min SHIH, Po-Quang CHEN (Taiwan) Clinical outcome of the instumented lumbosacral fixation. A 3 to 8 years follow-up study
12.05-12.11	#75	O'BRIEN JP (UK) Anterior spine fusions in low back pain syndromes
12.12-12.16	Discussion	Adil Surat MD
12.17-12.40	**Floor discussion**	
12.40-14.00	**Lunch**	
Chairmen	**İlker ÇETİN MD** **Tarık YAZAR MD**	
14.00-14.15	Lecture 30	İ. Teoman BENLİ MD (Turkey) Animal models in spine research.
14.16-14.30	Lecture 31	Feza KORKUSUZ MD (Turkey) Recent advancements in spinal biomechanics
14.31-14.45	Lecture 32	Erhan SESLİ MD (Turkey) Scheuermann disease
Session XII	**Spinal trauma (3)**	
14.46-14.52	#76	SESLİ E, ÖZYALÇIN H., KAYALAR M., ÖZKAYIN N. (Turkey) The Modified Spinal System (MSS) Instrumentation in the treatment of thoracolumbar vertebra fractures
14.53-14.59	#77	AKPINAR F., TOSUN N., DOĞAN A., İSLAM C (Turkey) The treatment of thoracal and lumbar vertebrae fractures by Alıcı spinal system
15.00-15.06	#78	ALICI E., KIRIMCA M., BERK H., GÖÇEN S., AKSU G. (Turkey) Neurological deficit in relation to the canal encroachment and level of thoracolumbar fractures.

15.07-15.11	Discussion	Haluk AĞUŞ MD
15.12-15.18	#79	ALTUN N.Ş., TAKKA S., VURAL A., ŞATANA T., SARBAN S. (Turkey) Efficacy of indirect reduction in thoracolumbar vertebra fractures
15.19-15.25	#80	TECİMER T., ZAYİM E., DÖĞERLİ E., BERKEL T. (Turkey) Multisegmental spine fractures
15.26-15.32	#81	ERGÜVEN M., UTKAN A., CILIZ A., KÖSE C. (Turkey) Surgical treatment of multiple level contiguous thoracolumbar vertebrae fractures
15.33-15.37	Discussion	Mehmet ALTINMAKAS MD
15.38-15.44	#82	TABAK AY., GÜNEL U., ÖMEROĞLU H., SARSU A., BİÇİMOĞLU A (Turkey) Effect of properly and inproperly inserted pedicular screws on the results of spine fractures
15.45-15.51	#83	YALÇIN S., MECİKOĞLU M., SEVİNÇ T., GÜVEN O. (Turkey) The screw at the fractured vertebrae: It's merits and hazards
15.52-15.58	#84	ELGİN MA., ESENKAYA İ., TÜRKMEN İ. M., GÖRGEÇ M. (Turkey) Comparison between Harri-Luque method and transpedicuar fixation systems in the surgical treatment of the thoracolumbar spine fractures
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16.04-16.10	#85	GÖKÇE C., ŞENEL Ş., ÖZAL M., KÜÇÜK M.I. (Turkey) The comparison of stabilization techniques of unstable thoracolumbar vertebra fractures and are not stabilized because of different reasons
16.12-16.17	#86	UTKAN A., DAYICAN A., ERGÜVEN M., TÜMÖZ M. A. (Turkey) The management of thoracolumbar vertebral fracture dislocations

16.18-16.24	#87	SERİN E., KARATOSUN V., KÖSEOĞLU H.C., BALCI C., ERSOY H.H., ÜLKÜ Ö. (Turkey) Complications of posterior surgical stabilisation in the treatment of thoracolumbar spine fractures.
16.25-16.32	#88	ALTINMAKAS M., AYDOĞAN N, ŞEHİRLİOĞLU A., , YAMAN H., MOLLA G. (Turkey) Transpedicular screw application to the fractured vertebra
16.33-16.38	Discussion	Nejdet Şükrü ALTUN MD
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Horizontal plane analysis of the idiopatic scoliotic curves treated with the ISOLA spinal instrumentation

P#2 SCHULZ K., PANSER D.
The operative treatment of scoliosis at the orthopaedic clinic of the university of Rostock

P#3 ÇITAK M., BENLİ İ. T., KIŞ M., AKALIN S., BAZ A.B.
Single rod technique in idiopathic scoliosis

P#4 AKALIN S., TÜZÜNER M., KIŞ M., BENLİ İ. T., ÖZLÜ S., BAZ A. B
The early results of anterior release and instrumentation in the treatment of idiopathic scoliosis patients

P#5 BENLİ U. S., BENLİ İ.T., KIŞ M., AKALIN S.,, VARLI K., TAN E.
Electrophysiological evaluation and surgical treatment results of a scoliosis patient with Friedric ataxia

P#6 DEVİREN V., ACAROĞLU E., SURAT A.
Is T1 rotationaly aligned with clavicles?

Congenital scoliosis

P#7 US. K., DEMİRÖRS H., SELÇUK M., SELEK H., MERGEN E.
Two stage resection of hemivertebra for the treatment of congenital lumbar scoliosis. (Case presentation)

P#8 AYDINLI U., ÇELEBİ S., ÖZERDEMOĞLU R.
Congenital vertebral displacement

P#9 BEKTAŞ U., AY Ş., GÜRKAN İ., MERGEN E.
Congenital anomalies of vertebrae and associated deformities

P#10 ALANAY A., ACAROĞLU E., SURAT A.
Multiple dural ectasia associated with neurofibromatosis scoliosis : A case report

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Surgical treatment of degenerative disorders of the lumbar spine

P#12 AZAR N., MİRZANLI C., CANİKOĞLU M., GÜNGÖR H., BAYMAN A.
Surgical treatment of symptomatic spondylolisthesis

P#13 US K., KINIK H., YAZAR T., ÖZDEMİR M., KORKUSUZ Z.
İbni - Sina anterior spinal instrumentation and our results in the treatment of thoracolumbar vertebral instabilities

P#14 AKALIN S., BENLİ İ. T., KIŞ M., TÜZÜNER M., ÖZLÜ S., BAZ A. B.
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P#15 KİRİŞOĞLU Ü., ERBAYRAKTAR S., ERK S., ÖZER H., GÜNER M.
Surgical treatment of cervical spondylotic myelopathy

P#16 KASAROĞLU D., BİLGE T., YAYMACI Y., DOĞU H., TOPSAKAL C., ACAR C., BARUT Ş., AYDIN Y.
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P#17 ERBAYRAKTAR S., KİRİŞOĞLU Ü., GÜNER M., ACAR M., MERTOL T.
Laser discectomy in cervical disc with laser disc herniations

P#18 ERBAYRAKTAR S., KİRİŞOĞLU Ü., GÜNER M., ACAR Ü., MERTOL T.
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P#19 ÖSÜN A., YÜCESOY K., YÜKSEL Z., MERTOL T., GÜNER M.
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P#20 MERTOL T., BİLGE B, YÜCESOY K., ÖSÜN A.
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P#22 MİRZANLI C., AZAR N., KARAMEHMETOĞLU M., KUTLU H., CANİKLİOĞLU M.
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Short segment transpedicular screw application in the treatment of lumbar spine fractures

P#24 GÖKÇE C., KARAKAYA Y., TURAN S.
The application of anterior decompression plate - screw and grafting in the patients with thoracolumbar spine fractures

P#25 ATLIHAN D., ATEŞ Y., DİNDAR N., AKSOY G., PARMAKSIZ Ö., YILDIRIM H.
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P#26 ATLIHAN D., ATEŞ Y., DİNDAR N. AKSOY G., PARMAKSIZ Ö., YILDIRIM H.
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P#27 TEZEREN G., TURGUT Ş., TÜRKER S., DEREBOY F., AVCI S.
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P#28 ALTUN N.Ş., KAYMAK Ö., VURAL A. M. TAKKA S.
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P#29 KÖSEOĞLU H. C., KARATOSUN V., SERİN E., BALCI C., ERSOY H., ÜLKÜ Ö.
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#1

IgG and IgM CONCENTRATION IN PROLAPSED HUMAN INTERVERTEBRAL DISC AND THEIR SIGNIFICANCE FOR THE ETIOLOGY OF SCIATICA

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PURPOSE OF THE STUDY ; The aim of this study is to expand our know ledge about the pathogenesis of back pain and sciatica in disk herniation. A prospective study was conducted in patients operated because of sciatica and the results were compared to those of controlls.

MATERIAL - METHODS ; Nuclei pulposi retrieved from 10 patients operated upon for sciatica due to disk herniation and from 8 patients used as controls. Were homogenized and together with serum and cerebrospinal fluid were examined for local production of IgG and IgM by rate nephelometry.

RESULTS ; There was found an elevated raito IgG_{NP}/ $IgG_S x 10_3$ and IgM_{NP}/ $IgM_S x 10_3$ in all patients - samples, where as only the IgM_{NP}/ $IgM_S x 10_3$ ratio was significantly higher ($p<0.005$) when compared to those of the control values.

CONCLUSIONS ; Possibly these findings are related to an inflammatory reaction close to the nerve root and prolapsed NP and may contribute to the hypothesis of inflammatory origin the sciatica.

#2

SPINAL BONE MINERAL DENSITY CHANGES FOLLOWING IMMOBILIZATION WITH HALO FOR CERVICAL TRAUMA

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Purpose of the Study ; In this prospective study we attempted to follow the bone mineral density (BMD) changes of the injuired cervical spine being immobilized with the Halo-vest.

Background Data ; Thousands of spinal braces are used each year either for postoperative stabilization or for conservative treatment of several diseases of the lumbar, thoracic and cervical spine. The Halo-cast was first used for postoperative immobilization after cervical spine fusion in 1959. More recently the Halo device is most often used to treat traumatic injuries of the cervical spine and has proved to be an effective treatment method.

Mateiral and Methods ; In order to define the natural history of cancellous vertebral bone loss and remain dual-energy densitometry was used on each of ten selected cervical spines in the lateral view 1) immediately after the application of the device, 2) in the end of the treatment with the Halo and 3) three months after removal of the Halo-vest. The age of the patients ranged from 18 to 80 years. The duration of the Halo immobilization was 9.5 weeks ranging from 8 to 13 weeks.

Results; The Halo-vest produces local osteoporosis in the immobilized cervical spine with an overall reduce of bone mineral density averaging 2.83% ($p<0.05$). The response of the cervical spine to immobilization was only slightly different from patient to patient and between different vertebral bodies in each particular spine. The type and the level of injury of the cervical spine were not related to the changes of BMD, age and gender of the patient, whereas the local osteoporosis was mostly reversible in the follow-up evaluation of 5-6 months.

Conclusion ; The Halo-vest immobilizes the whole cervical spine sufficiently resulting in a temporary and completely reversible local osteoporosis which can be compared with that in the extremities.

#3

THE SHAPE OF THE LUMBAR VERTEBRAL CANAL IN NEWBORNS

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STUDY DESING ; Shape of the lumbar vertebral canal was examined with regard to it's shape and the incidence of trefoilness.

OBJECTIVE ; Spinal canals of the L4-5 vertebrae were examined in stillborn infants. This study was undertaken because there is a lack of data on newborn vertebrae.

SUMMARY OF BACKGROUND DATA ; The last two lumbar vertebras of 32 stillborn term infant cadavers were removed and examined from the collection of the Anatomy Department of Ondokuz Mayıs University.

METHODS ; After removal of the L4-5 vertebrae they were processed and embedded into paraffin blocks in order to have accurate axial slices at the pedicle level.

Subsequently : nonmagnified images were obtained through a color photocopy machine. These two dimentional images were scanned to a computer.

Computerized images were provided the accurate measurements. The shape of the canal was examined to assess the circularity, the trefoilness and the location of centroid.

RESULTS ; Trefoilness measurements according the criterie set by Porter indicated that trefoil shaped spinal canal does not exist in newborns. Spinal canal at this age mostly resembles a dome-shape.

CONCLUSION ; In accordance with the previous statements made by other authors a trefoil shape of the lumbar vertebra does not occur at the end of the intrauterine period.

#4

RADIONUCLID AND HISTOPATOLOGICAL EVALUATION OF COMBINED ALLOGRAFT AND AUTOGENEUS GRAFT APPLICATIONS IN ANTERIOR AND POSTERIOR SPINAL FUSION

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Autogeneus grafting is most effective choice in obtaining fusion in spinal surgery. Allograft usage is also popular especially when the autogeneus graft mass is insufficient. In this study, 42 patients were evaluated in whom Tutoplast allografts and autogeneus grafts were combined for fusion at Departments of Orthopaedics and Traumatology of Ankara Social Security Hospital. Besides radiological evaluation at 6 th and 12 th months, Tc 99 MDP bone scintigraphic studies of the patients were done. Twenty patient had vertebral fractures and 22 patients had idiopathic scoliosis. A solid fusion mass was observed radiogaphically and scintigraphically. Histopathologic studies of 11 patients with implant removal and 5 patients of control group who had only autogeneus grafting were done. Any significant histopathological differences were not observed in fusion masses of the patients. In light of these findings it is concluded that autograft combination can be used in selected cases.

#5

BIOMECHANICAL INVESTIGATION OF THE STRENGTH OF THE COSTAL AND ILIAC GRAFTS IN THE THOROCALUMBAR JUNCTION OF THE CALF SPINE

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INTRODUCTION: Treatment of the burst fractures of the thoracolumbar spine is still controversial. Anterior corpectomy, anterior grafting and anterior or posterior stabilization is recommended by many authors especially in the presence of neurologic and/or osseous instability. Many authors prefer iliac strut grafting after corpectomy, but to our knowledge no studies exist in the literature comparing the iliac grafts to the costal grafts. Purpose of the present study was to compare the strength of iliac to the costal grafts in calf spines.

MATERİAL AND METHOD : T11, T12, and L1 vertebrae of the 14 adult calf spines are dissected and appropriately prepared for mechanical testing. The spine segments were stored at -20 C in double-wrapped plastic bags until time of testing. All spines were screened radiographically and rejected if spine segments were found to have bony abnormalities. Corpectomy was performed to the T12 level in all specimens. T11 and L1 vertebrae are put into a molde which including liquid polyester to achieve a smooth surface for a homogen loading from below and top after became hard of the polyester. Tricortical iliac grafts are preapared from the same calfs and put into the corpectomy area in 7 specimen. For the remaining 7 specimen 3 pierces of costa according to the length of the graft area are prepared from one costa of the same calf. Holes according to the costal grafts are prepared at the T11 and L1 vertebrae for optimal and stiff positioning. All specimens underwent axial loading on Instron 1114 (Canton MA). During axial loading deformations and fracture of the grafts and/or adjacent vertebrae are noted. Statistical evaluation was performed with Mann Whitney-U test.

RESULTS: Mean maximum load without any damage to the grafts was 664 N in tricortical iliac strut grafts (TCISG) and was 1241 N in costa grafts. Mean

strength to the loading was 1508 N in costa grafts, and was 832 N in tri-cortical iliac strut grafts. Mean shift was 9.47 mm in TCISGA and 12.76 mm in costa grafts. All differences between two groups were statistically significant. Failure was observed at the superior end plate of the L1 and inferior end plate of the T11, and iliac, costal grafts in all specimens. Most common sites of the failure were inferior end plate of the T11 and superior end plate of the L1 vertebrae. Serious damage was observed in only 2 of the TCISG and 1 of the costa graft.

CONCLUSION: In our study costal grafts are stronger than tricortical iliac grafts in calf spines. Although calf and human spines are different in osseous architecture and features, the present study may mimic comparison of these two different grafts as in human. Advantages of the using of the costa grafts were, no need of additional incision, shortening of the operation time, less morbidity, and with the results of this study more stability.

#6

EFFECT OF AUTOCLAVING ON MECHANICAL STRENGTH OF ALICI SPINAL RODS AND TRANSPEDICULAR SCREWS (IMPROVED) MECHANICAL EXPERIMENT 2

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A mechanical study was performed to evaluate if autoclaving different times has any effect on mechanical strength of Alıcı Spinal Implants and was presented as a poster at III. International Congress On Spine Surgery. This study was improved according to criticism that were were faced with.

The most of the Spinal Instrumentation system are offered to the surgeon as an set of different size implants. After each operation missed ones are completed. Therefore one can find different times autoclovised implants in the same set. High temperature may affect carbon bound of metals. If autocloving had any effect in this respect, implants with different mechanical properties might be found in the same set.

Twelve 10 mm, twelve 20 mm Alıcı-I rod and six 45 mm, six 55 mm Alıcı-I transpedicular screw obtained from factory were divided in six groups, taking two from each. Group were autoclovised (saturated steam at a pressure of 750 mm Hg at a temperature of 120 °C minimum 45 minute) 0, 25, 50, 75, 110, 125 times. Each autoclavisation was performed at separate days.

At "TSE", tensile strength of transpedicular screws and 3 point bending strength of rods were checked on Instron machine by applying load 5 cm/min. Stress-strain graphs of each implant was drawn (figure 1). Ultimate tensile strengths, the maximum stress the material can sustain before fracturing, are calculated.

Ultimate loads were found to be between 135 - 140 kgs for rods and 1240-1300 kgs for transpedicular screws. There wasn't any significant difference between the groups. The results were similar with the previous study although autoclavisation number increased 5 times.

In conclusion autoclaving doesn't make any change on 3 point bending strength of Alıcı-I rods tensile strength of Alıcı-I transpedicular screws.

#7

THE COMPARISON OF PULL-OUT STRENGTHS OF THE PEDICLE HOOKS OF DIFFERENT SPINAL INSTRUMENTATION SYSTEMS ON HUMAN CADAVER SPINES

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Failure of the bone-metal interface in posterior spinal instrumentation system is still a problem in spinal surgery. The posterior pull-out of the upper hooks with or without loss of correction is a relatively common problem postoperatively. We have performed a serial of experiments on the human cadaver thoracolumbar spines for clarifying the reasons of the upper hook pull-out phenomena. In these tests, we compared the anatomical pedicle hooks with the non-anatomical pedicle hooks concerning the posterior pull-out strength with Instron Universal Test Machine. Finally, we were able to decide that the design and contact surface with and depth of the hook blade are important factors for the posterior pull-out strength. Because of the contact surface area of the anatomical pedicle hooks are greater than that of nonanatomical pedicle hooks, maximum load to failure of the anatomical hooks is also higher. Except from the effect of the contact surface area of the pedicle hooks on the pull-out strength, rod contouring, careful technique of the hook site preparation and selection of the fusion levels accurately, avoiding the overdistraction intraoperatively, use of claw construct and insertion, preoperative evaluation of the patient and supporting the upper hooks with sublaminar wiring are also effective against the failure of the upper hooks postoperatively.

#8

ENDURANCE OF POSTERIOR SPINAL SYSTEMS AGAINST TORSIONAL FORCES IN BURST FRACTURES (BIOMECHANICAL STUDY)

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For preventing from postoperative kyphosis and loss of reduction superiorities of various posterior spinal systems to each other have been discussed several modifications in performing these system have been offered in the treatment of thoracolumbar burst fractures.

This study was fulfilled for trial of resistances of different posterior spinal systems against torsional forces. 8 fresh thoracal 11 to lumbar 3 spines from calves were dissected off muscle but remaining soft tissue. Burst fractures were produced at L1. We applied Posterior Alıcı Spinal System (PSS) to superior first and second and inferior first and inferior first and second vertebrae influences of conbined axial compressional flexion and rotational forces on spinal models from calves were tested in an instrument specially prepared. Loading capacities of systems were respectively 800 and 8600 Newton.

We concluded that there was no increase in resistance against torsional forces when more spinal segments were fixed. But this increase isn't significant. Because of various disadvantages of fixing more spinal segments it should be avoided.

#9

COMBINED FUSIONS IN SPINE SURGERY

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Between January 1989-May 1995 fifty-six patients underwent combined spinal fusion in our department. The cases were 28 (50%) males and 28 (50%) females with a mean age of 21.62 (3-65). The indications for combined fusion in our patients were as follows; paralytic scoliosis in 11(19.6%), Pott's disease in 9 (16%), congenital scoliosis in 7 (12.5%), congenital kyphosis in 7 (12.5%) fractures in 6 (10.7%), idiopathic scoliosis in 4(7.1%), degenerative instability in 3(5.4%), ankylosing spondylitis in 1 (1.8%), and adolescent scoliosis in 1 (1.8%) Anterior and posterior fusion 7 cases were performed in the same sesion. Anterior fusion was performed prior to posterior in all patients except two cases who were supplemented by anterior fusion after insufficient posterior instrumentation. Anterior approach was performed as anterior cervical in 3, thoractomy in 215, thoracoabdominal in 21, lumbar retroperitoneal in 7 patients.

We observed 7 serious complications: Death in 1 case , neurologic impairment in 2, pseudoarthrosis in 1, implant failure in 2 and graft dislocation in 1 case.

Anterior and posterior fusion could be performed in the same or different sessions. If the condition of the patient permist, one stage combined surgery should be prefferred. As it seems a heavy procedure, combined fusion could improve the success of surgery with appropriate indication and patient selection.

#10

ONE STAGE SIMULTANEOUS AND SEQUENTIAL ANTERIOR AND POSTERIOR SPINAL SURGERY

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Twentythree patients were treated by one stage anterior and posterior spinal surgery.

Eleven patients underwent simultaneous anterior and posterior spinal surgery. Burst fractures were the predominating pathologic indication for surgery. The average operation time was 5 hours (4-6 hrs). No major complication was observed, except one patient died because of mycardial infarction during postoperative hospitalization period.

Twelve patients underwent sequential anterior and posterior spinal surgery. Deformities were the predominating pathologic indication for surgery. The average operation time was 6 hours (5-8 hrs). Two patients had late posterior wound infection.

Simultaneous anterior and posterior spinal surgery is a good alternative, especially for pathologies including 2 to 3 vertebral segment. This procedure providies the abilitiy of manipulating both anterior and posterior aspects of the spine at the same time period, and appears to result in less blood loss, shorter operative time and provides early recovery.

#11

SALVAGE AND RECONSTRUCTIVE SPINAL SURGERY

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INTRODUCTION: reconstructive spine surgery consists of additional surgical procedures necessrar for achieving a solidly fused and balanced spine in residual deformities after previous surgery. The majority of patients who need reconstructive surgery are patients with idiopathic scoliosis and neuromuscular deformities of the spine. Pseudoarthrosis, curve progression, loss of lumbar lordosis, trunk-shift and lateral decompensation, short fusion or disc degeneration below the fused area would be the major causes leading to reconstructive surgery.

PATIENTS: Seven patients had reconstructive spinal surgery between 1992 and 1995. Of these four were idiopathic, two were paralytic and one was congenital scoliosis. Two of the idiopathic cases had previous posterior fusion with Drummond technique and they had anterior and posterior reconstructive surgery because of excessive kyphosis at thoracolumbar junction just below the fused segments. The third idiopathic scoliois patient also had anterior and posterior surgery because of the increased deformity and pseudoarthrosis. The fourth one had increased deformity, trunk-shift and pelvic tilt despite previous anterior discectomy and posterior fusion and stabilization. We performed a re-anterior fusion and erior egg-shell procedure, posterior osteotomy and extended the fusion to the sacrum. So that pelvic tilt in this patient was corrected by anterior and posterior lumbosacral fusion. Two patients with polio and paralytic scoliosis had previous Luque-Galveston but pseudoarthrosis and rod-breakage occured. Anterior discectomy and anterior and posterior fusion were performed in theese two cases. The congenital scoliosis case had three previous posterior surgery. In this case anterior discectomy including L5-S1 level, anterior egg-shell procedure, posterior osteotomy and extension of the fusion to S1 and sacrum were performed in order to correct pelvic tilt and trunk-shift deformity and stabilize.

CONCLUSION: It is crucial for planning reconstructive spine surgery that 3-D analysis of the spine and deformity should be performed. Fusion should be extended to the sacrum in patients as well. Reconstructive surgery is more difficult and demanding compared to primary procedures and requires careful planning.

#12

EGG-SHELL PROCEDURE IN THE TREATMENT OF VARIOUS SPINAL PROBLEMS

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Egg-shell procedure is performed in the treatment of most kyphotic deformity and some scoliosis cases. Since 1993 we performed the Egg-Shell procedure in 8 cases. Patients can be classified in 3 groups. Group 1; Kyphosis due to old tuberculosis infection. It's a sequela of spinal tubeculosis. There were 3 patients in this group. Group 2; congenital kyphosis. 1 patient. Group 3; failed back syndrome with epidural fibrosis and loss of lomber lordosis. There were 4 patients in this group. Mean follow up was 20.6 months.

RESULTS: In group 1 all three patients were corrected in one stage posteriorly without any complication. In group 2 patient with congenital kyphosis is corrected without any complication in one stage. In group 3 four patients with severe back and leg pain due to epidural fibrosis as a result of previous operations were treated with egg-shell method. Lumbar lordosis is re-established, and spinal cord is relaxed due to shortening of the posterior column. Patients are (reconstructive surgery) completely sahisfied with this procedure. There were no back and leg pain post-operatively.

CONCLUSION: Egg-shell method a reliable and useful method which every spinal surgeon should be aware of it. It can be used with different purposes with special indications.

#13

THE SURGICAL TREATMENT OF NON-MALIGNANT TUBERCULOSIS OF THE SPINE

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Spine tuberculosis is a well known pathology. Although many methods of correction of kyphotic deformities, evacuation of the abscess and stabilization the spine have been reported-the best choice is said to be the radical anterior evacuation of the abscess with bone grafting and posterior stabilization. By this method, the patient is subjected to undergo major surgery with prolonged time of surgery, or, he will be subjected to two surgeries, if not done in the same session. Posterior transpedicular extensive bilateral evacuation of the abscess and transpedicular bone grafting has been done for 11 patients with simultaneous posterior transpedicular stabilization of the spine. Good results have been obtained which support the credibility of the idea and solid fusion has been achieved after follow up after 24 months. Not only have we achieved good posterior fusion of the spine by this method, but also have corrected the kyphotic deformity and saved the patient from having to undergo an anterior surgery. A standard post operative follow up of 11 cases showed complete bone fusion, good stability with satisfactory correction of the kyphotic deformity with only one case developing a recurrent collection of posterior epidural abscess.

#14

THE RESULTS OF ANTERIOR INSTRUMENTATION IN VERTEBRAL TUBERCULOSIS

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Classic procedure in the treatment of vertebral tuberculosis is drainage of the abcess, curetage of the devitalized vertebra and application of anti-tuberculous chemotherapy regimen. Posterior instrumentation results are encouraging in the prevention or treatment of late kyphosis, however, a second stage operation is needed. In this study the results of 9 patients with a diagnosis of Mal de Pott treated by anterior drainage, anterior fusion and Z Plate anterior instrumentation at the same stage at the 1st Department of Orthopaedics and Traumatology of Ankara Social Security Hospital are presented. Mean age was 45.6. Mella follow-up is 28.4 months with a minimum follow-up 2 years. All patients had one year continued triple drug therapy. Partial motor and sensorial loss which was observed preoperatively in 6 patients totally improved postoperatively. All the patients had a solid fusion mass at the last controls. Also any implant failures or sagittal index correction loss were not observed. Reactivation was not seen, but in one patient a supurative infection developed and after three weeks of chemotherapy, the anterior implant was removed and a posterior fusion was added. In light of these findings it is thought that anterior instrumentation after anterior drainage and fusion at the same is a useful procedure in the prevention of late kyphotic deformities.

#15

CHEMOTHERAPY AND SURGICAL INTERVENTION ON TREATMENT OF SPINE TUBERCULOSIS

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From 1985 to 1995, 26 patients with spine tuberculosis were treated by chemotherapy and surgical intervention. Mean age of the patients was 39 (2-69) average follow-up was 24 months (6-84 months). Pathology was located in thoracal (38%), thoracolumbar (31%), lumbar region (31%). Before treatment neurologic deficit was present in 12 % of patients and all of them completely resolved. Combined chemotherapy and surgical intervention were applied all patients. Our indications for spinal operations : progressive instability, neurogical impairment and abscess. Eight patients were treated posterior fusion, 16 patients were treated anterior fusion, 2 patients were treated anterior and posterior fusion. Internal fixation was used in 3 patients. Anterior approach consisted of excision of the infected focus and cold abscess, decompression of spinal canal with removal of bone sequester and solid interbody fusion only with autogenous bone graft (rib 19 %, rib + iliac graft (0,4 %), iliac graft 50%)

It was concluded that, the neurologic involvement due to spinal tuberculosis is a relatively benign condition independent from the type of surgery utilised but complete debridement and drainage of the lesions and chemotherapy offered better chances for functional recovery.

#16

EVALUATION of KYPHOSIS ANGLES IN THE CASES TO WHOM ANTERIOR SPINAL FUSION WAS APPLIED

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It has been indicated that there is a progressive increase in kyphosis in spite of anterior spinal fusion in spinal tuberculosis, when there is lesion in vertebrae more than two, in cervicothoracic and thoracolumbar lesions and when there is overgrowth in posterior elements in children.

In 44 of the cases with kyphosis among the 53 cases to whom radical debridement and anterior spinal fusion were applied due to the lesion in thoracal and thoracolumbar region, the changes in kyphosis angles were investigated in our Department between the years 1984 and 1995.

29 (65.9 %) of the cases were female, 15 (34.1 %) were male, the youngest was 2, the oldest was 60 years old and the average age was 28.3 years. The number of involved vertabrae is between 1 and 4, and it was observed that 2.4 vertebrae had lesion in average. When the kyphosis angles were evaluated preoperative according to Kaplan, 22 of the cases had slight (10°-30°), 14 had medium (31°-60°) and 8 had severe (61° and over) kyphosis. It was seen in the cases that there was a loss of height in vertebra at least 0.2 at most. 1.5 and as average 0.68 in proportion.

It was found that in all of the cases followed 21 and 132 months, 48.7 months as an average, fusion established in lesion region between 4-15 months and 6.5 months in average.

Compared to preoperative situations it was seen that there was no difference in kyphosis angle in 30 cases (68.2 %), an increase in kyphosis in 9 cases (20.4 %), and a decrease in kyphosis in 5 cases (11.4 %).

According to the evaluation of the children and adult cases, it was concluded that anterior spinal fusion didn't cause an increase in kyphosis angle and prevent the loss of vertebral height forming a support in the anterior of vertebrae.

#17

POST OPERATIVE INFECTIONS OF THE SPINE : TECHNIQUE INDICATIONS AND RESULTS OF THE SURGICAL TREATMENT, A RETROSPECTIVE STUDY ABOUT 90 PATIENTS

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Post operative infection in spine surgery is a well known complication. The authors study a serie of 90 patients with a homogenous strategy based on excision of necrotic and infected tissues associated with an adapted antibiotic treatment.

The results are analyzed according to the degree of infection (type and germs association), the type of patients, the delay, and the anatomic extension of the infected lesions.

The difference between superficial and deep infection is of no interest in the therapeutic field and may induce a wrong and too weak treatment.

One must separate usual and frequent infections due to germs as staphylococcus aureus, or from the urinary or digestive tract and severe infections due to a massive and deep contamination or occuring in a patient with poor general conditions. The diagnosis may be easy but can be hidden by the primary infection.

This serie is mainly about posterior approaches of the spine, with or without osteosynthesis. Technical problems of treatment depend on the site of infection,particularly at the thoracic kyphosis level or at the lumbar level where the necrosis of the muscles can be extensive. At the cervical spine an infection of an anterior approach impose to check the aero degistive tract.

Removal of osteosynthesis is not mandatory in many cases of post operative spinal infections, as it may induce severe destabilisation. It is not also

necessarily required to add an anterior approach in case of posterior infection except in case intersomatic graft. Non uninon or an infected spine, initially treated to abtain a fusion is the worse complication. In case of previous posterior infection fusion can be obtained through an anterior grafting with or without osteosynthsesis.

In this serie, there was no neurological complication due to infection. However 8 diseases occured on week patients with neurological involvement. This points out the importance of the general treatment associated with surgery and the necessity of a complete check - up at the therapeutic choice moment.

Infection rates mentioned in the litterature about spine surgery have evoluted with the operative techniques and the development of the prophylactic pre and post operative antibiotherapy.

LONSTEIN, WINTER and MOE had a 7% rate reduced to 3,6% during the period 1960 - 1985 on Harrington rod technique.

KOSTUIK had 8,5%, ROY-CAMILLE, LOUIS and ZUCKERMAN had a rate about 6%.

The most common germ is staphylococcus aureus (KELLER, PAPAS).

The goal of the surgical treatment is to get rid of the infection and obtain a stable healing. In case of fixation, one must try to keep it (osteosynthesis and graft) in order to obtain a future stability.

This work study anatomical and mechanical problems associated with infection which effects the therapeutic strategy. These aspects are analysed according to the patient's condition, the severity of infection its site and its association with an osteosynthesis.

#18

CORRECTION LOSS AFTER POSTERIOR SPINAL INSTRUMENTATION IN THORACIC AND LUMBAR SPINE FRACTURES

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Posterior reduction, instrumentation and fusion are fequently used in unstabile thoracic and lumbar spine fractures. The aim of the posterior instrumentation is achieving sagital contour and restoring the vertebral corpus height, widening the spinal canal by indirect decompression and maintanence of these until bony fusion. Correction loss to some degree is seen after the posterior instrumentation depending on various reasons.

In this study, correction achieved after posterior instrumentation and correction loss determined after the mean 24 months (6 months - 70 months) follow up were evaluated in 48 patients who had unstabile thoracic and lumbar spine fractures. According to the sagital index 3.1 degrees correction loss was determined in sagital contour and correction loss in anterior corpus height was 4.7%.

Clinical results were evaluated according to Dennis's pain and work capacity scales and the effect of the correction loss on the clinical outcome is evaluated. It was found to be poor when the correction loss was more then 5 degrees in sagittal contour or anterior corpus height correction loss was more than 7%.

#19

TREATMENT OF PRESSURE SORES IN PARAPLEGIC PATIENTS WITH GLUTEAL PERFORATOR BASED FLAP

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One of the main problem in paraplegic patients, after spinal injuries is pressure sores that occurs at sacral and lumbal regions. Coverage of pressure sores with good tissue is still a problem because of common infection. Skin grafting and local randomly designed rotation and transposition flaps had been used and have unsatisfactory results.

Musculocutaneous flaps give good results in such conditions. Gluteal perforator based flap included gluteus maximus and its perforator arteries originating from the internal pudental and lateral sacral artery provides excellent soft tissue padding over bone and good blood supply for preventing of infection, following the excision of pressure sores.

Between 1993 and 1995, eleven paraplegic patients with sacral pressure sores were operated in Ege University Medical Faculty, Department of Orthopaedics. In preoperative examination, the locations of the perforators were determined with ultrasound audimeter. Average age during the operation was 34 (min. 18 - max. 46) years. 9 patients were male and 2 were female. In all patients cause of paraplegia was thoroco-lumbar vertebra fractures. The average surface area of the defects 16 x 10 cm. (ranged 6 x 6 cm to 20 x 10 cm). Postoperatively, there were no problem of flap viability and the donor sites were closed primarily without any tension and no reccurence of any pressure sore and infection were observed in follow-up examinations, ranged 7 months to 22 months.

The advantages of gluteal perfarator based flaps are the reliable blood flow of the perforator arteries, preservation of the gluteus maximus muscle, no additional need for a skin graft for the donor site defects and the large skin territory covered by a single perforator. The disadvantage anatomical variations in the location of perforator arteries, because of this careful dissection and preoperative ultrasound audimeter examination is necessary. As a result, this flap is useful in lumbal and sacral pressure sores of paraplegic patients and gives excellent results.

#20

SELECTION OF FUSION LEVELS IN THORACIC IDIOPATHIC SCOLIOSIS

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INTRODUCION : Selection of upper and lower fusion levels in thoracic adolescent idiopathic scoliosis still remains as an untettled issue in scoliosis surgery. Several patterns and mechanims of decompensation after spinal instrumentation and fusion as well as guidelines to avoid decompensation have been defined.

OBJECTIVES : This study aims to analyse the presence of any decompensation in coronal of sagittal planes and to detect any effect of the amount of correction and selection of fusion levels on the occurrence of decompensation.

MATERIAL AND METHODS : The patient population retrospectively analysed consists of twenty consecutive patients operated by one surgeon. Average was 16 years (12-25) and majority was considered skeletally mature (Risser $\geq$ 3). All patients had posterior instrumentation and fusion while 10 had additional anterior release and fusion operations. 14 patients were type II, 4 type III, 1 type V and 1 type I. Isola instrumentation was used in 19 patients. All instrumentations consisted of pedicular screws in lumbar segments, bilateral claw formations at the upper end and sublaminar wires at the concavity. Average preop. Cobb angle was 62.1 deg. for thoracic and 45.0 deg. for lumbar curves. Average preop coronal decompensation was 13 (-5-25) mm.Lower end was L4 in 2 patients. L2 in 8 and L3 in 10, while the upper end was T2 in 13, T3 in 6 and T6 in 1 patient.

RESULTS AND DISCUSSION : Average postoperative Cobb measurements were 25.1 deg. for thoracic and 26.3 deg. for lumbar curves corresponding to corrections of 63% and 45% respectively. Coronal decompensation was reduced to an average of 5 mm (median 0 mm). No patient demonstrated sagittal decompensation and a T1 tilt was present in only 1 patient. These findings suggested that selection of the lower end of the fusion at the mid lumbar region, made possible with the use of lumbar pedicular screws effectively eliminates the possibility of having to extend it to L4 in any type II scoliosis, and good correction of the thoracic as well as the lumbar curves can be obtained.

#21

BALANCE AND FUSION LEVELS IN RIGHT SIDED THORACIC ADOLESCENT IDIOPATHIC SCOLIOSIS

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To evaluate interactions between corrective forces applied by segmentary, spinal systems and fusion levels along with coronal and sagittal balance. X ray radiographs of 126 scoliosis patients operated in SSK İstanbul Education Hospital IInd Orthopedics and Traumatology Clinics between November 1990 and May 1995 were examined retrospecitively. Except 20 patients with atypical or left sided curves. 106 right sided adolescent thoracic idiopathic scoliosis were classified according to King's criteria. King Type II (22 women 6 men mean age 14.8 years) and III (24 women 8 men: mean age 15.4) patients comprising almost 2/3 of the group were included in the study. Preoperatively, average coronal thoracic Cobb angle was 51.4 and lombar was 34.5 degress. For sixteen patients CD instrumentations (mean follow-up period 53.7 months) and for 44 patients MSS instrumentations (mean follow-up period 27.4 months) were used. Postopreratively average correction in coronal Cobb measurement thoracic curves was 61.5% and for lombar was 63.6% King Type II and Type III scoliotic curves are evaluated seperately, and further subgrouped in relation with lowest instrumented vertebrae (LIV) relative to stable vertabrae (SV). Coranal and sagital balance are evaluated in these groups and statistical data was obtained for relavance and validity. Coronal decompansation was observed in 7 (25%) Type II patient, and 3 (9.4%) Type III patient.

Data obtained from this study showed us that Type II curves can be corrected safely following selective fusion guidelines strictly, keeping in mind that patient based modifications should sometimes be done. Sharp angular deviations in junctional kyphosis region should alert scoliosis surgeon to avoid derotation manuever and to extend fusion to L1 by applying distractive forces to convex site and compressive forces to concave site in distal fusion area: otherwise results will be inevitably instrumentation ended at apex of kyphosis and progressive kyphosis. Type III curves can be managed safely ending fusion at SV, and ending short of SV does not obviously results with decompansation but rather with adding on phenomena.

#22

MAINTENANCE OF THE THREE DIMENSIONAL, CORRECTION OF IDIOPATHIC SCOLIOSIS

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The maintenance of correction of scoliosis in the axial, sagittal, and coronal planes requires a stable construct. Elaborate and expensive hook and pedicle screw systems have been designed to prevent rod rotation during and after the instrumentation to correct scoliosis by using multiple fixation points to reduce torque stress at each point of fixation, thus minimizing the risk of implant-bone failure.

We report a modification of the Luque technique of sublaminar segmental fixation in which rod rotation is prevented with a rod clamp while contouring the spine to the contoured rod on the concave side of the curve to restore normal kyphosis, correct the scoliosis, and achieve some axial derotation. The position is maintained by using a Danek cross link from the rod on the concave side to a rod on the convex side in the apical region of the curve. The cross link is tightened while maximum correction is maintained by stabilizing the concave rod against torque stress with a rod clamp. After tightening the cross link the torque is then transmitted through the cross link to the rod on the convex side generating a downward or derotational force on the posterior elements of the apical segment. The cross link rod ration that occurs over time by creep in the standard Luque rod construct where the torque stresses cause the rod contoured into kyphosis on the concave side to twist into the scoliotic deformity with loss of correction.

Ten patients were studied with pre and post-operative chest CT for axial rotation assessment and standard AP and lateral films for sagtital and coronal curve assessment. The patients were followed from two to four years after surgery. We were able to demonstrate results comparable to the best results reported by other system but at a cost for instrumentation of an average of $500 (U.S) per patient. An additional advantage of this approach is that the correction of the three planes of the curve is achieved gradually and kyphosis restored because the sublaminar cables are tightened serially taking advantage of plastic deformation of the structures involved and avoiding abrupt spine manipulation.

#23

FIVE YEARS RESULTS OF CDI IN SURGICAL TREATMENT OF IDIPATHIC SCOLIOSIS

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In this study, results of idiopathic scoliotic patients, were treated with CDI at the University of Ankara Faculty of Medicine İbni Sina Hospital, in the Department of Orthopaedic Surgery and Traumatology was compiled during November 1989- September 1995.

Mean age was 16+7 years (9+6 - 35+0) and mean follow-up period was 57 months (40-71). Thirty patients were female and eight patients were male. Distrubition of the patients according to King Classification were King I, II, III, IV, V respectively; 2 (%5.25), 7 (%18.5), 24 (%63), 3 (%8), 2 (%5.25).

In these Patients, the mean operation duration was 3 hours and 20 minutes and the mean average blood transfusion was 3.1 units. The patients were discharged on the average postoperative 9.7 th day. There were five complications due to implant and six complications concerning other medical conditions were observed.

Results were evaluated in the frontal, sagittal and axial plane. Average correction was %45.35 and was highest in thoracal (%48.9). Thoracolumbar (%61.4) single curve. Greater correction was observed in hyperkyphotic and hypokyphothic patients compared to normokyphotic patients. Average horizontal plane correction was %17.74.

At the end of the follow-up period, the average loss of correction was 11. 4 degreess in frontal plane. In the sagittal plane analysis, there was an avarage 7.2 degress increase in kyphosis. An important loss of correction was not observed in horizontal plane.

#24

COTREL-DUBOUSSET INSTRUMENTATION FOR ADOLESCENT IDIOPATHIC SCOLIOSIS A 2 TO 8 YEARS FOLLOW-UP STUDY

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We evaluated the result of segmental fixation of the spine with Cotrel-Dubousset instrumentation (CDI) in seventy-three patients who had adolescent idiopathic scoliosis (AIS) between July 1988 and October 1993. There were ten males and sixty-three females and they were followed up for an average of 50 months, with a range of 24 to 87 months. The average age at the time of operation was fifteen years and three months, with a range of eleven years and two months to twenty years and four months.

The instrument was used in an attempt to achieve three-dimensional correction of the scoliosis, maintain lumbar lordosis, creat thoracic kyphosis and avoid the need for a postoperative cast or brace. Cotrel-Dubousset instrumentation provided an average correction of the coronal curve of 69.7% at immediate postoperative evaluation, and 64.1% at the time of the most recent follow-up with a 5.6% loss of correction. The thoracic kyphosis was increased slightly (average, +2.4 degrees). There was no major neurologic complications. Two superficial wound infections were noted in the hospitalisation period. There were 2 patients with hemopneumothorax which needed chest tube indwelling. Curve progression over ten degrees was noted in 6 patients implant failure in 2, crank shaft phenomenon in 2, and decompensation of lumbar curves of King Type II curves in 2 patients. There were 7 implant problem in this group, including hook dislodgement and breakage.

#25

PEDICLE SCREW FIXATION IN THE LUMBAR SPINE OF PATIENTS WITH IDIOPATHIC SCOLIOSIS KING TYPE I. II.

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PURPOSE : To compare frontal and axial correction between hooks and pedicle screw constructs used on the convex portion of the lumbar curve in idiopathic scoliosis King Type I, II. All patients had DERO three dimensional spinal Instrumentation.

MATERIAL and METHODS : Eighty three patients with idopathic King type I. II. were surgically treated in our hospital between 1993-1994 with pedicle screw inserted on the convex portion of their lumbar curve. Patients with King type I was 22, King type II was 61. females 70 and male 13, with mean age 14,6 years. mean follow-up 18 months.

RESULTS : King type I. The average frontal Cobb angle of the lumbar curve was 68°preop and 21° postop. (correction= 70°) Average apical rotation (Perdriolle method) of the lumbar curve was 37° preop and 9° postop. (correction= 24). King type II. The average frontal Cobb angle of the lumbar curve was 63° preop and 17° postop. (correction= 73°) Average apical rotation of the lumbar curve was 31° preop and 7° postop. (correction= 22%)

CONCLUSION: The average frontal Cobb angle correction of lumbar curve King type I. II. with pedicle screw was 15% bigger versus our previous results hook patients. Apical derotation in group with pedicle screw was 10% bigger versus hook patients.

#26

ASSOCIATION OF SPONDYLOLISTHESIS AND SCOLIOSIS IN THE SAME PATIENT

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INTRODUCTION : The coexistance of these two entities is well described, but little is known about the patterns of scoliosis associated with the severitiy of the spondylolisthesis deformity of the effect of surgical treatment of one of these on the remaining entity.

PURPOSE : To evaluate 1) The incidence of scoliosis associated with the primary diagnosis of spondylolisthesis and vice versa, 2) The patterns and magnitude of scoliosis and their correlation with the amount of spondylolisthesis translation and angulation and, 3) The effect of surgical treatment of the primary entiy on the secondary entity.

MATERIALS AND METHOD : 52 patients with a primary diagnosis of either scoliosis of isthmic spondylolisthesis were identified from our clinical databank. These patients were evaluated for the presence of the secondary entity. There were 52 patients X-rays were evaluated for scoliosis curve, magnitude, and pattern and for spondylolisthesis translation and angulation. Patients undergoing surgery were evaluated for a minimum of 2 years using the above parameters.

RESULTS : The incidence of scoliosis in patients with spondylolistheis was 8.8% and spondylolisthesis was noted 6.7% of patients who presented primarily with scoliosis. Analysis of the anatomic curve patterns showed a predominance of single thorocic and single lumbar curves. In primary spondylolisthesis, the predominant curve pattern was lumbar with a mean size of 19° (i.e., small curves) In primary scoliosis, the main curve pattern was a single thoracic curve with a mean of 36° In the primary spondylolisthesis group, the degree of translation did not affect curve magnitude, nor did the degree of lumbosacral kyphosis as measured by slip angle and sagittal rotation,

EFFECT OF SURGICAL TREATMENT: 19 patients had primary spondyolisthesis surgery and 12 patients had primary scoliosis and surgery. Reduction of translation or lumbosacral kyphosis of the spondylolisthesis did not result in any improvement in the scoliosis and two patients showed later progression. Small improvement in scoliosis was seen in two patients who had in situ fusions. Scoliosis surgery did not results in any improvement of spondylolisthesis by any parameter. One patient did have subsequent progression

of translation of the spondylolisthesis in follow-up.

CONCLUSIONS : 1) There was a low incidence of structural scoliosis in patients with primary spondylolisthesis (8.8%) and of spondylolisthesis in patients with primary scoliosis (6.7%) 2) the curves in primary spondylolisthesis were commonly lumbar, and the small lumbar curve associated with spondylolisthesis were felt to be reactive in origin. 3) Lumbosacral deformity (translation slip angle and sagittal rotation) does not affect curve pattern and size. 4) Curve size is not reduced by reduction of spondylolisthesis. 5) Curve size is not reduced by "fusion in situ" of spondylolisthesis except six small lumbar "reactive" curves may be reduced by fusion in situ for spondylolisthesis. 7) surgery of primary scoliosis does not affect spondylolisthesis.

#27

SCOLIOSIS IN BETA-THALASSEMIA, PREVALENCE, ETIOLOGY

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INTRODUCTION : No previous detailed study has assesed the incidence of scoliosis in the entire thalasemic population and the evolution of such a scoliosis. Only a single report of our exists on reporting on the overall incidence of scoliosis in a small thalassemic population.

PURPOSE OF STUDY: A prospective study was carried out of the incidence and evolution of scolicsis in patients with homozygouys ß-thalassemia unit The result were compared to those obtained previcosly from patients with idiopathic scoliosis.

METHODS: Hundred and fifteen out 120 thalassemic patients of our Thalassemia Unit Practically all thalassemic patients of our thalassemia unit (115 out 120) were both clinically and radiologically assesed for scoliosis. 49 thalassemic patients, were re-assesed one year later, in order to investigate the natural history and evolution of scoliosis in this particular population.

RESULTS: Scoliosis of at least 5° was evident in 77 patients. The overall incidence of scoliosis was 66.9%, and the overall female to male ratio was 1.14. The ratio was 0.85 for curves of at least 10°, and 1.3 for curves of less magnitude. The most-common curve pattern was the left lumbar (23.48%) followed by the double-curve pattern (11.3%) Forty nine patients (42.6%) randomily selected, cut of 115 patients, were re-examined one year later. An overall progression, of at least 5° was observed in 14 (28.57%) 7 male and 7 female patients, whereas 6 (12.24%) patients showed a spontaneous improvement up to 6°. The pattern and evolution of the scoliosis observed in the thalassemic population showed clear differences to those previously described in children with idiopathic scoliosis.

CONCLUSIONS : On the basis of the data obtained in this series, the incidence, natural history and etiology of scoliosis in thalassemia differs from those of the idiopathic one and seems that the scoliosis in thalassemia may be a new type of scoliosis.

#28

THE EFFECT OF ANTERIOR SPINAL INSTRUMENT DEROTATION ON THE SAGITTAL CONTOUR OF THE SCOLIOTIC SPINE

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BACKGROUND: Dwyer and Zielke anterior instruments are widely used in spine deformities. Derotation of the scoliotic spine is possible with the special device of the Zielke instrument. However, rigid system (Alıcı, TSRH) don't need special devices in derotation manouver. Retrolisthesis of the lower instrumented vertebra is a complication of the anterior instrumentation.

AIM: We retrospectively evaluated the effect of derotation, especially retrolisthesis of the lower instrumented vertebra, of the Anterior Alıcı Spinal Instruments in the sagittal plane of lumbar spine.

MATERIALS AND METHODS: There were 16 (13 females, 3 males) patients who underwent arterior instrumentation with Alıcı Spinal System. Average age was 14,9 years with a range of 11 to 29. Eleven curves were right thoracic and left lumbar, two left lumbar, two right lumbar and one left thoracolumbar. Upper instrumented vertebra was T12 in two cases and L1 in 14 cases; and lower instrumented vertebra was L4 in 8 cases, and L5 in 8 cases. We identified 10 cases who solely underwent posterior instrumentation which the lower instrumented vertebra was L4. The average age of the control group was 14.3 and there were 8 females and 2 males. Rod derotatation manouver was done in all posterior instrumentation group. We have measured vertebral corpus width on sagittal X-rays and noted any listhesis or retrolisthesis. Mann-Whitney U tests were used in statistical analysis.

RESULTS: We found 5 retrolisthesises of upper instrumented vertebra ranging from 2.9% to 9.4% (Average: 1.7%) and 16 retrolistheses of lower instrumented vertebra ranging from 2.3% to 23.1% (Average 9.8%) of the anterior instrumentation group. Whereas on the control group 5 out of 10 cases showed retrolisthesis of the lower instrumented vertebra ranging from 0 to 13.2% (Average 3.5%) (p=0.004)

CONCLUSION: Our data, though limited, shows that the derotation of a rigid anterior system creates a retrolisthesis of the lower instrumented vertebra. This effect might be maximum if the principles of Zielke system is followed. Our findings need to be proved by larger series.

#29

PREOPERATIVE AND POSTOPERATIVE MEASUREMENT OF VERTEBRAL ROTATION WITH CT IN IDIOPATHIC SCOLIOSIS

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Many different methods have been described at the measurement of spinal rotation in idiopathic scoliosis. Measurement of rotation with computarized is a considerably new method when compared to Moe and Perdriolle method.

We performed spinal instrumentation with TSRH and ALICI systems to 26 cases with idiopathic scoliosis at the Orthopaedics and Traumatology Department of Gülhane Military Academy between January 1991 and November 1995 but we measured spinal rotation with CT in 16 patients preoperative and postoperatively. Thirteen (81.25 %) of the cases were female and 3 (18.75 %) were male. While determining spinal rotation with CT, two different measurements; RAml and RAsag were used as described by Aaro and Dahlborn in 1981 (1,2). Statistical analysis of the data was made and we observed that we could be able to make a rotational correction about 28% in apical vertebra,

#30

THE CHARLESTON NIGHT TIME BRACING vs. TLSO FOR STABILIZATION OF IDIOPATHIC SCOLIOSIS.

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STUDY DESIGN : Retrospective review and prospective follow-up of the first 87 patients treated with the Charleston bending brace, compared to 47 matched patients treated with a Boston type brace.

OBJECTIVE: To compare the efficiacy of night time bracing in a rigid bending brace to the TLSO Boston type brace.

SUMMARY OF BACKGROUND DATA: There is limited information about the efficiacy of night time bracing in the treatment of idiopathic scoliosis, its impact on curve progression, comfort, pain and activity restriction.

METHODS: We studied 87 patients, 4 to 14 years old suffering idiopathic scoliosis, treated with the Charleston bending brace who were followed longer than 12 MO, had a Risser stage 0-3 and a curve larger than 20 degrees. They were compared with a matched control group of 47 patients treated in a TLSO Boston type brace. Serial full length AP X-rays of the spine were analized for curve progression. At follow-up patients were requested to rate pain, discomfort and activity restriction according to a visual analog scale.

RESULTS: The vast majority (>90%) of patients had a single thoracolumbar or lumbar curve. The study group patients and controls were followed 12-30 MQ (mean 18.4 and 19.4 MO respectively) Study group thoracic curves avereged 30 degrees in inital visit and 30 degrees at last follow-up. Thoracolumbar single curves avereged 31.5 degrees at initial visit and 30.8 degrees at last follow-up. Single lumbar curves measured 24.3 degrees initialy and 20.3 degrees at last follow-up. In the control group curves and Cobb angles were 27-27.3, 34.5-34.2 and 25.8-27.6 respectively. Mean score for pain and discomfort in the study group was 2.0 (0-10 scale) in contrast to 3.3 in the control. Activity restriction was rated 2.3 for the Charleston brace and 3.2 for the Boston type brace. Failure of treatment defined as 5 degrees curve progression occured in 13.4% of the study group and 14.2% of the controls.

CONCLUSIONS: In properly selected patients, with single thoracolumbar and lumbar curves, night time bending brace of the Charleston type offers a promising alternative to the TLSO bending brace.

A#31

SIDE-SHIFTING EXERCISES IN THE TREATMENT OF ADOLESCENT IDIOPATHIC SCOLIOSIS

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Despite extensive studies, the pathogenesis of idiopathic scoliosis remains unknown. Muscle dysfunction, skeletal factors, genetic factors, metabolic and chemical factors and abnormal function of the central nervous system might be responsible. These controversies also affect the treatment methods. Bracing is a very old form of managament of scoliosis. Electrospinal stimulation is another form of conservative treatment. These two are passive correction methods in scoliosis. The principle of active correction in scoliosis by shifting the trunk sideways over the pelvis is the most common conservative treatment method for scoliosis in our institution since 1990. Early idiopathic scoliosis could be corrected by control of minor lumbar or thoracolumbar curves. All curves were under 30° and we extended the method to the treatment of curves in young children with Risser grades 0-3. Age, skeletal maturity and curve magnitude were analyzed separately. Regarding our results, side-shifting exercises were found to be useful in selected cases.

#32

BIOMECHANICAL EVALUATION OF THE SYNERGY ™ SPINAL SYSTEM

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INTRODUCTION: Any new spinal instrumentation system must show, among other things, that it holds up in the testing as well as clinically proven instrumentation systems. The purpose of this study is to compare fatigue endurance limits and load vs. number of cycles curves for Synergy Spinal System constructs to similar constructs utilizing Harrington, Zielke, Harms, CD, Steffee, Isola and TSRH instrumentation.

MATERIALS AND METHODS : All constructs were assembled according to manufacturer specifications and conducted under ambient conditions. Constructs were loaded in axial compression under cyclic fatigue to develop load vs. number of cycles curves. First, unilateral screw/rod constructs were tested utilizing Zielke, Harms polyaxial, TSRH and Synergy designs. Second, bilateral screw/rod constructs were tested utilizing Steffee and various Synergy configurations, including open, closed, variable locking and lateral connector/ open screw designs. Third, unilateral hook/rod constructs were tested utilizing Harrington, CD, TSRH, Isola and Synergy designs.

RESULTS : Significant differences were noted between the curves generated in all three groups. The Synergy constructs typically had similar or increased fatigue properties when compared to the other designs tested.

CONCLUSIONS : The increased fatigue properties of the Synergy constructs appear to be primarily due to the utilization of tapered minor diameter screws and smooth rods, as well as solid anchor-to- rod clamping mechanisms. Clinically, the Synergy Spinal System should hold up as well or better than the other clinically proven systems. Some of the failure modes noted in these tests have not been noted clinically, indicating that the loads used to cause failure may exceed those seen clinically.

#33

TREATMENT OF SPINAL DEFORMITIES WITH COLORADO TECHNIQUE

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Colorado technique, based on a principle of reduction by translation, ensures an optimal correction of the spine deformity on frontal plane thanks also to its excellent elasticity and strong resistance. We treated 53 patients with scoliosis from May '94 to September '95. The average follow-up was 7 months (range, 4 to 20 months) There were 43 females and 10 males. 33 scoliosis were idiophatic, 4 degenerative, 6 congenital and neuromuscular. The idiopathic scoliosis were classified as King I in 10 cases, King II in 13, King III in 1, King IV in 8 and King V in 1. The angular correction was important: in patients with idiopathic scoliosis, the average angular rate before surgery was 67° (range, 46° to 94°) and decreased to 31° postoperatively (range, 8° to 55°). At follow-up the angular result is unchanged in 30 idiopathic scoliosis. In 2 cases, a loss of reduction from 10° to 15° was observed; in 1 case a loss of 20° was registered at 3rd month but was unchanged at 12th month. There were no complications during and immediately after the operation. In 10 neuromuscular scoliosis average angular correction was of 37° (87° preoperative - 50° at follow - up). There was only one case who required a reoperation, due to a mechanical mistake when setting. One patient with spinal muscular atrophy required tracheostomy and died of pneumonia. 15 days after surgery. Postoperatively, adult patients wore a plaster cast until 45th day, then a brace till 4th month after the operation.Teen-agers were placed in a brace for four months. Patients with neuromuscular scoliosis were not immobilized after surgery. Colorado technique enables to obtain good results in scoliosis and it was also used in 13 kyphosis. Conclusions about kyphosis cannot be reported because four too unhomogeneous series.

#34

GDLH IN THE LUMBAR SPINE

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The GDLH Posterior Spinal System is a top loading system for pathology at the Spine in which fixation is obtained by segmental claw hooks which adapt to multiple pathology. Rigid or semi rigid screws can be used if necessary as well as single hooks for segmental compression or distraction. In degenerate disease of the low back, it is specially idicated in instability; lateral like spondylolisthesis, longitudinal as in the loss of IV space or rotational like degenerate scoliosis deformity, fractures, tumors etc., or simply to enhance the possibilities of arthrodesis. The main objective of this system is to provide a simple technique and a minimum of complications for spinal fusion. As an example of its use, we reproduce the abstract published for the 6th International Conference on Lumbar Fusion in Canberra, Australia, Nov. 1993.

MATERIAL : 72 cases with F.U. of 2 yrs. to 4.2 yrs. Ave. 3.2 yrs. are reported. Age : 68 to 80 yrs. Ave. 73.

METHOD : The Diagnosis : Stenosis of the neural canal 22/ Multiple level disease 8/ Degenerate scoliosis 9/ Degenerate spondylolisthesis 10/ Instability post discectomy 23.

RESULT : Complications : 8 pts. had persistent neurologic pain at F.U. U.O. There were 7 pts. with retarded skin healing two of these went to superficial infections controlled with antibiotics and local dressings. There was one pseudoarthrosis recognized at F.U. but 24 pts. or 30% had little evidence of bone formation with no symptoms. 7 pts. had immediate post.op.minor medical complications. Discussion : Although our complication rate was 24% and that±30% of our patients showed little bone mass. The pain level in this group came down from Ave. 8.7 to 3.2 and in all but 3 pts. the neurological signs disappeared.

CONCLUSION : The GDLH System is an effective posterior instrumentation system with equal results at 3 yrs. F.U. as other more clunbersone and difficult system. It, as others, is not a substitute for a good arthrodesis technique.

A#35

İBNİ SİNA POSTERIOR INSTRUMENTATION TECHNIQUE AND EARLY RELULTS

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Ortopedi ve Travmatoloji A.B.D. ANKARA

With the advancements in spinal surgery, scoliosis surgery also advanced from single distraction systems to three-plane correction systems. The techniques described by some authors need special operating tables for an effective three-plan correction. In a patient lying prone on a standard operating table; the rib cage prevents or makes derotation by the hooks difficult, leading in some cases to iatrogenic laminar or neurologic injuries. Also the correction achieved by this way is usually less than the optium. In IBNI SINA technique, after the placement of physiologically contoured rod and distal and proximal hooks; multilevel sublaminar wiring (Minimum 8 vertebrae) is performed. After attaching the wires to the rod, the rod is rotated 90 degrees. Optium correction is achieved with this multisegmental manipulation.

#36

DISCOM-NEW SPINAL INSTRUMENTATION FOR ANTERIOR STABILIZATION OF THORACOLUMBAR SPINE

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In the paper we presented some ways of anterior stabilization of the spine. We introcuded new device DISCOM system for anterior correction and stabilization of the thoracolumbar spine. The advantages of DisCom: possibilities of distraction or compression of thoracolumbar part of spine. Easy for implantation, secure stabilization ensure of construct rigidity; fusion of minimal number of motion segments, gives ability to canal clearance, indicated for burst and compression fracture, special application for treatment of tumor and infection diseases of spine.

#37

SURGICAL TREATMENT OF SPINE DEFORMITIES IN PATIENTS WITH SPINA BIFIDA CYSTICA

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SUMMARY OF BACKGROUND DATA: Spinal deformity is a common complication patients with myelomeningocele. The generally accepted treatment method for myelodisplastic spinal deformities has evolved to include anterior distectomy and fusion followed by segmental instrumentation. However, additional anterior surgery increases the hospitalization time, hospital costs, and the incidence of complications.

OBJECTIVES: In this study, spina bifida cystica patients with spinal deformity treated with different surgical techniques were rewieved retrospectively. The major intertion of this study was to answer the questions of "Is a diagnosis of myelomeningocele an absolute indication for two-stage spinal procudere? "and "Does posterior Isola instrumentation work in the treatment of myelodisplastic spinal deformities?"

STUDY DESING : From February 1989 to January 1993 fifteen consecutive spina bifida cystica patients with significant spine deformity were treated surgically using of Isola posterior instrumentation and fusion (Group I.) To evaluate the efficacy Isola instrumentation and to compare the earlier posterior segmental instrumentation system such as Luque, CD, etc., a second group of patients fulfilling the following criteria was formed : 1. Minimum two years follow-up. 2. a diagnosis of spina bifida cystica, 3. operated on or before February 1989. Seventeen concecutive patients were reviewed and fifteen fulfilled these criteria (Group S) A retrospective analysis was performed on 30 patients from both groups.

RESULTS: There was no significant difference between the two groups regarding age, weight instrumentation limits, preoperative scoliosis and pelvic obliquity, scoliosis and pelvic obliquity correction, and pseudarthrosis rate. The parameters that demonstrated a significant difference included number of

additional anterior surgery, hospital stay, operation time, estimated blood loss.

CONCLUSION: A diagnosis of myelomeningocele is not an absolute indication for two-staged procedure. Paralytic type scoliosis with or without kyphotic component could be treated with posterior surgery only. Successful clinical results could be obtained with one-stage posterior instrumentation in these patients having big scoliosis curves, severe pelvic obliquity, and posterior bony insufficiency. Additional anterior release and fusion should be reserved for rigid and congenital curves. Isola instrumentation sytems offers a strong, low profile and safe alternative for posterior segmental instrumentation in mylomeningocele.

#38

ANALYSIS OF RISK FACTORS ASSOCIATED WITH CORRECTIVE SURGERY IN CONGENITAL SCOLIOSIS WITH TETHERED CORD

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INTRODUCTION: Scoliosis associated with tethered cords may be due to either congenital vertebral anomalies, or the tethering effect of the cord, or paralysis associated with tethering. Treatment consists of early fusion of the involved segments with or without untethering the cord before the progression of the deformity.

OBJECTIVES: The primary objective of this study was to identify the risk factors associated with corrective scoliosis surgery in neglected cases presenting with severe deformity.

MATERIAL AND METHODS: Nine cases of scoliosis associated with tethered cords that were operated on in the period between 1992 and 1995 were prospectively analysed. Another case who had corrective surgery in 1985 was also added to this population. The study group of this report consists of six of these patients that had corrective surgery with instrumentation for congenital scoliosis associated with tethered cords. Average age was 13.8 (9-17) years. Five had untethering operations prior to corrective surgery. Cause of tethering was identified as diastematomyelia in four and tight filum terminale in two patients. Average preop. Cobb measurement was 74.8 (50-100) deg. Two patients had only posterior surgeries while four had both anterior and posterior. One patient was found to have undergone Harrington distraction instrumentation. Other patients were operated with multiple osteotomies of the spinal column aiming to shorten the convex side and instrumented accordingly using Isola in four and TSRH in one. Average postop. Cobb angle was 40.5 degrees with an average correction of 45.9%. Follow-up ranged from 1 to 10 years for five patients while the sixth patient was operated on only recently. Complications were seen in two patients. One patient had late deep infection

of the instrumentation that necessitated hardware removal with mild loss of correction. Another patient that had sequential anterior-posterior surgery demonstrated monoparesis of the left lower extremity after surgery which gradually progressed to complete paralegia in one week despite prompt removal of instrumentation allowing the collapse of the spinal column. This complication could not be atttributed to a specific pathology except probably very poor oxygenation of the cord because of respiratory problems following surgery. She was recovering from ARDS at the time of this report.

DISCUSSION: Treatment of scoliosis associated with tethered cords with or without neurologic problems should be the prevention of the progression of any deformity. Patients with severe neglected deformities present a very difficult problem surgically as well as ethically. Although correction obtained with effective shortening of the spinal column appears to be relatively safe in this population, associated cardiopulmonary problems can lead to disastrous complications.

#39

OCCULT SPINAL DYSRAPHISM OUR EXPERIENCE IN TUNISIA

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The authors refer to a group of 100 patients with occult spinal dysraphism. This cord and spinal malformation constitutes 16% of spinal deformities and 49% of congenital scoliosis.

Neurological manifestations were the first signal in 25% of patients and spinal deformities in the remaining cases.

Cutaneous abnormalities were encoutered in 68% of patients.

At first examination, 24% of patients complaint of vesical distrubances. 65% had foot deformities with neurotrophic disorders in 17%.

The cord abnomalies consists in:

- 81% tethered cord with hypertrophic filum terminale. Lipo-filum or isolated lipoma. Diastomatomyelia was present in 60% of the cases.
- 19% the cord were not attached with diastomatomyelia in 13% and in 6% with mega cul-de-sac.

It must be emphasized the majority of tethered cord patients (90%) complaint neurological deficit.

-51 patients have been operated, 39 benefit from cord liberation with spinal deformities correction. No worsening were observed. 53% of them got neurological recovery.

- 49 had spontaneous course:
- 19 patients deprived neurological signs with equilibrated
- 30 cases had a worsening of their neurological status.

All authors agree to perform cord liberation as soon as possible in order to stabilise or normalise neurological symptoms. Spinal deformities will be surgically corrected (epiphysiodesis or grafting).

#40

SPINAL SHORTENING PROCEDURES

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Lengthening procedures in correction of spine deformity is an inheritance of long bone traction (alignment) and this same idea translated to Harrington instrumentation.

In severe deformities of the spine the vascular supply is altered any may have a precarious nutrition to the neural cord. Shortening procedures without harming the segmental blood supply is a true anatomical correction, maintaining adequate blood supply.

Shortening pathology can be caused by evolving deformity (eg. scoliosis, kyphosis) by infection, tumor, degeneration of discs, fractures, etc. Unless, there is a compression of the neural canal, no neurological signs will be present. Correction by shortening disquectomies, egg shell procedures or multiple vertebrectomies will provide a biomechanical base for fusion and an opportunity of aligning the spine without interfering with the blood supply of the cord. Eg. in infection, spondylolisthesis, degenerate spines, scoliosis, fractures and other pathologies can illustrate the validity of the principal.

#41

NEW METHODS OF ELEVATIONAL THORAXOPLASTICS BY THE SCOLIOSIS

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The multilevel deformation of the spine by the hard formation of scoliosis is followed up by the formation of Ribs' Kyphosis with the convex side and concave side. The deformation of the thorax is reflected not only on cosmetics but also on the breathing functions.

Therefore, for the sick adults the elevational thoraxoplastics is the only means of overcoming those defects.

We have operated 79 sick people where we had used the above mentioned methods. These methods are targeted for elevation with the prolongation of concave Ribs with the maximal preservation of their connection with the periost and the pleura.

The essens of one of them is boiled down in multiple ostheothomia of all convex Ribs without exfoliation of the periost and the down laid pleura. The elevation of the Ribs is made with the assistans of the implanted elevational device to which during the elevation the fragments of Ribs are fixed. By convex hemithorax the osteotomies of Ribs is made on the large terrain in the framework of the perimetre of the concavity.

The elevation is made with the help of outside traction device. By the dispersion of the laid down tissues the vacuum of outside pleura of the treatment are positive.

#42

CONTROLLED RELEASE WITH DYNAMIC EXTERNAL FIXATOR BEFORE FUSION IN SEVERE - RIGID (KYPHO-) SCOLIOSIS AS A NEW METHOD

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In severe rigid scoliosis the basic choice of treatment is commined anterior and posterior aprocahes. After ant. instrumentation and fusion and before posterior fusion order to correct the curve halo-pelvic and halo-femoral traction are currently used methods.

In our clinic between September 1992 June 1995 9 patients were treated by this method. In this study to both end of the curves, after with or without anterior release short posterior instrumentation were applied. CAF type external fixator was connected to the proximal and distal and distal instrumentation by means of special connectors. After controlled distraction of the deformity at mean 8.9 days, posterior fusion was done in our series 5 male, 4 female, patients with the mean age of 17.8y (10-25) are present and mean follow up is 16.1 m (6-38). In frontal plane mean angle of deformity was 103.8 degrees before operation. Mean correction was 26.2 degrees after distraction and 35.7 degrees after post instrumentation.

As a result in this method in constrast to halopelvic and holofemoral distraction only the deformity is distracted instead of whole vertebral column easy even for the surgeon and the patient it also reduces the risk of paraplegia.

#43

POSTERIOR TOTAL WEDGE RESECTION OSTEOTOMY FOR SURGICAL TREATMENT OF RIGID KYPHOSIS

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INTRODUCTION: Anterior and posterior procedures, both, are performed at present for the surgical treatment of severe, rigid, local kyphosis due to trauma, infection, congenital anomalies, etc.

A one-stage solution for this clinical problem would be a posteriorly based, wedge-resection osteotomy which starts at the posterior elements of the vertebra and ends at the anterior site of vertebral body or anterior longitudinal ligament. The osteotomy results in shortened posterior colomn and tension action on the spinal cord is decreased. One foramen intervertebrale contains two spinal nerves at resection level.

CASES: Between 1990 and 1995, 20 patients with rigid local kyphosis were surgically treated by posterior wedge osteotomy and stabilization with Cotrel-Dubousset or Synergy instrumentation. Etiology was congenital anomaly in 7, infection in 8, previous laminectomy 3, and Scheuermann's kyphosis in 2 cases.

RESULTS: The average follow-up was 30 months (range 12-60 months) The mean preoperative angle of local kyphosis was 89.3 degrees (range 60°-112°) and it was improved to 27.3 degrees (20°-48°) postoperatively. Fusion was achieved in all cases. mean loss of correction at follow-up was 3.5 degrees, and 1 patient had neurologic deficit postoperatively.

CONCLUSION: Posterior total wedge resection osteotomy eliminates the need for anterior procedure and does not cause tractional force on the spinal cord since the posterior column is shortened. It is an effective new method especially for the treatment of sharp and rigid kyphosis. Being a one stage procerdure it provides the most effective surgical solution to this clinical problem.

#44

THE SURGICAL TREATMENT OF NON-MALIGNANT AND TUMOR-LIKE DEFECTS OF THE SPINE

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We have been treating 65 sick people with non-malignant tumor in the spine which is 3,2 % from the over all number of sick people with tumors in the skeleton. The tumors went out from the corps and arcs of the vertebra as well as horizontal and appendixes spinosus. The tumors were distributed as follows: hemangioma-12, osteohondroma-11, chondoma-8, osteoblastoclastoma-6, chondroma-4, osteoma-5, ostheoid-osteoma-2, bone-cartilage, exzosthose with chondroma grow up-5, eosinophilic granuloma-4, anerysmal cyst, -8. Figures were effected in 10 cases, thorax vertebra in 22 cases, lumbar vertebra in 25 cases sacrum vertebra-in 8 cases. There were 39 men, 26 women. The age was between 11 and 63 years old. 59 sick people from 65 with non-malignant tumor and displasie in the spine were operated. By the effect of back segments of the spine we used different types of resection, in 6 cases with posterior spondylodes.

By the hemangiomas of the appendixes, areas we used resection of the back bone plastical fixation. In cases of the processis overcoming on the body the sick people were sent for X-ray therapy. The chordomas were treated by the combined methods. In most difficult cases 2 sick people were treated by eozinophilic granulema. For them lamineckтomy with resection of the effected body with further autoplastics and back spondylodesis were made.

The neurological symptoms were regressed the sick people were rehabilitated in medical and social life.

#45

METHODS OF SURGICAL TREATMENT FOR PRIMARY TUMORS OF THE SPINE

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INTRODUCTION ; Primary tumors of the spine are rarely seen. When they are located on the body or posterior elements, the patient first complains of backache. After an appropriate diagnostic evaluation, the next step would be preoperative planning using sophisticated imaging techniques, the modalities for proper treatment are complete surgical removal, instrumentation and fusion if instability is caused, adjuvant or neoadjuvant chemo-and / or radiotherapy and embolisation.

CASES; Between 1990 and 1995, at the Department of Orthopedics and Traumatology, Istanbul Medical Faculty, we have surgically treated 24 patients with primary spinal bone tumors. The histopathologic diagnosis of the patients are; choroma (3), chondrosarcoma (1), giant cell tumor (2), eosinophilic granuloma (2), primary bone lymphoma (1), aneurysmal bone tumor (1), osteochondroma (1), fibrous dysplasia (1), osteoid osteoma (6) and osteoblastoma (5). All of the patients have been preoperatively evaluated using conventional radiography, computerized tomography, MRI, Tc 99 bone scintigraphy and angiography when needed. The most important factors influencing the surgical strategy are histopathologic diagnosis, anatomic localization and blood supply of the mass.

RESULTS ; A well vascularized giant cell tumor on L5 has fully disappeared after embolisation and another one on the same localization has shrinked to a very small volume making the surgical intervention quite easy. All the masses have been totally removed using posterior and/or anterior route. Five operations resulted with instability of the spinal column and fusion with instrumentation has been added. We have neither seen any early or late complications nor any local recurrences.

CONCLUSION; Primary tumors of the spine can be successfully treated using modern, sophisticated preoperative imaging techniques and the aid of preoperative embolisation.

#46

SPINAL MENINGIOMAS

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Between 1985 and 1995, fourteen patients affected by spinal meningiomas underwent surgery at our department. All patients were female. 86 per cent of tumors were thoracic, and the rest was cervical. Thoracic meningiomas, occured predominatly in the lower thoracic spine. One patient had multiple spinal meningiomas while two other patients had concurrent spinal and cranial meningiomas.

The cases are studied in respect to their epidemiology, tumor location, clinical presentation, type of the surgical procedure, histopathology and outcome.

#47

DIAGNOSTIC STRATEGY FOR BONE TUMORS OF THE SPINE ABOVE SACRUM

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The experience collected at Istituto Rizzoli on 602 cases is reviewed to focus on the criteria to be fullfillend for diagnosis, planing and correctly treating bone tumors of the spine. An accurate work-up by standard radiogram, isotope scan, CT-scan, MRI, allows to define a spectrum of hypothesis: non-tumoral/tumoral; benign/malignant; primary/metastic. Biopsy is required for diagnosis, type of biopsy (trocar CT-scan guided, incisional, transpeduncular, frozen section) must be decided according to the features of the lesion. All the data obtained are used for the staging of primary tumors: bening lesions are classified as latent (not requiring treatment), active (curettage), aggressive (curettage plus adjuvants or marginal resection). The primary malignant lesions are intracompartimental or extracompartimental (both low and high grade); a wide resection is to be achieved, but seldom this is really feasible.

An angiographic study of the spinal cord is compulsory for primary lesions located at the thoraco-lumbar region. The value of embolization is enhanced, primarily in highly vascular lesions.

An accurate pre-operative study of the vital parameters of the patient, together with a continuous intra-operative monitoring is mandatory.

Palliative surgery is indicated in metastatic lesions: The extent of the operation is to be decided according to the neurological status of the patient, the need of stabilization, the life expectancy. Malignant haemopathies (myeloma, lymphoma) are highly radiosensitive, don't require ablative surgery, but can be considered for palliative surgery as well.

The surgical technique is described and the results of en-bloc resection of bone tumors of the spine is reported. These innovative techniques allow to apply to spine tumors the same criteria successfully applied to bone tumors of the limbs. A new carbon fiber prosthesis is used to replace the vertebral body in connection with posterior and anterior devices.

#48

CERVICAL DISCOPATIES AND DEGENERATIVE DISEASE

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92 patients who underwent operations for their cervical discopaties and degenerative disease in Bakırköy Mental and Psyhiatric Hospital, II. Clinic of Neurological surgery between 1989 and 1995 are reviewed retrospectively with respect to the incidence, anotomic location, imaging techniques, age and sex distribution, type of the surgical procedure, physical findings and postoperative care. As a standard approach anterior discectomy and Smith Robinson fusion was done.

#49

THE POSTERIOR CERVICAL LATERAL MASS PLATING TECHNIQUE

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Ten cases who underwent posterior cervical lateral mass plating were evaluated. There were 7 males and 3 females with and average age of 37 years. (range 16-15 years.) Diagnoses were traumatic cervical instabilities in 6, tuberculosis in 3, and neurofibromatosis in 1 case. Combined anterior and posterior fusions were performed in tuberculosis and neurofibromatosis cases.

AO 3.5 mm 1/3 tubular or reconstruction plates were used for fixation. Magerl technique is employed for screw placement.

There were no early post operative complications related to plate-screw fixation.

Eight cases could be followed-up more than 6 months with an averege of 16 months. (range 6-31 months). Solid fusion is obtained, and implant failure is not observed in these cases.

Posterior cervical lateral mass plating technique was found to be safe and efficacious.

#50

LUMBASACRAL FIXATION PROBLEMS

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Loss of sacral fixation is the most frequently cited complication of lumbosacral deformity surgery. In this study, 58 patients who underwent lumbosacral fusion and instrumentation because of different spinal problems were included for evaluation. 34 patients had different types of spodylolisthesis. 6 of the patients had had adult scoliosis, 5 tumor, 10 degenerative spine and segmental instability, 3 spinal tuberculosis.

116 sacral screws were used. In 14 patients sacral rods were burried into the sacrum in addition to the sacral screws which were named as Jackson's method. In 26 patients promontorial (medial), in 18 patients alar (lateral) screw placement were performed. In 22 patients long segment fixation, in 36 patients short segment fixation were performed. Fixation of above L4 was considered as long fixation (More than three segments)

Lumbosacral fixation types were in 3 groups : 1. Lateral (Alar) Fixation (18 patients) 2. Medial (Promontorial) Fixation (26 patients) 3. Jackson's method (Iliac butress) (14 patients).

Complications were 4 (6.8%) sacral screw loosening and pseudoartrosis. 3 (16.6%) of them in group I. 1 (3.8 %) them in group II. no complications occured in group III. On the other hand all complications were in long fusion group. (4 patients, 18%)

CONCLUSION: 1. Jackson's method is a secure lumbosacral fixation method. 2. Promontorial fixation is better than alar fixation. 3. Long segment fixation with L-S area is prone to mechanic complications more than short segment fixation.

#51

POSTEROLATERAL FUSION AND POSTERIOR INSTRUMENTATION TREATMENT OF SPONDYLOLISTHESIS

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In SSK İzmir Educational Hospital, between January 1992 and January 1996 56 patients were operated with posterior instrumentation and posterolateral fusion were evaluated. The degree of slipping were calculated according to Meyerding classification.

There were 40 female (80%), and 10 male (20%) patients. Two of the patients have only spondylosis (4%) and 48 of them have spondylolisthesis. 8 of the patients have both spondylolisis and HNP, 9 of the patients have only HNP.

According to Meyerding's spondylolisthesis classification : 25 of the 48 patients were 1. degree, 19 of the 48 patients were 2. degree. 3 patients with 1. degree spondylolisthesis have two level spondylolisthesis.

Posterolateral fusion and discectomy were applied to two patients with spondylolisis.

Of the 48 patients with spondylolisthesis. Posterolateral fusion and discectomy were applied to 3 patients, Posterolateral fusion and posterior spinal instrumentation were applied to 30 patients, Posterolateral fusion and posterior spinal instrumentation and laminectomy were appiled to 15 patients.

In 15 patients who were applied Buca spinal instrumentation pain resolved completely. In 23 patients who were applied posterior spinal instrument (Alıcı - MSS) pain has resolved completely, in 6 patients pain has decreased, in 1 patient has increased.

Postoperatively, in 5 patients slip degree remained same, in 33 patients slip degree decreased to 0 degree, in 10 patients slip degree decreased to 1. degree.

According to our experience with these three posterior spinal instruments, we have had satisfactory results.

A#52

POSTERIOR INSTRUMENTATION IN THE TREATMENT OF VERTEBRAL INSTABILITY DUE TO POST-NEUROSURGICAL PROCEDURES

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Spinal instability is unavoidable after total laminectomy in the treatment of intraspinal neural tumor excision and protruded disc excision. In order to prevent a probable spinal instability, posterior instrumentation and fusion was performed with the collabration of 1st Department of Orthopaedics and Traumatology and 2nd Department of Neurosurgery of Ankara Social Security Hospital in the treatment of 6 patients with intraspinal tumor excision and 5 patitents with multilevel discectomy. Mean age was 31.1 Two patients had Isola Spinal Instrumentation, 2 had Alıcı Spinal Instrumentation, and 7 had TSRH Instrumentation. Mean follow up was 14.6 months. A solid fusion mass was observed in all patients and any spinal instability was not revealed after postoperative radiological and clinical evaluation. In light of these findings it is suggested that posterior instrumentation is needed for the prevention of spinal instability after neurosurgical procedures.

#53

THE TREATMENT OF SPONDYLOLISTHESIS WITH POSTERIOR LUMBAR INTERBODY FUSION

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14 patients who were treated with PLIF for spondylolisthesis between 1993 and 1995 were reviewed. There were 9 females and 5 males ranging from 17 to 63 years with a mean of 45 years. The sites of spondylolisthesis were at L3-4 in 1, L4-5 in 8 and L5-S1 in 6 patients. There were 8 grade 1 /1 patient has two levels.), 6 grade 2 and 1 grade 4 slips. (Meyerding) All patients had low-back pain, 5 patients had leg pain and 9 patients had neurogenic intermittent claudication.

In 6 cases posterior transverse incision and in 8 cases median longitudinal incision were made. Total laminectomy, foraminotomy, discectomy, interbody fusion and posterior instrumentation were done in all cases. Posteroloteral fusion was added in 11 cases. In 1 case allograft were done in all cases. Posterolateral fusion was added in 11 cases. In 1 case allograft and in 13 cases and three levels in one case. In two cases MSS instrumentation and in 11 cases BUCA spinal instrumentation were used.

Post op x-ray analysis revealed full reduction in 8, 50-75%in 4 and no reduction in 2 cases. 3 patients had postop infection which was resolved with treatment and 1 necessitated the removal of the instruments. At the last follow-up, 1 patient's neurological status was improved and needed reoperation, 1 patient's slipping increassed but no operation was needed and the remaining (12) cases were in good condition.

#54

SURGICAL TREATMENT OF SPONDYLOPTOSIS (TWO CASES)

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INTRODUCTION: Spondyloptosis is defined as the most severe form of L5 spondylolisthesis, one that permist vertical descent of the entire vertebral body of L5 below the end plate of S1. Its surgical treatment involves some significant tehnical difficulties and relatively high complication rate. Various surgical techniques have been developed and reported, and this paper reports two cases who were treated by two different methods.

CASE REPORT CASE 1: The 16 year-old girl showed severe distortion of her sagittal contour with marked forward displacement of the trunk, posterior prominence of the posterior iliac crest. The orientation of sacrum was vertical, and increased lumbar lordosis extended into the thoracic area. No neurologic deficit was present. The angle of lumbosacral kyphosis was 15 degrees.

Right after the laminectomy at L5 level, posterior reduction and fusion was performed with Compact-Cotrel-Dubousset (CCD) instrumentation. Anterior fusion was performed as a second procedure. The patient was free of her complaints at last follow-up and sagittal balance was restored.

CASE 2: The 16 year-old boy showed the same clinical findings as the first case. The angle of lumbosacral kyphosis was 60 degrees. Posterior decompression and reduction with CDI was previously performed but proved to be unsuccesfull. After that, L5 body was anteriory resected and then posterior reduction and fusion with CDI was performed at the same sesion. Anterior fusion was added as a second stage procedure. The patient has developed a postoperative neurologic deficit at lower extremities due to L5 nerve root lesion. Solid fusion was achieved at 5 months and last follow-up at 12 months demonstrated only minor residual deficit as diminsihed first toe extension on one side.

CONCLUSION: We think that surgical treatment for spondyloptosis does change according to the case and there is high risk of neurologic deficit following reduction.

#55

THE SURGICAL TREATMENT IN DEGENERATIVE SPONDYLOLISTHESIS

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Thirty patients with lumbar degenerative spondylolisthesis were operated in the Orthopaedics and Traumatology Clinic of Ege University from August 1991 to December 1995. There were twentyone women and nine men. The mean age of all patients was 42 years. Preoperatively all patients had back and leg pain and seventeen patients had neurologic deficits.

All of patients treated by posterolateral segmental fusion with combined pedicle screw and plate instrumentation. The level of the fusion was between the fourth and fourth and fifth lumbar vertebrae in twentythree patients and between the fourth and fifth lumbar vertebrae in twentythree patients and between third, fourth and fifth vertebrae in seven patients who had severe (slipped over 50%) spondylolisthesis. The autogenous iliac crest graft was used in eighteen patients and the allograft was used in eleven patients. All patients were weared total contact LSO for three months postoperatively.

The average period of follow-up was 25 months (min. 18-max.39 months). The solid fusion was achieved in twentyfour patients (80%). No significant difference was between the group of autogenous iliac crest graft and the allograft. The pain was diminished in all patients and no further progression was slipping. The neurologic deficit was reduced in fifteen (92%) patients.

In conclusion, pedicular fixation and posterolateral fusion by using allograft are to be prefferred for surgical treatment of degenerative spondylolisthesis.

#56

LOW VELOCITY CIVILIAN GUNSHOT WOUNDS OF THE SPINE IN AN URBAN SETTING

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Gunshot injuries to the spine are becoming the second most frequent cause of spinal injury in the United States of America in urban settings because of escalating crime and firearms use.

All spinal injury patients admitted to Baylor College of Medicine, Ben Taub Trauma Center between 1989 and 1993 were reviewed, 37 patients with low velocity gunshot injuries (LV-GSI) to the spine were identified. Medical records, radiographs, computerized axial tomography (CAT) were reviewed to assess the patient demographics neurologic deficit and outcome, prophylactic antibiotic administration, rate of infection, spine stability, and princible associated injuries.

Neurologic improvement of 1 or 2 Frankel grades occurred in only seven patients. Prophylactic antibiotics were given to twenty patients, and one infection occurred and was associated with colon perforation. Spinal instability was noted in 3 patients with cervical injury, and 1 patient with lumbar injury, and neurologic deficit was variable, despite the presence of instability. The major associated injury was vascular occlusion or disruption in 8/12 (66%) of cervical LV-GSI to the spine.

Neurologic outcome of the LV-GSI to the spine depended on the level of the injury and the presenting neurologic deficit, in lumbar spine neurologic improvement of one or two Frankel grades was more frequent compared to thoracic and cervical injuries. In the absence of hollow viscus perforation, antibiotic prophylaxis did not appear beneficial. Vascular injuries, occlusion or disruption are common in the cervical spine and routine angiography is recommended following LV-GSIs. Spinal instability was observed despite variable neurologic presentation, especially patients with LV-GSIs to the cervical spine. We recommend that patients should be carefully scrutinized for the presence of instability to prevent further deterioration in neurologic status.

A#57

SURGICAL TREATMENT FOR FRACTURES OF THE CERVICAL SPINE

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INTRODUCTION: The basic principles of the treatment of cervical fractures are anatomic realignment of the injured segment, decompression of neural tissues, early and stable fixation, early mobilization without external support, facilitating nursing and shortening rehabilitation time. In this paper, we discuss the results of operative treatment of cervical fractures with regard to the above mentioned principles.

CASES: We operated 25 cervical fractures between the years of 1990 and 1995. The mean age of the patients was 38.5 (14-57), and the mean follow up was 23.2 (8-60) months. The series consists of one odontoid fracture, one atlantoaxial dislocation, 11 unilateral facet fracture or dislocation, 8 bilateral facet dislocations and 3 burst fractures. Another case had complete fusion of the spinal column due to ankylosing spondylitis and the injury was a C 5-6 fracture with the flexion distraction mechanism.

The operative regimen consists of C1-2 fusion in atlantoaxial dislocation and fractures, 13 posterior cerclage wiring, one anterior plate fixation and posterior wiring, and 6 anterior and posterior plate fixation. Burst fractures have been treated with anterior decompression and posterior cerclage wiring. We used autologous iliac crest graft in all cases. Patient treated with only cerclage wiring used addionally halo-vest as an external support for three months; plate fixation have been supported with a cervical collar only.

RESULTS: Preoperatively, three patients had complete quadriplegia and 6 had radicular pathology. One of the quadriplegics changed to Frankel D posto peratively; the other two showed no change of the neurologic status. Patients with radicular symptoms had complete relief after six months. Complete bony fusion was achieved in all cases and there were no complications like loss of correction or instrument failure. We had no infection at the operative site but two pin tract infections in patients with halo-vest. The mean hospital stay period was 9.5 days.

CONCLUSION: Unstable cervical fractures can be securely fixed implants like screws and plates excluding the need of an external support. Early surgical intervention facilitates early mobilization and primary rehabilitation in patients with neurologic compromise.

#58

THE TREATMENT OF THORACOLUMBAR BURST FRACTURES BY ANTERIOR PROCEDURE

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Between 1993 and 1996 11 patients with thoracolumbar burst fractures were treated by anterior procedure. The sites of fractures were T12 in 2, L1 in 3, L2 in 4 and L3 in 2 patients The mean follow up is 16 months (Av. 29 to 5 months) The mean narrowing of the medullary canal was 65% (Av. 29% to 20%). According to modified Frankel classification A in 3, C in 1, D1 in 1, D2 in 3 and E in 3 patients were determined.

Total vertebrectomy (due to anterior decompression), graft and anterior instrumentation were performed in all cases. Two Alıcı spinal system and 9 BUCA spinal plate were used. In 4 cases tricortical iliac crest, in 4 cases ribs and in 3 cases both were used. One deep infection, 3 superficial infection and 1 instrumentation was added. In three cases screw loosening was seen but the removal of the instruments was not needed. The overall clinical results were satisfactory with the relief of clinical symptoms and the neurologic recovery with a high rate of solid union.

#59

SPINAL CANAL REMODELLING IN BURST FRACTURES OF THE THORACOLUMBAR SPINE

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SUMMARY OF BACKGROUND DATA: In burst fractures, narrowing of the spinal canal does not always correlate with the neurologic impairment. Therefore, canal narrowing by itself is not considered as an indication for surgery. Since spontaneous resorption of the retropulsed fragment has been shown in patients treated with either operative or nonoperative methods, the claim that postraumatic canal encroachment might cause spinal stenosis in later stage has not been widely accepted.

OBJECTIVES: The resorption of retropulsed fragment has been reported to occur less favourably in nonoperatively treated patients compared to operatively treated patients. However, to our knowledge, there is no detailed study comparing the operative and nonoperative treatment groups regarding the canal remodelling process by using sensitive radiological measurement methods. In this study, operative and nonoperative treatment methods of burst fractures were compared regarding the canal remodelling.

STUDY DESING: The entire series consisted of 18 patients, with 7 in operative treatment treatment group and 11 in nonoperative treatment group. All fractures were studied with computerized tomography (CT) at the postoperative (operative treatment group) or postinjury (nonoperative treatment group), and at the latest follow-up. All patients were followed for a minimum 18 months.

RESULTS: There was not statistical difference between postoperative and postinjury canal areas ($p = 0.0859$). However, the difference between the rates of remodelling was found significant ($p= 0.0059$).

CONCLUSION: A statistically significant canal remodelling occured in both groups. There is no statistically significant difference between the two groups in terms of age, follow-up period, and postoperative (surgical treatment group) or postinjury (conservative treatment group) canal areas. However, at the latest follow-up, patients in whom operative in whom operative treatment was performed improved better and a statistically significant difference emerged between the two groups in terms of canal remodelling.

#60

RELATIONSHIP BETWEEN TRAUMATIC SPINAL CANAL ENCROACHMENT AND NEURODEFICIT IN THORACOLUMBAR BURST FRACTURES

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Thoracolumbar burst fracture is a kind of unstable spine injury. In such fractures, neurologic injury may occur due to spinal canal encroachment. The purpose of this study is, to detect whether there is correlation between % loss of anterior vertebral height (AVH), Cobb's angle, vertebral body angle (VBA) and medullary encroachment in CT, and risk of neurodeficit occurence, or not.

114 cases with burst fractures in thoracolumbar junction were evaluated. Their mean age was 38.7 and 45 of them were female and 69 of them were male. Fractures as to the levels were as follows. T 11-12 (29 cases), L1 (55 cases) and L2 (30 cases). In 11 cases of T11-12,19 cases of L2 fractures there were neurodeficits. Correlation test was used in statistical analysis.

Finally, there was no correlation between spinal canal encroachment amounts in CT, fracture level and type of Burst fracture (Denis). In contrary, there was significant correlation between vertebral body angle (VBA), Cobb's angle and %loss of Anterior Vertebral Height. However, there was a correlation between worse neurological status and increasingly% of medullary encroachment in (CT) ($r= 0,5775$, $p= 0.000$).

#61

COMPARISON OF DIFFERENT METHODS IN THE SURGICAL TREATMENT OF BURST FRACTURES

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Evaluated in this study are the results of 27 patients with thoracolumbar burst fractures who were treated by anterior decompression and fusion. In 14 of these patients Kaneda instrumentation was added to the procedure, in 12 of them posterior fusion and posterior instrumentation was performed either in the same or in a second session for stabilization. In 1 of the patients no additional surgery was performed and external fixation was obtained by cast treatment. Other patients were supported with soft braces in the early postoperative period. We believe that the excision of posterior half of the vertebral body along with the retropulsed bony fragments and spanning the gap by a bicortical iliac bone graft and performing an anterior instrumentation is the most suitable treatment method biomechanically, but potential complications, of both early and long term, must be kept in mind while choosing this method.

#62

TRAUMATIC LESIONS OF CERVICAL SPINE IN ANKYOSING SPONDYLITIS OUR EXPERIENCE ABOUT 16 CASES

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According to the litterature, neurological complications are frequent for cervical traumatic lesions in ankylosing spondylarthritis. Surgery is difficult with a high rate of complications.

The authors report their experience about orthopaeadic treatment and surgical management through posterior approach.

MATERIAL AND METHODS: 16 patients have been treated from 1980 to 1993 in our department (15 men, 1 woman). Mean age was 55 years, mean follow up 5 years. 9 cases had neurological involvement (1 paraplegia, 2 incomplete tetraplegia, 6 radiculopathies.) The cases include 1 C1, C2 instability, 4 luxations, 1 trans-discal lesions, 3 trans-corporeal lesions, one case with a two levels fractures and one articular facet fracture at C7 T1 with kyphosis.

6 cases had an orthopaedic treatment; among these, 5 of them had traction followed by halocast, in order to reduce the deformity by distraction. 3 of these improved their initial spine curvature.

10 patients have been operated, 9 through posterior approach and 1 with a combined posterior and anterior apporoach.

8 posterior plating have been performed using the Roy Camille technique fixation in the articular masses. This fixation was symetrical on both side regarding to the main lesion.

In one case, laminectomy without fixation has been performed, followed by a halo cast immobilisation.

The C1 C2 instability was reduced and fixed by posterior wiring and grafting.

One patient had a revision producedure with laminectomy because of a post operative neurological involment.

5 cases had a primary laminectomy. Graft was used in association with Hibbs procedure in only 4 cases.

RESULTS: The delay for consolidation is 3.5 months either for orthopaedic or surgical treatment.

1°) Results of orthopaedic treatment (6 cases)

One case had minimal neurological signs and 4 cases had a very good evolution. The mean reduction of kyphosis by traction and halocast is 22°

One patient died of pulmonary embolism at the 17th day of treatment.

This patient has been treated 6 months before for a cervical kyphosis (progressive reduction by halocast); at this time, he had a C6 fracture with important posterior displacement.

2°) Results of surgical treatment (10 cases)

2 cases had a good evolution; light cervical ache remained in 7 cases. One patient died at the 7th day post op (posterior approach and reduction C5 C6 luxation with C6 fracture) because of a post operative tetraplegia: he was immediately reoperated for complementary laminectomy and anterior decompression, graft and fixation.

The C1 C2 instability case, was treated by wiring and fusion. This patient needed a revision at the 6th month because of a pseudarthosis.

No radicular involmenent with articular screws, and no displacement were observed in the patients treated by posterior plating.

In 3 cases, we used the injured level to improve the global aspect of the cervical spine (mean reduction: 20°).

CONCLUSION: Orthopaedic treatment is used for non neurologic patients or for minor radiculopathy. In some cases, correction of deformity can be obtained by traction and halocast.

Medullary problems or important radicular syndroma with deficit, important deformities or lack of reduction by traction lead to surgery. In somes cases pre-operative traction can be used for reduction or immobilization.

Although this technique of posterior fixation in the cervical articular masses may seem delicate, it appears to be less invasive than a systematic anterior approach for traumatic cervical lesions in ankylosing spondylitis.

#63

THE OPERATIVE TREATMENT OF UNSTABLE LOWER CERVICAL SPINE INJURIES

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The final results of the operative treatment of severe lower cervical spine (C3-C7) injurles (fractures-dislocations) are concerned by this study.

Seventy two patients, 54 males - 18 females, aged between 16 and 72 years old were evaluated during a period of ten years (1986-1995). The causes of injuries were road traffic accidents 52 cases, falls 15 cases, and sea diving 5 cases.

The pre-operative clinical evaluation of the neurological status according to Frankel classification showed 15 cases graded as A, 14 cases as B, 10 cases as C, 5 cases as D, and 28 cases and Frankel E.

The operative treatment were performed through an anterior (61), posterior (9), or both (2) anterior-posterior approaches. Implants (plates and screws) were used in 56 cases.

The post operative evaluation of the neurological status showed improved of all cases having paraplegia, incomplete at least of one level of Frankel's classification. Patients with complete paraplegia remalied in the same situation.

The intra and post-operative compications as well as the stability of the fusion are further discussed.

#64

IS THE USE OF THE TSRH INSTRUMENTATION EFFECTIVE WHEN TREATING THORACOLUMBAR SPINAL TRAUMA?

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PURHOSE OF THE STUDY: To evaluate the results of the use Texas Scottish Rite Hospital (T.S.R.H.) instrumentation for the treatment of unstable fractures and isolations of the thoracolumbar spine.

MATERIAL AND METHODS: Forty consecutive patients (32 males, 8 females) with average age of 45, 19 ± 17 years, who had suffered unstable fractures and dislocations of the thoracolumbar spine canal were treated with T.S.R.H. instrumentation and fusion. All patients were operated using a posterior approach and exactly the same technique: Two 3/4" rods appropriately contoured in order to achieve and maintain the physiological sagittal profile of the spine, two claws applied two levels above and below the fractured level. The two rods were fixed together by using two T.S.R.H. crosslinks. All patients were mobilized 48 hours postoperatively. All values are expressed as mean ± SD and for statistical analysis of the results were used one-way ANOVA and regression analysis.

ANALYSIS: These patients were subsequently assessed for neurologic outcome, spinal canal clearance, sagittal spinal deformity correction, preoperatively, postoperatively and in an average follow-up of 31 (rage 25-41) months. In the follow-up evaluation patients showed an overall improvement of their neurologic function of 0.476±0.873 (range 0-3) FRANKEL Grade. The preoperative immediateely postoperattive and follow-up encroachment of the spinal canal were 20.4%±9% respectively (no statistically significant change). The preoperative, immediately postoperative and follow-up Gardner angle were 17.3°±8.05°.9.5°±7.4°. 11.75°.7.8° respectively (one way ANOVA, $P<0.01$).

The preoperative immediately postoperative follow-up anterior height ratio were 0.681±0.142, 0.79±0.119, 0.679±0.132 respectively (one-way ANOVA, $p<0.025$). The preoperative immediately postoperative and follow-up posterior

height ratio were 0.93±0.14, 0.93±0.085, 0.893±0.118, (no statistically significant change). All incomplete neurological lesions which were observed in patients with age between 42-78 years, showed a significant neurological (FRANKEL) improvement ($P<0.05$). In contrast, the observed FRANKEL changes were not related to: (1) CT-encroachment changes, (2) Gardner angle changes and (3) Anterior and posterior vertebra height ratio changes, (2) Gardner angle changes and (3) Anterior and posterior vertebra height ratio changes. No material failure, no loss of correction and no infections were observed in this series.

CONCLUSIVELY: The T.S.R.H. instrumentation provides (1) excellent immediate correction of the injured thoracolumbar spine, (2) adequate restoration of the sagital profile of the spine and (3) maintenance up to an average follow-up of 31 months. Although T.S.R.H. instrumentation does not correct the bony encroachment of the spinal canal allows improvement of the neurological impairment and facilitates early rehabilitation of the patient.

#65

DORSAL STABILISATION IN FRACTURE DISLOCATIONS OF THE THORACOLUMBAR SPINE

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The results of operative treatment by dorsal stabilisation of the thoracolumbar spine using spinal plates are analyzed in a series of 35 patients presenting unstable fracture-dislocations, uncomplicated and complicated fractures with neurological involvement up to full paraplegia.

Very good results are obtained in 19 cases with uncomplicated fracture, operated by fixation with Meurig Williams plates and dorsal vertebral fusion. A full regression of neurological deficit is observed in 5 out of 13 patients with neurological involvement, with independent micturation and ambulation being attained in two of them with complete paraplegia. Dorsal stabilisation in conjunction with posterior vertebral fusion and prolonged immobilisisation to secure bone block development are recommended in the treatment of fracture dislocations of the thoracolumbar spine.

#66

THORACOLUMBAR BURST FRACTURES: CORRELATION BETWEEN POST TRAUMATIC SPINAL CANAL STENOSIS AND INITIAL NEURLOGICAL DEFICT.

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The purpose of this study was the identification of the existing correlation between the post-traumatic spinal stenosis and the initial neurological deficit.

Fifty seven patients (39 males and 18 females), aged 18-62 years old, with thoracolumbar burst fracture, who treated between 1980-1995, retrospectively were studied.

The evaluation included:

1. Neurological examination according to Frankel method.

2. Radiological examination and evaluation of burst fractures according to Denis and to Dall and stauffer classifications.

3. Estimation of the post-traumatic spinal stenosis (cross-sectional area) in the existing CT-Scans, at each level of injury.

From the clinical and radiological interrelelation, we concluded that:

1. The presence of Dall and Stauffer type II fracture consists statistically important factor with negative involvement in the caution of initial neurological status.

2. In thoracolumbar spine, there is an inversely proportional relation, with satistical importance, between the level of injury and the post-traumatic spinal stenosis.

#67

REDUCTION OF DORSAL-LUMBAR ANGULATION.

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Arab women who do not carry head loads have an average dorsal kyphosis of 39.5° and a lumbar lordosis of 31.5°. Jewish women who are mainly town dwellers do not use head loading and have a dorsal kyphosis of 36.8° and a lumbar lordosis of 32.3°. In the East carrying weights on the head is a common method of transportation of goods. Women who head load have a dorsal kyphosis of 30.7° and a lumbar lordosis of 27.7° with a total angulation of 58.4°. Out of 26 Jewish women 12 had an angulation above 75°. Arab women who are town dwellers had an angulation above 75°in 7 out of 14 women. In Arab women who head loaded there were only 3 out of 21 women who had angulation 75°.

Head loading corrects stance and gait and reduces strain when the head load is balanced, Women who carry weight on the head have spinal curves that are straighter than those of normal women. Stretching the head and elevating the spine causes a postural correction which reduces dorsal and lumbar angulation. Deformities of stance and gait are reduced when dorsal and lumbar angulation are involved. Arab women who head load and undertake physical work have a significantly reduced dorsal kyphosis and lumbar lordosis. Women who head loaded had an average reduced spinal angulation of 11.8°. This is a reduction of dorso-lumbar angulation of 17%.

This study shows that balancing a free weight one head is associated with a significant reduction of spinal angulation. The constant upward postural correction, an unconscious motion, seems to be the mechanism causing reduction of dorsal and lumbar angulation.

#68

POSTERIOR FIOXATION OF THE CERVICO THORACIC HINGE A BIOMECHANICAL AND CLINICAL STUDY ABOUT 48 CASES

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The anatomy of the cervico thoracic hinge explains the difficulties of reduction and fixation in case of C7 or T1 fractures, or in case of destabilization of the C7 T1 dics.

This work is about the author's experience of posterior fixation with or without anterior grafting. Neurological liberation is provided through a posterior approach, posterior plating is used with screws implanted in the articular masses at the cervical level and in the pedicles at the thoracic level.

A biomechanical study has been performed for a better analysis of the lesions C7 and T1 vertebrae and of C7 T1 dics.

CLINICAL STUDY MATERIAL AND METHODS : Between 1983 and 1991, 48 cases have been treated with a mean follow up 4,7 years, 32 men and 15 women.

They include 15 recent traumas, 9 malunions, 4 deformities in degenerative spine with previous surgery, 14 metastasis, 4 primary tumors and 1 Pott's disease.

40 patients complained of cervical pain, 10 had a severe radicular involvement, 12 were tetraplegic and 5 tetraplegic.

10 cases had less than 15° of kyphosis, 18 between 20 and 30° and 20 were over 30°.

Evident symptoms of instalibity were found in 30 cases, 10 cases were previously operated with a laminectomy (7 cases) and partial facectomy (3 cases)

All the patients have been first operated through a posterior approach. Regarding the main lesion the osteosynthesis was symmetric in 19 cases, asymetric with added thoracic levels in 19 cases, asymetric with added cervical

levels in 10 cases.)

31 cases had long fixation with 2 levels above and bellow the main lesion, 17 cases had a short fixation one level or each side of the lesion.

Laminectomy was performed in 46 patients and postero lateral approach, to decompress in 6 cases.

Anterior approach has been needed in 10 cases (8 cases through and original cervicosternotomy). They were indicated to graft and fix in case of important bone gap or poor bone quality.

RESULTS: All tetraplegic improved with a pedicular recovery and better cervical posture.

All radicular involements disapeared except 3.

Cervical pain improved in 38 cases.

Complete reduction was obtained in 41 cases, 11 had a secondary kyphosis under 10°. Among the 7 incomplete reductions. 4 had an complementary anterior approach.

4 infections occured, 2 needed re-do surgery because of the fragility of the cutaneous tissues at the cervico-thoracic junction. 3 Claude Bernard Horner syndromes occured after correction of C7 T1, malunion.

BIOMECHANICAL STUDY: 12 fresh cervico thoracic junctions have been tested for rigidity outside the neutral zone for intact spine and after posterior fixation for C7 T1 lesions, C7 or T1 corporectomy.

Associated articular masses lesions have been performed for each cases. posterior plating increases rigidity in anterior flexion, lateral flexion and rotation. The increase of rigidity is more important at C7 T1, level than at C6 C7. The loss of rigidity in case of discal lesion is 10% and 45% in case of corporectomy. The associated decrease is 15% in case of unilateral articular lesion and 35% in case of bilateral.

CONCLUSION: Posterior fixation at the cervico thoracic junction has been developped by ROY-CAMILLE. This technique offers a lot of advantages in case of discal or corporeal lesions. This original fixation allows important reduction with few and little secondary displacement. Anterior approach is necessary in case of important reduction and for poor bone quality. Little secondary kyphosis occured only in case of a poor articular masses lesions.

#69

THE BIOMECHANICAL COMPARISON OF TWO VERSUS SCREW-PLATE FIXATION FOR THE LUMBO SACRAL STABILITY

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INTRODUCTION: Most serious complication of the lubro-sacral arthrodesis is pseudoarthrosis. For this reason the arthrodesis has to be augmented by instrument. The cortical bone of the sacrum is very thin and cancellous bone is very loose. Therefore, anatomy of the sacrum is a disadvantage for rigid fixation.

AIM: The aim of this study is to compare the biomechanical effects of the two and three screw sacral fixation plates over calf bones.

MATERIAL AND METHOD: Vertebral instrumentation system named A1 and A2 have sacral plate with two screw fixations, and the newly developed vertebral instrumentation system named A4 has sacral plate with three screw fixation. Each screw of two- screw sacral plate had 10° cranio-caudal angle in frontal plane and 45° angle in transversal plane respectively. In coordinate plane these corresponded to V1x= V1sin.10°, V1y=0, V1z= Vlcos. 10°; V2x=V2 cos. 45°; v2y= V2sin. 45°, V2z= 0. sacral plate with three screws had third screw which was perpendicular to the frontal plane. This screw corresponded to V3x=V3, V3y=0, V3z=0 in x-y-z coordinate plane of the system. We used each of these systems of seven calves sacral and L5 vertebral bones. We inserted transpedicular screws to L5 vertebra and then fixted sacral plate with two of three screws. Than rods were implanted to the system following implantation. We embedded the system in to the polyester for biomechanical testing. We have used Instron (1114 Conton MA U.S.A.) instrument for axial compression and measured deplacement in x-y-z coordinate with Mitsubishi compretors (M.D. JAP.)

RESULTS: In two screws sacral plates axial loading began on 500 N causing deplacement in each coordinate axis. When the force in this system reached oved 3500 N the deformation has begun. In sacral plate with three

screws the axially loading on 500 N caused only x-y coordinate displacement in z coordinate until the axially loading reached 3000 N. Sacral plates with three screws in axialy loading with 5500 N had caused deformation.

CONCLUSION: While the displacement in z coordinate was measured directly, this was measured indirectly, in x-y coordinate. For this reason the measurement of displacement in x-y-z coordinate was meaningful only in z coordinate.

We concluded that the third screw being applied in sacral plate with three screws, could stabilize the system more effectively.

#70

THE AGING PROCESS WITHIN THE LUMBAR INTERVERTEBRAL DISC

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INTRODUCTION: It is understood that blood vessels are generally not observed in normal intervertebral dics tissue.

PURPOSE OF THE STUDY: To evalute the presence of blood vessels within the intact postmortem and hemiated lumbar disc, in order to correlate the age-related changes and their significance for the disc herniation.

MATERIAL AND METHODS: 62 intraoperatively taken lumbar disc specimens (Patient's age range between 28 and 70 years), excised because of herniation and 76 intact lumbar disc, removed from postmortem spines (cadavers' age 10 months and 84 years), were histologically examined by using the immunohistological method AVIDIN-BIOTIN (stain for endothelial cells of the vessels) and ULEX EUROPAEUS-0 (stain to investigate the small vessels or isolated endothelial cells) for observation of lumbar intervertebral disc degeneration process.

RESULTS: In the surgically obtained specimens of prolapsed discs there were observed isolated endothelial cells of newely formed small caliber vessels surrounded by loose connective tissue not only in the anulous fibrousus but close to the nucleus pulposus. On the other hand in the anulous fibrousus but close to the nucleus pulposus. On the other hand in the postmortem specimens taken from young individuals (age 10 months to 25 years) there were found vessels of small caliber only at the peripheral part of the anulus fibrosus. These vessels were surrounded by a dense hyaloid collagen tissue ad seem to be drived from the longitudinal ligaments and intestinal fibro andiposus tissue. In this group no vessels were found within the nucleus pulposus. In the postmortem specimens of individuals with ages between 25 and 50 years we observed a higher concentration of newely formed vessels close to the nucleus pulposus. In the postmortem specimens of ages between 50 and 84 years we observed the same histological picture as that of the intra-

operatively taken prolapsed lumbar disc specimens (statistically significant difference between the 3 groups of ages 10 months-25 years, 25-50 years, 50-84 years/t-test, $P<0.01$).

CONCLUSION: On the basis of the data obtained from this comparative study, we believe that blood vessels that invade the different layers, of the intervertebral disc is a results of its degeneration. The latter was justified by the histological age-related changes from the cadaveric specimens.

#71

LASER DISCECTOMY FOR LUMBAR DISC PROLAPSE

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After Laser has proved to be effective in many surgical fields, trials were done to implement this evaluation in spinal surgery. Lately, it was introduced as percutaneous approach for treating cases of prolapsed lumbar disc.

A prospective study was done on 48 cases of herniated lumbar disc, 32 males and 16 females, mean age 32 years.

Laser disc decompression was done for all when 6 were at L3-L4 level, 22 at L4-5 level and 20 at L5-S1 level. Patients were followed-up for one year when results were considered failures. Apart from these 10 cases of re-currence of symtoms no major complications were encountered.

Finally, we concluded that laser disc decompression is safe, less invasive procedure for treating herniated disc yet its indications are limited for con-tained discs and its results are not yet superior to other procedures.

#72

REPAIR OF LUMBAR SPONDYLOLYSIS AND GRADE I SPONDYLOLISTHESIS WITH A HOOK SCREW

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When the conservative treatment of lumbar spondylolysis fails to improve symptoms, surgical repair of the isthmus is indicated. We prefer a technique using a hook screw introduced by Morscher. From September 1987 to November 1992, 21 patients with spondylolysis and grade I Spondylolisthesis were treated with the use of the hook screw. There were 15 men and 6 women, aged 14 to 31 years (mean 17.5 yrs) 20 patients had spondylolysis at L5 level and a 25-year-old woman at L5, L3 and L2 levels. Displacement of spondylolysis was 3 to 5 mm in 16 patient and more than 5 mm in 5 patients, who had grade I spondylolisthesis of 3 to 5 mm. none of them had radiographic signs of disc degeneration. They were followed for 2 to 7 years ('mean 4.6 yrs.) 18 patients (82, 4%) were free of symptoms; they showed complete radiographic fusion of the pars defect. One patient in whom preoperative spondylolisthesis of 5 mm was reduced by 4 mm, and who showed complete fusion of spondylitic defect continued to have pain elicited by bending and heavy physical work. Symptoms persisted in 2 patients (11,8%) older than 25 years who showed no evidence of fusion. Repair of lumbar spondylolysis and low grade spondylolisthesis with the hook screw is recommended in patients under 25 years of age, while it is less satisfactory in older patients with spondylolisthesis and higher degree of instability.

#73

LUMBAR SPINE INSTABILITY AND FAILURE, SUCCESS OF OPERATIVE TREATMENT

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Unstable backs constitute a major problem for considerable number of patients in the community. Whatever the cause of instability whether congenital, development, degenerative, pathological, post-traumatic or due to failed back surgery it causes chronic low back pain with or without neural affection.

Stability of spine is the goal and stabilization constitutes the only solution after conservative measures fail. Stabilisation can be either achieved by anterior or posterior implants according to the indication.

Kaneda device for anterior fixation of the spine proved effective and successful in the management of casses of fractures, tumors, post-traumatic instability where decompression of cord is indicated.

Steffe V.S.P. plating system for posterior fixation of the spine proved successful in case of spondylolisthesis whether degenerative, developmental lytic types or for fractures or tumors necessitating posterior decompression.

Isola System has proved to be successful in correcting and stabilizing unstable scolitic paralytic spines. Whether the fixation device fusion is mandatory lest should implants fail.

#74

CLINICAL OUTCOME OF THE INSTRUMENTED LUMBOSACRAL FIXATION A 3 TO 8 YEARS FOLLOW-UP STUDY

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From 1988 to 1992, lumbosacral fusion fixed with Cotrel-Dubousset Instrumentation (CDI) or Zielke's implant (DKS) was performed in 74 patients by the senior surgeon (PQC). There were 31 men and 43 women. The mean age was 59 years old. The disorders included 26 spondylolisthesis, 19 spinal stenosis, 22 degenerative lumbar, scoliosis and 6 failed back conditions. The fusion level varied from one to 6 levels, with 14 cases in one level, 24 in two levels, and 36 more than three levels.

The overall results were excellent and good in 86.47%, fair to poor in 13.51%

Radiolucent zone was found more in the rigid sacral screws. Fusion was noted as expected. Only one patient had pseudoarthrosis of the fusion mass. However, there were complications due to instrumentation. Four patient was noted to have weakness of the foot. Five rod breakage was noted in the DKS group, while screw pullout was noted in 7 cases in the CDI group. Superficial wound infection was found in 2 cases. Three patients had subsequent implant removal due to various reasons.

In conclusion, lumbosacral fixation using CDI or DKS could get better fusion rate, early ambulation and expected good clinical results.

#75

ANTERIOR SPINE FUSION IN LOW BACK PAIN SYNDROMES

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Anterior spinal fusion for low back disorders was original as the surgical treatment of spondylolisthesis of L5 causing chronic low back pain. It is a mechanically sound procedure with removal of the torn painful disc and its replacement with bone graft. If supplementary fixation of the facet joints is added, fusion rates of over 95% will be achieved.

More recently laparoscopic anterior lumbar fusion has found a palace. The approach to date is transperitonael taking great care of the pre-sacral nerve. Damage to the left common iliac vein is possible and should it occur, conversion to an open procedure is an urgent matter.

It is likely that a two level procedure for failed back surgery and other situations will not be within the realm of laparoscopic lumbar fusion.

Attention to the surgical principle is all important if high fusion rates are to be achieved. Experience with femoral cortical allograft, the core packed with the patient's own bone, provides a very high rate of fusion, particularly when the facet joints have been locked with trans-laminar screws.

#76

MODIFIED SPINAL SYSTEM (MSS) INSTRUMENTATION BY THE TREATMENT OF THOROCOLUMBAR VERTEBRA FRACTURES

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Currently available instrumentation modalities for surgical treatment of thoracolumbar vertebra fractures are various. Although a lot of modifications were described, the most common implant usage is screw and hook fixation, combined with rods and plates.

In this study, we reviewed 32 patients, treated with MSS (Modified Spinal System) between February 1993-February 1996 years at Orthopaedics and Traumatology Department of Ege University Medical Faculty. The average age of our patients were 36.3 (min. 19-max. 75). Fourteen of those patients were female and eighteen were male. According to incidence of etiologic factors; the main causative factor was traffic accident the most common anatomic localization was first lumbar vertebra.

We performed surgical treatment immediately all the patients with neurologic deficit. We used one or two level pedicular hook fixation for thoracal vertabra or pedicular screw fixation for lomber vertebra. With an anteriorly curved rod they connected with each other. We didn't performed any other procedure such as laminectomy or posterior fusion.

However, we haven't got long term results. We observed that there was'nt any loosening between bone and implant that all patient's implant can easily bear weight.

The results of our series indicate that MSS intrumentation is one of the reliable alternative treatment method for the thoracolomber vertebra fractures.

#77

TREATMENT OF THORACAL AND LUMBAR VERTEBRAE FRACTURES BY ALICI SPINAL SYSTEM

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15 patients with thoracal, thoracolumbar or lumbar spinal trauma were operated on at the hospital of Yüzüncü Yıl University Medical School between Jan. 1995 and Jan. 1996. All of the cases were male and their mean age was 32.4 (14-75) years. 18 operations were performed to these 15 patients and the levels of the fractures varied between 4th thoracal and 4th lumbar vertebrae. The avarage follow-up period was 9 months.

These fractures-dislocations of spinal column were classified as "Burst Fracture" (in 9 patients). "Fracture+Dislocations" (in 2 patients); Multilevel Compression Fracture (in 3 patients), and "Single Level Compression Fracture" (in 1 patients).

All of the fractures were treated via posterior approach by using posterior instrument of "ALICI Spinal System". We operated only one patients anteriorly first then posteriorly. The instrument was taken out in one patient because of infection at the 6th week after operation. One of the patients died of MI at the 21th day of postoperatively.

#78

NEUROLOGICAL DEFICIT IN RELATION TO THE CANAL ENCROACHMENT, LEVEL AND TYPE OF THE THOROCOLUMBAR FRACTURES

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The spinal column is a unique osteoligamentous structure of integral components that allow it to function as a supportive member of skeleton, and it consists of mobile segments whose structure varies according to anatomic level. With excessive motion and force, a host of injuries can occur, depending of mechanism and anatomic level involved. The main forces include, compression, distraction, shear and torsion, which can be applied in flexion, extension and rotation. The association of nerologic injury with vertebral fractures has been well established. Nearly 25%: of these will result with paraplegia and many others will results in more limited neurological injuries.

The aim of this study is the assessment of the relationship between the neurological deficit, level and type of the fracture and canal encroachment.

Between 1990 and 1996, operatively treated 110 patients in Dokuz Eylül University Hospital Department of Orthopedics and Traumatology, were included into this study. The patients' ages ranged from ten to sixty-eight, mean 36 years. Male-female ratio was 1.5. The level of injury, type of the fracture, canal encroachment and the neurological status were determined for each patient. A computer was used to analyze the data gathered from the patients' charts, and Pearson's correlation had been applied.

Of the 110 patients, 67 (61%) had a burst fracture, 27 (24.5%) had a compression fracture, 15(13.6%) had a chance fracture, and 1 (0.09%) had a flexion-distraction fracture. 57 patients had no neurologic compromise and 53 patients had neurologic deficit, ranging from Frankel A to D. The most frequently fractured level is L1(35.5). Neurologic compromise occurs more frequently at the upper levels (Coefficient = 0.2549, p= 0.007), and there is a significant correlation between the canal encroachment and neurological compromise (C= 0.6814, p= 0). Also there is a significant correlation between the type of the fracture and the neurologic compromise (C= 0.4761, P=0). The correclation coefficient between type of the fracture and canal encroachment is 0.2883, P= 0.036. There is no significant correlation between the type and the level of the fracture.

As a results, there is a significant correlation between the neurological compromise, fracture type and amount of canal encroachment.

#79

EFFICACY OF INDIRECT REDUCTION IN THORACOLUMBAR VERTEBRA FRACTURES

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AIM: The factors influence indirect reduction of thoracolumbar vertebra fractures, via posterior approach, were studied.

PATIENTS AND METHODS: 25 patients with unstable thoracolumbar vertebra fractures, that were treated by using the posterior approach were studied. The patients were instrumented with the combinations of rods transpedicular screws or rods-hooks or rods-hooks-transpedicular screws. Evaluation of results was based on three criteria; sagittal index, ratio of compression and canal compromise. The patients were studied in two groups; those that were surgically treated before 12 days following trauma and those that were treated after 12 days.

RESULTS: While the correction of sagittal index was 67% in the early (before 12 days following trauma) group, it was 60% in the late (after 12 days following trauma) group. On the other hand, correction of the ratio of compression was 62% and 32% in early late operated groups, respectively. However, canal compromise did not decrease in either group.

DISCUSSION: Early surgical treatment is an important factor of the successful indirect reduction. It would be decisive if the evaluation of the success of indirect reduction is based just upon the sagittal index. Since the disc interval is heightened anteriorly in posterior manipulation, this results in reduction of the value of sagittal index. Although this may correct the kyphotic deformity, it is enough to consider the fracture reduced. Only if comparable correction in the ratio of compression accompaines the correction of sagittal index, the fracture is considered as reduced.

#80

MULTISEGEMENTAL SPINE FRACTURES

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Multisegmental spinal colon injuries are generally seen after high energy trauma. Therefore neurologic injury rate and kyphotic angulation degree is high after multisegmental spinal colon injuries. Besides the need of multilevel instrumentation and fusion affecets the clinical outcome negatively.

Multisegmental spinal colon fractures been seen in 13 of 48 patients (27.1%) who were operated because of unstabile thoracic and lumbar spine fractures. While in 11 of these patients there fractures of the contiguous vertebrae, two patients had noncontiguous vertebrae fractures. It was estimated that neurologic deficit rate kyphotic angulation degrees were more in multisegmental spinal colon fractures than unisegmental ones.

When the fracture patterns of the two patients with noncontiguous level fractures it was seen that they didn't match with the injury patterns described by, Calenoff and Gupta.

#81

SURGICAL TREATMENT OF MULTIPLE LEVEL CONTIGUOUS THORACOLUMBAR VERTEBRAE FRACTURES

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Multiple level spinal fractures which may contiguous or separated are estimated to occur in 3-5% of patients with spinal fractures. Non contiguous ones can be easily missed and the contiguous ones are highly mechanically unstable.

One hundred and twenty-three patients with unstable thoracolumbar fracture were treated surgically in our clinic between January 1989 - October 1995. In fifteen of them (12%), there were multiple level contiguous fracture. In 2 patients three level injuries and in 13 two level injuries were seen. The most affected pair was T12-L1 and all the affected levels were between T5 an L4. There were 32 segment affected.

All the patients were treated by using. Alıcı Spinal Instrumentation, transpedicular screws or combinations of screws with hooks depending on the level. Transpedicular screws were put also through fractured vertebrae in 9 case. Each affected vertebral body analyzed with respect to its load carrying capacity and those segments that can not support physiologic loads were included in fusion.

Patients were evaluated clinical and radiological. The mean follow up period was 19 months. Identification of these secondary fractures is important to avoid increase in neurologic deficit, chronic pain or progressive deformity. These gross instabilities were treated successfully posteriorly by using Alıcı Spinal Instrumentation. In all of them anatomic sagital contours are achieved.

#82

EFFECT OF PROPERLY AND INPROPERLY INSERTED PEDICULAR SCREWS ON THE RESULTS OF THE SPINE FRACTURES

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The biomechanics of reduction and loss of correction of the burst fractures treated with transpedicular systems have not been adequately investigated. There are a wide range of conditions that can cause instabilty of the thoracolumbar spine after transpedicular fixation. One of the most important situation is proper insertion of the screw through the pedicle.

A total of 87 patients, with unstable burst fractures of the lower thoracic and lumbar spine were treated with transpedicular spinal instrumentation (Alıcı;45, Isola;30, AO Spinal Internal Fixator;12). All patients were evaluated pre and postoperatively with plain radiographs and computed tomography.

The average follow-up was 2.4 years and patients had an average 11° loss of correction in local kyphotic angle.

In 20 of the patients improper insertion of the pedicular screw was observed and we observed an average 13° of loss of correction in local kyphosis angle. In the cases that had proper pedicular screw insertion, there was an average 5° loss of corection, and this was statistically significant ($p<0.05$).

This clinical study emphasized the importance of the proper insertion of pedicular screws during spinal trauma surgery. This influences the results both mechanically and neurologically.

#83

THE SCREW AT THE FRACTURED VERTEBRAE : IT'S MERITS AND HAZARDS

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The extent of internal fixation in the fractured thoracolumbar spine is still debated. In Marmara University Schooll of Medicine Department of Orthopaedics & Traumatology we conducted a prospective study to evaluate the advantages and hazards of pedicular screws inserted to the fractured vertebrae. Between July 1993-August 1995 fourteen patients were admitted into this study. There were 11 males and 3 females with a mean age of 27.4 (16-60). Three cases had fracture-dislocations (L2-3, T7-8, L4), 7 cases had burst fractures (L1-5), 4 patients had compression fractures (T12-L1). In 5 cases one screw, in 9 cases two screws were employed. The segmental sagital deformities were corrected by 0-40 degrees (mean :13.2). The vertebral height were corrected by an average of %33.1 (%0.04 - %68). The mean vertebral height at the last control was %81.6 (%34-%117). In five cases a laminectomy was also performed to aid the neurological recovery. All cases were mobilised with a light TLSO brace. There were no complications related to the use of a screw at the fractured vertebra. The observed advantages of this technique of internal fixation are:

- Easier reduction of fracture-dislocation and burst injuries, relatively short segment fixation in unstable fractures, restoration of anatomical sagittal alignment at the fractured segment and to decompansate the loss of stability and graft bed in cases requiring a decompressive laminectomy.

However we do acknowledge the potential hazards of this technique : Screw misplacement or displacement of bony fragments at the time of screw insertation may cause iatrogenic nerve injury.

Conclusion : Screws at the fractured vertebrae can be employed in selected cases to obtain better correction and stability.

#84

COMPARISION BETWEEN HARRI-LUQUE METHOD AND TRANSPEDICULAR FIXATION SYSTEM IN THE SURGICAL TREATMENT OF THE THORACOLUMBAR SPINE FRACTURES

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45 patients who had thoracolumbar spine fractures were treated with posterior instrumentation and fusion between 1991-1995. Harri-luque method in 20 patients (Group-A); CD in 15 patients, ALICI system in 10 patients (Group-B) were used. 2 patients who were in Group A were treated with anterior decompression and grafting in addition to the posterior instrumentation.

In Group A 23 fractures of the 20 patients were classified as follow; 16 fractures were burst fracture, 6 fractures were fracture-dislocation, 1 fracture was compression fracture. In this group average follow-up time was 14 months (7-25). In Group B 29 fractures of the 25 patients were classified as follows; 26 fractures were burst fracture, 3 fractures were compression fracture. In this group average follow-up time was 18 months (8-33).

In Group A; preoperatively average local kyphosis angle was 23.3°, postoperatively it was 10.7°, in the last follow-up it was 17.8°.

In Group B; preoperatively average local kyphosis angle was 14.9° postoperatively it was 1.3°, in the last follow-up it was 4.7°.

In Group A complications were as follows; 1 patient had superficial infection, in 1 patient rod was broken and penetrated the skin, in 2 patients lower hooks were dislodged from lamina, in the last follow-up, average loss of correction was 7.1°.

In Group B complications were as follows in 8 patients we had 12 screw problems, 1 patient had per-op lamina fracture.

In post-op examinations nobody had worsening of the neurologic functions.

TLSO corset was used 4 moths by Group A patients and 3.5 months by Group B patients postoperatively.

As a conclussion we decided that in selected patients who had economic problems Harri-Luque method was a reasonable choice. But transpedicular fixation systems were superior in establishing physiologic curvatures of the vertebral column and in stabilizing the vertebral column.

#85

THE COMPARISON OF STABILIZATION TECHNIQUES OF UNSTABLE THORACOLUMBAR VERTEBRA FRACTURES THAT ARE NOT STABILIZED BECAUSE OF DIFFERENT REASONS.

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In between 1989-1993, 24 patients with unstable thoracolumbar vertebra fractures, that had not been stabilized before were operated in Ankara Numune Hospital 1. Ortopedics and Traumatology Clinic and Alıcı Spinal Instrumentation were performed for vertebral stabilization. The follow-up period is 24 months. 18 of 24 patients (75%) had undergone laminectomy procedure in an other medical center, but any internal stabilisation did not performed. The patients are divided into three groups (hook-rod, TPS-rod, hook-TPS-rod) according to the surgical stabilization method and evaluated radiographically. As a result stabilisation is essential in patients suffered from vertebral fractures even in late cases. Although it is difficult to obtain anatomical reduction, the best correction can be achieved by hook-rod system.

#86

THE MANAGEMENT OF THORACOLUMBAR VERTEBRAL FRACTURE DISLOCATIONS

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Fracture dislocations of thoracolumbar vertebrae are usually caused by a combination of compression, tension, rotation and shear forces and are associated with the highest incidence of neurologic deficit.

Between January 1989 - October 1995, 123 patients with unstable thoracolumbar fracture were treated surgically in our clinic. They are classified according to Denis and 31 of them were found to be fracture dislocation. In 20 of them, we used Alıcı (only) transpedicular screw fixation, in 6 Alıcı screw, hook combination and in 5 AO fixateur interne.

There were 23 male, 8 female patient with mean age 33.5. Patients were evaluated clinically by using Frankel classfication and radiological by using translation and active repair ratios, sagital index and local kyphosis angle. the mean follow-up period was 21 months.

Flexion - Rotation was the most seen subgroup and T12-L1 was the most affected level. The active repair ratio was strictly related with the time passing between accident and the surgery. The significant loss in sagital index and kyphotic deformity, regarding early postoperative and final radiographs were not detected.

Realigning of the spinal column and providing adequate posterior stabilization for early mobilization is the goal of treatment and can be achieved better by using transpedicular screw fixation. Dislocation is better reducted if surgery is done early.

#87

COMPLICATIONS OF POSTERIOR SURGICAL STABILISATION IN THE TREATMENT OF THORCOLUMBAR SPINE FRACTURES

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Posterior reduction and stabilisation is one of the most common choices in the treatment of unstable spine fractures. The purpose of this study is, to detect the complications concerning posterior stabilisation.

We evaluated 120 patients (175 fractures) with unstable spine fractures who were undergone posterior stabilisation with Alıcı Spinal System. Mean follow-up was 25.7 months (not less than 6 months) and mean age was 34 years. All of the cases were stabilised by means of Alıcı Spinal System and mean time from injury to operation was 4.3 days.

During surgery, as a complication, we had progressive neurodeficits in 2 cases (one was due to poor anaesthesia and the other was due to insertion of transpedicular screw into the spinal canal). Pedicular fracture rate was %2.5 in transpedicular screw applications and was %0.6 in hook applications.

In early postoperative period, 3 cases were dead. The rate of surgical and urinary infection rate were %5 (5 superficial and 1 deep) and %11.5, respectively. In 2 cases, anterior approach became necessary because of insufficient reduction. Complications concerning instruments were dislocation of pedicular hooks (%3.2), dislocation of laminar hooks (%2.8), loosening of transpedicular screws (%6.5), breakage of transpedicular screws (%2.6), bending of transpedicular srews, (%3.9), breakage of rod (%0.4) and loosening of telescopical nuts (%2.4). During follow-up an increase of 5.9 degrees in Cobb Angle was observed.

Finally, as we evaluated the reasons of complications retrospectively, in order to prevent the possible complications, experienced surgical team and anaesthesist, suitable operation room conditions, preoperative preperation and surgical planning and postoperative management are very important factors.

#88

APPLICATION OF TRANSPEDICULAR SCREW TO THE FRACTURED VERTEBRAE IN LUMBAR VERTEBRAE FRACTURES

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We applied transpedicular screw fixation and fusion one level above and below the fracture level including the fractured vertebrae especially in lumbar fractures to obtain more stabile and short frame.

19 cases with lumbar fractures were operated with this method at the Orthopaedics and Traumatology Department of Gülhane Military Medical Academy between July 1993 and January 1996.15 of the cases were male, 4 were female. Average age was 26.6 (range 16-49) and mean follow up was 11.3 (range : 4-32) months.

We observed that application of screws to the fractured vertebrae did not cause increase in canal compromise. Fixation of fractured vertebrae establishes more stable frame when compared to two level (one above and one below) fixation, the complication rates are low, less segments are fused and it is particularly feasible at lumbar fractures with shorter fixation.

P#1

HORIZONTAL PLANE ANALYSIS OF THE IDIOPATHIC SCOLIOTIC CURVES TREATED WITH THE ISOLA SPINAL INSTRUMENTATION

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Seven female and three male patients with idiopathic scoliosis were treated surgically with the Isola Spinal Instrumentation at the 3rd Department of Orthopaecdic Surgery and Traumatology of Ankara Numune Hospital, between the dates July 1993 and November 1995. The age at operation ranged from 9 to 24 years with an average of 13.6 years. The type of the curve according to King's classification was type II in I curve, type III in 7 curves and type IV in 2. curves.

Preoperative and postoperative horizontal plane analyses of totally 11 curves were made by using the Perdriolle torsionmeter. The average measurement values were 25.00°±7.75° (15°-40°) preoperatively and 19.55°±8.50° (10°-35°) postopertively. The amount of average correction was 20%. Statistical analysis of the data was made by using student t-test, and it was seen that there was no statistically significant difference ($p=0.066$) between the preoperative and postoperative measurement values of the curves in the horizontal plane.

It was concuded that, although the frontal plane correction, obtained with the Isola Spinal Instrumentation as very significant ($p<0.001$), the amount of horizontal plane correction of an idiopathic scoliotic curve, treated with this system was not as notable as the frontal one.

P#2

THE OPERATIVE TREATMENT OF SCOLIOSIS AT THE ORTHOPAEDIC CLINIC OF THE UNIVERSITY OF ROSTOCK : EXPERIENCES AND LONG-TERM RESULTS

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After many years of experiences in conservative treatment of scoliosis we started with operative therapy in 1975.

Now we look back on 71 patients, who were operated on scoliosis by HARRINGTON-spondylodesis. This procedure was combined with LUQUE-wiring since 1988.

In Rostock the age of anchorage with pedicle screws began in 1992.

The lonely spondylodesis with the HARRINGTON-system caused - in spite of plaster immobility of 6 month - a loss of correction from 80%.

Through the additional LUQUE-wiring it was possible to reduce the loss of correction on 50%.

The first results after using the ISOLA-spinal-system with only 15% loss of correction are good.

The long-term result of all HARRINGTON-spondylodesis was a consolidated scoliosis curve.

70% of our patients were free of pain and able to normal physical activity!

P#3

SINGLE ROD TECHNIQUE IN IDIOPATHIC SCOLIOSIS

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In this study, 6 idiopathic scoliosis patient which was treated with single rod technique in 1st Department of Orthopaedics and Traumatology of Ankara

Social Security Hospital between 1992 and 1994 was evaluated. Mean age was 14.2 and mean follow-up was 18.6 months. Three patients had King Type III curve pattern. All patients were instrumented with Texas Scottish Rite Hospital (TSRH) System. Preoperative mean Cobb angle of major curve which was 56.4° brought to 22.1° postoperatively. In the last control, loss of correction was 5.6° averagely. Any implant was not noted.

P#4

THE EARLY RESULTS OF ANTERIOR RELEASE AND INSTRUMENTATION IN THE TREATMENT OF IDIOPATHIC SCOLIOSIS PATIENTS

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Anterior release is generally indicated in the treatment of idiopathic scoliosis patients with rigid curves. One staged anterior instrumentation had started with Zielke, however, high rates of morbidity and psedoarthrosis rates of this system has prevented its widespread use. In this study the results 5 patients with one staged anterior instrumentation and 2 patients with anterior instrumentation followed by posterior instrumentation ere evaluated. Mean follow-up was 18.1 months and mean age was 15.6 (11-22) years. One patient had Alıcı Spinal Instrumentation, one had Texas Scottish Hospital System, on a had Kaneda SR and remaning 3 patients had Cotrel-Dubousset-Hopf Instrumentation. Preoperative mean Cobb angle of major curves which was 79.9 (60-90) was brought to 46.1° (30°-73 °) postoperatively and 43% (18.9% - 62.5 %) of correction was obtained. A solid fusion mass was observed in all patients. One patient with implant failure was revised with posterior instrumentation. In one patient retrolisthesis developed, balance deteriorated and posterior instrumentation was added. In light of these findings it is suggested that although we are at the beginning of the learning curve, encouraging results can be obtained with anterior release and instrumentation in the of idiopathic scoliosis patients.

P#5

ELECTROPHYSIOLOGICAL EVALUATION AND SURGICAL TREATMENT RESULTS OF SCOLIOSIS PATIENTS WITH FRIEDRICH ATAXIA

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A fourteen year old boy with idiopathic scoliosis was examined at Neurology Department of Hacettepe University Medical School after development of an ataxic gait, motor strength loss and dispnea after a posterior instrumentation and fusion operation at 1st Department of Orthopaedics and Traumatogoly of Ankara Social Security Hospital in April 1994. Transcortical magnetic stimulated motor evoked potentials and nerve conduction velocity of the patient were recorder. This patient also had bilateral mild pes-cavus. The electrophysiological findings correlated with demyelinized neuropathy and myocardial dysfunction was determined with echocardiography. By the way, Friedrich Ataxia was diagnosed in the patient. Preoperative Cobb angle which was 95° was brought to 24° and corrected by 74.7%. Thoracic kyphosis which was 66° preopertively was also brought to physiological limits (40°). The balance of the patient was significantly corrcected as lateral trunk shift which was 2.6 vertebral units (VU) was corrected to 9 VU. However, after 18 months' of follow-up a severe correction loss was recorded at the frontal plane. This case is presented emphasis the importance of a meticulous neurological examination as this can also effect the future therapy planning.

P#6

IS T1 ROTATIONALY ALIGNED WITH CLAVICLES?

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INTRODUCTION : Rotational decompensation in scoliotic patients is not redily recognised and investigated subject. It is also very difficult to quantify such a phenomenon if it exists. Since the clinical presentation is usually that of rotational malalignment of the shoulders, it may resonably correlate with the rotation of the uppermost thoracic vertebra, T1.

OBJECTIVE : The objective of this study was to investigate the relationship between the rotational alignment of T1 with that of the clavicles in normal subjects, so as to serve as a basis for further studies in scoliotic patients.

MATERIALS AND METHODS : The study group consisted of twenty-four patients that did not have any scoliotic deformity exceeding 5 degrees, measured on PA lung X-rays. All patients had been hospitalised for skeletal malignencies and therefore have CT scans of their lungs. Average age was 34.9 ± 12.7 years. For each patient, an apical view showing both T1 and clavicles were selected and was measured for the angle between the sagittal axis of T1 and the bisect of the longitudinal axes of the clavicles by two independent observers (V.D. and E.A.)

RESULTS : The average absolute value of the angle defined above is found to be 1.208± 1.112 (0-4) degrees by one observer and 0.979 ± 0.699 (0-2) degrees by the other. The average discrepancy between the measurements of the observers were 0.81± 0.56 (0-2) degrees.

DISCUSSION : This study has demonstrated that in patients with no significant thoracic spine deformity, rotational allignment of T1 correlates with that of the clavicles with in limits of errors of measurement. Hence in normal subjects, the rotation allignment of the shoulders can be given as a single measurement, the rotational alignment of T1. Future work is going to include the analysis of scoliotic subjects that my have thoracic cage deformities long with spinal deformities.

P#7

TWO STAGE RESECTION OF HEMIVERTEBRA FOR THE TREATMENT OF CONGENITAL LUMBAR SCOLIOSIS

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Hemivertebra, being one of the leading causes of congenital scoliosis following unilateral unsegmented bars, can change in number, localization and type. Especially fully segmented ones with lumbosacral localizations leads to lumbar take-off and secondary non-structural curves which detoriates progresively. Intra-spinal and other congenital anomalies must be carefully evaluated in order to avoid any kind of posible neurologic injury, before planning the treatment schedule.

We are going to present a patient of 12 years of age whom admitted to our clinic with the complaints of left knee pain and limp. Her routine evluation revealed a lumber scoliosis of 38° with a fully segmented L 4 hemivertebra. Tethered cord was apparent on the M.R.L. Patient had no abnormal neurologic findings other than tight hamstrings on the left side.

Surgical treatment is planned and at first a posterior approach is utilized for the release of the tethered cord and removal of posterior elements of the hemivertebra. In a week an anterior procedure is combined excising the remaining corpus with anterior fusion and instrumentation (Z-Plate).

At the post-operative I4 th month, the curve was reduced to 6° and there was no complication.

P#8

CONGENITAL VERTEBRAL DISPLACEMENT

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A retrospective chart review was conducted on 2 patients, presenting a congenital vertebral displacement. Both deformities were located in the lumbar spine. Neurological deficits were present at the time of diagnosis. Their ages were 1.5 yrs and 10 yrs, at the time of the diagnosis, and the average duration of follow up was 1.5 years. Decompression of the stenotic canal, anterior and posterior fusion were performed. Gross mechanical instability was demonstrated during the surgery. Both patient had some neurological improvement.

We recommed early anterior and posterior fusion with decompression in patients with congenital vertebral displacement.

P#9

CONGENITAL ANOMALIES OF VERTEBRAE AND ASSOCIATE DEFORMITIES

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Several resarches were carried out into the anomalies of vertebrae that can be seen in congenital scoliosis, their relationships with the related curves and their treatment modalities. Between January 1984 and December 1995 we received 107 patients with congenital scoliosis. During their follow-up period some of them were treated conservatively, and some of the surgically. In our study we tried to obtain a statistically helpful data from our observations retrospectively.

P#10

MULTIPLE DURAL ECTASIA ASSOCIATED WITH NEUROFIBROMATOSIS SCOLIOSIS A CASE REPORT

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INTRODUCTION: Scoliosis associted with neurofibromatosis is known to have a dismal prognosis especially in patients with dystrophic vertebral changes. Dural ectasia is a rare manifestation of neurofibromatosis in the spinal column. This case report is about a patient who had multiple dural ectasias associated with a lumbar scoliosis that necessitated surgical treatment because of coronal plane imbalance.

CASE REPORT : A sixteen year old boy was seen with progressive deformity in the lumbar region. He was known to have multiple cafe au lait spots as well as multiple subcutaneous neurofibromas since birth. Physical examination was notable for lumbar kyphoscoliosis that cused a coronal plane decompensation of 5 cm. to left side. Radiological examination revealed lumbar kyphoscoliosis of 80 deg. measured from T 12 to L4 along with severe scalloping of vertebral bodies evident on sagittal X-rays. Myelography, myelo CT and MRI investigations revealed the cause of these scalloped vertebral bodies to be multiple dural ectasias that had eroded the vertebral bodies in the lumbar region but did not affect the disc spaces. A two stage anterior-posterior fusion with posterior instrumentation was performed. Performing the anterior discectomies did not present any problems at the anterior surgery, and bilateral pedicular screws also could be placed in L5 from posterior without any complications. Posterior instrumentation was extended up to T6 with multiple hooks and claw configurations in the thoracic area. The problematic lumbar segments were instrumented with spinous process wires so as to avoid and violation of the spinal canal. His lumbar lordosis was restored, lumbar scoliosis could be corrected to 50 degrees, and lumbosacral scoliosis that had measured 40 degrees before surgery was reduced to 15 degrees effectively correcting the coronal imbalance.

DISCUSSION: This case report presents a very rare manifestation of neurofibromatosis in the vertebral column as multiple dural ectasias. We believe that such deformities may be considered as being one of the major indications of using spinous process wires in the instrumentation.

P#11

SURGICAL TREATMENT OF DEGENERATIVE DISORDERS OF THE LUMBAR SPINE

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INTRODUCTION : Spinal stenosis, spondylolisthesis, scoliosis, dics herniations and failed back syndromes are some of the most common degenerative lumbar disease seen in adults. Neural tissue compression and/or instabilities are the leading pathologies in these clinical entities. Aim of the surgical treatment is decompresison of neural tissues, correction of deformities and stabilisation of unstable segments. In this paper, we discuss our experience about the surgical treatment for in such cases.

CASES : Between the years of 1992 and 1995, we surgically treated 15 cases. The mean age of the group was 52.5 (37-65) years; 8 patients had spinal stenosis and 7 had degenerative spondylolisthesis. All cases had low back pain, aditionally 8 patients had radicular pain, 7 had neurologic claudication, 8 had motor and sensorial deficit and hyporeflexia. The surgical treament consisted of laminectomy and foraminetomy and posterolateral fusion with posterior instrumentation in 9 cases; additionally 5 cases had posterior interbody fusion (PLIF) and one case had posterior decompression and fusion and anteror fusion.

RESULTS: The mean follow up period is 28.2 months (12-45); 11 patients (%73) are free of pain at the end and the claudication is lost in every patient. One case had an infection and another had instrumentation failure.

CONCLUSION: The primary surgical intervention in the treatment of de-

generative lumbar spine disease is fusion with instrumentation with or without decompresison. The addition of anterior or posterior interbody fusion yields to more reliable results.

P#12
SURGICAL TREATMENT OF SYMPTOMATIC SPONDYLOLISTHESIS

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Independent of etiologic factors. Progression of sliding persistent pain and radiculopathy are indicators for the surgery.

In II. Orthop. and Trav. Clinics of SSK Istanbul Hospital Between January 1993-October 1995 14 female and 2 male of 16 patient were treated. The mean age is 44.8y and mean follow up is 22.3 month. Transpedicular fixation and posterolateral fusion was used as a treatment.

In terms of classification degenerative in 12 cases. Isthmic spondylolisthesis in 4 cases according to Meyerding classification similarly 8 cases in grade 1.7 cases in grade II. and 1 case in grade III. In our study we use magnetic resonans imaging in addition to plane x-ray for diagnostic purpose.

In 6 cases decompression - post. Fusion and in other 10 cases only insitu post. Fusion were done. And the results was 9 excellent. 3 good 2 moderate and 2 insufficient cases according to Oswestry criterias.

So we can conclude that in spondylolysthesis posterolateral fusion is a confident method for surgical treatment to relieve the pain decompress the neural elements and mobilize the patients.

P#13

IBNI SINA ANTERIOR SPINAL INSTRUMENTATION AND OUR RESULTS IN THE TREATMENT OF THORACOLUMBAR VERTEBRAL INSTABILITIES

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İBNI SİNA Anterior Spinal System which has been used since February 1995 in our clinic; consists of hexagonal rods, vertebral body screws, plates and transverse connectors. In patients with intact posterior vertebral column, single rod application is possible because of its high rotational stability.

One high thoracic kyphotic deformity, 3 posttraumatic kyphotic deformities, 9 spinal tumors, 3 vertebral tuberculosis infections, 1 chronic nonspesific infection and 20 vertebral burst fractures were treated with anterior vertebral decompression and stabilisation with İBNİ SİNA system in our clinic. We have an average of 8 months follow-up and the early results are promising.

P#14

THE RESULTS OF POSTERIOR INSTRUMENTATION AND PLIF IN PATIENTS WITH SPINAL STENOSIS

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In this study the results of posterior decompression, PLIF and posterior instrumentation in 7 spinal stenosis patients whom were operated at the 1st Department of Orthopaedics and Traumatology of Ankara Social Security Hospital were evluated. Of these patients 1 had posteriorly localized osteoblastoma, 2 had sypondylarthrosis and 7 of them had sypondylolisthesis. Six of the patients are female, 4 were male. Mean age was 48.1 and mean follow-up was

22.3 (12-48) months. All of the patients had severe back pain and their root or chord compression were demonstrated with radiological techniques. Eight of the patients had posterior instrumentation with Texas Scottish Rite Hospital System. Alıcı Spinal Instrumentation was performed in a patients and Compact Cotrel-Dubousset Instrumentation was also performed in patient. Postoperatively all back pain complaints except one were diminshed. In this patient a solid fusion mass was not observed and other patients had a solid fusion mass. Paresthesis complents of 3 patients and in continence complaints of one patient totaly improved postoperatively.

P#15

SURGICAL THERAPY IN CASES WITH CERVICAL SPONDYLOTIC MYELOPATHY

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Three hundred and twenty-two patients were operated due to cervical pathologies in our department between years 1984 and 1995. Spondylotic myelopathy was found in 27 cases among them, 15 were operated anteriorly and 12 posteriorly. Clinical and neuroradiological findings with operative approaches and their results are discussed in this retrospective study.

P#16

REVIEW OF ANTERIOR CERVICAL DISCECTOMIES WITH GRAFT APPLICATION

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Various approaches in the surgical management of cervical discal diseases

are on use today. The anterior approach should be executed, particulary in the "one or two level midline" cervical discal herniations. The use of bone graft with anterior approch s still a matter of debate.

İn between January 90 and June 95, 50 patients with cervical discal herniations were operated on performing anterior discectomy in the neurosurgery department of Taksim Hospital; and were reviewed retrospectively. No discrepancy was observed by means of clinical outcomes.

Here in, our aimis to review and discuss the significance of graft use with anterior discectomy operations by the help of literature available.

P#17

LASER DISCECTOMY IN CERVICAL DISC HERNIATIONS

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In our deparment, percutaneous intradiscal laser nucleotomy had been used for the treatment of a selected group of patients with herniated cervical dics disease since March 1993. We operated 59 patients until January 1996. Among these, 48 cases whose follow-up periods were longer than one year was included in this study. 78% of them were operated in their late follow-up. Open surgery was proposed in five cases, and three of them were operated. Over all improvement in minor motor, sensorial and deep tendon reflex deficits ere 77.4% 60.7%, and 65.0%,respectively. We recommend laser nucleotomy as an effective procedure for cervical disc herniations, and it can be performed with a low complication rate.

P#18

TREATMENT OF HERNIATED LUMBAR DISC WITH LASER DISCECTOMY

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Percutaneous intradiscal laser nucleotomy is a safe, minimal invasive and short lasting procedure for treatment of a selected group of patients with herniated lumbar intervertebral disc disease. We have been using this technique since March 1993. We operated 283 cases until January 1996. Among these, 132 patients whose follow-up periods were longer than one year was included in this study. Patients seemed to be favoured better in the early postoperative period when compared with the late follow-up. Although 87.3% of the cases had negative laseque test, the rate for complete relief of complaints were 68.9%.5% of the cases were reoperated with laser discectomy, but two of them didn't favour and underwent to laminotomy and disc removal. Open surgery have been proposed in 26(19.6%) and 16 of them were operated. Overall improvement in minor motor, sensorial and deep tendon reflex deficits were 70.9%, 67.6% and 48.8%, respectively. We recommend laser nucleotomy as an effective treatment modality, and it can be performed with a very low complication rate, especially, if the preoperative computerized tomographic scans showing the coordinated for the trajectory of the needle, are available.

P#19

LUMBAR DISC SURGERY: A REPORT OF 1384 CASES

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In this retrospective study, we presented 1384 cases with lumbar discal hernia, treated surgically at the Department of Neurosurgery, Dokuz Eylül Uni-

versity. Faculty of Medicine. Tne mean age was 43.9 (15-83) and 710 were male. 943 cases were operated bacause of unilevel and 296 were multilevel discal lumbar hernia, 127 were lumbar spinal stenosis and 18 were spondylolisthesis co-exiciting with lumbar discal hernia. 125 cases underwent reoperation because of fibrosis, recurences or new disc disease at another level, CSF fistulas and revision of the surgical incision.

The surgical results of these cases were discussed under the view of the literature.

P#20

CORRELATION OF EPIDURAL FIBROSIS AND THE SIZE OF LAMINA DEFECT PERFORMED ON OPERATION

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In this study 100 patients in the ages of 20-50 are evaluated retrospectively according to their surgical approaches, 86 and 7 patients who had fibrosis after hemipartial and hemilaminectomy respectively were reported. We have never observed reoperation due to fibrosis in the patients underwent operation by a total laminectomy. Also we have never seen reoperation due to fibrosis by total laminectomy. For these reasons we compare the epidural and the size of lamina defect and considered that hemilaminectomy could be preferred to hemipartial laminectomy to prevent from reoperation due to fibrosis.

P#21

THE RESULTS OF THE POSTERIOR SPINAL INSTRUMENTATION OF THE THORACOLUMBAR BURST FRACTURES

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The surgical treatment of the thoracolumbar burst type spine fractures has been widely explored. The long term survial and the possibility of functional rehabilitation of patients with spinal cord injuries has led to increased interest in treatment of these patients.

Between 1992-1995, 87 patients with unstable thoracolumbar burst type fractures were surgically treated by posterior intrumentation and fusion within five days from the injury. The applied posterior instrumentation system were Alıcı for 45 patients. Isola for 30 patients and Dick for 12 patients. After an average follow-up period of 2.4 years. The mean loss of correction in local kyphotic angle was 11° . The average improvement in the canal deviance was found %26. The improper placement of the transpedicular screw fixation was %9.2 (to the fractured vertebra in 1 and to the disc space in 7 patients) Although the post-operative pain on the thoracolumbar vertebral region was identified in %2.3 it was %31 on the posterior iliac graft site. With respect to neurologic recovery.The average improvement was 1.17 Frankel grades. The mean post-operative infection rate was %4.6.

As a results; The surgical treatment of the unstable burst type thoracolumbar vertebral fractures with a posterior instrumentation system in the proper method when the indications of the surgery and the approach type are well-decided.

P#22

COMPARISON OF TRANSPEDICULAR FIXATION CONFIGURATIONS IN BURST FRACTURES OF THORACOLUMBAR VERTEBRAE

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Application of traspedicular screwing in rigit internal fixation of toracolumbar vertebral pathology is curretiy used methot first discribed by Roy-Camille.

In II. Orthop. and Trav. Clinics of SSK Istanbul Hospital we treated 123 patients by this method. 3 different configurations were used; short segment long segment short : segment ensrumantation with application of TPS to burst vertebra.

Preoperatively type of fractures. local kyphosis angle ratio of ant. body compression interpedicular distance occupation of the canal as radiologic parameters. We followed up these parameters for each group and compared them.

In short segmented cases we found 16.2 degrees of correction loss and 22.3% implant failure meanly. In contrast in long segmented group 5.7% of correction loss and 3.6% implant failure.

As a results short segment configuraton is not confidential. Although long segment is sufficient biomechanicly, since it fuses more vertebrae we have to work on short but strong and stable configurations. In our new configuration application of pedicular screw to chosen burst vertebra it increases stability and endurance of the instrumantation.

P#23

SHORT SEGMENT TRANSPEDICULAR SCREW APPLICATIONS IN THE TREATMENT OF LUMBAR SPINE FRACTURES

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In unstable spine fractures, short segment instrumentation with transpedicular screws through posterior approach is one of the choices.

In this paper, 16 patients, whose L 1-3 burst fractures stabilised by Alıcı Spinal System were evaluated. Mean follow-up and age of patients were 40 months (not less 30 months) and 31.6, respectively.

In our patients anterior vertebral height (AVH) loss was %44 preoperatively, %17 postoperatively and %21 in the follow-up. Vertebral body angle (VBA) was 23.2°, 8.5° and 11.1°, preoperatively and in the 1.2° in the follow-up. Spinal canal encroachment in CT Scan was %46.3 preoperatively, and was %21.2 postoperatively. According to Frankel's classification only one case with incomplete neurodeficit recovered partially.

Wound infections in 2 cases (1 superficial and 1 deep) and sterile sinus syndrome in 1 case were the medical complications in the postoperative period. Complications concerning instruments in the postoperative period were loosening of transpedicular screws (in 2 cases, 3 screws), bending of transpedicular screws (in 1 case, 2 screws) and breakage of transpedicular screws (in 1 case, 1 screw).

As a result, although short segment transpedicular screw instrumentation had the advantage of short segment immobilization and sufficient anatomic reduction and stabilisation we also observed screw complications especially in cases without sufficient correction.

P#24

THE APPLICATION OF ANTERIOR DECOMPRESSION, PLATE-SCREW AND GRAFTING IN THE PATIENTS WITH THORACOLUMBAR SPINE FRACTURES

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The aim in this study is to prove that; anterior decompression, bone grafting and plate-screw stabilization is a safe and effective method in treatment of thoracolumbar spine fractures.

Between January 1994 - January 1996 in Ankara Numune Hospital 1st Clinic of Orthopaedics and Traumatology 18 patients were treated with anterior procedures such as: corpectomy, decompression, grafting and plate-screw stabilization who had thoracolumbar spine fractures especially with neurologic deficit and compression of the neural elements in the spinal canal. The procedures are effective to shorten postoperative immobilization period, fusion period, neurologic recovery and increase the life quality.

P#25

COMPARISON OF ANTERIOR FUSION AND CIRCUMFERENTIAL FUSION IN THE TREATMENT OF SPINAL FRACTURES

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Posterior instrumentation in the way it is instituted up the date have shown dismal results despite the advances and refinement of implant desing and production. Long term loss of correction in posterior interventions have led orthopedists to find better approaches. Considering that the majority of the pathology is located anteriorly in spinal fractures, new developments in anterior implants and fusion techniques have been recorder. With these developments in mind, we have compared the anteriorly instrumented and fused cases with posteriorly instrumented and circumferentially fused cases.

Twelve patients were operated on between December 1994-December 1995. Nine male and three female patients with an average of 34, 7 years (range, 20 to 54 years) were operated on for spinal fractures. Five cases had anterior intervention while seven received posterior instrumentation and postero-anterior (circumferential) fusion in a one stage procedure. Eight patients had burst fractures, three compression and one fractures dislocation. Three of the fractures were localized on T12, four on L1, two on L2, two on L3 and one patient had L2-3 fracture-dislocation.

Instruments used in anterior interventions were Alıcı in 2, Kaneda in 2 and one broad DCP, posterior interventions were with Alıcı in 4 and Isola in 3. Our posterior interventions consisted of transpedicular instrumentation with anterior grafting. Circumferential fusion was done on 2 cases with previous laminectomy and 2 lamina fractures that necessiated laminetomy, the fifth patient was spinal stenosis following isolated posterior instrumentation. After the implantation of posterior instruments, the ruptured disc as diagnosed by preopertive radiological examination was removed, the intact neighboring plate was currectted and the defect was filled with grafts. Posterior intact lamina was also decorticated and grafted.

One case attained late femoral nerve lesion, most probably due to heamotoma in the illiopsoas. Three superficial infections resolved with parenteral antibiotics and superficial debridement. No implant fracture or pseudoarthrosis were seen. Circumferential grafting resulted in solid fusions on the anterior sites.

We think that anterior grafting combined with refined posterior instrumentation will give better results. We have not seen any severe complication in our short term follow-up and we have obtained solid fusions in longer followed-up patients.

P#26

SURGERY FOR SPINAL FRACTURES

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Eventhough there is no accepted universal criteria for surgical indication in spinal fractures it is accepted that surgical intervention is superior to conservative measures in mechanical and/or neurologically unstable patients. Surgical intervention must aim at restoring normal spinal anatomy, protecting instrumentation & fusion, anterior decompression & fusion or posterior instrumentation with circumferential fusion. We have retrospectively evaluated our surgical treatment results.

Betwen December 1993 - December 1995, we have operated on 25 cases of spinal fractures. Fifteen of the patients were male & ten female with an average age of 36.2 years (range 16 to 58 years). The etiologies of the fractures were traffic accidents in 19 patients & fally from a height in 6. The average follow up was 13 months (range , 5 to 22 month).

There were 12 compression fractures (5 localized on L1). 11 burst fractures (5 localized on T12) and 2 fracture - dislocation. Neurologic evaluation showed 5 cases with Frankel A, 1 Frankel C; 3 Frankel D & 16 Frankel E.

Five cases were transferred from the Neurosurgery deparment following laminectomy. We primarily intervened surgically on other cases 1 - 7 days after admission.

Thirteen patients received posterior instrumentation (Alıcı, Isola & Fixateur Intern) & fusion, 5 received anterior instrumentation (Alıcı. Kaneda & Broad DCP) & fusion, 7 patient with posterior instrumentation & circumferential fusion.

Five patients developed superficial infection that resolved with local debridement & İ. V. antibiotics. One patient developed spinal stenosis following posterior instrumentation & fusion due to misplaced pedicular screws. One patient had loosened posterior instrument probably due to pseudoarthrosis. One patient attained femoral nerve lesion after anterior .

P#27

SURGICAL TREATMENT OF THORACIC AND LUMBAR VERTEBRE FRACTURES

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Surgical reconstruction and fusion were used to stabilize unstable thoracic and lumbar fractures in 23 patients at the Bayındır Medical Center between March 1994- November 1995.

The charts, radiograps and cilinical records were reviewed retrospectively. 22 patients were treated with different posterior instrumentation system (Alıcı, Internal Fixator, Isola) One patient was treated with anterior Kaneda device. 5 patients were lost to follow-up. Of the remaining 18 patients all were evaluated at follow-up ranging from 1 to 20 months (mean, 6 months). There was one infection treated by debridement and antibiotics. Pedicle screws pulled out in only one patient was found at follow-up. There was no neurologic complication.

Conclusions 1. One failure of short segment pedicle instrumentation was seen at follow-up. We prefer longer constructs to obtain rigid fixation especially in thoracolumbar.

2. We believe that anterior decompression and instrumentation is the best choice in the patients with neurologic deficit.

3. social status of the patients and user friendly devices were the important factors in the choice of implants.

P#28

TREATMENT IN MULTIPLE VERTEBRAL FRACTURES

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There are only a limited number of reports on multi-level vertebral fractures in the orthopedic literature. However, they are rather common in our country because of the frequency of traffic accidents. Treatment of these fractures in more difficult because of increasing risks and stability problems. In this study, patients with multi-level verdtebral are examined retrospectively and surgical indications are discussed.

PATIENTS AND METHOD: Between 1991-1995, 20 patients with multi-level vertebral fractures were treated surgically. Fourteen patients were male and six were female. Mean age was 32 (17-59). Sixteen patients presented with a total of 47 vertebral fractures. One patient was treated with combined anterior and posterior surgery and the rest of the patients were treated with posterior instrumentations and fusion.

RESULTS: Approximately half of the fractures were seen between T12 and L2 (49 %) 78 % of the fractures were compression type, 11% were burst type, and 11% were fracture-dislocations. neurological lesions were seen in 30%, other organ injuries and fractures were seen in 25% of the patients.

DİCSUSSİON: Patients with multi-level vertebral fractures that are treated with surgical stabilization, usually present with postoperative loss of sagittal index values, in spite of initial rigid fixation. This loss is greater in patients who were not treated with surgical stabilization. In conclusion, we believe that in multipe vertebral fractures, conservative treatment is inapropriate. Surgical stabilization prevents complications associated with conservative treatment and therefore it must be the treatment of choice in multi-level vertebral fractures.

P#29

SURGICAL TREATMENT IN MULTIPLE NON-CONTIGUOUS SPINE FRACTURES

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Multiple non-contiguous spine fractures are more rarely encountered when compared with multiple level (contiguous) spine fractures. Instrumentation to obtain reduction and stabilisation in multiple non-contiguous spine fractures has specific characteristics.

In this study, we evaluated the results of posterior reduction and stabilisation with Alıcı Spinal System in the treatment of 6 patients with multiple non-contiguous spine fractures. In the light of these applications choice of instrumentation type in such injuries were discussed.

Naturally, statistical analysis hasn't done because of the fewness of our cases. On the other hand we also decided that, in the treatment of multiple non-contiguous spine fractures, when pedicular anatomy is suitable, in order to get better correction, decompression and immobilisation of fewer segments, transpedicular screw fixation would be better when compared with long segment hook applications.

P#30

THE EFFECT OF DIFFERENT INTERNAL FIXATION METHODS ON THE NEUROLOGICAL OUTCOME OF THORACOLUMBAR VERTEBRA FRACTURES

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Neurological status of 45 patients who were operated on for the treatment

of thoracolumbar fractures were evaluated. Internal fixations includes 19 SSI, 12 posterior CD instrumentation and 14 Kaneda instrumentation. No significant difference between these internal fixation methods regarding the difference between preoperative and postoperative neurological status of the patients could be found.

P#31

SURGICAL TREATMENT FOR FRACTURES OF THE UPPER THORACIC SPINE (ABOVE T7-T8)

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INTRODUCTION: Major factors that would influence treatment for fractures of the upper thoracic spine, that is above T8, are physiologic kyphosis of thoracic spine, intrinsic stability provided by the rib cage and sternum (thoracic cage) and narrow thoracic medullary canal. A majority of thoracic spine fractures are caused by excessive axial load at forward flexion. Fracture-dislocation and hyperextension injuries as high energy trauma are less common and frequently result in complate neurologic deficit.

PATIENTS AND METHOD: Between 1991 and 1995, 9 patients with fractures of upper thoracic spine were surgically treated. Of these 3 were paraplegic at presentation because of fracture-dislocation injury and had posterior instrumentation alone for reduction and stabilization. All patients with fracture-dislocation injury also had hemo-pneumothorax and multiple rib fractures which suggested a high-energy trauma 3 patients with burst fracture and incomplete neurologic deficit underwent anterior decompression and fusion and posterior instrumentation. The remaining 3 patients had a translation injury at T4-T5 level but no neurologic deficit. These patients had posterior surgery for stabilization and fusion. Sublaminary wires from T2 to three level below the lesion were applied to concavity of the translation and these were pulled out toward midline for reduction.

RESULTS: Right after stabilization surgery early rehabilitation was started

in the patients with fracture-dislocation injury. One is able to walk with an orthosis and two are wheel-chair dependent because they refused orthosis. All three had developement urinary tract infection during hospilization. One had developed a sacral decubitus lesion which was reconstructed with a rotational flap. This same patient, later on, has developed myositis ossificans of his right hip and knee. All patients with burst fractures had complete neurologic recovery and solid fusion. Overall none of the patients had loss of correction, pseudoarthrosis or infection at follow-up.

CONCLUSION : Compression or burst fractures above T8 without fractures bove T8 without fractures of sternum and/or ribs are stable and treatment in conservative. Such patients, if they have no neurologic deficit and loss of vertebral body height is so more than 50% shoulde be treated with bed-rest or ambulatıon with halovest or halo-cast since brace would be ineffective at or above T8. Unstable group consists of incomplete neurologic deficit, burst fractures of sternum and ribs, two or more than two level complete compression fractures and translation injuries (more than 2.5 mm and intact neurologic examination) and surgical intervention is needed for these patients.

P#32

HARRI-LUQUE METHOD IN SURGICAL TREATMENT OF THE THORACOLUMBAR SPINE FRACTURES

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26 patiens who had thoracolumbar spine fractures were treated with Harrington rods and segmental sublaminar wires between 1992-95. Because of the neurologic findings, anterior decompression and grafting in addition to the posterior instrumentation were done in 2 patients.

Average follow-up time was 14 mounths (7-25) Out of the 23 fractures of the 20 patients; who had enough follow-up 16 fractures were burst fracture, other 6 fractures were fracture-dislocation.

Preoperatively average local kyphosis angle was 23.3° postoperatively it

was 10.7°, in the last follow-up it was 17.8°

Postoperatively, average time that patients used TLSO corset was 4 months (1 week -1 year).

Patients treated with this method had following complacations; 1 patient had superficial infection, in 1 patient rod was broken, in 2 patients lower hooks were dislodged from lamina, in the last follow-up, average loss of correction was 7.1°

In the last few patients we were used DTT for making the system rectangular.

Complications related to Harrington system were postulated in the literature. But in patients who had poor economic status, this method could be used effectively if fusion was done. TLSO corset was used and controles were made routinely.

P#33

THE EFFECT OF POSTERIOR SPINE SURGERY ON NEUROLOGIC RECOVERY IN SPINE FRACTURES WITH NEUROLOGIC DEFICITS

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Spinal cord lesions seen after spinal colon trauma may be cacsed severe results such as mortality, long time work los and permanent disabilitiy. Spinal cord injury is seen 40% after cervical spine trauma and 15-20% after thoracic and lumbar spine trauma. Neurologic recovery sufficient for the functional rehabilition could be expected if optimal conditions for the neurologic recovery have been maintained.

26 patients who had thoracic and lumbar spine fractures with various degrees of neurologic deficits were treated with posterior spine surgery (decompression, reduction, stabilization and fusion.) The patients were follow up with the mean of 24 months (1 months-70 months) and the neurologic recovery was evaluated.

While 1 or 2 Frankel degrees neurologic recoveries were determinerd in 18 of 22 patients (82%) who had incomplet neurologic deficits, no recoveries

were seen in 4 patients with complet neurologic deficits. As a result it could be said posterior spine surgery has a significant effect on neorologic recovery in incomplete deficits.

P#34

POSTOPERATIVE CARE IN SPINE FRACTURES

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Surgical intervention can have drastic effect on the vital sings and hemodynamic parameters in those patients with spinal trauma. As a result the follow-up these patients after surgery has its own features.

By examining 59 patients who were operated with posterior instrumentation in Kartal Research and Trainning Hospital Orthopaedics and Traumatology Clinici 1 with a diagnosis of untable thoracic or lumbar vertebrae fracture between 1989 and 1995 retrospectively, we try to evaluate the nursing care of these patients. In 33% of these patients there were general medical complications. In order to avoid complications a rational way of postoperative nursing care is determined.

The reduced incidence of postoperative complications as a results of well oraganized nursing care pointed out the necessity of a team work which consist of a doctor, caring nurse, physiotherapist, occupational therapist, psyschiatrist and a psylogoc.

P#35

DIFFERENTIAL DIAGNOSIS OF BENIGN AND MALIGNANT VERTEBRAL COMPRESISSION FRACTURTURES WITH MR IMAGING

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Determintion of the benign or malignant cause of vertebral compression fractures is a frequent and sometimes difficult problem especially in the elderly patients. Differentiation of benign from malignant compression fractures of vertebral bodies is important for appropriate clinical stagig, treatment planning and prognostic determination in patients appropriate clinical staging, treatment planning, and prognostic determination in patients with known nonosseous malignancies. Although most are benign in origin it is important to screen these patients to exclude underlying malignancy, since the spine is the most common skeletal site of metastatic disease and accounts for up to 39% of all bone metastases. Plain radiography, computed tomography (CT), and radionuclide scintigraphy performed alone may be inadequate in distinguishing the nature of compression fractures.

MRI has been claimed to be the most sensitive producere avaible for the demonstration of bone marrow metastases to the spine and to be more sensitive for early bone marrow metastatses than plain radiography and radionuclide bone scanning, The purpose of this study was to assess the capabilities of MRI in distinguishing benign from malignant compression fractures of vertebral bodies to establish criteria useful in differentiating, these two entities.

P#36
ATYPICAL NEUROLOGICAL SYNDORM FOLLOWING SPINAL TRAUMA

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In clinical practice, it is well known that the neurological findings such as increment in muscle tone and deep tendon reflexes below the lesion level and spastic urinary bladder are related with upper motor neuron disorder. In this proceeding, 4 cases (19%) out of 21 cases with spinal trauma have been presented. They have atypical neurological symptoms and findings such as decreased deep tendon reflexes and urinary retantion. Patients with lumbosacral

trauma have not included in this study.

Two cases (9.5%) had abnormal pathological findings in their neurorodiological evaluation, but the other 2 (9.5%) were normal. In this study we emphasize the importance of both the evaluation of the possibility of atypical neurological symptoms and the performing repeated neurological examination following spinal trauma.

P#37
THE EARLY POSTOERATIVE RESULTS OF ANTERIOR APPLICATION OF ALICI ANTERIOR PLATE AND ALICI SPINAL SYSTEM

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Anterior approach is useful for treatment of early and late thoracic and lumbar spine fractures, spinal infections and tumors. This apporoach to the spine offers several unique solutions to problem posed by patients with thoracolumbar injuries, infections and tumors. Properly chosen anterior instrumentation has the unigue ability to stabilize the involved spine over only one or two motion segments in contrast to posterior instrumentation which require four to five segments. The anterior apporach to decompression allows direct visulization of the spinal cord.

The objective of this study, is to the early postoperative results of ALICI anterior plate and ALICI spinal system. In this study's, we evaluated pros and cons of both system.

Between 1990 and 1995, 57 male patients and 46 female patients ranging in age from 16 to 75 years (average 43.7 years), with spinal fracture, infections and primary ord metastatic tumors were treated by anterior decompression and stabilization, at the Orthopaedic Department of Medical Faculty Hospital of Dokuz Eylül University. ALICI anterior plate was used in 18 patients, spinal system was used in 85 patients for stabilization after decompression or cordectomy. Anterior surgery were performed for vertebral fracture in 51 patients, for spinal infections especially spinal tuberculosis in 27 patients, for primary or metastatic spinal tumors in 25 patient. All patients had

plain lateral and anteroposterior of dorsolumbar vertebrae radiographs preperative and within a week after the operation postoperative. In this radiographs, we evaulated preoperatively and postoperatively local kyphosis angle sagittal index, retrolisthesis of instrumented distal vertebra, translation of instrumented vertebra in applicated anterior plate and spinal instrument.

ALICI anterior plate applicated patients had an average 20.7 degress local kyphosis angle and 24.8 sagittal index preoperatively, and an average 8.5 degrees local kyphosis angle and 14.05 sagittal index postoperatively. ALICI spinal system applicated patients had an average 21.2 degrees local kyphosis angle and 23.2 sagittal index preoperatively, and an average 10.6 degrees local kyphosis angle and 15.5 sagittal index postoperatively. As a result, in the patients with anterior plate, local kyphosis angle was reduced avaragely 12.2 degrees and 10.6 degrees in the patients with spinal system degrees. Scoliosis angle in the patients applicated anterior plate and spinal instrument showed an average incease of 0.9 degrees postoperatively Retrolisthesis index was 0.4 in these patients. There was no translation of instrumented distal vertebra in the patients with spinal instrument, although, in the patients with anterior plate it was mesaured as an average 1.9 mm.

As a result, we couldn't find any significant difference between the early radiographic results of ALICI anterior plate and ALICI spinal system anterior application. The anterior reconstruction method permit effective decompression of the spinal canal and offers superior mechanical stabilitiy compared with the indirect decompression and stabilization of posterior instrument. The early results of ALICI anterior plate are encouraging but longer clinical follow-up study is required.

P#38

TREATMENT OF COMPLETE FRACTURE - DISLOCATION WITH PARAPLEGIA AT UPPER LEVEL OF THORACIC VERTEBRAE

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Complete fracture - dislocation with spondyloptosis of upper thoracic vertebrae have not seen frequently. For that reason there are not so much satisfactory knowledge about the treatment of this cases. In this report we established two cases which attend to our clinic between may '95- september '95.

In acute phase, the systemic complications and ascendan bulber oedema caused by peroperatuary forcefull manupilations increase the mortality rate.

When proximal vertabral colon had falled anterior to distal vertabral colon, in our opinion reduction is impossible by peroperatuar manuplations. The segments which are proximal side are neurologically intact and the level is to high for anterior instrumentation so having resection from distal colon at the level of dislocation by anterior approach and than posterior stabilisation is the only way of reduction. Surgeon must not attempt to an urgent operaton to the patients with total rupture of spinal cord. (posterior elements of anterior dislocated vertebra are intact radiologically) Corticosteroid medication for releasing oedema at spinal cord and halotraction for stabilising the vital systems, are applied to the patients. After this application as we prefer, insitu posterior instrumentation without reduction by pedicular screw and rod system and anterior fusion with bone graft is applied to the patients as a treatment.

We have two case report in this study.

P#39

ALICI SPINAL SYSTEM AND COMPRESSIVE INTERSPINOUS WIRING IN THE TREATMENT OF THORACOLUMBAR FRACTURE-DISLOCATIONS

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It's very difficult to obtain reduction and to maintain the reduction with instrumentation in three - columnar fracture - dislocation of spine. For this reason, in cases with thoracolumbar fracture-dislocations interspinous compression by means of rods or wires may be necessary in

order to enchance the stability.

In this study, we evaluated the results of Alıcı Spinal System combined with interspinous compressive wiring in the treatment of thoracolumbar fracture dislocations. Mean follow-up was 23.3 months in 25 of 27 patients. Their mean age was 30, 12 of them were male and 15 of them were female.

In one case, reduction and instrumentation was technically unsuccessful, intraoperatively. Spinal alignment was anatomically successful in the other cases. 24 (20 of were complete and 4 of were incomplete) of 25 fully followed cases had neurodeficits preoperatively. In the follow-up, only, 2 of the cases had shown partial neurologic recovery. In the late follow-up, spinal alignment has been still preserved.

In the light of our results, we can suggest Alıcı Spinal System in combination with interspinous wiring in the treatment of fracture-dislocations of the spine.

P#40

HYDATID DISEASE IN SPINE

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By presenting a 45 years old female patient with vertebral hydatidosis who was treated in Kartal Research and Training Hospital Orthopaedics and Traumatology Clinic 1, we discuss the clinical findings, treatment and the outcome of hydatidosis. Backache, paresis of both limbs, inability to walk were the complaints of the patient. In physical examination there were loss of motor function in hip muscle, clonus and a pozitive Babinski sign. In radiological examination, the widespread involvemet of the vertebral column between 7th thoracic and 1st lumbar vertebra and compression of the dura in the level of 9th and 10th thoracic vertebrae were noticed. Upon performing laminectomy between 6th thoracic and 1st lumbar vertebrae, posterior instrumentation and fusion were applied as the surgical procedure. The patient has also used albendazole with a dosage of 200 mg/day. Echinococus multicolaris has been

detected in the pathologic speciemens obtained by surgery. After surgery all the symptoms were disappeared and none has detected in her last control.

In vertebral hydatidosis with neurological involment the prognosis is poor. The aim of the treatment must be resolve this involment by laminectomy and by stabilizing the involved portion of the vertebral column. The possibility of recurrence must be always kept in mind.

P#41

DETECTION OF MYCOBACTERIUM TUBERCULOSIS IN FORMALIN-FIXED, PARAFFIN EMBEDDED TISSUE BY POLYMERASE CHAİN REACTION POTT'S DISEASE

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SUMMARY OF BACKGROUND DATA: Diagnosis of a mycobacterial infection is a long process: identification and antibiotic sensitivity testing can take up to 10 weeks and still the sensitivity of culture can be as low as 50%. Direct microscopy may be insensitive due to insufficient number of mycobacteria. Polymerase chain reaction which can amplifiy specific target DNA sequences many thousand times in a matter of hours, has been applied in the rapid amplification and identification of many organisms, including mycobacteria. We investigated the presence of myobacterial DNA by PCR in routinely fixed, paraffin-embedded vertebral biopsy samples of cases who underwent Hong-kong operation and tried to find out the sensivitiy and specificity of the method.

METHODS: 25 formalin-fixed, praffin-embedded tissue blocks from vertebral biopsy materials with presumptive diagnosis of tuberculous spondylitis (TS) (19) and non-specific (NS) vertebral osteomyelitis (6) were studied. Approximately 1 µm tissue sections of paraffin blocks were cut and deparaffinizied. An insertion element IS 6110, a DNA sequence unique to Mycobacterium complex was amplified by PCR. DNA marker, positive control

with purified M. tuberculosis DNA, negative control (ultra pure H_2O), and human leukocyte DNA along with positive or negative patient were included in each experiment. The reaction mixtures were electrophoresed on etidium bromide.

RESULTS: PCR was positive in 18 cases of 19 TS. There were 6 chronic NS infections and PCR resulted negative in five cases. DNA amlification was positive even after three tests in the remaining case Three of our PCR tests were positive with concomitant negative culture and positive AFS-bacilli staining. When compared with culture results there were 9 positive and 10 negative cultures. AFS-bacilli were positive in 3 of 10 negative cultures. In paraffin blocks with histology compatible with NS infectious spondylitis PCR yielded 5 negative results out of 6 cases. There had been one positive PCR result where culture and AFS-bacilli and histology were negative. Three of our PCR tests were positive with concomitant negative culture, positive AFS-bacillistaining.

CONCLUSION: PCR has a sensitivity of 94.7%, specificity of 83.3%, positive preditictive value of 94.7% and a negative predictive value of 83.3%. Accuracy was calculated as 92%

P#42

LATE POTT PARAPLEGIA

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If the thoracal kyphosis deformity of children with Pott disease is not treated surgically, a sharp kyphosis develops in most of the cases. In later stages of the disease spondylotic myelopathy could be seen in some cases (Late Pott paraplegia) In our clinic 5 complete late Pott paraplegia were treated with anterior decompression and bone grafting. Complete recovery was detected in 4 cases in the early postoperative period, while the recovery was slow in the other case.

P#43

MULTIFOCAL TUBERCULOSIS OF THE SPINE

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A 15 year old boy was admitted to our clinic with back pain. He had no signs and symptoms of spinal cord or root compression. Plain radiographs of vertebral column demostrated multipl isolated involvement at T1, T4, T6, T8 and T12-L1 levels. Chest roentgenogram is completely normal. Computed tomography and magnetic resonance imaging revealed the destructive lesions in vertebdal body extented to right pedicle at L1. histologic examination of specimens which were taken frrom T8 and T12-L1 vertebrae showed typical apperance of tuberculosis of bone. The patient was successfully treated by anterior radical debridement and grafting with fibula and rib for T12-L12 level combined with antituberculous drugs for 12 months period. After a year grafts were incorporated and there was no further kyphosis at thoracolumbar junction.

P#44

INTERVERTEBRAL SPACE INFECTION: AN EXPERIMENTAL MODEL

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Intervertebral space infections are rarely seen complications of lumbar discal hernia operations. However they are important because their definite diagnosis and treatment are difficult, their treatments is expensive and they cause loss of work. The treatment is medical except some special cases and it's very hard to grow the pathogen microorganism from the cultures of both blood and intervertebral space specimens. Because of these reasons sufficient knowledge about the bacteriological and histopathological changes couldn't have been obtained.

In this experimental study, a distiance infections model was made in rats

under laboratory conditions. S. aureus, K. penumoniae, P. aeruginosa and physiological saline had been inoculated, into the intervertebral space and rats were examined microbiologically and histopathologically after three weeks. Among the inoculated microorganisms, S. aerus contineud its activity and caused destructive changes after this period of time. Also vacuoler myelopathia was detected in the spinal cord and spinal roots of all three pathogen inoculated groups.

P#45

VERTEBRAL SPONDYLITIS DUE TO BRUCELLA SPECIES

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Brucellois is a zoonosis of world-wide distribution that is caused by small, gram negative coccobacili of the genus Brucella. Although few cases are found in industrialized countries, it is still endemic and considered as a public health problem in Mediterranean basin., Middle East, central and South America Although the frequency of osteoarticular involvement of chronic brucellosis is high, it varies between 10% to 85% in the published series and spondylitis, mainly located at the lumar spine is the most prevalent.

In this study, we have described 16 patients with proven brucellar spondylitis. The mean age was 46.8 and 10 were male. Brucellar spondylitis was diagnosed according to their clinical findings and brucella agglutination tests. All the patients had good reponse to the medical treatment and one of these patients had been operated because of paravertebral abscess. Brucellar spondylitis had been discussed under the view of literature.

P#46

BRUCELLA OSTEOMYELITIS IN LUMBAR VERTEBRAE

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Brucellosis is a worldwide anthropozoonosis which 500000 persons have become ill in the world every year and commonly seen especially in East and South-East Anatolia region of our country where is being occupied with stock-breeding. This disease is transmitted by ingesting unpasteurized fresh milk or milk products (eg. Butter and cheese). Brucellosis results in a multisystemic view in which osteoarticuler involvement appears in ratio between 20-85% and 3-15% of them complicates with spodylarthritis.

A case diagnosed with Brucella osteomyelitis in lumbar vertebrae 3, 4,5 is presented, 37 years old male patient was occupied with farming and has been suffering from backache for 6 months. The patients whose SAT was 1/640, had typical brucella osteomyelitis findins in his radiografies and computerised tomography. The patient improved with medical treatment only.

P#47

DRENAGE APPLICATIONS WITH POSTERIOR APPROACH FROM THE INTERVERTEBRAL DISC SPACE FOLLOWED WITH POSTERIOR INSTRUMENTATION IN PATIENTS WITH DISTAL LUMBAR AND SACRAL TUBERCULOSIS ABCESS

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Anterior drenage of distal lumbar and sacral Pott abcess is rather difficult than upper localizations as major vessel complications are likely to occur. In this study the results of one patient with L2-L3 and two patients with L5-S1 localized vertebral tuberculosis were evaluated whom had posterior lam-

inectomy, abcess drenage through the intervertebral disc space, curatage of devasted corpus material followed by posterolateral interbody fusion (PLIF) by using autogeneus graft. Mean age was 35 years and two of the patients male, one of the patients was female. In all the patients a short segment Texas Scottish Rite Hospital System Instrumentation was performed. Mean follow-up 12 months. At their last controls all the patients had a solid fusion mass. In light of these findings it is suggested that the method ve presented can be a good treatment alternative in such patients with such a rare tuberculous abcess localization.

P#48

SURGICAL TREATMENT IN METASTATIC TUMORS OF SPINE

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We operated 34 patients with metastatic spinal tumors at Orthopaedics and Traumatolgy Department of GMMA between 1988 and 1995. The average age of the patiets was 49 (range: 20-63) and mean follow up was 15 months.

the pathologic diagnosis of our cases werde, breast carenal, cell ca, adeno ca, hypernephroma, plasmocytoma, prostate gland ca and pancreas ca.

We performed compression without fusion and long posterior instrumentation, especially to the patients with multiple metastasis, the aim of this study was to prevent medullary compression and pain with multidisciplinary apporoach composed of surgical treatment, chemotheraphy and radiationtheraphy thus increasing the life quality of the patient.

P#49

SPINAL MASS LESIONS

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52 patients who underwent operations for their spinal mass lesions in Bakırköy Mental had and Psychiatric Hospital II. Clinic of Neurological Surgery between 1990 and 1995 are reviewed retrospectively with respect to the incidence, anatomic location, histopathology, imaging techniques, age and sex distribution, type of the surgical procedure, physical findings and postoperative care. Primary and metastatic tumors of the spine were the most common pathologies. The rest consisted of pyogenic and tuberculois abcesses and hydatid cysts. As a standart approach laminectomy and resection of the tumor was done. For infectious and tumoral lesions that had selectively involved the vertebral body, however, an anterior approach to the spine was prefferred.

P#50

SPINAL TUMORS

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Ninety-two cases with spinal tumors were operated in our department between years 1984 and 1995. Fourty-two of them were found in thorasic, 35 in lumbar and 15 in cervical spine. Metastatic lesions were constituting 38% of the cases. Majority of the cases were treatment via a posterior approach, The clinical, neuroradiological and operative findings were presented, and results are discussed in the light of the literature.

P#51

PERCUTANEOUS TRANSPEDICULAR BIOPSY FOR VERTEBRAL LESIONS

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Some of the vertebral lesions such as Pott's disease are easy to diagnose and decide to perform the definitive operation without biopsy. On the other hand there are many lesions when there is suspect of primary or metastatic lesion of vertebral colon one must hesitate to operate the patient prior to biopsy. So we decided to perform percutaneous transpedicular biopsy which was technically difficult but less time consuming and having less morbidity. 5 cases of vertebral pathology were biopsied under local anesthesia supplemented with light neuroleptic analgesia in this way. The Kambin instrument were used for the procedure.

The histopathologic results were as follows: Tuberculosis in 1 case, plasmocytoma in 1, non specific infection in 1, metastatic disease in 2 cases.

We did not observe any post-operative complication.

P#52

COMPLICATIONS OF POSTERIOR SPINE SURGERY IN SPINE FRACTURES

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Complications could be classsified in two groups as common medical complications due to spine fractures and spine surgery. Rate of the complications due to spine surgery in thoracic and lumbar spine fracturs are 15-25%

Complications seen in 48 patients treated with posterior spine surgery for unstabil thoracic and lumbar spine fractures were evaluated and it is found as 30% in our patients. Reoperations were needed in 23% of these patients be-

cause of various complications.

Because of high complication rates indications of surgery for the treatment of thoracic and lumbar spine fractures should be restricted.

P#53

COMPLICATIONS IN CERVICAL SPINE SURGERY

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Since 1984, 322 cases have been operated due to cervical pathologies. Among them 275 were operated anteriorly, 44 posteriorly and three transoral. Post-operative complications were usually related with bone grafting and among them, twelve cases underwent to reoperation by an anterior approach. Postoperative complications and reasons for reoperation were discussed in this study.

P#54

ELECTROPHYSIOLOGICAL AND HISTOPATHOLOGICAL EVALUATION OF CHORD COMPRESSION IN DOGS OBTAINED BY POSTERIOR BONE BLOCK PLACEMENT

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In this study 6 healthy dogs were examined after laminectomy and a cubic bone block placement at Animal and Reserarch Laboratory of Social Security Hospital. The cubic bone was removed at 5th second, 1st minute, 3rd week or left indefinetely. The motor evoked potentials of the dogs were monitorized with Cadwell Quantum 80 equipment intraoperatively and at the postoperative 3rd week. After curicification of the dogs chord samples of them were examined histopathologically. Electrophysiological determination was found to

be correlated with duration of the chord compression. Moreover, histopathological neuronal destruction and fibrosis were also harmonius with clinical findings. In light of these findings it is thought that preoperative electrophysiological evaluation of the in patients with spinal stenosis or spinal chord compression could determine the benefits of surgery before decompression planning.

P#55

HISTOPATHOLOGICAL ANALYSIS OF THERMAL CHANGES OF THE PARAVERTEBRAL SOFT TISSUES DUE TO MRI AFTER ANTERIOR TITANIUM PLATE APPLICATION

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Evaluation of the thermal effects or MRI was planned after diagnosing aortic aneuvrism in a patient who had severe abdominal pain after postoperative MRI evaluation of this patient, as anterior vertebrectomy, anterior strut grafting and titanium Z plate instrumentation was performed for posttraumatic kyphosis. For this aim MRI evaluation of 10 calf fresh vertebral segments were examined with their anterior vessels and soft tissues were preserved. Five of them were sperated as control group. Titanium Z plate instrumentation was performed in contact with the aorte to the maining 5 calf spines. Averagely 3.8°C of warming of titanium plates with the magnetic thermal offect of MRI was noted. It was demonstrated that an histopathological changes did not occur in soft tissues and vessels both in the samples and the control group. In light of these findings it is suggested that soft tissue damages after MRI did not occur in patients with titanium anterior instrumentation.

P#56

CLINICAL IMPORTANCE OF THE MINIMAL CANCELLOUS DIAMETER OF LOWER THORACIC AND LUMBAR VERTEBRAL PEDICLES

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Transpediculer spinal fixation is a widely used method in vertebral surgery, but is suffers from complications due to mismatches between the screw and pedicle. Therefore, information of minimal cancellous (MCD) and minimal external diameters (MED) of the pedicle is highly important for vertebral surgery. To determine these diameters and their ratios. 2.808 measurements of 1.404 pedicles of 702 human vertebrae were made from Th 11 to L5. We found that the mean ratio of MCD to MED was 72.2%. MCD to vertical diameter (VD) was 41.7% and MCD to transvers diameter (TD) was 62.2% in all levels. We recommend that these results be considered prior to pediculer fixation operations and design of new implantable devices.

P#57

PERCUTANEOUS AUTOMATED BIOPSY IN THE DIAGNOSIS AND TREATMENT OF JUVENILE CERVICAL INTERVERTEBRAL DISC CALCIFICATION

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A nine-year old female patient applied to our department with a resistent neck and right arm pain lasting over 7 months of medical therapy, her neurodiological investigations were consistent with juvenile intervertebral disc calcification, but there was a mass lesion compressing the dura at C2-3 disc level. Because of her resistent radicular symptoms, we performed percutaneous automated nucleotomy technique easily under local anesthesia either for decompressing and obtaining material for bacteriological and histopathological

investigations. she had a rapid relief of pain in the immediate postoperative period. The decompression was satisfactory on her postoperative cervical magnetic resonance images. The bacteriological investigations were negative and the histopathological dianosis was a calcified and degenerated disc tissue. Three months have passed after her discharge, and she had no complain or neurological deficit on her latest control.

P#58

AN ANTERIOR APPROACH TO THE CERVICOTHORACIC JUNCTION OF THE SPINE (MODIFIED OSTEOTOMY OF THE MANUBRIUM STERNI AND CLAVICLE)

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INSTRODUCTION: Significant technical difficulties are involved when anterior cervicothoracic approach is planned for various pathologic conditions like tumor, infection or fracture. The kyphotic deformity and large vessels along with osseous structures, that is clavicle and sternum, are the major structures that would restrict the anterior procedures. Standard anterior approaches for lower cervical region would expose only down to T1 level even in patients with a relatively long neck. However the field for surgical manipulation is usually inadequate. Transpleural approach to the upper thoracic region is also inadequate for this junctional region. For these reasons various different surgical approaches are advocated.

OPERATIVE TECHNIQUE: One of these is osteotomy and resection of the manubrium sterni and medial end of the clavicle as recommented by Sundaresan. Sundaresan technique provides a good visual and surgical field but it ends up with a significant defect of bone. We have modified this technique such that we did not disrupt the sternoclavicular joint and performed one-piece resection. Following the decompression and fusion, the resected segment was replanted and fixed.

CASE REPORT: We have used this approach in two cases of cervical tu-

berculosis which had destruction between C6-T2 and C7-T1. Fibular strut graft was used in both cases and they are followed for 28 and 16 months respectively. Cross K-wire fixation was used for the replanted bone segment. Solid fusion was achieved in both cases and union of the replanted segments was uneventful. Ipsilateral shoulder joint had normal range of motion in both cases.

CONCLUSION: Osteotomy of the manubrium sterni and clavicle provides a good and adequate visual and surgical field for cervicothoracic region lesions. Replantation of the resected segment helps preserve the bony integrity and union is apparently uneventful.

P#59

THE PLACE OF ALLOGRAFTS IN SPINAL SURGERY

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The success in spinal surgery depends not only on appropriate implants and correction but also on abundant grafting that will result in good fusion. The use of autografts in these cases may result in donor site complications (8.6 % major, 20.23 % minor) The most notable complications are infection prolonged wound drainage, pain that can last up to 6 months, loss of sensation, large heamatomas and unsightly scars. In order to avoid these complications we have used allografts and would like to present our short term results.

We have used spinal instrumentation and allografts for spinal fusion between December 1994-december 1995 in thirteen cases. The average age of the fracture group was 32 years (range, 20 to 47 years) which consisted of 5 male and 2 female patients, 4 degenerative spinal fusion was performed in 4 females with an average age of 52 years (range 45 to 67 years) and posterior instrumentation and fusion was performed in two scoliosis cases with an average age of 13 years (range 10 to 16 years). The average follow up was 6 months (range 3 to 12 months)

Fractures were treated with 2 anterior and 5 posterior interventions. In anterior interventions we have used fibular allografts combined with tricortical

autografts, in posterior interventions, allografts were used in combination with osseous material obtained from posterior elements. Scoliosis patients received chip grafts after posterior decortications.

Complications occurred in two cases. One had a femoral nerve lesion following anterior intervention. One patient with posterior intervention developed back pain which was due to spinal stenosis. This patient received a revision with laminectomy, anterior disc space was cleared and grafting was done. Sufficient amount of fusion bulk was found at this revision in 5 months. There was no infection, no immunologic reactions or rejections. All patients attained complete fusion.

The use of allografts decreases blood loss and operation time. The preformed grafts (chips, granules, fibular strust) also decrease the time required for graft shaping. There was also no donor site complications with a good solid fusion. For this reason we think that allografts have a place in spinal surgery.

P#60

THORACOSCOPIC SPINE OPERATIONS: CASE REPORT

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Via thoracoscopic approach to thoracal vertebrae abcess biopsy discectomy anterior release and fusion can be performed. In our clinic we drained and grafted a T 5-8 pott absess and T 5-10 discectomy with right hemiephysiodesis. This method enabled us to achieve our surgical goal with a significant decrease in morbidity

CASE 1: A 23 year old male patient was admitted with a complaint of progressive back pain. Despite to various treatments he had received. On his X-rays a 50° of kyphosis was observed at T 5-8 level

CASE 2: A 3.5 year old girl was admitted with a right congenital scoliosis measured 52° between T 4-11 vertabrae. On her physical and neurological examination there was only VSD without any thereapeutic requirement.

OPERATIVE TECHNIQUE: A double lumen endotracheal tube was inserted

immediately after the anesthesia induction. Since both pathologies were located right anterolaterally. The patients were placed on the table in right decubitus position. Bone grafts were prepared from illac crects.

After deflating the right lung. In the first case a 10 mm trocar was inserted on the midaxillary line at fifth intercostal space, through which the camera was introduced. Then under direct vision. Another 10 mm trocar at seventh intercostal space and a 5 mm trocar at third intercostal space on anterior axlliary line were inserted for instrumentation. Since the lung was totally collapsed, CO2 insuflation was not used. Parietal pleura was opened by spatulated cautery. Segmentary arteries and veins were dissected and clipped seperately. 50 cc of yellowish purulant material was drained and the cavity was washed with %0.08 saline. Debridment of necrotic material was performed and the space was filled with chipped spongious bone grafts prepared from illac crest. A chest tube was inserted and secured.

In the second case, only 5 mm trocars were used for the instruments. The first one was inserted through sixth intercostal space and the second one through fifth intercostal space. Discectomy and epiphysioilsis was performed between T 5-10. Chipped spongious bone grafts were inserted to the spaces. 14 days later a right posterior fusion was performed through T4-11 vertebrae and the patient was followed with a Milwaukee brace for 6 months. After one year follow-up the scoliosis between T4-11 was only 55°.

Both patients were followed in ICU during the first 24 postoperative hours. Chest tubes of both patients were removed within the first postoperative day.

Minimally Invasive techniques can be used in such cases effectively with minimal morbidity.

P#61

OUR EXPERIENCE IN ANTERIOR SPINE SURGERY

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Sixtyone anterior apporoach were performed at the University of Uludağ Department of Orthoaedics between 1992 and 1995.

Thirtythree of the patients were male and twentyeight of them were female with an average age of thirtythree (min 1.5 yrs-max 82 yrs). Average follow up with 15 months (1 month - 3 yrs.) Pathologic indications for anterior approach were vertebral infection in 15, vertebral fracture in 23, scoliosis in 10, neoplastic disease in 7, kyphosis in 4 and congenital vertebral displacement in 2.

Twentyfour anterior and thirtyseven anterior-posterior operations were performed. Neurologic deficit was present in 17 patients preoperatively and were improved in 11 patients postoperatively.

Eleven patients had atelectasis, 2 had pneumonia, 1 had skin necrosis on thoracotomy site, 2 had deep and 2 had superficial infection on posterior incision site postoperatively. Two patients died in the hospital course and 1 during the 3 months follow up.

P#62

UPDATE MECHANISTIC CLASSIFICATION OF THE THORACOLUMBAR SPINE FRACTURES AND A NEW THREE COLUMN CONCEPT IN SPINAL STABILITY

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To include all the fracture patterns and the soft tissue lesions we made a new classification system according to the mechanism of the fractures from our clinical experience in Haydarpaşa Numune Hospital. In this classification system 3 group exist.

GROUP A: Fractures resulting from compression forces

GROUP B: Fractures resulting from traslational forces.

GROUP C: Fractures resulting from rotational forces

For establishing importance of the Holdsworth's posterior column and for giving a new approach to neurologic instability in deciding operation we made a new three column concept. According to this concept;

Anterior column is made up of ALL, anterior vertebral body, anterior an-

nulus fibrosus.

Midle column is made up of PLL, vertebral body, posterior annulus fibrosus, pedicle, lamina, ligamentum flavum, facets. Posterior column is made up of transverse process intertransverse ligament, spinous process, supra and infra spinous ligaments.

For deciding mechanical instability there must be lesion of the at least 3 anatomic parts in different columns of there must lesion of the least 2 anatomic parts in a single column. In middle column if there is lesion of the at least 2 anatomic parts than neurologic instability will develop.

P#63

USE OF HETEROGENOUS BONE GRAFT IN SCOLIOSIS SURGERY; Report of a case with a long-term follow-up

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A 13 year old female patient was operated on at the Department of Orthopaedics and tarumatology of Ankara Numune Hospital, because of idiopathic adolescent scoliosis. Isola spinal instrumentation was applied, and while performing posterior spinal fusion heterogenous bone graft was used.

At 3 years postoperatively, spinal implants were removed and a solid fusion mass was observed. Histopathologic examination of the material, taken from the fusion mass revealed "mature bone tissue".

It was concluded that, heterogenous bone graft could be used in the scoliotic patients who had inadequate iliac bone graft for posterior spinal fusion.

P#64

CAN CT BE USED FOR THE SELECTION OF SUITABLE SURGICAL IN SPINE IMPLANTS

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Today several implants are used for traumatic and nontraumatic disorders of vertebra. Especially in posterior spine surgery it is important to minimize intra and postoperative complications by selection of suitable sizes and degrees of transpedicular screws. Because of this, in our department we have compared the results, which we have obtained from the morphometric measurements of lower toracal and lumbar, vertebrae of 50 patients that were sent for CT scanning for any other reason, and the sizes of the implants that can be used in spine surgery. In the light of these results we can draw the conclusion, that there can be absolutely different values in sizes of the vertebrae. That is the reason why C.T. scan measurements are very helpful in a spine surgery, when an implant has to be used.

P#65

A SIMPLE FRAME FOR THORACOLUMBAR SURGERY

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Proper positioning of the patient for posterior spine surgery is crucial to avoid complications. Any compression on the abdomen is to be avoided to prevent the secondary compression of the inferior vena cava which will cause enlargement of the epidural veins and heavier bleeding at the operative site.

In Marmara University School of Medicine Department of Orthopaedics & Traumatology we developed a very simple spinal frame which we utilized since June 1991 in more than 200 cases without considerable complications. This frame consists of a velcro traps-covered wooden board and four cushioned

wooden blocks which can be adjusted according to the patients physionomy. This frame can be replicated easily for a very low cost.

The advangates of this frame are:

- Simple to produce,
- Cheap
- Easy & reliable patient fositioning
- no loss of position during manipulative surgery,
- Adjustable for almost any patient (6-100 kg in our experience)
- Radiolucent,
- Can be used on any operation table without any special attachments,
- Does not interfere with intraoperative patient monitoring and anesthesia.

The only observed disadvantage of this frame was its shortcoming to be used with hip flexion.

P#66

ANTERIOR RETROPERITONEAL APPROACH TO PATIENTS WITH POSTERIOR INSTRUMENTATION

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The patient who had neurologic symtomps caused by tumor, pathologic fracture kyphosis at L1-L2 vertebrae was operated. In the first operation posterior fusion and instrumentation was applied. Anterior retroperitoneal approach with lateral bending position was planned for the patient to excise tumor, apply bone graft and cement. However we encountered to difficulties during the second operation. It wasn't possible to place the patient in a lateral bending position because of their posterior instrumentation and fusion. There was insufficent iliocostal distance for manipulations and instrumentations.

Insufficent iliocostal distance by anterior retroperitoneal approach with lateral bending position may cause inadiquate manuplation area also to reach to unexpected lumbar vertebrae. Therefore we suggest the measurements of ilocostal distance preoperatively on the patients at mid-axiller line, on their normal AP graphy and maximum lateral bending AP graphy.

P#67

FAT SUPPURSION MR IMAGING OF VERTEBRAL HEMANIOMAS

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ABSTRACT: Vertebral hemangiomas include a wide range of signal characteristics on MRI. All vertebral hemangimas do not have pathognomonic signal properties and it's of ten difficult to distinguish them from various processes affecting bone marrow, such as hemorrhage, trombosis radiation therapy, degenerative, disk diseases and even some metastasis. Fat suppression magnetic resonance imaging is performed to investigate the additional advantage of the technique, to diagnose atypical vertebral hemangiomas. Eighteen patients with a total of 21 vertebral hemangiomas were studied with conventional and fat suppressed MRI. Fat suppressed T1 weighted images revealed signal decrease within the lesions, having atypical signal properties on convenrtional MR images. Although nonfat suppressed images allowed to diagnose 84% of vertebral hemangiomas, this ratio for fat saturation images was increased to 96%. Fat supperesion MRI is found as a valuable technique in evaluation of atypical forms of vertebral hemangiomas and differentiate lesions, having similar signal properties.

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