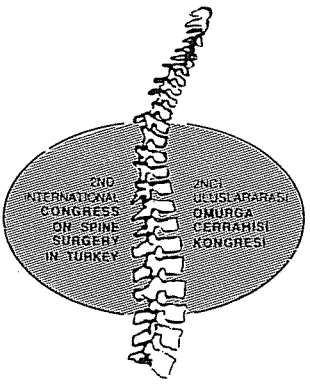


2nd INTERNATIONAL CONGRESS ON SPINE SURGERY IN TURKEY

ABSTRACT BOOK

7 - 10 September, 1992
Istanbul - Turkey

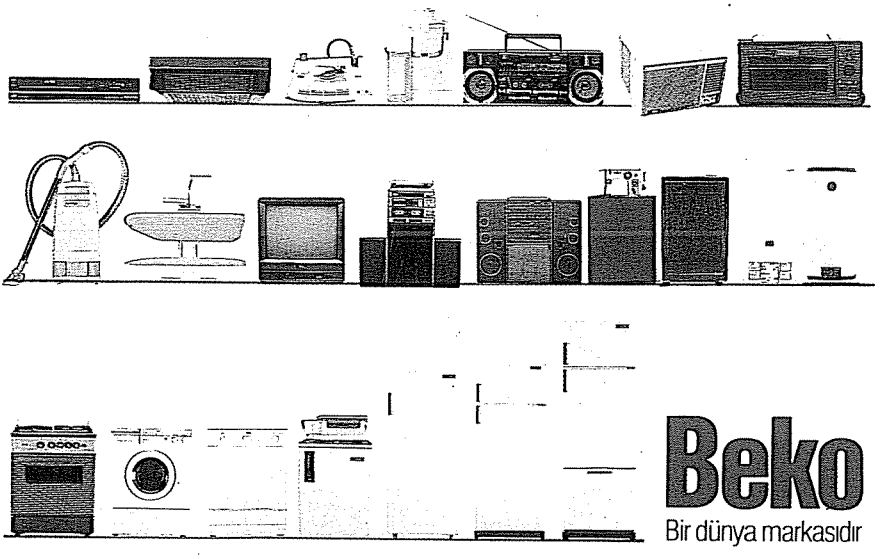
...Ve yılların sorumluluğu uluslararası bir marka yarattı.

Beko

Bir dünya markasıdır

Önce kendi ulusuna saygı duyan uluslararası olmaya hak kazanır. Beko, 36 yıl önce bu gerçeği bilerek yola çıktı. Mühendisinden işçisine, yetkili satıcısından servisine olağanüstü özenle ve titizlikle Beko ailesini, önce Türkiye için oluşturdu. Ve yılların sorumluluğu, uluslararası markayı yarattı.

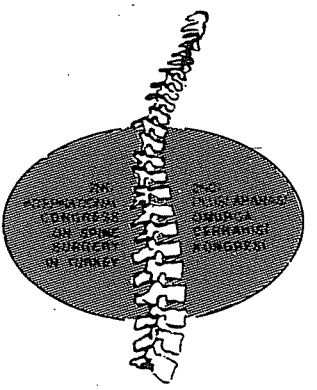
İngiltere'den Macaristan'a Danimarka'dan Sovyetler Birliği'ne... dünya, Beko markalı ürünlerle tanıştı. Beko televizyonları, Beko fırınları, buzdolapları, çamaşır makineleriyle tanıştı. Şu anda Türkiye'de ve dünyada, her 30 saniyede bir, 8 Beko ürünü yeni sahiplerine ulaşıyor. Londra ve İstanbul aynı kaliteyi paylaşıyor. Amsterdam ve Mardin, aynı teknolojiyi kullanıyor. Ankara, Samsun, Brüksel, İzmir, Moskova, Adana... aynı üstün standardı yaşıyor. Bu noktaya önce kendi insanımıza saygıyla geldik.



Beko

Bir dünya markasıdır

Koç



2nd INTERNATIONAL CONGRESS ON SPINE SURGERY IN TURKEY

ABSTRACT BOOK

7 - 10 September, 1992
Istanbul - Turkey

CONGRESS ORGANIZATION

Honorary President : Dr. Rıdvan EGE
Congress Chairmen : Dr. Ünsal DOMANİÇ / Dr. Nafız BİLSEL
Congress Secretaries : Dr. Azmi HAMZAOĞLU / Dr. Murat HIZ

SCIENTIFIC COMMITTEE

Chairman :	R. B. WINTER	USA
Members :	E. K. ALPAR	Birmingham, UK
	F. A. ALVES	O'porto, PORTUGAL
	D. CHOPIN	Berc, FRANCE
	F. DENIS	Minneapolis, USA
	J. DOVE	Stoke-on-Trent, UK
	J. DUBOUSSET	Paris, FRANCE
	H. H. MATTHIAS	Münster, GERMANY
	P. G. MARCHETTI	Bologna, ITALY
	P. SMYRNIS	Athens, GREECE
	H. SHUFFLEBARGER	USA
	K. KANEDA	JAPAN

Turkish Members :	E. ALICI	Z. KORKUSUZ
	N. BİLSER	F. SEYHAN
	D. DİNÇER	A. SURAT
	Ü. DOMANİÇ	B. O. TEMOÇİN
	A. HAMZAOĞLU	Y. TÜMER
	M. HIZ	

SOCIAL COMMITTEE

Chairman :	O. GÜVEN	
Members :	I. AKGÜN	M. A. KAYGUSUZ
	M. CANİKLİOĞLU	M. KUŞKUCU
	T. CENTEL	C. ŞAR
	İ. ESENKAYA	

CONGRESS BUREAU AND OFFICIAL TRAVEL AGENT

VIP TOURISM
Pirinççioğlu Inc.

Cumhuriyet Cad. No: 269/2 Harbiye-80230 ISTANBUL / TURKEY
Tel: (901) 241 65 14 Fax: (901) 241 19 95 Telex: 27 089 vip tr

KATILIMCILAR

ABDİ İBRAHİM İLAÇ SAN. ve TİC. A.Ş.
Kore Şehitleri cad. No: 19 Zincirlikuyu, İSTANBUL
Tel: (1) 272 20 01
Fax: (1) 273 06 29
Bir Syntex ürünü olan Naprosyn, antiromatizmal ve analjezik etkili bir nonsteroid antienflamatuar ilaçtır. Etkisini prostaglandin sentezini inhibe ederek gösterir. Romatizmal hastalıklarda (romatoid artrit,osteoartrit, ankilozan spondilit, gut), kas-iskelet ve eklem sistemi hastalıklarında (bursit, tendinit, sinovit, lumbago), cerrahi ve travmatolojide (burkulma, gerilme, ortopedik ve cerrahi ameliyatlarda) ve enfeksiyöz rahatsızlıklarda güvenilerek kullanılır.250 ve 500 mg'lık tablet, 500 mg'lık supozituar ve % 10'luk jel formları mevcuttur.

AESCULAP / KALYON MEDİKAL ARAÇLAR LTD. ŞTİ.
Kültür Mah. Düzedere Sok. Küçükçamlık Sitesi
G Blok Etiler, İSTANBUL
Tel: (1) 257 77 54-55
Fax: (1) 265 32 56
1867 yılında kurulan firma üstün teknolojisinin sonucunda ürünlerini günümüzde de tıp dünyasının hizmetine sunmaktadır.

BİLİM İLAÇ SAN. ve TİC. A.Ş.
Ayazağa Köyü Yolu 80670 Maslak,İSTANBUL
Tel: (1) 276 56 80 (10)
Fax: (1) 276 29 19
Forsef: Forsef'in 0,5 g'lık IM ve IV pediatrik formları ve 1g'lık IM ve IV fomları bulunmaktadır.
Sefagen: 0,5 g ve 1 g enjektabl flakon formları IM ve IV, 2 g IV enjektabl flakon formu ise IV olarak uygulanır.
Klindan: 150 mg Klindamisin hidroklorid içeren Klindan 16 kapsül, 300 ve 600 mg klindamisin fosfat içeren klindan 300 ve Klindan 600 ampul formları mevcuttur.

BİLMAR /MESİ
Tophanelioğlu Cad., No: 13 B Blok 81140 Altunizade, İSTANBUL
Tel: (1) 333 17 28 - 342 63 01
Fax: (1) 334 87 96
Bilmar MR Görüntüleme Merkezi yüksek performanslı PHILIPS T5 cihazıyla donatılmış olup, yüksek rezolüsyonlu normal çekimler yanında geniş kapsamlı satıh bobinleri kullanılarak bilhassa **eklem yumuşak dokularının ve omurganın** başka cihazlarla erişilemeyen bir rezolüsyonla görüntülenmesini sağlayarak cerrahlarımızın başarılarındaki katkılarımız dolayısıyla gurur duymaktayız.
Bilmar Tel: 342 63 01
Philips Tel: 310 78 00

CIBA-GEIGY
Yıldızposta Cad. Dedeman İşhanı 48/2 Esentepe, İSTANBUL
Tel: (1) 274 88 60
Fax: (1) 272 40 71
Voltaren belirgin antiromatizmal, antienflamatuar, ağrı kesici ve antipiretik özeliklere sahip steroid yapıda olmayan bir bileşik olan diklofenak sodyum içerir.
Kulanıldığı Durumlar: Romatizmanın enflamatuvar ve dejeneratif şekilleri, akut muskulo-skeletal bozukluklar, akut gut, post-travmatik ve post-operatif enflamasyon ve şişmeler, dismenore gibi jinekolojik ağrılı ve/veya enflamatuvar durumlar, böbrek ve safra koliği (Ampul), kulak, burun veya boğazda ağrılı enflamatuvar enfeksiyonlarda yardımcı tedavi olarak (sadece ateş bir endikasyon değildir).
Formları: 25 ve 50 mg'lık tablet, 100 mg'lık retard tablet 100 mg'lık suppozituvar, 75 mg. 3 ml ampul. Ayrıca lokal tedavi için Voltaren Emulgel (diklofenak dietilamonyum)

DEVA HOLDİNG A.Ş.
Saatçi Bayırı Cad. No:1 Gayrettepe, İSTANBUL
Tel: (1) 275 27 00 (15)
Fax: (1) 274 65 70
Ketrodol: Analjezik, antienflamatuar
30 mg Ketorolak Trometamol içerir.
Postoperatif, posttravmatik ve diğer tüm akut ağrılarda endikedir.

DOĞU İLAÇ FABRİKASI A.Ş.
Kore Şehitleri Cad. Yzb. Kaya Aldoğan Sok. No: 13 Zincirlikuyu, İSTANBUL
Tel: (1) 274 30 52 (8)
Fax: (1) 274 30 65
Fraxiparine: Derin ven trombozu ve pulmoner embolilerin profilaksisi ve tedavisinde kullanılan antitrombotik ilaçlar grubundan, düşük molekül ağırlıklı heparindir. Kullanıma hazır enjektörlerde, 0,3 ml,0,6 ml ve 1,0 ml'lik formlarda mevcuttur.

EMAR SAĞLIK HİZMETLERİ A.Ş.
Abdi İpekçi Cad. 79/1 Polat Saray Maçka, İSTANBUL
Tel: (1) 231 28 37 (4)
Fax: (1) 246 38 10
Görüntüleme merkezimizde Hitachi MR P-20 cihazı ile özelikle nöroradyolojik, abdominal ve kemik yumuşak doku tanısal incelemeleri yapılmaktadır. Görüntüleme ve tanıda çok önemli bir adım olan MR inceleme tekniği merkezimizde ileri teknik gelişmeleri içeren cihazımızla başarıyla uygulanmakta; hastalıkların takibi ve tedavi yönünde büyük katkı sağlanmaktadır.Merkezimizde Benett mammografi cihazı ile en düşük radyasyon yükü ile gerek erken meme kanseri teşhisi, gerekse yüksek kaliteli mammografi uygulamaları gerçekleştirilmektedir. Ayrıca iki adet son sistem Accuson XP-10 cihazı ile her tür ultrasonografi inceleme; periferik, kardiak, transkranial, renkli ve dublex Doppler ve continuous wave ve M-model kardiak incelemeler yapılmaktadır.

FAMET DIŞ TİCARET ve PAZARLAMA LTD. ŞTİ.
Selanik Cad. No: 25/8 Kızılay, ANKARA
Tel: (4) 425 60 45
Fax: (4)417 43 71
Famet Ltd. Şti., Acromed, A.O. Synthes ve Surgicraft Firmalarının Türkiye tek yetkili temsilcisidir.
ABD/ Acromed Firmasının Isola ve Kaneda sistemlerini, İsviçre/A.O. Synthes Firmasının Dick Internal Fiksasyon sistemini ve İngiltere/Surgicraft Firmasının Hartshill Sistemini Türkiye genelinde pazarlamaktadır.
Dick Internal Fiksasyon Sistemi ve Hartshill sistemi hakında ayrıntılı bilgileri 20 numaralı, Isola ve Kaneda Sistemleri hakkındaki ayrıntılı bilgileri ise 30-31-32 numaralı Famet stantlarından edinebilirsiniz.

GLAXO - S.Ü.S.T.A.Ş.
Yıldızposta Cad. 52/8 Esentepe, İSTANBUL
Tel: (1) 275 42 82-83
Fax: (1) 272 35 81
Fortum 500 mg, 1g, 2 g IV/IM: Seftazidim sodyum içeren Fortum, geniş spektrumlu, güçlü bakterisit etkili 3. kuşak sefalosporin grubu antibiyotik olup; kemik ve eklem enfeksiyonları; osteit, osteomiyelit, septik artrit, enfekte bursitte endikedir. Kalça ve diz artroplastisinde profilaksi dozu; anestezi indüksiyonuyla 1 g IV'yi takiben 6. ve 12 saat sonra 500 mg/IM (Leigh D.A.) osteomiyelit tedavisinde ise; 8 saatte bir 1g IV/IM veya 2 g IV/IM şeklinde (Court-Brown CM) olabilir.
Zinacef 250 mg, 750 mg, 1.5g IV/IM: Zinacef çoğu beta -laktamazlara dirençli, semisentetik geniş spektrumlu parenteral (I.M.,IV) yoldan uygulanabilen sefalosporin grubu bir antibiyotiktir. Pelvik ve ortopedik operasyonlar için doz anestezinin indüksiyon devresinde i.v. olarak 1.5g. dır. Fakat 8 ve 16 saat sonra i. m. olarak 2 kez daha 750 mg'lık dozlar ilave edilebilir.

GÜN DIŞ TİCARET
Valikonağı Cad.Madalyon sok. 16/2 Nişantaşı, İSTANBUL
Tel: (1) 230 74 81
Fax: (1) 230 82 71
Gün Dış Ticaret Firması 1986 yılında kurulmuş olup, beş senedir özelikle İstanbul dahilindeki hastanelere, doktorlara ve hastalara ortopedik cerrahi sarf malzemeleriyle güvenli hizmet vermektedir.İspanyol IQL ve Amerikan KIRSCHNER MEDICAL CORPORATION firmalarının Türkiye tek yetkili satıcısıdır.
Ayrıca PROTEK kalça protez ürünlerini tümüyle bulunduran İstanbul bayisidir.

HAS MEDİKAL
Büyük Reşit Paşa Cad. Kaya İşhanı No: 42/4 Laleli, İSTANBUL
Tel: (1) 513 86 71- 511 83 22
Fax: (1) 526 61 74
Diz protezleri, tümör rezeksiyon protezleri, diğer plak ve protezler.

HİPOKRAT A.Ş.
Şair Eşref Bulvarı No: 102/3 Alsancak, İZMİR
Tel:(51) 22 05 15-63 17 04
Fax: (51) 21 82 81
1972'den beri başta kalça protezleri, kemik plak ve çivileri olmak üzere ortopedik implantlar üretiyoruz.

İSTANBUL ORTOPEDİ
Ziya Gökalp Cad. No:40 Fındıkzade, İSTANBUL
Tel: (1) 530 14 30
Tüm omurga tedavilerinde kulanılan TLSO, Reklinasyon, Milvoke, Taylor tipi korseler. Tüm ayak sağlığına uygun tabanlıklar ve botlar. Polio vakalarında tüm yürüme cihazları (Bris). suni ayak ve kol protezleri, diğer ortopedik araç ve gereçler.

KAYACAN İTHALAT İHRACAT VE TİC. LTD. ŞTİ.
Kazancı Yokuşu Başkurt Sok. 1/7 80091 Taksim, İSTANBUL
Tel: (1) 251 96 11-249 85 83
Fax: (1) 251 96 11-249 85 83
Firmamız bu önemli kongreye Fransız Dimso Firması tarafından üretilen Diapason sistemi ile katılmaktadır. Diapason sistemi lumbo sacral bölgede olan spondylolistesis, kırık,tümör, spinal stenoz vakalarında başarı ile kulanılan pediküler vida sistemidir. Tamamen Titanyumdan üretilmiş olup MRI uyumludur. Kolay kullanımı ve pratik olması ile sayın cerrahlarımıza büyük avantajlar vermekte ve ameliyat süresini de kısaltmaktadır. Ülkemizde başarı ile yapılan tüm uygulamalarda çok olumlu neticeler alınmıştır.

MET MEDİKAL CİHAZ ve ALETLERİ TİC. LTD. ŞTİ.
Şehit Adem Yavuz Sok. 9/12 06440 Yenişehir,ANKARA
Tel: (4) 418 05 85
Fax: (4) 425 25 96
ULRICH: Universal Spinal Instrumentation System,
IQL: Dorsal, Lumbar frame, Drumont, F.V.M. Malage Vertebral Fixation
BIOMET: Bı-Metrıc sementsiz kalça protezi,AGC diz protezi, Biomodular omuz protezi, Kudo dirsek protezi, VLC Cannulated screw, Bı-Metrıc revizyon kalça protezi, Boneloc kendi içinde karışan çimento sistemi
G. CREMASLOLİ: Doğuştan kalça çıkığı için protez, Düz tabanlık protezi, I/B posterior stabilizer diz protezi
BIOSINSS: Biofix absorbable PLLA-PGA vida ve rod
ORTHOFIX: Fixator ve uzatma cihazı

NESA ORTOPEDİ
Merkez: Bahariye Cad. Ali Suavi Sok. No: 14 Kadıköy, İSTANBUL
Tel: (1) 338 19 86-337 38 69
Fax: (1) 348 12 81
Şube: Halaskargazi Cad. No: 303/3 Paydaş apt. Osmanbey, İSTANBUL
Tel: (1) 248 60 52-232 50 05
Fax: (1) 232 50 05
Her türlü ortez ve protez ortopedik bot, korseler imalatı. Sentetik alçı pamuğu Türkiye tek imalatçısı.

SANDOZ ÜRÜNLERİ A.Ş.
Büyükdere Cad. No: 215 4.Levent, İSTANBUL
Tel: (1) 279 80 00 (35)-279 60 90
Fax: (1) 268 71 57
SIRDALUD (Spesifik Miyorelaksan)
Etkisi kısa sürede başlar, kasılmış hasta direkt olarak etki gösterdiği için genel kas güçsüzlüğüne neden olmaz.

SANTA FARMA İLAÇ SANAYİİ A.Ş.
Akdeniz Cad. No. 122/5 K: 2-5 34250 Fatih, İSTANBUL
Tel: (1) 525 65 04-05
Fax: (1) 521 34 18
Apikobal tablet (Tiamin, Piridoksin, Siyanokobalamin), Septopal zincir (Gentamisin Sülfat), Tantum Draje (Benzidamin), Spalt tablet (Parasetamol, Kafein, Benzil, Mandelat), Hirudoid pomad (Organoheparinoid), Paraflex tablet (klorzoksazon), Parafon tablet (Klorzoksazon, Parasetamol), Tolectin tablet (Tolmetin), Polybion (B kopleks vitaminleri)

SOFAMOR
B.P. 4 62180 RANG-DU-FLIERS FRANCE
Skolyoz ve Kifoz, Omurga Dejenerasyonu, Tümörler ve Belkemiği travmalarında, Cotrel Dubousset Enstrumantasyonu.

Türkiye Mümesili:

EVRENLER TIBBİ MAMÜLLER PAZARLAMA A.Ş.
Büyük Reşit Paşa Cad. Karadeniz Apt. No: 54/3 Beyazıt, İSTANBUL
Tel: (1) 527 75 54 - 511 87 21 - 511 33 29 - 511 33 30
Fax: (1) 511 54 75

ŞEHREMİNİ ORTOPEDİ
Ereğli Mahalesi Börekçi Veli Sok. No: 28 Şehremini, İSTANBUL
Tel: (1) 586 65 88 - 589 58 68
Protezler: Kalça dezartikülasyon için protez, Femur, Diz altı, Şopart, Dirsek üstü ve dirsek altı kol protezleri.
Cihazlar: Uzun yürüme, Yüksek uyluk, Kısa yürüme, Perthes uyluk, Perthes, O bain, Abdüksiyon, Barlow cihazları, Genu rekurvatum.
Ateller: Spiral, Forester braun, Denis braun, Von rozen, Tvister, Ponseti, Saint cerman, Algus Valgus atelleri, Abduksiyon donu, kasık bağı, Suspansuar. Ayrıca her türlü skolyoz ve vertebra korseleri imalatı yapılmaktadır.

Dear Colleagues,

We welcome you with great pleasure to the 2nd International Congress on Spine Surgery.

We are deeply glorified by your presence in a city that is unique in terms of geographical location connecting two continents; Asia and Europe and the Bosphorus dividing the two continents with great natural beauty.

We are sure that you will have countless pleasures both from the congress you are participating in and Istanbul City with its culturally and historically rich places and monuments.

As you know well, so many people are involved in every stage of organizing such a congress on international basis. Therefore, I would like to thank to everybody involved especially, the Congress Secretary, **Dr. Azmi Hamzaoğlu** for the outstanding efforts he has devoted in coordinating and unifying the arrangements. I am also grateful to **Dr. R.B. Winter**, Chairman of the Scientific Committee for evaluating fastidiously the scientific papers and contributing to solving the problems to make the congress run efficiently. Also, I would like to emphasize the considerable worth while support and valuable assistances of **Dr. Mathias, Dr. Shufflebarger, Dr. Denis, Dr. Kaneda, Dr. M. Smith** and **Dr. Chopin**.

You will find within the contents of this book, the abstracts of all the scientific papers which are to be presented orally and as posters. Since our time was very limited, some of the valuable abstracts presented by our colleagues had to be chosen as posters. I believe this book will definitely enable us to attract more interest in the congress and will be a precious source whenever you are in need of information.

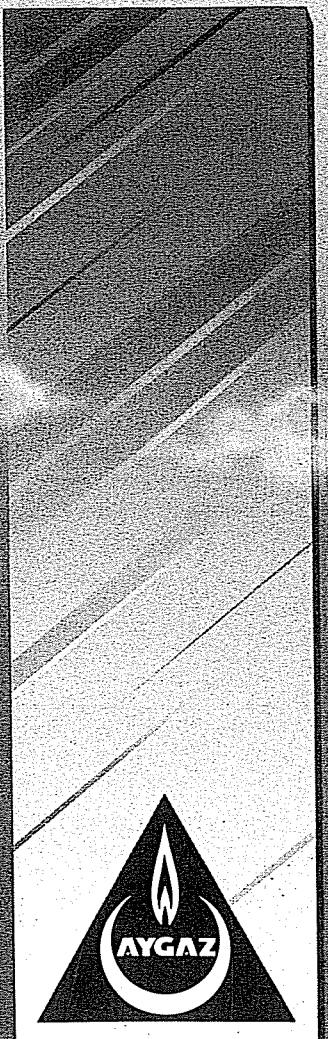
I would like to present my best regards to all of you and hope to see you amongst us in the 3rd International Spine Surgery Congress which will be held in Cappadocia in 1994.

Nafiz Bilsel M.D. *Ünsal Domaniç M.D.*

Congress Presidents

LECTURES

TECRÜBEYLE GELEN GÜVEN
TEKNOLOJİYLE GELEN KALİTE
AYGAZ



AYGAZ

Büyükdere Cad. 145 Aygaz Han Zincirlikuyu 80300 İSTANBUL
Tel: 266 44 00 / 10 Hat - 274 89 60 / 15 Hat Faks: 272 40 67

EARLY RESULTS OF ISOLA SPINAL INSTRUMENTATION

T. YAZAR, D. DİNÇER, İ. ÇETİN, M. DOĞAN

DEPARTMENT OF ORTHOPAEDIC SURGERY OF ANKARA UNIVERSITY
MEDICAL FACULTY, İBN'İ SİNA HOSPITAL, ANKARA, TURKEY

In this study seventeen patients who were instrumented with ISOLA system from February to June 1992 were analized.

Eleven of these patients were diagnosed as Idiopathic Adolescent Scoliosis. Mean curve of these patients were measured 65.5 degrees preoperatively and 32.2 degrees postoperatively. The average correction was 33.3 degrees (50.8%). Mean kyphosis was 10 degrees in hypokyphotic patients preoperatively and 25 degrees postoperatively , we obtained 15 degrees (150%) of correction in these patients. Mean kyphosis was 52.25 degrees in hyperkyphotic patients preoperatively. We obtained 17 degrees (32%) correction in these patients and attained 35.25 degrees mean kyphosis postoperatively. The mean kyphosis was 36 degrees in normokyphotic patients preoperatively. Postoperative mean kyphosis was 36.4 degrees and difference was only 0.4 degrees (1.1%). Axial rotation was measured by the Pedriolle method and it was 26.7 degrees preoperatively and 24 degrees postoperatively. Only 2.7 degrees correction (10%) was obtained.

Two patients with the diagnosis of Neuromusculer Scliosis obtained a correction 43.5 degrees (57%) on the frontal plane, 1 degree (2%) on sagittal plane and 5 degrees (13%) on axial plane.

The system was applied as posterior stabilisation device in three patients. One with the diagnosis Congenital Kyphosis and two with metastatic tumor. We gained 3 on of height anteriorly and posteriorly of a vertebral corpus fracture treated with Isola system. We opine that ISOLA system is an effective device for the correction of frontal and sagittal curves. It also can be used as a posterior stabilisation device. Insufficient rotational correction convinced us it is a non effective system in the axial plane.

2

EARLY RESULTS OF TEXAS SCOTTISH RITE HOSPITAL (TSRH) SYSTEM IN THE SURGICAL TREATMENT OF IDIOPATHIC SCOLIOSIS

M. KIŞ, T. BENLİ, M. ÇITAK, S. AKALIN

Texas Scottish Rite Hospital (TSRH) Instrumentation, one of the recent developed systems, is a system which builds up a rigid frame with multiple hook and crosslink plates and has high correction potential in correcting the deformity in three planes.

From September 1991 to April 1992, 21 TSRH instrumentation were performed for the treatment of idiopathic scoliosis at the 1st Orthopaedics and Traumatology Clinic of Ankara Social Security Hospital. Including all patients, mean Cobb angle in the thoracal curves and in the lumbar curves at the frontal plane which were 54.1° (40°-104°) and 45.3° (30°-70°) were corrected by 59.9% and 40.0% respectively. The highest correction rate was obtained in King Type III patients who had single thoracal flexible curve (averagely 73.2%). In 71.4% of the patients, normal physiologic thoracal kyphosis and in 47.6% normal physiologic lumbar lordosis were constituted. In all of the patients, an improvement in pulmonary functions was obtained at the 6th month controls. Complication rate in the early postoperative period was 9.5%.

In light of these findings it is suggested that in the surgical treatment of idiopathic scoliosis surgery, TSRH system is one of first choices, as it has superiorities such as providing correction in three planes and ability of building up a rigid frame with crosslink plates.

3

ALICI SPINAL INSTRUMENTS IN THE TREATMENT OF IDIOPATHIC SCOLIOSIS

E. ALICI, H. BERK, M. ÖZKAN, N. EREL

DOKUZ EYLUL UNIVERSITY, SCHOOL OF MEDICINE, IZMIR
BUCA SSK HOSPITAL, IZMIR

104 patients who have had scoliosis were treated between August 1989 and April 1992. Short term results of 49 Idiopathic scoliosis mean age 15.4 (11-29 years) is presented. Classification of curves according to King-Moe showed 40% type I, 20% type II, 27.5% type III, 7.5% type IV and 5% type V. On preoperative radiographs mean frontal Cobb angles were found to be 48.9° (22°-98°), lumbar Cobb angles 31.8° (20°-45°). On sagittal plane analysis mean 25.5° of thoracic kyphosis were measured. Flexibility index was 35.2% (5.5%-66.6%). ALICI spinal instruments were used in all patients (8 anterior and posterior, 1 anterior only and 40 posterior). Mean operation time in anterior and posterior surgery were 230 min. and 207 min respectively. 2.1 and 3.0 units of blood were transfused in anterior and posterior surgeries respectively. Postoperative frontal Cobb angle measurements (mean: 14.7° ; min. 5°-max.48°) showed a correction of 67.5% (26.1%-90%). On postoperative sagittal plane analysis 19.2° of thoracic kyphosis was measured. Postoperative Cobb angle measurements and correction ratio showed a good reduction of scoliosis curve both in frontal and sagittal planes.

4

HARTSHILL FIXATION SYSTEM IN SPINAL SURGERY

M. GÜLŞEN, H.TOKER, Y. SARPEL, İ. TAN, G. BAYTOK

DEPARTMENT OF ORTOPAEDICS AND TRAUMATOLOGY, FACULTY OF MEDICINE, UNIVERSTY OF ÇUKUROVA, ADANA, TÜRKİYE

We used Hartshill fixation system in 21 cases (12 males and 9 females). Mean age was 30.5 years (range 7-81 years). Indications for surgery were vertebral fractures in 5, post laminectomy instability in 1, Pott's disease in 2, spinal tumor in 2, degenerative instability in 3, and spinal deformity in 8 cases.

Hartshill rectangles were used with sublaminar wires or pedicle screw bridges in 19 cases. In two cases pedicle screw bridges were used with Harrington distraction rods. Mean follow-up time was 5.5 months with arrange of 3 to 11 months. Complications related to implants were breakage of wires in two cases. There were no neurologic complications. Hartshill fixation system is easy and versatile that can be used in wide variety of spinal disorders.

5

RESULTS AND COMPLICATIONS OF SEGMENTAL SUBLAMINAR WIRING (SSI) METHOD

A. GÜRBÜZ, M. KIŞ, İ.T. BENLİ, S. AKALIN, R. TANDOĞAN, E. F. MUMCU

Segmental Sublaminar Wiring Method (SSI), is being used especially in the surgical treatment of idiopathic scoliosis, neuromuscular spinal deformities and vertebral fractures. There are many studies reporting high correction rates of this system. In this study, 21 patients who were treated by Luque-SSI or Hartshill-SSI at the 1st Orthopaedics and Traumatology Clinic of Ankara Social Security Hospital between October 1991 and January 1992 were evaluated. Mean follow-up period was 13.2 (6-21 m.) months. When all the patients with idiopathic scoliosis were included mean Cobb angels of the mean curves were corrected by 45.2% (28.9%-73.3%). In 30.8% of the patients in this group normal physiological kyphosis was restored. 28.2% (26.3%-31%) and 70% of correctors were obtained in 3 neuromuscular scoliotic patients with pelvic tilt and in 1 neuromuscular scoliotic patient without pelvic tilt whom Galvestone method was used, especially. During follow-up averagely 17.3° (3°-45°) of correction loss in idiopathic scoliosis and 21.3° (13°-34°) of correction loss in neuromuscular scoliosis were observed. Complications occured in 57.1% of the patients 14.3% neurologic deficit and postoperative exitus was seen.

Based upon these finding, it was thought that beside high correction rates with sublaminar wiring method, this system could be used only in selected cases as it has high neurologic deficit risk and high complication rates.

6

THE COMPARISON BETWEEN THE RESULTS OF HARRI-LUQUE-AND CD-INSTRUMENTATION IN CASES OF IDIOPATHIC SCOLIOSIS

N. BİLSEL, T. CENTEL, I. AKGÜN, N.ARDALI

CERAHPAŞA FACULTY OF MEDICINE, DEPT. OF ORTHOPAEDICS AND TRAUMATOLOGY ISTANBUL, TURKEY

The results of two groups of patients with idiopathic scoliosis are reviewed. Group I consists of 26 cases treated with Harri-Luque instrumentation (the mean preop AP-Cobb angle 60°, the mean flexibility 29%, the mean postop correction degree 40% and the mean follow-up time 35 months). In Group II, 22 patients were treated with CD-İnstrumentation (the mean preop AP-Cobb angle 62°, the mean fexibility 36%, the mean postop correction degree 47% and the mean follow-up time 12 months). It is concluded that the advantages of the first group were it's efficiancy in rigid curves, it's cheapness and the need only for a few instruments. In the CD-group the greater correction degree, especially in flexible curves, and the unnecessity for an external support are the main advantages.

7

COTREL -DUBOUSSET INSTRUMENTATION FOR IDIOPATHIC SCOLIOSIS- OUR EXPERIENCE WITH THE FIRST EIGHTY PATIENTS

R. GEPSTEIN, Y. FOLMAN, M. ADLER, T. HALLEL

SPINAL UNIT, ORTHOPEDİC DEPARTMENT, MEIR HOSPITAL KFAR SABA, ISRAEL

The study presents our experiences with eighty patients with idiopathic scoliosis who were treated with C.D.I. and posterior spinal fusion. The average pre-operative scoliosis was 52° with a range of 40-150°. The average pre-operative kyphosis was 10° with a range of -10° to 40°. Thoracic scoliosis improved 65% following instrumentation. Thoracic hypokyphosis improved by an average of 11° or 70%. Combined measurement (C.M.), which included the frontal plus sagittal plane deformities, improved by 68% post-operatively. There were no neurological injuries nor infection. Implant failure occurred in three patients. One required removal of prominent D.T.T., due to bursitis, 4 years post-operatively. The other two included dislodgement of middle open pedicle hook convex side which did not influence scoliosis correction and did not require removal of the instrumentation. Pulmonary function tests were performed before and after surgery in 40 patients and showed improvement in post-operative pulmonary function. Normovolemic hemodilution technique was used during 19 operations and 11 units of homologous blood were transfused. In the control group, where the technique was not used, 21 patients received 73 units of homologous blood. The C.D. Instrumentation enables prompt ambulation, without the need of a post-operative cast or brace, with better 3D correction. Advantages and pitfalls are discussed.

THE SURGICAL TREATMENT FOR KING TYPE IV CURVES IN IDIOPATHIC SCOLIOSIS

A. HAMZAOĞLU, C. ŞAR, Ü. DOMANİÇ, B. O. TEMOÇİN, U. TALU

UNIVERSITY OF ISTANBUL, ISTANBUL MEDICAL FACULTY, DEPARTMENT OF ORTHOPAEDICS AND TRAUMATOLOGY, TURKEY

108 cases of idiopathic scoliosis have been treated surgically in our clinic during the period between June 1990 and June 1992 and King Type IV curves form 12 (%11.1) of these cases.

Anterior discectomy along with Zielke Instrumentation and posterior fusion with CD Instrumentation have been applied in four of these 12 cases. The remaining 8 cases were applied only posterior fusion with CD instrumentation.

Fusion was ended at L2 in one and L1 in three cases that were applied anterior procedures. Bending radiographs in supine position were obtained in these cases so that the vertebra that became parallel to sacrum and mobile disc level were recognized for determining the level where fusion should end. Zielke instrumentation was applied anteriorly in order to provide more mobile segment distally, relative to posterior fusion. When only Zielke procedure is applied postoperative cast application becomes necessary and rate of pseudoarthrosis is increased due to inadequate instrumentation. For reducing these complications posterior fusion and CD Instrumentation as well were applied in those patients, ending at the same level distally. In cases of posterior procedures only, fusion was ended at L3 in 4 and L4 in 4 cases.

When there is indication, especially in cases of thoracolumbar curves, we advocate the application of posterior fusion and instrumentation along with anterior procedure and instrumentation in order to provide more mobile segments distally, shorten the fusion area and reduce the complication of anterior procedures and instrumentation.

JUNCTIONAL ZONE ANATOMY AND DECOMPENSATION IN DOUBLE MAJOR CURVES

D. P.ROYE, J. B. RICKERT, J.P.C. FARCY

The purpose of this study is to further define the reasons for decompensation of the lumbar component of double major curves in adolescent idiopathic scoliosis after scoliosis surgery.

Eighty consecutive operative scoliosis patients were reviewed, 36 of whom had double major curves (45%). Follow-up varied from 12 to 80 months with a mean of 36 months. Age varied from 9 to 23 years with an average of 14 years 7 months. Twenty-three were treated with CDI alone, 10 were treated with CDI plus anterior surgery and three with Zielke alone. AP, lateral and bending radiographs were analyzed with respect to curve magnitude, sagittal alignment, junctional zone anatomy and decompensation. Preoperative thoracic curves ranged from 38 to 80 degrees (average 53) while lumbar curves ranged from 32 to 75 degrees (average 45).

In ten patients treated anterior/posterior there was no decompensation. Correction averaged 55% for the thoracic and 61% lumbar - the junctional zone was included in all of these fusions. Three patients treated with Zielke alone did not decompensate - all had the junctional zone included in their fusion. Twenty-three patients were treated with CDI alone. One patient sustained substantial decompensation of the lumbar curve necessitating revision. That patient did not have a kyphotic junctional zone included in the fusion. There were eight other patients who sustained a movement of the lumbar curve apex from 2mm to 23mm. In the three worst cases of this group, poor control of junctional kyphosis was implicated a possible etiology.

As elegantly stated by Dubousset and Graf, the cause of decompensation is often related to improper analysis of the junctional zone.

10

C.D. INSTRUMENTATION IN IDIOP. SCOLIOSIS

P. SMYRNIS, F. KAMBOURIDIS, P. EFSTATHIOU

In the last three years we have operated on 27 patients with Idiop. Scoliosis, 17 fem. and 10 males. The younger patient was 12 yrs and the older 40 yrs old. Seven patiens were older than 20 yrs and 19 from 15-20 yrs. The magnitude of the main curve was from 40 to 82 degrees, mean 58 degrees. The types of curves according to the King classification were: Type I - 2 cases, Type II - 11 cases, Type III - 5 cases, Type IV - 6 cases, Type V - 2 cases and 1 lumbar curve. Follow up from 6 mths to 2 1/2 yrs. Mean 1 yrs.

The postoperative correction of scoliosis was from 30 to 75 percent, mean 60 %. The correction of hypokyphosis from 0 - 20%- and the correction of kyphosis from 20-40%.

Our complications consisted of two deep wound infections, one with pseudomonas that cleared and healed completely with the instruments in situ and the second with staphylococcus, which healed only after removal of rods and hooks one year after surgery and without marked loss of correction.

Discussion: A major problem in the surgical treatment of id. Scoliosis is the proper selection mainly of the lower end vertebra and this arises mainly in the II type of curves (King- Moe)

We divided this group of curves in 2 sub types.

(a) Type IIA where the lumbar curve is greater than 35 degrees, the difference between thoracic and lumbar curve less than 12 degrees and the apical vertebra of the lumbar curve away from the vertical line of balance. We had 4 such cases and treated them like curves of King Type I.

(b) Type IIB. Lumbar curve less than 35 degrees. Difference of two curves greater than 12 degrees and apical lumbar vertebra in touch with line of balance. We had six such cases and in those we left lumbar curve out of the fusion area.

Another problem is the often unsightly scar left by the second incision for the iliac grafts. In our cases we did not use any iliac grafts, we only used the local spinal chips from the vertebral decortication. No case of pseudoarthrosis was found and even the infected case was solid enough to maintain correction after removal of rods.

Lastly, we noticed the usefulness of the rod bending in situ especially in a double thoracic curve.

11

PROBLEMS IN THE DIAGNOSIS AND SURGICAL TREATMENT FOR KING TYPE V IDIOPATHIC SCOLIOSIS

A. HAMZAOĞLU, Ü. DOMANİÇ, C. ŞAR, M. ŞENGÜN

UNIVERSITY OF ISTANBUL, ISTANBUL MEDICAL FACULTY, DEPARTMENT OF ORTHOPAEDICS AND TRAUMATOLOGY, TURKEY

14 patients with King Type V curves, from 108 idiopathic scoliosis patients who had surgical treatment in our clinic between June 1990 and June 1992 were retrospectively studied and we found 3 different groups in this type of curve.

Group 1: With T1 tilt on standing radiography and upper structural curve and which showed no correction under traction.

Group 2: With T1 tilt on standing radiography which showed correction of the tilt under traction.

Group 3: With T1 tilt on standing radiography, which showed T1 tilt under traction.

Cases in group 1 and 2 were consistent with King's criteriae whereas those in group 3 were inconsistent with these criteriae. Despite fusion including T2 shoulder asymmetry was undercorrected to some degree in group 1 those in group 2 rarely developed shoulder asymmetry postoperatively when T2 was included. It was understood that T2 had to be included in group 3 so that shoulder asymmetry would not develop postoperatively.

Our results show that King's criteriae are insufficient in double thoracal curves.

12

THE THREE DIMENSIONAL EVALUATION OF SPINAL POSITION AND DEFORMITY POSSIBLE FROM BIPLANAR RADIOGRAPHS

M. ASHER

UNIVERSITY OF KANSAS MEDICAL CENTER, KANSAS CITY, KANSAS, USA

The purpose of this presentation is to provide a common terminology framework from which three dimensional spinal position and deformity can be determined from currently available biplanar radiographs. Position and deformity possibilities of the human spine are most commonly defined on the basis of a right-handed orthogonal 90° coordinate system. Coordinate placement requires defining a point of origin in the direction of two of the three axes passing through this point. The second coordinate system is then constructed at a location to be compared to the first coordinate system and its position compared by three translations and three angulations, i.e. three dimensions and six degrees of freedom of motion. Five of these six degrees of freedom can be measured directly from biplanar coronal and sagittal plane radiographs and the sixth indirectly. By defining key points on the spine (T1, S1, end/inflexion vertebrae, neutral vertebrae and stable vertebrae) and knowing the normal three dimensional position of the spine, a reasonable representation of the spine deformity may be assembled. Inexpensive and readily available materials are all that are required.

13

C.D.I. SCOLIOSIS SURGERY AND NORMOVOLEMIC HEMODILUTION

R. GEPSTEIN, D. OLSFANGER, T. HALLEL, R. JEDEIKIN

DEPARMENTS OF ANESTHESIA AND ORTHOPAEDIC SURGERY
MEIR HOSPITAL, KFAR SABA, TEL-AVIV UNIVERSITY SACKLER
SCHOOL OF MEDICINE, ISRAEL

Normovolemic hemodilution which has many attributes making it an ideal procedure to use in scoliosis surgery. After induction of anesthesia the patient is bled to a hematocrit of 28 with the blood volume maintained with Ringer's lactate solution. At the conclusion of surgery the patient's own fresh blood, with a normal high hematocrit and the necessary clotting factors, including platelets, is reinfused. Two groups of 20 patients, each with similar demographic data who underwent C.D.I. operations for idiopathic scoliosis, are compared. One group as treated with homologous blood transfusion and the other normovolemic hemodilution. The pre, intra and postoperative blood tests were compared. There was a significant hemodiluted group of patients without any significant difference in operative, postoperative and recuperative factors. Normovolemic hemodilution technique was used during 19 operations and 11 units of homologous blood were transfused. In the control group, where the technique was not used, 21 patients received 73 units of homologous blood. Normovolemic hemodilution is a safe procedure to use in scoliosis surgery. It reduces the use of blood bank products with all their possible complications.

14

PROBLEMS IN THE SELECTION OF FUSION AREA IN THE SURGICAL TREATMENT FOR KING TYPE II IDIOPATHIC SCOLIOSIS

Ü. DOMANİÇ, A. HAMZAOĞLU, C. ŞAR, M. DEMİRHAN, M. ŞENGÜN

UNIVERSITY OF ISTANBUL, ISTANBUL MEDICAL FACULTY, DEPARTMENT OF ORTHOPAEDICS AND TRAUMATOLOGY, TURKEY

Posterior fusion and CD instrumentation have been performed on 13 cases of King Type II scoliosis in our clinic during the period between November 1988 and June 1992. Decompensation is noticed to be developed in 5 cases at the end of evaluation done after an average of 20.3 months (range 1 to 43 months postoperatively).

Consequent analysis of these five cases has revealed 40 degrees or more of lumbar curvature with 50% or less flexibility.

As a conclusion, classical hook pattern leads to decompensation and reverse hook pattern should be used in cases of King Type II curves having the above mentioned characteristics.

15

CORRELATION OF MAGNITUDE BETWEEN THORACOLUMBAR CURVE & COMPENSATORY LUMBOSACRAL CURVE IN PATIENTS WITH IDIOPATHIC SCOLIOSIS: A COMPARATIVE STUDY WITH 14 TILT FROM LATERAL BENDING OF NORMAL SUBJECTS

Y. NOHARA, M. OHORI

DEPT. OF ORTHO. SURG., KOSHIGAYA HOSPITAL, DOKKYO UNIV. SCHOOL OF MEDICINE, KOSHIGALA, JAPAN

Adult scoliotic patients usually demonstrated degenerative discs, zygapophyseal arthritis and rotatory lateral spondylolisthesis in the low compensatory lumbosacral curve often with foraminal stenosis and pain. We provided, if the cause of these degenerative changes already existed when patients had still been young.

This paper compares the tilt angle of L4 (L4 tilt) in thoracolumbar scoliotic patients (King type II) to that of normal subjects on lateral bending, also correlates the difference in magnitude between thoracolumbar and the compensatory lumbosacral curves (CLSC). A group of 50 thoracolumbar scoliotic patients less than 30 years old were assessed. There are 48 females and 2 males with an average age of 15.8 years (8-28 yrs). They are divided into two groups. 21 with end vertebra of the major curve at L3 (group-L3) and 29 at L4 (group-L4). The average major curve measured 22.7° (11-30°) in group L3 and 22.8° (10-45°) in group L4. CLSC or L4. tilt while standing in group L3 was 9.5° (3-15°) and group L4 was 10.9° (5-19°). The control was assessed from 31 young normal subjects of 11 males and 20 females (20-28 yrs, avg 22.3 yrs).

The tilt angle of L4 on lateral bending in the 31 controls averaged 8.5°. The correlation between the major and CLSC was statistically significant in both group L3 and L4 ($p<0.01$). A 10° L4 tilt correlated through linear regression to 23.2° in group L3 21.4° in group. Also the correlation between CLSC and L4 tilt for normal subjects was statistically significant in group L4, but not in group L3; though the average CLSC in group L3 is apt to be greater than the L4 tilt in normal subjects.

We noticed even in mild scoliotic patients who has thoracolumbar scoliosis may have a large compensatory lumbosacral curve which is greater than the tilt angle of L4 at lateral bending in normal subjects. The natural history of increased L4 tilt beyond normal value has still been unknown. We suggest it is important to follow increased L4 tilt even when lumbar scoliosis is mild.

16

PREVALANCE OF SPINAL CORD ANOMALIES IN IDIOPATHIC SCOLIOSIS

C. ŞAR, A. HAMZAOĞLU, Ü. DOMANİÇ, B. GÖKSAN

UNIVERSITY OF ISTANBUL, ISTANBUL MEDICAL FACULTY, DEPARTMENT OF ORTHOPAEDICS AND TRAUMATOLOGY, TURKEY

Between June 1990 and June 1992, a total of 43 patients with juvenile or adolescent idiopathic scoliosis with fast progression and left thoracic idiopathic scoliosis were investigated with magnetic resonance imaging for spinal cord pathology despite no pathology was encountered in the neurological examination.

There was syringomyelia in one of 7 patients with juvenile scoliosis and in one patient with left thoracic idiopathic scoliosis. Intramedullary tumor was found in one patient with left thoracic idiopathic scoliosis. Arnold Chiari malformation and syringomyelia was found in one of 34 patients with adolescent idiopathic scoliosis and herniation of the tonsils was found in another.

Spinal cord anomalies were found in 5 of 43 patients (%11.6) despite they were neurologically normal.

We conclude that, as emphasized in recent years, MRI with regard to intramedullary pathology is useful for revealing the etiology and planning the treatment in patients with left thoracic scoliosis and in juvenile or adolescent idiopathic scoliosis patients with fast progression.

17

INTRASPINAL AND UROGENITAL SYSTEM ABNORMALITIES IN CONGENITAL DEFORMITIES OF THE SPINE

U. AYDINLI, A. HAMZAOĞLU, C. ŞAR, U. TALU, L. ERALP

UNIVERSITY OF ULUDAĞ, BURSA
UNIVERSITY OF ISTANBUL, ÇAPA, ISTANBUL

In congenital spine deformities, the presence of intraspinal and urogenital abnormalities plays an important role in its treatment and follow up. Because of advanced radiological imaging systems, spinal canal and cord abnormalities are easily detected and therefore a significant increase in the incidence is being observed. Seventy-six patients with congenital spine deformity were studied by using computerized tomography (CT) + myelogram or magnetic resonance imaging (MRI) for spinal canal and cord, ultrasonography (US) or intravenous pyelography (IVP) for urogenital system. There were 39 (51%) males and 37 (49%) females, their mean age was 8 years (1.5-15) except for three adult patients. Thirty-two (42%) intraspinal and 11 (14%) urogenital system abnormalities were found. Out of these 32 patients 20 had more than one intraspinal pathology. The most frequently seen intraspinal abnormalities were diastematomyelia (19.7%), tethered cord (13.2%), syringomyelia (9.2%) Arnold-Chiari (6.6%). Hypertrichosis, dermal sinus, subcutaneous lipoma, pigmented nevus and anal dimple were noticed in 50% of patients with intraspinal abnormalities. These above findings urge us to conclude that; patients with congenital spine deformities should be searched for additional spinal cord or canal and urogenital system abnormalities routinely for the safety of treatment and unpleasant future occurence and consequences.

18

CONGENITAL SCOLIOSIS - MODERATE TERM RESULTS OF SURGICAL INTERVENTION

A. SURAT, E. ACAROĞLU, M. YAZICI, M. ALPASLAN, M. TOKGÖZOĞLU

HACETTEPE - ANKARA

44 patients with congenital spinal deformities that had surgical treatment is presented. Average patient age at the time of operation was 12 years, ranging between 2 to 25.

16 patients were male and 28 female. Average Cobb measurement at the age of operation was 74.7° ranging between 35 to 130. Surgical procedures consisted of three different groups. Some patients had only posterior in-situ fusions, some had both posterior and anterior in-situ fusions and another group had anterior release procedures followed by posterior instrumentation with an attempt to correct the deformity. The selection of surgical procedure depended upon the age of the patient, the localisation of the deformity, associated anomalies and the general condition and the neurologic status of the patient. Average overall post-operative Cobb measurement was 67° ranging between 35 and 118.

The average follow-up period was 31.3 months ranging from 5 to 103 months. Average Cobb measurement at the last follow-up was 68.5 degrees as one of the patients had deteriorated to 150 degrees despite posterior fusion. There were no neurologic complications in the posterior fusion group, one case of paraplegia in the anterior and posterior in-situ fusion group due to the violation of the spinal canal during the second stage posterior fusion. We have encountered two complete paraplegias and one case of partial paraparesia in the instrumented group. The partial neurologic deficit completely resolved after the removal of the hardware but the two complete lesions showed no progress. Both patients had partial neurologic deficits before surgery.

It is concluded that anterior and posterior surgical procedures coupled with instrumentation systems do give better cosmetic and functional results but carry a substantial risk of neurological complications.

19

CONGENITAL SCOLIOSIS

Y. TUMER

ANKARA, TURKEY

8 patients with progressive congenital scoliosis were operated before 9 years of age. Four patients were girl, four patients were boy. The youngest patients at the time of operation was 15 months old, the oldest was 9 years old. Convex hemifusion was performed in 7 patients, posterolateral concave bar resection in 1 patient. Minimum follow-up was 6 years, maximum was 11 years with an average 8.5 years. 1 patient has reached to maturity. Additional operations were performed in 3 patients (osteotomy and CD instrumentation in 1, Harrington instrumentation and posterior fusion in 1, repair of non-union in 1). 1 more patient needs instrumentation. Diastematomyelia was diagnosed in 2 patients and resected. Non-union has developed in 1 patient, crankshaft phenomenon in 1 patient.

The patients with progressive congenital scoliosis should be treated surgically as early as possible and followed closely until maturity.

THE DIAGNOSIS AND SURGICAL TREATMENT FOR CONGENITAL DEFORMITIES OF THE SPINE

A. HAMZAOĞLU, C. ŞAR, Ü. DOMANİÇ, M. ŞENGÜN, U. TALU

UNIVERSITY OF ISTANBUL, ISTANBUL MEDICAL FACULTY, DEPARTMENT OF ORTHOPAEDICS AND TRAUMATOLOGY, TURKEY

20 cases of congenital deformity of the spine have been surgically treated in our clinic during the period between April 1988 and June 1992.

Posterior fusion and instrumentation in 6, posterolateral fusion in 8, anterior and posterior convex hemiepiphysiodesis in 3 and hemivertebrectomy with anterior and posterior fusion at the same session in 2 cases were performed in these 20 cases.

Anterior and posterior procedure should be the preferred surgical treatment mode in cases of congenital kyphoscoliosis due to the presence of hemivertebra with posterolateral corner localization that especially causes sagittal plane deformity. So it would be possible to prevent possible future neurological deficit and crankshaft deformity.

Also, anterior and posterior fusion should again be preferred in rare cases of congenital lordosis.

Anterior and posterior convex hemiepiphysiodesis yields very good results when appropriate cases are chosen for this indication.

When posterior fusion is preferred, patient age, area of fusion and number of segments covered by fusion area should be the factors considered carefully to prevent possible future thoracal lordosis and crankshaft deformity that fusion leads to.

Hemivertebrectomy should be preferred especially when there is lumbar and lumbosacral region localized hemivertebra which impairs body balance and leads to short, angular deformity.

TWO STEP SURGICAL TREATMENT OF CONGENITAL KYPHOSIS (WEDGED VERTEBRAE)

Ş. GÜNGÖR*, Y. KARAKOÇ**, S. TÜRKER*, B. SEPİCİ***

* MINISTERY OF HEALTH, ANKARA HOSPITAL, DEPARTMENT OF ORTHOPAEDICS AND TRAUMATOLOGY, SPECIALIST DOCTOR.
** MINISTERY OF HEALTH, ANKARA HOSPITAL, DEPARTMENT OF ORTHOPAEDICS AND TRAUMATOLOGY, SENIOR RESIDENT.
*** MINISTERY OF HEALTH, ANKARA HOSPITAL, DEPARTMENT OF ORTHOPAEDICS AND TRAUMATOLOGY, SPECIALIST DOCTOR, DIRECTOR OF THE DEPARTMENT.

In the first step, anterior resection, fusion and Alıcı instrumentation & in the second step posterior fusion, Alıcı instrumentation were performed in Ankara Hospital, Ministery of Health's Orthopaedics and Traumatology clinic in 1992. The average angles of anterior kyphosis of the two cases were 50. The mean correction was found to be 34. No complications were noted in postoperative follow-up period.

22

NEUROMUSCULAR SCOLIOSIS MODERATE TERM RESULTS OF SURGICAL TREATMENT

E. ACAROĞLU, M. YAZICI, A. SURAT, M. ALPASLAN, Y. MUŞDAL

HACETTEPE, ANKARA

22 patients with neuromuscular scoliosis that have been treated surgically is presented. The diagnoses was poliomyelitis in the majority of the patients. 11 of the patients were male and 11 female. Average age at the time of presentation was 13.9 years ranging between 8 and 23.

Average Cobb measurement at the time of presentation was 74.6 degrees ranging from 39 to 116 degrees. The surgical procedures consisted of two different groups. Some patients had posterior Harrington instrumentations and fusions. Another group of patients had staged anterior and posterior interventions and segmental instrumentation techniques were performed. The selection of the operative procedure depended upon the severity of the deformity, the general condition of the patient and the instrumentation systems available.

Average follow-up was 33.2 months (range 9-70 mos). The average postoperative Cobb measurement was 51.4 degrees and was found to regress to 60.3 degrees at the last follow up. There were no neurologic complications.

It is concluded combined anterior and posterior procedures offer a better chance for correction of the deformities in neuromuscular scoliosis. Combined procedures are also associated with a much less incidence of correction loss though that may be due to the relatively shorter follow-up of these group of patients.

23

AUTOGRAFT DONOR SITE MORBIDITY IN SPINAL SURGERY

I. AKGÜN, M. HIZ, N. BİLSEL, Ö. AYDINGÖZ

DEPARTMENT OF ORTHOPAEDICS AND TRAUMATOLOGY,
CERRAHPAŞA FACULTY OF MEDICINE, UNIVERSITY OF ISTANBUL,TURKEY

Autogenous cancellous or cortical bone grafts are widely used in spinal surgery. To assess the donor site morbidity after these operations, out of 89 surgically treated scoliosis patients between 1.1.1986 and 31.12.1991, 22 patients in whom autografts had been harvested from posterior iliac crests and with a follow-up period of longer than 1 year were revaluated clinically and radiologically in regards of cosmetic appearence, pain, excessive bone formation, iliac crest regeneration and iliac epiphysis disturbance. 5 of these patients were male and 17 were female. Mean age at the time of operation was 15.5 and mean follow-up time was 37.8 months.

The donor sites were not detectable when compared with contralateral iliac bones except one from which bicortical grafts had been harvested. There was a palpable defect in this patient without herniation. Neither epiphyseal disturbance, nor excessive bone growth were observed in any of the patients. Two patients had mild subjective pain of the operation site and in another patient paresthesia was found on the incision site in physical examination. Based on the radiological data, reharvesting was found to be possible in 21 out of 22 patients (95.4%) and satisfactory spinal fusion was obtained in all patients.

A COMPARISON OF PERDRIOLLE RULER AND CT FOR MEASURING VERTEBRAL ROTATION

D. DİNÇER*, H. ÖMEROĞLU*, S. AKYAR**

*: DEPT. OF ORTHOPAEDIC SURGERY AND TRAUMATOLOGY, ANKARA UNIVERSITY IBNI SINA HOSPITAL, ANKARA, TURKEY
**: DEPT. OF RODIOLOGY, ANKARA UNIVERSITY IBNI SINA HOSPITAL, ANKARA, TURKEY

To determine the effectiviness of Perdriolle ruler (PR) and CT for measuring vertebral rotation, 10 major curves of 8 patients with idiopathic scoliosis, treated with CD instrumentation, were evaluated. Preoperative and postoperative rotation of 3 vertebrae, the apical vertebra, one below and one above the apical vertebra, was measured in every major curve by 2 different methods which were PR and CT. While determining vertebral rotation by CT, two different measurements, RAsag and RAml, were made. RAsag was the angle between the line through the dorsal, central aspect of the vertebral foramen and the middle of the vertebral body and the saggital plane. RAml was the angle between the line through the midline of the vertebral body and the dorsal central aspect of the vertebral foramen and the line from the vertebral foramen to the anterior midline of the body, mid-sternum in thorax, and the space between the two heads of the rectus abdominus in the lumbar area. The total number of vertebrae, which were evaluated, was 30, 23 thoracal and 7 lumbar.

Statistical analysis of the data was made by non-parametric "Wilcoxon test".

In thoracal vertebrae the average correction, measured by PR, CTsag and CTml was 22.9%, 29.7% and 25.7% respectively and no statistical difference was found between these methods ($p>0.05$).

In lumbar vertebrae, the average correction, measured by these 3 different methods was 20.3%, 36.0% and 37.9% respectively and statistically there were significant differences between PR and CTsag ($p>0.05$), and between PR and CTml ($p>0.05$).

When the average correction of all vertebrae was determined, it was observed that there was a significant difference between PR and CTsag ($p>0.05$).

In conclusion, PR was found to be a reliable method like CT for measuring vertebral rotation in thoracal vertebrae, but not in lumbar vertebrae.

REDUCTION AND STABILIZATION OF SPONDYLOLYSIS AND SPONDYLOLISTHESIS WITH ALICI SPINAL SYSTEM

E. ALICI, H. PINAR, D.AKSEKİ

DOKUZ EYLÜL UNIVERSITY HOSPITAL, 35340 İNCİRALTI, İZMİR, TURKEY

51 patients who were treated with Alıcı Spinal Instrumentation for spondylolysis (n:9) and spondylolisthesis (42) between 1989-1991 were reviewed. There were 33 females and 18 males whose ages ranged between 16 and 66 years (av. 41.3 years). Level of involvement was L3-4 in 1, L4-5 in 24, L5-S1 in 26 patients. Etiology was as follows:23 spondylolytic, 9 congenital, 12 degenerative and 7 traumatic. There were 28 grade 1, 10 grade 2, 2 grade 3 and 2 grade 4 slips (Meyerding). 18 patients had associated degenerative disk disease. The duration of symptoms, excluding the traumatic cases, were less than 5 years in 29, 5-10 years in 8, more than 10 years in 7 patients. All patients had pain at presentation. 19 patients had neurological findings. Indications for surgery are as follows: 1. Unremitting pain, 2. Neurological findings, 3. Increase in the degree of slip, 4. Failure of conservative therapy. The length of follow-up av. 17.6 months (range, 6-30 months). The vertebra at the level of slip, one above and one belove are stabilized by means of transpedicular screws and rods and fusion is done. Postop. X-ray analysis revealed full reduction in 22, 50-75% in 14, 25-50% in 4 and no reduction in 2 cases. 3 patients had postop infection which resolved with treatment and did not necessitate removal of the instruments. At the last follow-up, 8 patients had pain severe enough to take analgesics. No improvement of the neurological status was noted in 10 patients.

THE TREATMENT OF SPONDYLOLYSIS AND SPONDYLOLYSTHESIS BY ALICI SPINAL SYSTEM

E. KUTLUAY, E. CANSUNAR, A. SEBİK, E. GİLİM, A. KARALAR

BUCA SSK HOSPITAL, ORT. & TRAVMA. DEPT., İZMİR

During 1992, at the Buca SSK Hospital, the system was applied to 16 patients. **Sex:** 7 males, 9 females; **Age:** 30-61; **Type of instab.:** 6 w/spondylolysis, 10 w/sp.lysthesis (Slipping Degree accdg. to Meyerding class. 4 of 1st degree, 8 of 2nd degree, 4 of 3rd degree); **Ethiology:** 10 isthmic, 1 traumatic, 5 degener; **Complaints:** avg. since 9 yrs (1-25) 4 patients also w/HNP.

Conservative treatment was tried to all patients before operation. **Indications for surgery:** Persistant pains, cont.slipping, neurol.findings. The Alıcı spinal system was applied using transpedicular screws, hooks and rods plus fusion with iliac graft for the purpose of reduction and stabilization. **Duration of operation:** avg.4 hrs (3-5); **Blood transfusion:** avg. 4 units (2-6); **Standing position allowed:** avg. 6 weeks (4-8) after op.

Correction of slipping of patients w/sp.lysthesis: Of 4 patients w/3rd degree 3 patients to 1st, 1 patient to 2nd.; 8 patients w/2nd degree 4 patients to 1st, 4 full enat.reduction; Of 4 patients w/1st degree 4 patients full anatomic reduction. In one patient sup.infection has been observed.

In 12 patients complaints have totally dissappeared and in 4 patients minimized. The patients have been followed for avg. 1 year. This system has proven to be useful for reduction and stab. of spondylolysis and spondylolysthesis.

DECOMPRESSION AND POSTEROLATERAL FUSION FOR DEGENERATIVE SPONDYLOLISTHESIS WITH THE COMBINED DISTRACTION AND COMPRESSION ROD SYSTEM - MORE THAN FIVE YEARS FOLLOW - UP

S. SATOH, K. KANEDA, M. FUJİYA, K. OGUMA

DEPARTMENT OF ORTHOPEDIC SURG. HOKKAIDO UNIVERSITY,
SCHOOL OF MEDICINE SAPPORO, JAPAN

The principle problems in surgical treatment of unstable degenerative spondylolisthesis are how to decompress adequately and how to preserve or get stability. Decompressive procedures without stabilization have not infrequently resulted in troubles due to postoperative instability.

Method: During 1980 to 1987, consecutive 186 cases with unstable degenerative spondylolisthesis were treated by medial facetectomies and posterolateral fusion with combined distraction and compression rod instrumentation. There were 78 males and 108 females, ranging from 38 to 79 years, with a mean of 57 years. The site of spondylolisthesis were at L3-4 in 27, at L4-5 in 152 and at L5-6 or S in 7. The period of follow-up observation was ranged from 5 years to 12 years with a mean of 85 months. Single level fusion was performed in 77%, 2 levels in 18% and 3 levels in 4%.

Results: Preoperative low-back pain in 87% and leg pain and /or numbness in 92% were reduced to 8% and 5% respectively at follow-up examination. And neurogenic intermittent claudication in 88% was disappeared in all except 3 cases. The solid fusion rate was 97%. The preoperative mean % slip was 13.8% and the postoperative 14.4%. The preoperative mean slip angle was 3.2 degrees kyphosis which improved postoperatively 0.9 degrees lordosis. Complications were not seen except for 6 pseudarthrosis.

Conclusions: The overall clinical results were satisfactory relief of clinical symptoms and neurologic recovery with a high rate of solid union. The combined distraction and compression rod system was simple, safe and useful in stabilization of unstable degenerative spondylolisthesis following decompression by medial facetectomies.

28

TRANSLAMINAR AND TRANSPEDICULAR SCREWING: TWO SUCCESFUL OPERATIVE TECHNIQUES IN THE TREATMENT OF DEGENERATIVE LUMBAR DISEASE

H.G. KOLLMANN

NEUROSURGICAL DEPARTMENT, A.Ö.KH ZELL/SEE
5700 ZELL/SEE, AUSTRIA

The two mentioned techniques are very successful operative approaches to lumbar instability and stenosis. They particulary take into account the causing segmental pathology. Translaminar screwing is very successful in cases of instable retroposition of a vertebra or after decompression with partial or subtotal facetectomy. In cases of (degenerative) spondylolisthesis, a transpedicular screwing with internal fixation is mandatory. Both techniques require addition spinal fusion with autologous bone grafts from the iliac crest. In a group of 33 consecutive operated patients (mean age 54, follow-up periods from 9-20 months) 16 (48,5% obtained complete relief of their chonical pain, 14 (42,4%) improved significantly. Careful patient selection, adequate operative technique and the right postoperative procedure (plastic orthesis for 4 months) are most important features.

29

THE USE OF PREOPERATIVE RECOMBINANT ERYTHROPOIETIN IN SCOLIOSIS SURGERY

D. P. ROYE, P. ROTHSTEIN, J. B. RICKERT, J.P. C. FARCY, L. VERDISCO

The purpose of this report is to evaluate the efficacy of preoperative human recombinant erythropoietin administration in patients undergoing scoliosis surgery.

A prospective, randomized study was designed. Active patients were given erythropoietin (100u/kg) 3x/week for an average of 11 doses. Oral iron was also administered and blood pressure was measured on initial patient contact and each time erythropoietin was administered. Hemoglobin and hematocrit were measured serially during treatment and postoperatively. Control patients received iron only. Intraoperative red cell salvage was employed in all cases.

Twenty-five patients were enrolled, 20 famele and 5 male, average age 13.2+/-2.2 years and mean weight was 38 kg+/-10. There was no change in blood pressure in any patient during therapy and there were no side effects. Pre-treatment hemoglobin/ hematocrit in controls was 39.5+/-4.1 and in actives was 40.2+/-3.9. Post-therapy hematocrit was 48.2+/-4.7 in actives and 40.1+/-4.3 in controls (p=.02). Both postoperative and 6-week follow-up hematocrit were statistically significantly greater in the active group than in the controls: 30.0+/-5.6 compared to 21.2+/-4.8 and 38.4+/-5.1 compared to 30.9+/-4.4 respectively.

Erythropoietin use in children undergoing scoliosis surgery is an effective means of increasing red cell mass and thereby decreasing the need for homologous blood transfusion. No adverse affects, including hypertension were observed in this series.

30

A BLINDED COMPARISON OF ALLOGRAFT VERSUS AUTOGRAFT IN LUMBAR SPINAL FUSIONS

F.D.KOCH, S.M.FIORE, R.T.HOLT, W.W.KOTCAMP

SPINE SURGERY, P.S.C., 210 EAST GRAY STREET, 601,
LOUISVILLE KENTUCKY 40202 3900 U.S.A.

Several recent studies have reported poor results for allograft as compared to autograft used in lumbar fusion. The purpose of this study is to support or refute these by reporting a blinded analysis of two similar groups of patients who underwent lumbar spine fusion using either allograft or autograft.

Forty patients, twenty in each group, underwent either posterior lateral intertransverse fusion, anterior interbody fusion or a combination of the two, half with autograft and half with allograft. AP and lateral x-rays were evaluated at 3,6, and 12 months by a radiologist and a spine surgeon, both blinded as to the type of bone graft. Results are reported as to percent of bone graft remaining at each examination and the visualization of clearcut signs of incorporation such as trabeculation across the fusion site.

Follow-up in all cases was over one year. The vast majority of the allograft patients showed severe resorbtion of bone graft with 50-100% being the norm. Autograft did have some cases of complete resorbtion of bone graft but this was rare and there was significantly greater fusion mass for the autograft patients versus allograft. Clear cut signs of incorporation of bone graft were lacting in the majority of the allograft patients reviewed. Using a blinded rating scale by a radiologist and a spine surgeon not involved in the surgery, we feel we have objectively compared autograft with allograft in lumbar fusion and find better results radiographically using autograft. From these results we would expect to see a higher fusion rate with lumbar fusion using autograft.

31

CLINICAL USE OF HYDROXYAPATITE IN SPINE FUSION

F. SUETSUNA, N. ISE, H.TAKEDA, S. HARATA,

1)AOMORI PREFECTURAL CENTRAL HOSPITAL, AOMORI, JAPAN

2)HIROSAKI UNIVERSITY SCHOOL OF MEDICINE, HIROSAKI, JAPAN

Introduction: We applied spine fusion with iliac bone autografts for degenerative diseases of the spine as a fusion method. Because of problems of bleeding, operation time and pain or discomfort on the donor site, we recently applied spine fusion with Hydroxyapatites (HA). Our aim is to estimate the usefulness of HA as a substitute for iliac bone from clinical cases and experimental studies.

Methods: 35 patients (24 males and 11 females) between the age of 34 to 73 years old were treated. 18 patients with cervical canal stenosis were made laminoplasty. 7 patients with degenerative and lytic spondylolisthesis were made posterior lumbar interbody fusion with transpedicular screw. 5 patients with cervical myelopathy were made anterior fusion. 5 patients with degenerative lumbar deseases were made postero-lateral fusion. Minimum follow-up periods was 6 months.

Results: In cases of laminoplasty, we could have good stability and enlargement of spinal canal. Stability between bone and HA was obtained about 2 months from histological and biomechanical studies. In cases of PLIF, the height of interbody space was preserved and solid fusion was obtained. In cases of anterior fusion of cervical spine, solid fusion was obtained and average amount of bleeding was less than 30 ml. In all cases, we had no problem of deviation and destruction of HA.

Conclusion: We would like to emphasize the usefulness of HA for spine fusion. The use of HA gave us decrease of bleeding and grafting bone, shortening of operation time and good results. So, we can use HA for spine fusion instead of iliac bone.

32

COMPLICATIONS AT A LEVEL ADJACENT TO THE FUSION IN LUMBAR SPINE SURGERY

YIH-LAN GAU

DEPT. OF ORTHOPAEDI C, CHANG-GUNG MEMORIAL HOSP. KAOHSIUNG, TAIWAN

From July 1986 to December 1991, 9 patients had problem of stress transfer to the adjacent unfused lumbosacral segments. Preoperative diagnoses were segmental instability or acquired spondylolisthesis (6), degenerative or adult scoliosis (2), vertebral osteomyelitis (1). Two patients had spinal fusion without instrumentation (P-L fusion 1, combined A+P fusion 1). Seven patients underwent spinal fusion and posterior instrumentation (Luque 2, DKS 2, VSP 3). Four of 7 patients had combined anterior lumbar interbody fusion, either staged or continuous procedure. The complications of adjacent level included degenerative hypermobility above the fusion level (3), disc degeneration/spinal stenosis below the fusion (2), degenerative change above the fusion (2), and compression fracture above the fusion (2). In subsequent procedures, two of 9 patients were treated conservatively. 7 patients were treated surgically. In 7 patients, surgery including extension of fusion to the adjacent levels with instrumentation was performed. At follow-up, two patients still had problem of stress transfer to further adjacent levels. From these complications we observed, the rigid fixation of a short segment can provide good stabilization in lumbar spine surgery, it can also produce increased untoward effects on the juxta-fuse segment, especially in multiple previous surgery patients, combined anteriorposterior fusion patients with or without instrumentation, and elderly patients.

33

POST OPERATIVE STUDY FOR DEGENERATIVE LUMBAR SCOLIOSIS

T. HASHIMATO, I. KIMURA

DEPARTMENT OF ORTHOPAEDIC SURGERY, SAN-IN ROSAI HOSPITAL,
YONAGO CITY, JAPAN

Degenerative lumbar scoliosis (D.L.S.) is defined as scoliotic deformity of at least Cobb 10 degrees which occured on the basis of disc degeneration of the lumbar spine. 22 D.L.S. patients underwent operations, out of which 14 cases posterior decompression without fusion, 2 cases decompression with fusion, and 6 cases decompression and correction plus fusion with instrumentation. Decreasing lordosis, low strength of abdominal and back muscle, increasing scoliosis in sitting position are unfavourable factors influencing postoperative improvement of degenerative lumbar scoliosis. We consider that a decompression plus with a fusion should be done in these cases.

34

AUTOMATED PERCUTANEOUS LUMBAR DISCECTOMY-IS IT STILL UP-TO-DATE?

H. P. KAPS, M. SCHILTENWOLF

DEPARTEMENT OF ORTHOPEDIC SURGERY,
UNIVERSITY OF HEIDELBERG, GERMANY

Percutaneous discectomy for noninvasive treatment of herniated lumbar discs is of growing interest. The new technique avoids several risks of traditional therapy-surgical disc removal through a laminectomy.

Percutaneous discectomy was first performed by HIJIKATA (1975) and in Switzerland by SUEZAWA and JACOB (1978) removing disc material with a long pituitary forceps through a posterolateral cannulla.

Since January 1988 in the Orthopaedic Clinic of the University of Heidelberg the technique described by ONIK (1985) is used, called Automated Percutaneous Lumbar Discectomy (APLD).

We report about results of more than 180 patients with an average follow up of 3 years. 2/3 of the patients have very good or satisfying results. Because of persisting pain, 23% of the patients underwent traditional disc surgery.

The ideal criteria for patient selection are disc protusions and non sequestrated herniated discs in an area consistent with the specific clinical findings. The complain of sciatica is not an absolut criteria. Relative contraindications for APLD are spinal stenosis, degenerative facet disease and previous spinal surgery. APLD is contraindicated in evidence of a free fragment.

35

POSTERIOR LUMBAR INTERBODY FUSION WITH SUPPLEMENTAL USE OF HYDROXYAPATITE BLOCK

N. SUZUKI, Y. IWAMOTO

DEPT. OF ORTHOPAEDICS, SAISEIKAI CENTRAL HOSPITAL, TOKYO, JAPAN

INTRODUCTION: When the patient is aged and osteoporotic, the collapse of the graft bone in the lumbar interbody fusion is a common problem. To prevent this problem, we applied hydroxyapatite block (HA block) as the interbody spacer.

METHODS: 73 patients who underwent posterior lumbar interbody fusion (PLIF) using HA block and iliac bone graft along with transpedicular spinal instrumentation were analysed with more than 6 months follow-up period. Post-operative assessment was done in terms of the clinical signs and symptoms, pain at the doner site and the change of the disc space height.

RESULTS: 58 excellent, 14 good, and 1 fair result were obtained. 5 cases had tolerable pain at the donor site which subsided in less than 6 months in all cases. The interbody space height was preserved very well and solid fusion was obtained in all cases.

CONCLUSIONS: 1.The use of HA block with iliac bone (sandwitch method) for the interbody fusion gives excellent results. 2.This method enables the multi-segmental interbody fusion in the aged patients in whom sufficient graft bone cannot be obtained and the bone is porotic and weak.

36

SALVAGE FOR FAILED SURGERY

A. ROBSON

NEUROSURGEON, PRIVATE PRACTICE, CANBERRA, AUSTRALIA

What can be done to recover a patient to comfort?
An analysis of the salvage surgical management and outcome of more than 50 previously failed operations.
The salvage is based upon the imposition of one of the golden rules of spinal surgery.

37

SURGERY WITHOUT RELIEF OF PAIN

A. ROBSON

PRIVATE NEUROSURGEON, CANBERRA, AUSTRALIA

Why do some lumbar spinal operations fail? An examination of more than 50 recent selected cases.
The outcome of more than 50 failed standard operations for back and leg pain are analysed and a central theme is determined. This indicates that the poor outcome is based upon failure to observe one of the three golden rules for successful spinal surgery.

38

POTT'S DISEASE
(Results of 185 Cases)

Z. KORKUSUZ, C.ISLAM , M.DOĞAN , S.SÖZEN

DEPARTMENT OF ORTHOPAEDIC SURGERY AND TRAUMATOLOGY IBNI SINA HOSPITAL, ANKARA UNIVERSITY FACULTY OF MEDICINE ANKARA, TURKEY

From January-1973 to June-1992 185 patients with Pott's Disease have been operated by different anterior approaches. The mean age was 36.2 years. The follow-up period ranged from 2 to 51 months with an average of 31 months. Because of lessening of their complaints most of the patients lost to follow-up after 2 or 3 years. We have performed the operation via extrapleural approach in 20 cases. We have also applied "ALICI ANTERIOR INSTRUMENTATION" or "AO PLATE" in 5 patients in addition to interbody fusion. 32 of the patients were admitted to our clinic because of Pott's paraplegia. After performing the anterior decompression, the improvement of these patients was complete in 19 and partial in 5 and no change in 8. Various complications, including 7 deaths, have been observed in 23 patients.

39

POTT'S DISEASE ANALYSIS OF ONE HUNDRED PATIENTS WITH A MINIMUM OF TWELVE MONTHS FOLLOW-UP

A. SURAT, E. ACAROĞLU, N. ÖZDEMİR, M. YAZICI, Ş. MEMİOĞLU

HACETTEPE, ANKARA

Our clinic's experience in the treatment of Pott's disease over a period of twenty years has been analysed retrospectively. The whole patient population consisted of one hundred and sixtyseven patients with a mean age of 22.8 years. One hundred patients that had been followed more than one year was included in this study. The mean age of this group was 21.0 years. Ranging from 2 to 66 years. The average follow-up was 44.2 months.

Patients were divided into three groups according to the treatment modalities. The first group consisted of 60 patients who had been treated by posterior in-situ fusion and had medical treatment. The second group consisted of 26 patients who had been treated by anterior or postero-lateral drainage of the abscess and had medical treatment. The final group consisted of 14 patients that only had medical treatment.

The average follow-up periods were 50.9 months for the first group of patients, 23.9 months for the second group and 52.9 months for the last group. The patients were evaluated for their neurologic, functional and medical outcomes. It was concluded that neurologic involvement due to Pott's disease had a benign prognosis with surgical treatment and anterior drainage offered slightly better chances of functional recovery.

BIOMECHANICS OF ORTHOSES

M.YÜCEL

Orthoses are devices which provide correction, support and fixation and they are used in many various congenital or acquired disorders of the spine.

The longevity of an orthosis' corrective effect depends on reevaluation of corrective force every 2 or 4 weeks and recharge by loading. Orthoses should have a high elasticity constant. Orthoses are classified in three groups.

1. Active Orthoses: The desired posture is provided actively by pellot effect (Milwaukee Brace)

2.Semi- active orthoses: Corrective pellot causes the trunk lean toward the opposite unsupported site at the horizontal plane.

3. Passive Orthoses: This type of orthosis keeps the spine at a desired position or prevents its certain, inappropriate movements.

CONGENITAL ANOMALIES OF THE CERVICAL SPINE WITH DEFORMITY OR INSTABILITY

R. B. WINTER

The most common pain syndrome is the patient with Klippel-Feil syndrome who has over the years stressed the remaining joints to the point where they become uncomfortable and even unstable. The second most common problem is instability of the upper cervical spine with discomfort. The Klippel-Feil syndrome is a common problem. The congenitally non-segmented articulations do not cause pain, but the additional stress placed on the remaining motion segments can cause significant problems. This seldom is symptomatic during early childhood, but in our experience becomes symptomatic some time between the age of 15 and 30. This usualy begins as just a dull neck discomfort and can progress to considerable discomfort with muscle spasm and if severe enough, can go on to instability with potential myelopathy in some cases. The most dangerous types and the most symptomatic are those where there is a long fused segment distally and proximally, leaving one or two motion segments in the middle of the cervical spine. The only answer to these problems is to perform arthrodesis for the painful levels. Instability problems demand fusion to prevent the critical myelopathy. Significant instability with or without discomfort must have arthrodesis to achieve stability and prevent catastrophic neurologic deficit. Our experience has been excellent with poterior spine fusion using autogenous iliac bone graft and halo cast fixation. Failure to use the halo and failure to use autogenous bone graft are the two most common failures that we see.

ATLANTO-AXIAL ARTHRODESIS BY BROOKS' METHOD IN RHEUMATOID ARTHRITIS

M. FUJIYA*, M. SAITA*, K. KANEDA**

* HOKKAIDO ORTHOPEDIC MEMORIAL HOSPITAL
**DEPARTMANT OF ORTHOPEDIC SURGERY, HOKKAIDO UNIVERSITY, SCHOOL OF MEDICINE

Eighty-six patients with atlanto-axial instability in rheumatoid arthritis were operated on by Brooks' method. Sixty-four patients had anterior subluxation: four, posterior subluxation: eighteen, vertical subluxation. Excluding 4 cases of posterior subluxation, average atlanto-dental interval (ADI) was improved from 7.3mm to 1.9mm and average space available for the cord (SAC) was improved from 11.1mm to 16.0mm. The cases of vertical subluxation also showed improvement.

Forty-two patients followed over 4 years were examined for upward migration of the odontoid process by Redlund-Jonell's method. Only 2 cases showed slight progression between the occiput and the atlas. In all cases, the reduced status of atlanto-axial subluxation was maintained.

Atlanto-axial arthrodesis by Brooks' method should be indicated for the patients with atlanto-axial instability due to rheumatoid arthritis including vertical subluxation in early stage.

43

RADIOGRAPHIC MEASUREMENTS OF THE CRANIOCERVICAL REGION IN RHEUMATOID ARTHRITIS

U. AYDINLI, S. KÜÇÜKOĞLU, Ö. GEDİKOĞLU, M. PARLAK, M. SÖNMEZ, H. TEBER

UNIVERSITY OF ULUDAĞ, BURSA, TURKEY

Cervical spine involvement is a common finding in long term rheumatoid arthritis (RA). Atlanto-axial subluxation (AAS) or dislocation (AAD) and cranial settling (CS) occur secondary to synovial proliferation and restruction of the surronding bone and supporting ligamenteus structures. Thirty-four patients (24 female, 10 male) with an average 10.8 years history of RA have been evaluated routinely with lateral roentgenograms (extansion, flexion, neutral). Routine controls were done by two different methods described by Teigland and Sakaguchi-Kauppi to evalute AAS and CS. Comparing to various measuring methods, the landmarks chosen in Teiglant method are easily identifiable points. First measurements are not particularly significant but are important for follow up. The Sakaguchi-Kauppi method gives a reproducible tool for screening of CS and is also applicable to patients for whom earlier roentgenograms are not avaible. In statistical analysis these measuring methods showed significant correlation (p 0.001). We didn't experience any difficulty in using these measuring methods.

TRANSORAL APPROACH IN BENIGN COMPRESSIONS OF CRANIOVERTEBRAL JUNCTION

A.F. ÖZER, M.N. PAMİR, T.A. ZIRH, C. ERZEN

MEDICAL FACULTY OF MARMARA UNIVERSITY,
DEPARTMENTS OF NEUROSURGERY AND RADIOLOGY

11 transoral surgical operation have been performed at the Department of Neurosurgery in University of Marmara between 1990 and 1992.

The mean age of the patients was 43 (range 23-61). Six were females and five were males. Of the patients, three had primary basillar invagination, five had C2 dislocation due to rheumatoid arthritis and three had instability due to traumatic odontoid malunion.

Quadriparesia with different degrees, ataxia, disturbances of speak and visuality and nystagmus were noticed at the first neurological examination. Further neuroradiological evaluation has yielded a decrease in the diameter of foramen magnum and bone compression at the cervicomedullary region due to abdominal location of odontoid process.

Posterior fixation by metal implantation between occipital bone and C1-C3 laminae has been performed in all cases. Consequent to this procedure anterior decompression was achieved by transoral approach. Upto two years of follow-up has yielded clinical healing in seven but no alteration in the remaining four cases.

45

RE-OPERATION AT THE CERVICAL SPINE IN CASES OF DELAYED BONE HEALING AFTER FUSION

M. ROESGEN

FROM THE GERMAN BG-TRAUMA CENTRE DUISBURG, BUCHHOLZ

Fracture instability of the cervical spine demands operative treatment. This contends removal of the destroyed intervertebral disc, removal of bone fragment, revision of the spinal cord, filling up the defect and internal fixation. In our opinion the filling of the destroyed tissues by autogenous bone grafts is advantages. There is a very quick healing by bony integration, and by the buttress of the spine bodies which allow early mobility.

Filling up the gap by bone cement is some what easier and quicker. But the bony integration of the bone cement is not possible. In a lot of cases we see loosening of the cement block. This demands resection of cement and destroyed bone and reconstruction of the vertebral column by autogenous bone grafts.

In the operation for fusion of the cervical spine we used in the past 10 years 90 times autogenous bone grafts and the AO H-plate. 10 cases with former operation were send to us from another unit. They all were operated with bone cement instead of autogenous bone grafts. We solved this problem of instability, pain and loosening of metal by resection of the bone cement, resection of the pseudo-plate of the vertebral bodies proximal and distal, in searching of a big cortico-cancellous bone graft and a new plate-osteosynthesis. All those patients got a bony fusion without further complications.

Another problem is the osteosynthesis after fracture of the cervical spine in patients who suffer from a Morbus Bechterew. The rigid fixation of all spine bodies allow no compensatory mobility of the other segments. The weak point is so far the fracture site and the osteosynthesis in this region. Without additional fixation we observe re-dislocation and loosening of the screws and the plate to avoid this complication we use in addition to the internal fixation of the facture site a HALO-device to hinder the movement of the head till bony healing appeared.

In 13 patients we applied this double procedure with anatomical reduction, bone grafting and internal fixation and additional the external fixation by the HALO-vest. In all patients the bony healing appeared. The time of immobilisation by the HALO- fixator was about 2 months in general.

In conclusion the rigid fixation of the injured segment and the implantation with an solid autogenous cortico- cancellous bone graft allows the quick healing. It's a good technique in the primary operation to avoid secondary dislocation how we observed in the use of bone cement. This is also a good technique to solve problem in patients with delayed bone healing after an unsuccessful stabilisation by other materials.

Key words: cervical spine fracture - re- osteosynthesis - autogenous bone graft - additional HALO - fixator.

46

COMPARATIVE EVALUATION OF DISCOGRAPHY, CT AND MRI IN THE DIAGNOSIS OF CERVICAL DISCOPATHIES

K. F. SERTEL, K. KONERMANN

St. ELISABETH HOSPITAL, ORTOPEDI KL. 4352 HERTEN, GERMANY

Cervical discopathies are one of the common diseases encountered in daily life, along with other problems and environmental factors involving industrialized societies.

While degenerative changes at the cervical vertebrae are the leading cause at the present population, car accidents, work and sports traumas cause more and more discopathies.

In this study, we have comparatively investigated the correlation between our operative findings and discography, CT and MRI findings for the diagnosis of cervical discopathies.

In our opinion, discography and MRI are the most reliable methods for operative indication.

If the provocation pain spreading the involved dermatom that is subjectively described by the patient is seen especially during discography and MRI findings are correlated, then the most reliable method is formed for the diagnosis.

We have performed nucleotomy and anterior intercorporeal fusion with autologous bone graft (Robinson operation) in 37 cases of cervical discopathy in our clinic between 1988 and 1991.

Difficulties encountered at diagnosis and follow-up will be presented by giving examples from the cases.

AUGMENTATION OF TRANSPEDICULAR SCREW WIRING
Biomechanical Analysis of Pull-out Strenghts on a Bovine Model

E.ACAROĞLU, M.ÇETİN, A.SURAT, R.GEÇİT, G.LEBLEBİCİOĞLU, N.AKKAŞ

HACETTEPE, ANKARA

Trans-pedicular screws despite being known as the strongest method of vertebral fixation have a subtantial risk of pulling out of the pedicle during surgical manipulations, especially in the osteoporotic patients. The use of Acrylic Cement so as to augment the fixation of screws have been advocated but is considered to be very dangerous by many surgeons. This study is performed so as to see whether the pull-out strenghts of transpedicular screws could be increased with the addition of sublaminar wiring at the very same segment.

Fresh bovine vertebrae were used in the experimental model. The right side pedicles of eight lumbar vertebrae were drilled, tapped and trans-pedicular screws inserted. These screws were than attached to short segments of rod with connectors. The same procedures were performed for the left pedicles and every screw-connector-rod complex were augmented with double sublaminar wires.

The pull-out strenghts were measured using a servo-electronic testing device and load-displacement curves for each screw were obtained. Sublaminar wiring had some beneficial effects on the pull-out strenghts of the screws but did not result in a considerable improvement.

STRESS REACTIONS OF THE SPINE IN HIGH PERFORMANCE WEIGHT LIFTERS

A. GÜSSBACHER, F.U. NIETHARD

Top class weight lifters have a daily training rate of 90 metric tons. As most of the top athlets start with their training program in late adolescence, there is not comparable loading of the lumbar spine in human subjects, especially over a long period of time. So there is a great interest for the morphologic reactions of the spinal structures and their clinical relevance.

We have examined 2 groups of high performance weight lifters. The first group consisted of 7 weight lifters of the Olympic Team of the Federal Republic of Germany. These athlets have been examined during the Olympic Games 1988 in Seoul. The second group consisted of 9 athlets of the Junior National Team of the Federal Republic of Germany which have been examined in 1989. In all athlets clinical and radiological examinations of the lumbar spine had been performed.

At the time of investigation all athlets were in top condition and without complaints. There were no pathological clinical findings with regard to mobility of the lumbar spine or neurological function. The X-ray studies, however, revealed significant ossification defects of the end plates of the lumbar vertebrae which have been found in 6 out of 7 members of the Olympic Team showed ossification defects, 2 of them had the spondylolysis at the L5 level, 2 at the L2 und L3 level.

In the Junior National Team 4 out of 9 showed ossification defects of the end plates and 3 had spondylolysis at the L5 level.

The relatively high incidence of pathological X-ray-findings in top performance weight lifters indicates that continous maximal axial loading of the lumbar spine leads to severe stress reactions. From the biomechical analysis and videographic motion studies the disciplines of 2 hands snatch and clean and jerk are mostly exposed to pathologic reactions of the spine. These disciplines will lead to repeated hyperlordosis and rotational movemements of the spine, especially under the conditions of uncoordinated lifting technique or insufficient muscular stabilization of the trunk. The impact of hyperlordosis and rotation can lead to spondylolysis even in late adolescence. As in the discipline of 2 hands snatch most of the mobility is gained from the upper lumbar spine; this can lead to spondylolysis at unusual level.

From our videographic studies, we think that unsufficient lifting techniques and pathological loading of the lumbar spine can be avoided by a special training program which can only be successful under the teamwork of coach, medical doctor and athlet.

BIOMECHANICAL COMPARISON OF VARIOUS VERTEBRAL TRANSPEDICULAR SYSTEMS

M. ALTINMAKAS, K. KARAMETE, A. YİĞİT, R. GEÇİT, N. AYDOĞAN

*GÜLHANE MILITARY MEDICAL ACADEMY, DEPARTMENT OF ORTHOPACDICS AND TRAUMATHOLOGY
**MIDDLE EAST TECHNICAL UNIVERSITY, DEPARTMENT OF BIOMECHANICS

Various vertabral traspedicular fixation systems had been mechanically tested under nondestructive axial compression, forward bending and rotational forces using calf spine model. These forces had been applied to each spine model under three conditions: 1)intact spine. 2)spine artificially destabilized by corpectomy and 3) spine fixed with a transpedicular fixation sysytem. Load-deformation curves had been analyzed to determine the efficacy of each transpedicular system. Non-significant variation of mechanical durability had been obtained between each system with three modes of loading.

THE RECIPROCATING GAIT HIP-KNEE-ANKLE-FOOT ORTHOSIS FOR PARAPLEGIC PATIENTS

E. SESLİ, Ö. HALİT

ORTHOPEADY AND TRAUMATHOLOGY CLINIC OF EGE UNIVERSITY
MEDICAL FACULTY-IZMIR, TURKEY

The main concern of the paraplegic patients is to obtain reciprocating gait during mobilisation.

Bilateral hip-knee-ankle-foot orthoses with locked hip knee joint give two-point motion with high energy expenditure.

Mechanical orthoses with either cable control or hydraulic control despite their many limitations compromise the best solution to this problem.

We applied reciprocating gait hip-knee-ankle-foot orthoses to eight patients with cable control and to three patients with hydraulic control.

The etiology of paraplegia were; eight of vertebral fractures, two of meningomyelocell and one of unknown neurologic disorder.

All orthoses were supported with 4mm polyethylene and drop lock knee joints. The sitting was obtained by the two locks in cable controlled and one valve in hydrolic controlled to orthoses. We obtained hip joint stabilisation during standing and walking.

51

MECHANICAL STABILIZATION AFTER LAMINECTOMY IN PATIENTS WITH TRAUMATIC THORACOLUMBAR FRACTURES

U. GÜNEL, A. BİÇİMOĞLU, Y.TABAK, M.A.TÜMÖZ, A.UTKAN

NUMUNE HOSPITAL 2. CLINIC OF ORTHOPEDICH AND TRAUMATHOLOGY, ANKARA, TURKEY

Between 1989 and 1991, twenty-eight patients with spinal cord injury secondary to a thoracolumbar fracture were operated by two different transpedicular internal fixation systems known as Dick and Alıcı. All patients had been urgently treated by laminectomy at different centers. The levels of the laminectomy were changed between one to three. We have shown that the fixators can be applied for stabilization of the cases with prior laminectomy without technical problems.
The patients had been hospitalized after laminectomy in Ankara Rehabilitation center an average of 72 days (minimum 34 days, maximum 128 days). The patients in Frankel groups A-C were mobilized on average 6 days after the operation in a wheel chair (minimum 4 days, maximum 10 days) and started for rehabilitation program.

STRINGENT THERAPEUTICAL MANAGEMENT OF TUMOR OSTEOLYSES OF THE THORACIC AND LUMBAR SPINE

A. KORGE, P.KLUGER, H.P.SCHARF

Progress in oncological therapy within the last decade enhanced the prognosis of survival in patients with tumor invasion of the spine; therefore, the necessity of surgical action became more frequent.

The majority of tumorous osteolyses of the spine are located in ventral parts. Therefore, an operation from an initially ventral approach seems to be obvious.

However, the prolonged recovery after ventral operations especially at the thoracic spine and the comparatively small stability of exclusively ventral instrumentations must be taken into consideration; additionally in an oncological meaning, the possibility of radical surgery of the spine even from a ventral approach must be doubted. Consequently, a different concept seems to be both logical and obvious.

The initial dorsal approach with laminectomy, recalibration of the spinal canal and transpedicular, stable-angled montage with an internal fixator (optionally positioning of an intrathecal catheter for treating tumor pains) provides stability and removes the imminent danger of a progressive paraplegia; the tumor diagnosis can be ensured by biopsy. The acute treatment therefore does not prejudice any of the possible perspectives of decision. The patient's recovrey following this operation is quick and an early mobilisation and functional stress for 3 to 6 months are possible without further operation.

Therefore, this surgical step already represents the quality of a palliative treatment imposing only little stress; additionally with longer lasting prognosis, all other procedures can be carried out. No transport problems exist if embolisation or radiotherapy are necessary to prepare vertebrectomy. No matter if the vertebral body is replaced autologically or alloplastically after vertebrectomy, no additional ventral fixation procedures are necessary.

The case material of 45 patients presented by excerpts confirm the efficiency and validity of the therapeutical concept established in our hospital by increased quality of life and positively influenced overall prognosis.

SPINAL OSTEOSARCOMAS REPORT OF FIVE CASES

M.T. GÖĞÜŞ, E. ACAROĞLU, M.N DORAL, G. LEBLEBİCİOĞLU, A. SURAT

HACETTEPE, ANKARA

Five cases of osteosarcomas that were located at the spinal column were evaluated retrospectively. Three of the lesions were primary and two were secondary. Three patients were females and two were males, average patient age at the time of diagnosis was 23.6 years.

Four of the tumors were located at the lumbar vertebrae and one at the thoracal region. All five of the tumors were high grade lesions, and their surgical stages were one stage IIA, two stage IIB's and two were stage III lesions.

All patients were followed untill death. Two patients died at the third month after diagnosis, one died at the ninth month, one died at the twelvth month, and one at sixteenth month after diagnosis. Two patients were grade C, two patients grade D and one patient was grade E at the time of death.

It was concluded that the prospects of long term survival for osteosarcomas of the spine were very bad with inadequate surgical resection margins and more radical surgery including total spondylectomies are justified.

54

SPINAL CHONDROSARCOMAS REPORT OF SEVEN CASES

E. ACAROĞLU, M.T. GÖĞÜŞ, M. ALPASLAN, A. YÜCETÜRK, C. AKSOY

HACETTEPE, ANKARA

Seven cases of chondrosarcomas with spinal location that has been treated in our hospital were evaluated retrospectively. Three of the patients were females and four males. Average patient age at the time of diagnosis was 38.1 years. Only one of the cases was associated with multiple hereditary exostosis.

One tumor was located at the sacrum, one at L5, three at thoracal vertebrae and two at lower cervical vertebrae. Five of the lesion were histologically grade I, one was grade II and one was grade III. The surgical stages of the tumors were, one patient stage IA, five patients stage IB and one patient stage IIB. The surgical margins of resection were intra-lesional in four, marginal in two and wide contaminated in one patient.

Average follow-up was 67 months. One patient was lost to follow-up at six months, only one died at 24th month and the other five were living, their follow-up periods ranging from eleven to one hundred and twenty months.

It was seen that chondrosarcomas originating at the vertebral column were mostly low-grade lesions and had very good prognosis, with even marginal resections.

55

ALBENDAZOL AND MODERATE DOSE LOCAL IRRADIATON IN THE TREATMENT OF SPINAL HYDATID DISEASE

M. HIZ, A. AKGÜN, A. KASABALIGİL, S. OKKAN, S. AKÇURA, S. DERVİŞOĞLU

UNIVERSITY OF ISTANBUL, CERRAHPAŞA FACULTY OF MEDICINE, DEPARTMENT OF ORTHOPAEDICS AND TRAUMATOLOGY, DEPARTMENT OF RADIATION ONCOLOGY, DEPARTMENT OF NEUROCURGERY AND DEPARTMENT OF PATHOLOGY, ISTANBUL, TURKEY

Musculoskeletal hydatid disease is seldom located in the spinal tissues. When it involved the bone adjacent to the spinal cord, the achievement of radical surgical margin is very difficult. We introduced the combination of Albendazol and moderate dose (3600 cy) irradiation therapy in a patient with the hydatid disease of L2-L3 vertebral bodies and pedicles that caused cord compression. The patient was 52 years old, male, Caucasian with a history of intralesional insufficient excision of paraspinal hydatic cyst 6 months prior to admission to our institution. The patient was observed since 18 months after the completion of treatment model. He is free of pain and hypoaesthesia and the osseous lesions were satisfactorily calcified. No similar treatment report was found in the literature according to our survey.

56

CERVICAL MEDULLER NEUROFIBROMATOSIS

M.Z. BERKMAN, C. ENSON, L. AKDUYGU, Ş. ULUER, T. DERİNKÖK

SSK OKMEYDANI HOSPITAL ISTANBUL, TURKEY

Neurofibromatosis is a hereditary condition; manifested with peripheral and central neurofibroma; cafe-au-lait; optic glioms; bone and soft tissue malformations.
7.5 yrs. old boy with quadriparesia has admitted to SSK Okmeydanı Host. Neurosurgery unit. The diagnosis was neurofibromatosis. MRI revaled a neurofibroma on the level C1-C2 and due to bony malformations severe kyphosis whom apex is on the level C4-5 with caused medullary compression. He was operated anteriorly with decompression from C1 to C6 and fibular strut grafting. The clinical and surgical date were evaluated regarding the literature.

SURGICAL TREATMENT OF SYRINGOMYELIA IN 56 PATIENTS: A CRITICAL APPRAISAL

R.PADOVANI, N.ACCIARRI , M.GIULIONI

DEPARTMENT OF NEUROSURGERY G. GAIST-BELLARIA HOSPITAL
BOLOGNA, ITALY

Several surgical procedures have been proposed for the treatment of syringomyeia in view of the varying etiology causing spinal cord cavitation. Critical topics of discussion are:

a)The disease itself is chronic, featured by slow and progressive worsening of the clinical picture, sometimes with spontaneous remissions

b)Since the beginning of the disease, a non reversible damage to the nervous tissue within the spinal cord is likely to happen, so one can hardly suppose that signs and symptoms can be completely abolished by surgery

c)Indications and timing for surgery, and the choice of the technique remain open questions in the literature

The authors review the clinical course of 56 patients treated for syringomyelia over a 21-year period, with different surgical procedure. Age ranged from 2 to 65 years; the mean follow-up was 5 years. The following results were seen in our cases:

improvement..... 30.5%
stabilization of symptoms 60.5%
clinical worsening 9.0%

The surgical procedures adopted by the authors, and their pathophysiological implications are reviewed.

58

METASTATIC MALIGNANCY OF THE CERVICAL SPINE: A NON-OPERATIVE HISTORY

S. RAO, K. BADANİ, T. SCHILDAUER, M. BORGES

ORTHOPAEDIC HOSPITAL SPINE CENTER

PURPOSE: To study the natural history, life expectancy and outcome of nonoperative tretment for patients with metastatic disease of the cervical spine. PATIENTS AND METHODS: Records of patients with cervical spine metastase over a 4 year period were reviewed. Follow up was every 3 months till death. Primary tumor, symptoms, neural deficit and instability were identified. RESULTS: Of 48 patients with spinal metastases, 19 had cervical involvement. 57% originated from the breast, prostate and lung. Only 2 patients had spinal metastases restricted to the cervical region. Mean time from diagnosis of primary tumor to cervical metastasis was 29 months overall, 2.2 for lung, 18.6 for prostate and 89 for breast. Mean survival after diagnosis of the cervical metastases was 14.7 months overall, 5.5 for lung, 25.6 for cervical metastases was 14.7 months overall, 5.5 for lung, 25.6 for prostate and 27 for breast carcinoma. No patient had neurological deficit due to cervical metastasis and 3(16%) had slight radiographic collapse and deformity. Only 1(5%) had documented instability. All patients had nonoperative treatment with radiotherapy, chemotherapy or a combination. Irrespective, the pain recurred in all patients by 6 months. DISCUSSION: Cervical spinal metastases are infrequent, are accompanied in-variably by widespread metastases and hearld a terminal stage of life. The incidence of neurological deficit is rare. Progressive deformity is infrequent and instability is rare. Nonoperative treatment may be appropriate in the absence of significant neurological deficit or instability. The return of symptoms by 6 months, renews the debate for surgical treatment of intractable pain.

59

SCORING SYSTEM FOR THE PREOPERATIVE EVALUATION OF METASTATIC SPINE TUMOR PROGNOSIS

Y. TOKUHASHI, H. MATSUZAKI, S.TORIYAMA

DEPARTMENT OF ORTHOPAEDIC SURGERY, NIHON UNIVERSITY SCHOOL OF MEDICINE TOKYO, JAPAN

Since 1986, an assessment system for the prognosis, especially cancer, has been applied to the selection of the operative methods to the metastatic spine tumors. Six parameters were postulated in the assessment system: 1) the general condition, 2) the number of extraspinal bone metasases, 3) the number of metastases in the vertebral body, 4) metastases to the major internal organs (lungs, liver, kidneys and brain), 5)the primary site of the cancer, and 6) the severity of spinal cord palsy. Each parameter ranged from 0 to 2 points. In this study, for 99 cases including the cases thereafter, a report of the reevaluation of the scoring system will be presented. As a result of it, the total score obtained for each patient can be correlated with the prognosis, while being valuable in predicting it. However, the prognosis could not be predicted from a single parameter. In conclusion, an excisional operation should be done those cases who scored above 9 points, while a palliative operation is indicated for those who scored under 5 points. Since the presentation of this scoring system in 1986, it has been possible to estimate a relatively certain prognosis without changing the parameters and scores.

60

ANTERIOR SPINAL RECONSTRUCTION WITH DEMINERALIZED FEMORAL ALLOGRAFT - EVALUATION WITH SINGLE PHOTON EMISSION COMPUTED TOMOGRAPHY

S. RAO, T. A. SCILDHAUER, R. HATHAWAY, J. BEMBECK, C. A. STEWART

ORTHOPAEDIC HOSPITAL SPINE CENTER

PURPOSE: To assess the incorporation and viability of femoral surface demineralalized allograft using single photon emission computed tomography. METHODS: SPECT bone scintigraphy for evaluating fusion of femoral allograft was studied in 11 patients with vertebrectomy and femoral allograft reconstruction. At average 32 months post-op, AP, lateral, and flex-extension radiographs were evaluated for union, resorption, consolidation, and trabeculation. Activity in the body and margins of the graft was determined from scans: 0-absent (avascular and non-viable), 1-normal (mixed viable/ nonremodeling), and 2-normal, 3-normal 4-marked increase (osteoconductive). RESULTS: 1 of 11 had pain with motion. Radiographically 8 of 11 had incorporated grafts with bridging trabeculae. By clinical and radiographic evaluation 7 had complete fusion. Planar bone scinti-grams showed 3 grade 2 which were considered fused, 3 grade 3, 1 grade 4, and four grade 2. SPECT imaging showed 1 grade 2 and 1 increased activity. 1 had increased activity on the left but not right side of graft and 2 had upper and lower margins with increased activity but body activity decreased. DISCUSSION: SPECT showed all planar bone scintigraphy and radiographic abnormalities plus non-contiguous lesions. SPECT offers superior imaging of graft metabolic activity (viability). SPECT was superior in its ability to distinguish graft from host activity. Viability of the graft was not clearly critical for clinically satisfactory results.

61

THE RATIONALE AND RESULTS OF SINGLE-STAGE COMBINED POSTERIOR AND ANTERIOR SURGERY WITH SPINAL INSTRUMENTATION

S. SANO, K. KOSAKI, N. SUYAMA, A. TORIHAMA, K. ENOKI

SANRAKU HOSPITAL, DEPARTMENT OF ORTHOPEDIC SURGERY, TOKYO, JAPAN

Some of the conditions which involve both the posterior and anterior segments of the spine can theoretically be best treated by a combined posterior and anterior procedure using spinal instrumentation. The purpose of this paper is to discuss the rationale for performing this procedure in a single stage and study the results of our retrospective series. Materials and methods: Forty-nine patients were reviewed. Posterior instrumentation was used in all 49 patients and it was combined with anterior instrumentation in 23. The diagnosis was degenerative disease in 18 cases, trauma in 13, infectious spondylitis in 10, and tumor in 8. The mean operating time was 5 hours 20 minutes (2h11m-11h53m). The mean blood loss was 1556cc (90-7760c), and the mean follow-up period was 3 years 5 months (2y5m-5y5m) except the patients with metastasis. Results: Good bone union was obtained in all 42 patients for whom bone grafting was performed. Correction of a deformity or a dislocation was satisfactory in 22 of 24 patients. Regarding the pain relief in 42 patients other than those with metastasis, an excellent result (no pain) was obtained in 25 cases (60%), a good result (occasional mild pain) in 14 (33%), a fair result (frequent mild or occasional severe pain) in 2 (5%), and a poor result (frequent severe pain) in 1 (2%).

Discussion: Single-stage combined posterior and anterior surgery with instrumentation provided satisfactory results despite the severity of the diseases treated, except in the patients with spinal metastasis. This operation is indicated for the correction of rigid deformity, the reduction and stabilization of fracture-dislocation in which both the anterior and posterior columns of the spine have disintegrated, the removal of pathology around the spine in failed back or multi-factorial LBP, and for the stabilization of carefully selected cases with infectious spondylitis. Single-stage surgery appears to be better than two-stage surgery.

EVALUATION OF TRANSPEDICULAR SCREWS WITH COMPUTERIZED TOMOGRAPHY

O. GÜVEN, S.YALÇIN, T. ESEMENLİ, H. GÜNDEŞ

MARMARA UNIVERSITY, FACULTY OF MEDICINE, DEPARTMENT OF ORTHOPAEDICS AND TRAUMATOLOGY ISTANBUL, TURKEY

The accuracy of screw placement was assessed in 52 consecutive patients treated with transpedicular screw fixation. Postoperative CT scans were used to determine the position of the screw according to the pedicle. This report analyzes a total of 223 pedicular screws inserted with AO'Fixateur İnterne', Cotrel-Dubousset, Steffee, Alıcı, Dimso systems from T 9 to S2.90% of the screws were found to be within the pedicle. 4% of the screws were inserted medially into the spinal canal. Only 1 of these 9 screws caused root compression symptoms which was relieved with screw removal after 3 months. Screw placement lateral to the pedicle occurred in 5% of the total screws, 1% percent of the screws were found to be inserted superior to the pedicle. No complications developed related to these malpositioned screws. No screw entered the intervertebral foramen. Screw penetration depth was assessed also. None of the screws penetrated the anterior cortex of the vertebral body. 72% of the screws reached the anterior half of the vertebral body. The tips of 28% rested in the posterior half of the body. Pedicle screw fixation is an effective form of internal fixation of the thoracolumbosacral half of the body. Pedicle screw fixation is an effective form of internal fixation of the thoracolumbosacral spine. The potential complications are grave but a surgical team fully trained in the methodology can achieve good results with a minimum of complications.

THE LATE OUTCOME OF STABLE COMPRESSION FRACTURE WITHOUT NEUROLOGICAL IMPAIRMENT OF D12 - L1 - L2

M.ADLER, R.GEPSTEIN, Y.FOLMAN, T.HALLEL

SPINAL UNIT, ORTHOPEDIC DEPARTMENT, MEIR HOSPITAL, KFAR SABA

The study represents a long follow-up of 100 patients who sustained a T.L. (D12-L1-L2) stable fracture without neurological impairment, from whom we were able to collect all previous and actual X-rays as well as files. The mean follow-up is 9 years. The assessment of the late results of these fractures was based on the analysis of 28 variables concerning the injury level, the compression percentage, the resultant kyphosis, the hospitalization time, the physiotherapy, the pain level and the performance level of the patients. The results show that a stable compression fracture of D12-L1-L2 (mean compression 39.6%) affects the patients for a prolonged time, and after 9 years approximately 70% of the patients have back pain. 60% of the patients permanently changed their jobs and over 54% of the patients have difficulties and stress in the family which are attributed to the trauma, the pain and the reduced level of activity. We did not find any correlation between the percent of compression and the late results, nor between the resultant kyphosis and late outcome. The results were not affected by the type of treatment -belt or corset- or by the intensity of physiotherapy.

AN ANALYSIS OF CONSERVATIVE OR SURGICAL MANAGEMENT OF THORACOLUMBAR FRACTURES

A. AKBAŞ, T. ÜNSALDI, M. KUNT

DEPARTMENT OF ORTHOPEDICS AND TRAUMATOLOGY, FACULTY OF MEDICINE, CUMHURİYET UNIVERSITY, SIVAS, TURKEY

Between 1986 and 1992, 70 patients were treated for thoracolumbar fractures, 40 of them who were adequately followed up were evaluated. 35 patients had major injury; 20 of them were treated conservatively and 15 were treated surgically. The neural status of all conservatively treated patients was Frankel E. No neurological deterioration was seen in these patients. Various degrees of pain were present in most of the patients. 5 of the patients were unable to work in their employments. The mean initial deformity kyphosis and scoliosis were 13.3° and 3.3°, residual deformity kyphosis and scoliosis were 15.9° and 4.2° respectively. Of the 15 patients who were treated surgically, in 8 patients Frankel E, in 2 patients Frankel D, in 3 patients Frankel C, in 2 patients Frankel A were determined. 4 patients were applied Harrington+laminectomy+posterior fusion, 1 patient was applied Harrington+posterior fusion, 3 patients were applied Alıcı+laminectomy+posterior fusion, 5 patients were applied Alıcı, and 1 patient was applied Alıcı+anterior fusion by an anterior approach. No improvement was seen in Frankel A group. 1 patient showed neurological deterioration while 5 patients had an improvement in their neurological status. The mean kyphosis and scoliosis angles were found to be 15.3° postoperatively (initial values were 23.1° - 1.8°). These values were determined as 20.8°-1.6° at the most recent follow-up.

We suggested that either conservative or surgical treatment can be useful in thoracolumbar fractures.

CONSERVATIVE TREATMENT OF VERTEBRAL FRACTURES

M. ALTINMAKAS, N. AYDOĞAN, A. ŞEHİRLİOĞLU, S. TUNAY, V. KIRDEMİR

ORTHOPAEDICS AND TRAUMATOLOGY DEPARTMENT OF GÜLHANE MILITARY MEDICAL ACADEMY, ANKARA, TURKEY

The stability of the thoraco-lumbar fractures determines the type of the treatment protocol. 38 cases with different traumatic causes were conservatively treated between 1985-1992. The patients were between 18-42 years old. 15 patients had L_1 vertebral fractures, 18 had in other levels vertebral fractures and 5 cases had more than one vertebral fractures. There was no neurological deficit. The fractures were evaluated by X-ray, MRI and CT. A body cast were used as an external support for 3 months and after this period commercial braces were used for additional 45 days. We observed an increase in kyphosis angle with an average of 6 degrees due to the collapse of vertebral corpus in 23% of the cases after 2 years of follow-up period.

CLINICAL RELEVANCE OF SPINAL CANAL STENOSIS AFTER CONSERVATIVE TREATMENT OF LOWER THORACIC AND LUMBAR SPINE FRACTURES

G.KALTENECKER, C.H. GABLER, R. MAIER, O. KWASNY

Deformity is always present following the healing of vertebral compression fractures, whether they be treated operatively or conservatively. Nevertheless one of the main aims of treatment is reduction of the deformity to a minimum in order to maximize the biological integrity of the vertebral column and prevent degenerative changes from taking place. Classically, treatment by the BÖHLER method is indicated for fractures between T 12 and L5, which constitute 60%of all vertebral fractures.
72 patients with fractures at these region, treated by the BÖHLER method from 1972-1987 could be followed up. There were 33 men and 39 women with an average age of 44.3 years (23-69y).
A comparison with the findings on the day of the accident showed that the vertebral deformity decreased in all cases. In the CT scan we found spinal stenosis in up to 30% in 9 patients (12,5%) with no neurological symptoms.
Based on these results, the authors recommend the BÖHLER method in lower thoracic and lumbar compression fractures without neurological symptoms and without stenosis up to one third of the spinal canal, which is without clinical relevance.

IS THERE AN AGE LIMIT FOR THE SURGICAL TREATMENT OF DENS FRACTURES?

E. WALLENBÖCK

GRAZ, HOSPITAL FOR ACCIDENT SURGERY GRAZ, AUSTRIA

Introduction: Surgical stabilization of traumatic cervical spine lesions does not only reduce the time required for treatment but also facilitates care as it spares the patient several weeks to months of extension treatment with subsequent immobilization in a Minerva plaster cast.

Especially to elderly patients conservative treatment constitutes a severe stress in both physical and psychic respect.

Material: In the period from 1981 through 1990, a total of 23 patients (14 male, 8 female, age 18-88 years, average age 53 years) were submitted to surgical treatment of dens fractures at the Graz Hospital for Accident Surgery. The surgical procedures adopted were frontal screw compression osteosynthesis in 18 cases, the same method combined with dorsal spondylodesis in one case, dorsal spondylodesis alone in 3 cases, and employment of a halo fixateur in one case.

Discussion and Conclusions: As a rule, screw compression osteosynthesis of a fractured dens will lead to osseous healing within 8 weeks by compression of the fracture. For external immobilization, a plastic cuff, which has to be worn for 4-6 weeks, will be sufficient. Unless there is any additional traumatic lesion patients treated by surgery may already be allowed age surgical intervention will considerably facilitate treatment and decisively improve their quality of life. Consequently, there seems to be no age limit for the surgical treatment of dens fractures.

REDUCTION AND POSTERIOR FUSION OF MISSED CERVICAL DISLOCATIONS WITH ALICI SPINAL SYSTEM

E. ALICI, H. PINAR, D. AKSEKİ

DEPARTMENT OF ORTHOPAEDICS AND TRAUMATOLOGY,
DOKUZ EYLUL UNIVERSITY, SCHOOL OF MEDICINE, IZMIR, TURKEY

We report 8 patients with missed dislocation of cervical spine. There were three fractures and five fracture-dislocations. The injuries were at C1-2 in 1, C2-3 in 2, C3-4 in 2, C4-5 in 1, C5-6 in 1, C6-7 in 1 patient. There were 6 men and 2 women whose ages averaged 47.8 years (range 26-63 years). The time period between the injury and the presentation was 4 days to 9 months, average 82 days. 7 of the 8 patients had presented to a hospital but did not get appropriate diagnosis and/or treatment for various reasons. The presenting complaints were neck pain and limitation of motion in all patients. In addition, one patient complained of motor weakness of all extremities. 5 patients had objective neurological findings at presentation. The transverse traction devices of Alıcı Spinal Instrumentation were used for reduction and stabilization and posterior fusion was done. Immediate postoperative lateral radiographs revealed full reduction in four, 50% reduction in two, 30% reduction in one and no reduction in one. Average follow-up was 12 months (range, 3-25 months). At the latest follow-up all the patients were satisfied. There were no loss of reduction on radiographs.

FIRST EXPERIENCES WITH THE HWS CERVICAL SPINE COMPRESSION IMPLANT FROM DORSAL CERVICAL STABILIZATION (D-C-S) SYSTEM

H. HIERTZ, A. OLSCHOWSKI, J. FISCHER

WAGNER-JAUREGG-KRANKENHAUS, NEUROSURGERY, LINZ, AUSTRIA

The use of the normally used dorsal stabilization processes in the HWS-laminar wires, facet fusion, transpedicular stabilization involves the danger of an injury, neither of the central nerve root nor the arteriae vertebralis.

When using compression clamp of the D-C-S System the chance of complications is impossible. The Cervical Spine Compression Implant consists of 2-clamp joint hinge with a central spindle. The stabilization may include one or more segments.

After erection of the arches and, if necessary, putting in a bone interposition, the clamps will be put in the vertebrae arches and set under compression by rotating of the central spindle.

Stabilization may include one or several motive elements; however always on both sides and the compression distance must be as long as on the other side.

Till now, these processes have been used by 10 patients without any complications by the following indications:

Dens pseudoarthrosis, Sub-or luxation and instability.

PITFALLS IN THE SURGICAL MANAGEMENT OF CERVICAL SPINAL TRAUMA

S. RAO, E. BADANI, E. JAMIESON, T. SCHILDHAUER

ORTHOPAEDIC HOSPITAL SPINE CENTER, LOS ANGELES

PURPOSE: To identify and quantify those areas of management of cervical injuries, which are susceptible to error in the perioperative period. **METHODS:** Records of 69 cervical spine injury patients referred to the authors institution over a 3 year period were reviewed. The senior author documented "definite" or "probable" pitfalls occurring in the pre, intra or postoperative management. Diagnosis, traction, bracing, surgical timing, intraoperative technical errors or incorrect surgical decisions were noted. **RESULTS:** Of the 69 patients, 39 (56%) suffered a pitfall of management. 27 (69%) patients accumulated 49 "definite" pitfalls and 12 (31%) patients had 20 "probable" pitfalls. Of the 49 definite pitfalls, 7 (14%) were preoperative, 38 (77%) intraoperative and 4 (9%) postoperative. Diagnostic errors and incorrect bracing and traction led to neurological worsening. Intraoperatively, technical errors (33%), wrong timing of surgery (24%) and incorrect operation (19%) were the common pitfalls. Postoperative pit-falls consisted of inappropriate bracing (12%). **DISCUSSION:** Cervical Spine Research Society Review (1990) rated complications of cervical spine surgery at 6.3% (63/992). In this study, a sizeable portion (56%) of cervical spine injury patients requiring surgery were at a risk of complications. Short of complications, there are areas of management where errors may have less well documented undesirable effects or increase the potential for morbidity. An awareness of these pitfalls and nonoperative treatment may eliminate upto 72% of the pitfalls and thereby decrease the morbidity associated with the management of the cervical spine injuries.

OPERATIVE STABILIZATION OF TRAUMATIC LUXATIONS AND LUXATION FRACTURES OF THE CERVICAL SPINE

R. MAIER, C. GÄEBLER, G. KALTENECKER

UNIVERSITY CLINIC OF TRAUMATOLOGY VIENNA, AUSTRIA

Early recognition and appropriate initial management of spinal cord injuries maybe essential to avoid or lesson disabling sequale and mortality. It is estimated that 10% to 25% of patients with an underlying cervical spine injury develop paralysis resulting of unprotected manipulation of head and neck during the initial care.

Between 1982 and 1991, 73 patients with 68 luxation fractures (C2-C7) and 5 traumatic luxations were treated operatively. There were 54 men and 19 women. The patients' ages ranged from 16 to 83 years. 35 patients had neurologic involvement. The number of complications of clinical importance was 5. There occured three loosenings of the implants and one deep wound infection. Two patients with paraplegia above C5 died on pulmonary complications.

Many authors prefer surgical treatment of unstable cervical fractures to closed manipulation, traction and prolonged external immobilisation. Surgical stabilization is recommended for an unstable fracture associated with cord injury when adequate reduction is not obtained or when slipping is likely to occur.

72

OUR EXPERIENCE WITH ANTERIOR STABILIZATION IN CERVICAL FRACTURES

C. GÖKÇE, F. ERGÜNGÖR, G. TEZEREN

ANKARA NUMUNE HOSPITAL, I. ORTHOPEDICS AND TRAUMATOLOGY CLINIC, ANKARA, TURKEY

In our clinic, 5 patients with cervical fractures were treated by vertebrectomy, fusion and internal fixation with plates by anterior approach.

Previously applied procedures were anterior fusion with Cloward technique in 3 patients and halo-cast in 2 patients.

Plate fixation by anterior approach together with Colward technique is an easily applied procedure that permits early mobilization and that does not require external fixation.

EFFECT OF THE LOG-ROLLING MANEUVER ON THE UNSTABLE FRACTURED SPINE

S. RAO, K.BADANI, P. MCGUIRE, J. KUMAR

ORTHOPAEDIC HOSPITAL SPINE CENTER, LOS ANGELES

PURPOSE: To determine the relationship of the log-rolling maneuver to angular and translatory motion of the unstable fractured thoracic and lumbar spine. **METHODS:** 18 consecutive patients were studied prospectively. AP and lateral roentgenograms of the fracture site were obtained, in the supine, right lateral and left lateral decubitus positions, with the patients being "log-rolled" 90° from the supine position to each side. Angular and translatory motion at the fracture site and angular deformity was recorded. 5° angular change and 3 mm translatory motion was assessed as "significant". Results were assessed using a scoring system devised by the authors to add the effects of motion in each plane. **RESULTS:** There were 10 two column fractures and 8 three column fractures. The majority (12) were lumbar in distribution. No patient had significant sagittal plane translation. 67% did not show significant coronal plane translation. 67% of the patients had no significant change in the kyphosis angle. 72% patients showed no significant change in scoliosis angle. Using the scoring system to assess overall motion, 72% of the patients showed no significant motion. Of the remaining five patients, three showed marginally significant motion. No patient deteriorated neurologically. **DISSCUSSION:** Patients with spine trauma are commonly managed with the "log-roll" maneuver. The effects on angular and translatory motion at the fractures site, for acute spine trauma have not been documented. With a "significance" threshold of 3 mm translation and 5° angular change, the log rolling maneuver was found to be safe for the management of acute thoracic and lumbar spine injured patient.

BURST FRACTURES OF THE THORACO-LUMBAR JUNCTION TREATED BY THE "MODULAR CONSTRUCT" TYPE OF THE COTREL-DUBOUSSET (C.D.) DEVICE

G.ARGENSON, F. DE PERETTI, C. LACOUR,
J.M. PUCH, P.M. CAMBAS, E. HOVORKA

SERVICE ORTHOPÉDIE-TRAUMATOLOGIE, HÔSITAL SAINT-ROCH,
5 RUE PIERRE DÉVOLUY 06000 NICE FRANCE

Between March 1986 and October 1990, 71 patients underwent an internal by C.D. instrumentation for thoraco-lumbar burst fractures:

- 24 patients were subject to a "modular construct" (fig. two) instrumented vertebra at the level of the upper vertebra, the screws being placed in the pedicles of the first vertebra above the lesion and a hook override the lamina of the second vertebra above; a single lumbar level is instrumented below the lesion by pedicular screws and under lamina hook. The screws resist to compression forces and hook to pulling out forces; this type of construct has a decreasing rigidity towards his superior part, avoiding screws'breakage.
- 23 patients were subject to "various" combined devices using only screws or only hooks or any other combined construct that one's reported above.

In all cases, postero-lateral bone graft was added; early mobilisation without external brace support was generally carried out in the post-op period.

Results: vertebral kyphosis (in degrees)

	PRE-OP	POST-OP	FOLLOW UP (>1 year)	LOSS
"various" construct	15.2	3.8	13.7	9.9
"modular" construct	18	4.2	7.4	4.1

There wasn't any breakage of screw or implant failure in the "modular construct"; the only complication was infection in 2 cases. Since November 1990, we use only "modular construct".

THE PLACE OF ANTERIOR PROCEDURE FOR UNSTABLE FRACTURES OF THE SPINE

A. HAMZAOĞLU, C. ŞAR, Ş. AKMAN, B. GÖKSAN

UNIVERSITY OF ISTANBUL, ISTANBUL MEDICAL FACULTY, DEPARTMENT OF ORTHOPAEDICS AND TRAUMATOLOGY, TURKEY

Between June 1990 and June 1992, of 39 cases with unstable fractures of the thoracolumbar spine, 9 had anterior and posterior procedures, 30 had only posterior reduction and stabilization with CD instrumentation in our department.

In the group treated with anterior procedure, there were two post-traumatic kyphosis, two burst fractures with a local kyphosis angle greater than 25° and type-III instability according to Farcy J.P.C. criteria, two operated burst fractures with 80% narrowing of the medullary canal but neurologically intact and 3 cases with progressive incomplete neurologic deficit.

Anterior discectomy without medullary canal decompression, strut graft and posterior stabilization was performed in 3 cases. In 6 cases, anterior decompression, strut graft and posterior stabilization was performed.

2 of 3 cases with incomplete neurologic deficit improved from Frankel B to D and one improved from B to C.

We recommend anterior procedure especially in patients with progressive incomplete neurologic deficit, in cases with posttraumatic kyphosis and in cases with local kyphosis angle more than 25° in order to avoid failure of the posterior instrumentation.

OUR EXPERIENCE WITH CD INSTRUMENTATION AND ROD-SLEEVE TECHNIQUE IN THORACOLUMBAR SPINE FRACTURES

F. ALTINTAŞ, A. EREN, A. SAKAOĞULLARI, A. KONAL

GOZTEPE SOCIAL SECURITY HOSPITAL, ISTANBUL

The surgical treatment was performed on unstable thoracolumbar spine fractures of 20 cases (17 male, 3 female) at orthopaedics and traumatology clinic of Göztepe Social Security Hospital in Istanbul between June 1990 and January 1992.CD instrumentation was applied on 13 cases and rod-sleeve technique was performed on 7 cases. Preoperative and postoperative CT scans were obtained for all cases. Local kyphosis angle, local fracture angle, posterior and lateral translation amount and vertebral body height loss in conventional radiographs were evaluated. The average follow up was 11 months (range 5-18). Spinal canal occlusion was restored mean %25 by CD and rod-sleeve techniques. At the end of this study, the problems of rod-sleeve technique and the advantages of CD instrumentation were mentioned.

THORACOLUMBER FRACTURES FIXED WITH A LOCALLY MADE FIXATOR INTERNAE

A. AZIZ, N. M. AKHTAR

KING EDWARD MEDICAL COLLEGE, LAHORE, PAKISTAN

25 cases of thoraco lumbar spinal fractures have been operated upon in our Unit during the last two years using a locally made fixator intern. The fixator is based on the AO External Fixation and consists of 4x6 mm thick Schanz Screws - 4 clamps and 2x6 thick rods. The Schanz screws are free size and the surplus after insertion is cut off with the large AO pin cutter. An ordinardy Black & Decker Drill is used for drilling through the pedicles. X-ray control in the lateral plane is used. The average operation in 6 months. No neurological damage was worsened.

- The fixators got infected one pin cut out was encountered.
- Three pins broke all had been insitu for 9 months.
- No Clamp/Rod failure occurred.
- The fixator should be removed between six - nine months.
- Post operation extension brace should be used. Done properly.
- Transpedicular fracture fixation is a good method and our fixator is acceptable.

PRICE OF OUR DEVICE: Rs. 5000/-
$ 200/-

THE CERVICAL SPINE IN THE CHILD

J. W. FIELDING

COLUMBIA UNIVERSITY- COLLEGE OF PHYSICIANS AND SURGEONS
NEW YORK, NY, USA

The injured child's neck often becomes a diagnostic enigma. Normal patterns may be misinterpreted as injuries. Variations of ossification and hypermobility may contribute to difficulty in diagnosis. Vertebral body injuries usually occur at the junction between cartilagenous endplate which can not be detected by x-ray, but may be suspected by widening of the interspace. The odontoid process may be fully developed and the cartilagenous upper section may not show on the x-ray leading to diagnosis of an anomaly. Injuries in children usually occur in the upper portion of the neck, unlike those in adults which occur in the lower portion of the neck, hence care should be taken evaluate the upper portion of the cervical spine in the injured child. Surgical intervention in young children should be carefully evaluated.

ANTERIOR DEVICE FOR THORACOLUMBAR BURST FRACTURES

Y. OKAJIMA, M. MOTEGI, H. TSURUOKA

TOHO UNIVERSITY, TOKYO, JAPAN

42 patients-33 males, 9 females, age ranging from 18 to 55 underwent this method from 1984-1991.

The follow up has been from 6 months to 8 years.

Modified Kostuik-Harrington technique was used for patients. Three types of technique has been done one rod & screws, two rod & screws plus transverse fixator.

Complications such as infections, instrumentation failures has been no more in this short but long term follow up series. Bony union occured in all patients. Loss of reduction occured in all patients, one rod & screws has been higher than the others. The advantage of this technique has been

1) Correction of kyphotic deformity
2) Loss or no more surgical time
3) As the instruments are smaller
4) Technically easier & safer.

COMBINED DORSOVENTRAL CORRECTION OF POSTTRAUMATIC DEFECTIVE POSITIONS AND INSTABILITIES OF THE THORACIC AND LUMBAR SPINE - INDICATIONS; TECHNIQUE AND RESULTS OF THE DOUBLE-APPROACH

P. KLUGER, A. KORGE, H.P. GERNER*

44 operations of the thoracic and lumbar spine performed simultaneously from a dorsal and ventral approach were carried out in order to treat posttraumatic instabilities and defective positions. In all cases, reduction and stabilization were made with the internal fixator. Until the end of 1984, the instrumentation of the AO ("Arbeitsgemeinschaft für Osteosynthese") was implanted; since 1985, we used the spine fixator developed by us. With growing experience, we succeeded in an increasingly complete correction of old defective positions; only at the thoracic spine we must put up with deficits of correction because of the total deformation of the thorax. Autologous cortico-spongious chips and ground autospongiosa were used in nearly equal amounts for the ventral intercorporal fusion. Despite two cases with failure of the implant, no measurable loss of correction occured. Additionally, three thromboses were found as postoperative complications; neurological aggravations did not occur. In six cases with the trauma dating back less than 6 months, slight neurological improvements appeared. The indication for operation, however, was based more clearly on static-myalgic complaints of instability than on the hope of neurological remission.

With the simultaneously dorsal and ventral approach, the application of a transpedicularly anchored internal fixator allows both the instrumental reduction with unhindered free approach to the vertebral bodies and the short-distances fusion without ventrally placed implants. The extent of the operation and the imaginable risks require an extremely careful diagnosis for the operation, which should be carried out only in an experienced center.

STABILIZATION OF VERTEBRAL FRACTURES WITH TSRH SPINAL IMPLANT SYSTEM

N. ALTUN, E. CİLA, Ş. ATİK

GAZI UNIVERSITY MEDICAL SCHOOL, ANKARA, TURKEY

In this report, the application of a new spinal implant system for stabilization of vertebral fractures, Texas Scottish Rite Hospital (TSRH) has been studied.

The TSRH spinal system has been applied for stabilization of 15 patients with unstable vertebral fractures. Preoperative postoperative clinical and radiological features of these patients have been evaluated.

In an average follow-up period of 9 months, complications, neither early nor late, have not been encountered. 7 patients presented with neurological lesions. One of these patients showed complete and three patients showed partial neurological recovery. In all of the cases, radiological results were completely satisfactory.

Although the average follow-up period is only 9 months, the results show that TSRH spinal system is an effective means of stabilizing vertebral fractures.

STABILIZATION OF THORACO-LUMBAR FRACTURES BY FIXATEUR INTERNE -INDICATION, OPERATION AND RESULTS-

M. ROESGEN

The aim of the treatment in spine injury is to restore stability, to reduce malposition, to achieve normal function and to improve neurological damage. Tasks of the operation of an unstable injury are: Reduction of injured segments, decompression of the cord and stabilization of the vertebral bodies. The indications are given by collapse of the weight bearing column, rupture of the dorsal connective ligaments, a gibbosity of more than 20°, a luxation and in case of a compression-distraction injury.

Great advantage in fusion of the thoraco-lumbar spine is given by the fixateur interne, created by DICK. The internal fixator acts as a tension band device. It is possible to perform distraction, bridging or neutralisation of the injured segment. By use of an additional transpedicular bone grafting and transpedicular reduction of the compressed spine body we achieve the normal length and the normal size of the vertebral body.

This device is stable enough for early physiotherapy and early weight bearing. The removal of metal is performed 6 to 9 months after stabilization. The treatment begins after 1 week with standing up at bedside, then walking with crutches. Sitting up is allowed 6 to 8 weeks after the operation.

In the last 7 years the implantation was performed in 83 patients, 37 of them with additional paraplegia. In 71 the anatomical reduction could be achieved. 8 showed a rest of gibbosity of 10°, 4 infections were healed by early removal of metal but without loss of stability. The application was possible from the segment Th 8 down to the Os sacrum. Twice a double application to bridge two or more segments was performed.

Our results show, that the internal fixator allows the stable fixation of unstable injuries only from one dorsal approach including the decompression of the spinal cord. Most of the problems of the injured spine can be solved by one implant only.

Key words: Spine injury - unstable fractures - dorsal instrumentation - internal fixator - results

THE RESULTS OF ROD-SLEEVE METHOD IN THORACOLUMBAR FRACTURES

İ.E. KAÇAN, İ. M. TÜRKMEN, M. A. KAYGUSUZ

HAYDARPAŞA NUMUNE STATE HOSPITAL ISTANBUL, TURKEY

From February 1988 to May 1991, 18 patients with unstable thoracolumbar injuries without neurologic deficit were treated by spinal rod-sleeve method at the department of Orthopaedics and Traumatology.

In 12 cases distraction rods with a pair of sleeves were set on the fractured apical vertebra, in the other six which have undergone total laminectomy, two pairs of sleeves were placed to bridge a laminectomy defect over the first intact lamina above and over the facets below. In all cases posterolateral fusion extending the lenght of the instrumentation was done. Postoperatively as an external support TLSO or reclination brace was used for an average period of 5 months. The mean follow-up was 26 months (range 12 to 50 months). Complications were few, no infection and no laminar fractures occured. The most common complication was single rod dislodgement which was seen only in 3 cases.

In rod-sleeve device, in addition to axial forces directed by Harrington rods, sagittal and mediolateral forces are also produced by the sleeves. As a result, not only traumatic kyphosis and scoliosis are corrected but also an effective canal decompression and a more rigid fixation are obtained.

PRELIMINARY RESULTS OF SURGICAL TREATMENT OF VERTEBRAL FRACTURES

A. KUTLU, R. MEMIK, M.İ.S. KAPICIOĞLU, M. MUTLU, B. KASAL

DEPT. OF ORTHOPAEDICS AND TRAUMATOLOGY, FACULTY OF MEDICINE, SELÇUK UNIVERSITY, KONYA, TURKEY

Between April 1990 to June 1992; 28 patients with injury of the thoracic and lumbar spine were treated surgically. Of those 23 patients were male and 5 patients were female. The age of the patients ranged from 17 to 64 years, averaging 33.2 years old. The type of fractures were; burst (19 patients), compression (3 patients) and fracture-dislocation (5 patients). Surgical interventions used were; Alıcı posterior spinal intrumentation (18 patients), Dick' fixateur intern (5 patients), Harrington instrumentation (3 patients) and TSRH (2 patients) methods. The patients were followed up from 1 month to 20 months, with an average of 8.5 months. Angle of local kyphosis, angle of anterior compression, posterior and lateral translation amount in plain graphies; spinal canal opening degrees, CT examinations and neurologic examinations with Frankel's classification of the cases are compared pre and post operatively.

COMPARISON OF RESULTS BETWEEN POSTEROLATERAL AND INDIRECT DECOMPRESSION PROCEDURES FOR FRACTURES OF THE THORACOLUMBAR SPINE

Ü. DOMANİÇ, C. ŞAR, İ. ESENKAYA, S. BAŞTÜRK

UNIVERSITY OF ISTANBUL, ISTANBUL MEDICAL FACULTY, DEPARTMENT OF ORTHOPAEDICS AND TRAUMATOLOGY, TURKEY

101 cases of burst fractures have been surgically treated in our clinic during the period between June 1987 and June 1992. Indirect decompression and stabilization by rod-sleeve and CD methods have been applied in 73 of these cases. Posterolateral decompression by resection of a pedicle and stabilization have been performed in 13 of these cases which had neurological deficits and fractured bone as free fragments in the spinal canal or bony encroachment into the canal, that is 60% or more in lumbar region and 40% or more in thoracal region.

Preoperative anteroposterior canal opening of 45.2% is found to be 68.3% after the average 3.7 years follow-up postoperatively in cases of indirect decompression. On the other hand, posterolateral decompression cases had an average preoperative canal opening of 36.5% which is found to be 87.9% after 2.1 years on average postoperatively.

In conclusion, posterolateral decompression has been recognized as a more effective procedure in cases of burst fractures which either had free bony fragments in the canal or bony encroachment into the canal that is 60% or more in lumbar region and 40% or more in thoracal region.

THE PRINCIPLE OF THE INTERNAL FIXATOR AND ITS SIGNIFICANCE IN THE TREATMENT OF DEFECTIVE POSITIONS AND INSTABILITIES OF THE THORACIC AND LUMBAR SPINE - EXPERIENCE OF YEARS AND PERSPECTIVES

P. KLUGER

AUS DER ORTHOPÄDISCHEN KLINIK UND QUERSCHNITTGELÄHMTENZENTRUM IM RKU, FORSCHUNGS- UND LEHRBEREICH DER UNIVERSITAT ULM

The first patient specification, in which the mechanical principle of external fixation of extremities - long lever arms for reduction, variable anchoring distance and direction, angle stable fixation - was proposed and transferred towards a fully implantable instrumentation for the spine, dates back to May 1982.

The realization of this proposal by several systems has decisively influenced indications and results of the operative treatment of traumatic, congenital, degenerative and other (caused by different diseases) defective positions and instabilities of the thoracic and lumbar spine. Nowadays, 3000 to 4000 operations with such systems are carried out each year in the Federal Republic of Germany only.

Especially centers for acute treatment and rehabilitation of paraplegic patients early adopted these techniques and carried on development; this is even more remarkable because especially in those institutions a conservative mentality was predominant in earlier years considering the operative possibilities of treatment of spinal injuries with neurological deficits in those years.

In the beginning, this mechanical principle was only used in bridging constructions with a two-point anchoring; recent developments, however, aim additionally at a polysegmental instrumentation.

The various systems are presented and future possibilities of development are discussed.

ALICI SPINAL SYSTEM AND COTREL-DUBOUSSET INSTRUMENTATION FOR THE TREATMENT OF THE BURST FRACTURES IN THE THORACOLUMBAR SPINE

M. CANİKLİOĞLU, D. ALGÜN, C. MİRZANLI, N. ÇÖL, M. MERT

During a period of 9 months, between the years of 1990-1991 we surgically treated 23 patients with thoracolumbar burst fractures. On 13 of these patients, short posterior stabilization by Cotrel-Dubousset Instrumentation (CDI) was performed whereas on 10 patients the same treatment by Alıcı Spinal System (ASS) was applied. All the patients were classified according to Denis' 3 column spine concept and their surgical indications were again determined by Denis' instability evaluation. As a result, all these patients were specified as mechanically instable.

All the cases were neurologically intact (Frankel E.) By means of this treatment we succeded in having a correction of 94% in the post-operative angle of local kyphosis, a correction of 66% in the sagittal index and a correction of 60% in the height of vertebra body.

We followed 18 patients up for approximately 11.5 months & made their final checks. In the angle to our own collapse percentage method, we observed a collapse of 69% in the angle of local kyphosis, 66% in the sagittal index and a collapse of 20% in the height of anterior vertebra body. Results were evaluated according to a score method developed by ourselves. This method was based on Denis' scale of work (w) and pain (p), sagittal index and angle of scoliosis.

According to this method, we obtained 2 excellent, 10 good, 3 fair and 2 poor results.

As a result, in terms of correction, loss of correction radiological fusion, we could not define any statistical difference between ASS and CDI. However, we observed "late transpedicular screw complications" in the cases of which ASS was applied which is statistically meaningfull.

THE MANAGEMENT OF UNSTABLE FRACTURES OF THE THORACOLUMBAR SPINE WITH THE "AO INTERNAL FIXATOR" *

İ. ÇETİN, K. US, T. YAZAR, H. KINIK

DEPARTMENT OF ORTHOPAEDIC SURGERY OF ANKARA UNIVERSITY MEDICAL FACULTY, IBN'I SINA HOSPITAL, ANKARA, TURKEY

The Internal Fixator is the most popular device, nowadays, in the surgical treatment of thoracolumbar spine fractures. The device consists of long Schanz screws inserted into the vertebral bodies from a posterior approach through the pedicles and of connecting threaded longitudinal rods carrying mobile clamps that can be fixed in every position by nuts. The long leverarms of the Schanz screws provide manual reduction during the operation. Since the device is stable against flexion and rotation by itself the fixation can be restricted to the most immediate adjacent vertebrae which leaves the rest of the spine mobile. In our clinic the AO Internal Fixator applications have been started in May 1989. The early results of these applications have shown that the implant is one of the most reliable methods in the surgical treatment of lower thoracic and lumbar vertebrae fractures. This report presents and discusses 46 instrumentations in fresh fractures. The main advantage of the application is the short fixation area and the ease of postoperative treatment.

EARLY RESULTS OF THORACOLUMBAR FRACTURES WITH TREATMENT BY PEDICLE SCREWS (ALICI SPINAL INSTRUMENTATION)

Ç. ÖNDER, A.U. TURHAN, C. BAKİ, M. YILDIZ, G. YULUĞ

K.T.Ü. TIP FAKÜLTESİ ORTOPEDİ VE TRAVMATOLOJİ ANABİLİM DALI
TRABZON, TÜRKİYE

In this study we are presenting 24 thoracolumbar spinal fractures treating with Alıcı Spinal Instrumentation at Orthopedics and Traumatology Clinic of Karadeniz Technical University School of Medicine, from October 1989 to January 1992.

Our cases (16 male, 8 female) the youngest 18, the oldest 61, the average 33.2 years old; were followed up for at least 6 months and most for 18 months, with an average of 11 months. Preoperative and postoperative neurological evaluation has been performed according to the classification of Frankel at. al. Spinal canal has been assessed by CT. Spinal canal has been restored mean 48%.

We think that early results of Alıcı interpedicular screw fixation system seems satisfactory because accurate reduction of fracture is obtained with rigid fixation. Also another advantage is the fixation of a short segment of vertebral column.

SURGICAL TREATMENT OF THORACAL AND LUMBAR FRACTURES

H. TOKER, M. GÜLŞEN, M. HERDEM, E. TOĞRUL, G. BAYTOK

DEPARTMENT OF ORTOPAEDICS AND TRAUMATOLOGY, FACULTY OF MEDICINE, UNIVERSITY OF ÇUKUROVA, ADANA, TURKEY

35 cases of thoracal and lumbar fractures were surgically treated in Çukurova University Hospital. There were 23 males and 12 females. Mean age was 30.2 (range 16-55 years). The etiological factors were blunt trauma in 1 (3%), traffic accident in 19 (54%) and fall from height in 15 (43%) cases. Fracture types according to Denis' classification were as follows: Compression fractures in 8 (22.8%), burst fractures in 14 (40%) and fracture-dislocations in 13 (37.2%) cases. The implants for internal fixation were Luque rods, Harrington rods (alone or segmentally fixed), Hartshill rectangles and Isola system. We used all the given systems in various types of vertebral fractures with preference of Harrington distraction system in axial loading injuries.

The number of cases that could be followed more than 6 months was 20 and the mean follow-up for these cases was 16 months (range 6-28 months). Although we meanly 55.1% correction of kyphosis in early post-operative phase, the overall loss of correction kyphosis angle was 20% in the last follow-up.

THE POSTERIOR STABILIZATION OF THORACIC AND LUMBAR SPINE FRACTURES - STABILIZATION WITH PEDICLES IMPLANTS

R. MAIER, C. GÄEBLER, G. KALTENECKER

UNIVERSITY CLINIC OF TRAUMATOLOGY VIENNA, AUSTRIA

The acute spinal trauma with or without neurologic involvement is being treated operatively more frequently. Different considerations and the rapid development of new fixation procedures are responsible for this. In cases of a surgical indication in the thoracic as well as in the lumbar spine our choice mainly the less traumatic posterior approach. For stabilization we prefer pedicle implants as fixateur interne, Zilke with plate or VSP plating system because of their angular stability as well as the non fixed length. From 1984 - 1991 we operated 102 patients with fractures of the thoracic and lumbar spine. 45% of them were involved to a traffic accident. 54 patients (55%) had neurologic involvement. Postoperatively significant neurologic improvement was seen in 35 patients (35.7%). On complication we had 5 deep wound infections and 5 loosenings of the implants.

The spine is stabilized primarily to prevent further spinal cord injury. In addition, a high degree of restoration of the spinal anatomic axis, curvature and reduction of posterior wall fragments are of equal significance. In using pedicle implants we see the right way to achieve these goals.

PEDICULAR FIXATION OF THE THORACO-LUMBAR FRACTURES

T. TACAL, S. TURANLI

S.B. M.Ü. ACİL YARDIM VE TRAVMATOLOJİ HASTANESİ ORTOPEDİ VE TRAVMATOLOJİ KLİNİĞİ ANKARA, TURKEY

28 patients with unstable thoracolumbar fractures were treated by posterior fusion and pedicular fixation. The patients were 23-56 years old. The average follow-up period was 12-18 months. Computed tomographic evaluation of the patients were done both pre and postoperatively in order to evaluate the spinal canal. Pre and postoperative neurological evaluation was performed according to the classification of Frankel. (Our datas are at the table)

Local kyphosis angles were ranged 5-52 degrees preoperatively and 0-27 postoperatively. Patients were mobilized 2-5 days after the operation. Our opinion is that the more anatomical reduction, shorter segmental fixation and earlier mobilization enables posterior fusion secured by pedicular fixation is functional and satisfactory.

	Preoperative		Postoperative
	2	A	2
	2	B	
	8	C	8
		D	2
	16	E	22
TOTAL	28		34

ALICI SPINAL INSTRUMENTATION IN THE SURGICAL TREATMENT OF THORACOLUMBAR FRACTURES OF THE SPINE

E. ALICI, H. PINAR, Ö. AKÇALI

DOKUZ EYLÜL UNIVERSITY HOSPITAL, İNCİRALTI, İZMİR, TURKEY

43 patients with thoracolumbar fractures of the spine were treated with Alıcı Spinal Instrumentation between 1989 and 1991. The number of fractured vertebrae were 52. There were 30 males and 13 females with an average age of 37.4 years (range.15-73). The levels of fractures were 3 between T6-8, 36 between T9-L1 and 13 at L2-3. There were 4 burst fractures, 43 compression fractures and 5 fracture-dislocations. Decrease in vertebral height was less than 30% in 6, 30-50% in 12, 51-70% in 28 and more than 70% in 6 cases. 28 patients had preoperative CT scans which revealed narrowing of the medullary canal of less than 30% in 8, 30-50% in 14 and more than 50% in 6 cases. The patients were operated within 3 hours to 1 month (av. 2 days) of the injury. Indications for surgery were: 1. Neurological findings, 2. Instability (according to Denis). The surgical treatment consisted of distraction and reduction by means of Alıcı Hooks, transpedicular screws and rods. The follow-up was average 16.2 months (6-28). At follow-up examination, 5 patients Frankel A remained unchanged. 2 Frankel B patients improved to grade C and 2 remained unchanged. 3 of 5 grade D patients improved to grade E and 2 remained unchanged. 25 grade E patients did not have neurological deficits pre and postoperatively. There were complications in 3 patients: 1 superficial infection, 2 implant failures.

CD INSTRUMENTATION IN SPINAL FRACTURES

S. ÖZKAPA, E. DEMİRÇAY, B. ÜNSAÇ

S.S.K. GÖZTEPE HOSPITAL, ISTANBUL

30 unstable spinal fractures which were stabilized by the CD instrumentation and posterior fusion were reviewed between December 1990 - April 1992. There were 4 T-11, 7 T-12, 8 L-1, 8 L-2, 2 L-3 burst fractures and 1 T-11-12 fracture-dislocations. The age at operation range from 23-54 years. The mean follow-up period was 6.3 months (3 to 17).

In our study we suggest that CD instrumentation should be employed for stabilization of thoraco-lumber spinal fractures. CD instrumentation offers us better anatomical restoration with short segmental fusion by the use of transpediculer screws. The recovery time was dramatically shorter.

BANK TO THE FUTURE...

Take advantage of chances offered by a continuously improving bank.

DEMİRBANK

DEMİRBANK T.A.Ş.
Büyükdere Cad. No.122, 80280 Esentepe-Istanbul/TURKEY
Phn:(1) 275 19 00/5 Lines Fax:(1) 267 47 94-267 27 86
Tlx: 27368 dbav tr. Telgraf: Demirbankum

VIDEO PRESENTATION

V 1

INTRADURAL SPINAL TUMOUR REMOVAL BY THE MICROSURGICAL UNILATERAL HEMIPARTIAL LAMINECTOMY

İ. H. AYDIN, A. ÖNDER, E. TAKÇI, Y. TÜZÜN

ATATÜRK UNIVERSITY, MEDICAL SCHOOL RESEARCH HOSPITAL
ERZURUM, TURKEY

At the dorsal 5 level, intradural spinal tumour was totally removed by the microsurgical unilateral hemipartial laminectomy approach.

The patient was ambulated on the first day after the operation.

The pathological diagnosis was schwannoma.

V 2

TREATMENT OF A MEDULLARY TRAUMATISM

J. LAVET, P. ROUSSEAU

DEPARTMENT OF ORTHOPAEDIC SURGERY AND TRAUMATOLOGY
(PROFESSOR C. ARGENSON) HOSPITAL SAINT-ROCH - NICE FRANCE

This film follows the history of a patient of medullar traumatism from the day of his accident till his departure from the reeducation center.

At the moment of his admission to the hospital, a careful neurological examination makes possible to precise the deficiencies produced.

This examination is followed by a paraclinical stage including a C.T. scan which directs our indications. One sequence of the surgical technique shows the posterior decompression and the osteosynthesis.

The postoperative reeducation begins the day after the operation. It has been made easier by the lack of any external and then the patient is transferred to a special reeducation center where the different stages of his reeducation can be followed. At the end, the patient returns to his home - by car!

V 3

TREATMENT OF FRACTURES OF THE THORACIC AND LUMBAR SPINE USING THE COTREL-DUBOUSSET INSTRUMENTATION

C. ARGENSON, J. LOVET, F. DE PERETTI, M. FREHEL,
P.M. CAMBAS, J. GRIFFET, M. PERRAUD

DEPARTMENT OF ORTHOPAEDIC SURGERY AND TRAUMATOLOGY
(PROFESSOR C. ARGENSON) HOSPITAL SAINT-ROCH - NICE - FRANCE

The first part of this part of this film is 2.5 min. long - an introduction presenting the etiology of the fractures and the patients' transport.

The second part is 10 minutes long, it begins with the presentation of the technique of osteosynthesis and the ideal devices which have been recommended for the thoracic spine, for the thoracic-lumbar junction on the lumbar spine and for the lumbo-sacral junction.

In fact, we recommend a type of device for all these segments, guaranteed by our good results. Then, we illustrate our subject by two sequences of operation.

The third part shows the main outlines of the reeducation and the possibilities of the quick rehabilitation of our patients.

POSTERS

P 1

CD INSTRUMENTATION IN IDIOPATHIC SCOLIOSIS

S. ÖZKAYA, A. CEBESOY, B. ÜNSAÇ

S.S.K. GÖZTEPE HOSPITAL ISTANBUL

Our study presents the results of surgical treatment by CD instrumentation in idiopathic scoliosis.

We performed CD instrumentation and posterior fusion on 25 idiopathic scoliosis from December 1989 to March 1992. Mean follow-up period was 14.8 months (4-31). Male/female ratio was 10/15. Mean age was 15.3 years (14-26). 15 of them had not got any treatment before admission. 10 of them had treatment formerly. 9 of the curves were thoracic, 4 of the patients thoracolumbar, 12 of them thoracolumbar double major. The curves on the frontal plane ranged from 40 to 82 degrees, being postoperatively 11 to 32 degrees. At the results of this study, we believe CDI 3-dimensional correction rigid fixation of the scoliosis.

P 2

SAGITTAL AND TRANSVERSE PLANE ANALYSIS OF THE IDIOPATHIC SCOLIOTIC PATIENTS IN WHOM COTREL-DUBOUSSET INSTRUMENTATION IS USED

İ. T. BENLİ, S. AKALIN, M. ÇITAK, M. TÜZÜNER, M. KIŞ, E. F. MUMCU

In the pathogenesis of idiopathic scoliosis vertebral rotation in the axial plane is thought to be the primary deformity according to various opinions.

In this study 62 patients whom idiopathic scoliosis and managed surgically by using Cotrel-Dubousset Instrumentation at the 1st Orthopaedics and Traumatology Clinic of Ankara Social Security Hospital from December 1988 to June 1991 were examined. Preoperative rotation degrees of apex, intermediate and end neutral vertebras of the patients were measured by computed tomography.

As a result, the most correction at the apex vertebra was obtained in King Type III patients in whom derotation manoeuvre was performed and RAsag, RAml and RAdev values were corrected by 24.5%, 25.7% and 15.9 respectively. This group was followed by King Type IV and King Type II curves. Derotational effect was minimal in lumbar region in King Type I and King Type II curves. It is also determined that derotational effect is maximum in apical vertebra, this effect decrease towards end neutral vertebras and nearly zero at ends. Thus, it is thought that derotational force is not carried segmentally to distal or proximal part of the vertebral column.

P 3

THE RESULTS OF SURGICAL TREATMENT USING COTREL-DUBOUSSET INSTRUMENTATION FOR LATE-ONSET IDIOPATHIC SCOLIOSIS

İ. T. BENLİ, S. AKALIN, M. KIŞ, E. F. MUMCU, M. ÇITAK

From December 1988 to June 1991, 62 Cotrel-Dubousset instrumentations were performed at the 1st Orthopaedics and Travmatology Clinic of Ankara Social Security Hospital for the correction of late onset idiopathic scoliosis. The follow up period was between 10-42 months (mean 26.0 months).

Twenty seven (43.5%) of the patients were female and 35 (56.5%) were male. Mean age was 14.6 (range 10-19). When all the patients were included, Cobb angles was lowered to 23.5° (4°-66°) from 53.2° (35°-93°} and in flexible thoracal lordoscoliosis in which the best results were obtained 67.4% correction was provided with the Cotrel-Dubousset Technique. In 80% of the patients with the flexible thoracal lordoscoliosis, postural angles came to normal limits in the sagittal plane. In our series in which on an average of 7.2% correction loss was marked improvement was obtained in pulmonary function tests.

Based upon these data, we suggest that Cotrel-Dubousset Instrumentation can be performed successfully in the treatment of late onset idiopathic scoliosis as it not only provides correction in three planes but provides positive effects in pulmonary function tests as well.

P 4

PULMONARY FUNCTIONS IN IDIOPATHIC SCOLIOSIS

M. ÇITAK, İ. T. BENLİ, M. KIŞ, S. AKALIN, E. F. MUMCU

One of the main aims of scoliosis treatment is to improve the impaired pulmonary functions or if this is not possible, to sustain the present position of pulmonary functions.

In this study results of preoperative and postoperative pulmonary functions tests of 57 patients, in the 1., 3., 6., 12., 24., and 36th months who had idiopathic scoliosis and treated surgically by Cotrel-Dubousset Instrumentation at the 1st Orthopedics and Traumatology Clinic of Ankara Social Security Hospital between December 1988 and June 1991 were evaluted. Spyrometry was used in measuring pulmonary functions that started in the 1st month, accelerated in the 6th month and reached to a maximum in the 12th month was observed. Maximum improvement was noted in the flexible thoracal lordoscoliotic patients in whom derotation manoeuvre was performed. In this group Vital Capacity (VC) had improved an average of 13.1% in the 1st month 22.6% in the 6th month and 36.9% in the end of 12th month and no statistical difference was observed in the 24th and 36th months.

In view of these data, it is suggested that Cotrel-Dubousset Instrumentation technique significantly improves pulmonary functions and eventually carries out the primary aim in scoliosis surgery by correcting the chest deformity and bringing the sagittal contours to normal limits.

P 5

OUR EARLY RESULTS WITH TSRH INSTRUMENTATION ON THE TREATMENT OF ADOLESCENT IDIOPATHIC SCOLIOSIS

A. Ş. SOLAK, M. GİDER, E. AYDIN, E. IŞIK

SOCIAL INSURANCES HOSPITAL, ANKARA, TURKEY

In the 2. Orthopaedics and Traumatology Clinics of the Ankara Social Insurance Hospital, we treated 16 adolescent idiopathic scoliosis cases with TSRH vertebral instrumentation system between September 1991 and March 1992. Mean ages of our cases was 14.5. Mean cobb angle correction was 31° and mean Aara angle correction was 7.5°. Mean vital capacity increase was 29% and loss of correction was 3° at the end of the first three months. In this study we are presenting our results.

P 6

SAGITTAL PLANE ANALYSIS OF IDIOPATHIC SCOLIOTIC PATIENTS TREATMENT WITH COTREL-DUBOUSSET AND ISOLA INSTRUMENTATIONS

T. YAZAR, D. DİNÇER, B. GÜZEL

DEPARTMENT OF ORTHOPAEDIC SURGERY OF ANKARA UNIVERSITY MEDICAL FACULTY, IBNI SINA HOSPITAL, ANKARA-TURKEY

In this study, pre and postoperative sagittal plane measurements of 56 patients of whom, 45 were treated with CD instrumentation between Nov. 1989 and Jan. 1992 and 11 with ISOLA instrumentation between Feb. and June 1992, were analysed.

In hypokyphotic patients ($x < 20°$); 5.6° (42%) mean correction (13.1° preoperative to 18.7° postoperative) with CD and 15° (%50) mean correction (10° preoperative to 25° postoperative) with Isola instrumentation were achieved.

In hyperkyphotic patients ($x > 40°$); 13.5° (23%) mean correction (56.5° preop. to 43° postop.) with CD and 17° (32%) mean correction (52.2° preop. to 35.2° postop.) with Isola instrumentation are achieved.

In normokyphotic ($20° < x < 40°$) patients, mean kyphosis angles were 26.9° preoperatively and 27.1° postoperatively {0.2° (1%) increase} with CD. These values were 36° and 36.4° {0.4° (1.1%) increase} respectively for Isola instrumentation.

We concluded that both CD and Isola instrumentation are of value in the correction of sagittal plane alignment in hypo and hyperkykphotic patients and although the patients number is small yet, Isola instrumentation gives better results.

P 7

COMPLICATIONS IN SPINAL SURGERY

E. ALICI, H. BERK, E. KUTLUAY, C. EGE

1- DOKUZ EYLÜL UNIVERSITY SCHOOL OF MEDICINE, IZMIR, TURKEY
2- BUCA SSK HOSPITAL, IZMIR

Corrective spinal surgery is a major undertaking. A thorough knowledge of possible complications and high rate of clinical suspicion is essential for the care of the patient with a spinal deformity. 334 complications (15%) were seen in 2203 spinal surgery procedures that were done at the Ege University and Dokuz Eylül University hospitals from 1973 to 1992. Majority of the cases were scoliosis (n: 755; 34%), Pott's disease (n: 406; 18.4%) and spondylolysis and spondylolysthesis (n: 267; 12.1 %). Intraoperative and early postoperative complications were vascular injury (0.22%), neurologic deficit (0.36%), infection (3.3%), urinary tract infection (3.17%), pulmonary complications (0.18%) and late postoperative complications were pseudoarthrosis (0.81%) and implant failure (2.7%).

P 8

HIGH THORACIC CONGENITAL KYPHOSIS ASSOCIATED WITH A HIGH MEDIASTINAL NEUROENTERIC CYST (A CASE REPORT)

A. SURAT, E. ACAROĞLU, M. YAZICI, G. LEBLEBİCİOĞLU

HACETTEPE, ANKARA, TURKEY

A two and one half year old girl was brought to our clinic with the complaint of progressive deformity at the base of her neck. She had no other skeletal deformity, had begun walking at the age of twelve months but has not gained sphincteric control by then. Radiologic examination demonstrated congenital vertebral anomalies and high thoracic kyphosis with a cobb measurement of 63°. It was decided to follow her closely and a MRI investigation was scheduled in the search of any dysraphic changes in the spinal cord.

The patient was next seen three months later. Her kyphotic deformity had progressed to 75° and the MRI showed no cord anomalies but a giant cystic lesion located in the mediastinum just in front of the kyphotic vertebral segment. Because of the rapid progression of the deformity surgical intervention was planned.

As the first stage operation a thoracotomy was performed elevating the right scapula and excising the third costa. The cyctic lesion was connected to the right third thoracal vertebral foramen by a fibrous band and could be excised completely. An anterior fusion using a fibular strut graft was performed. The second stage operation consisted of posterior fusion.

Histologic examination revealed remnants of neural-like elements and the clinical diagnosis of a neuroenteric cyst was confirmed. High thoracic congenital kyphosis is a relatively well known clinical entity but its association with a high mediastinal neuroenteric cyst is very rare to our knowledge.

P 9

DIASTEMATOMYELIA: DIAGNOSIS AND SURGICAL APPROACH

M. M. ÖZEK, M. N. PAMİR, A. F. ÖZER, C. ERZEN

10 pediatric cases have been diagnosed as diastemalomyelia by neuroradiological investigations at the Department of Neurosurgery, Medical Faculty of Marmara University between January 1988 and March 1992.
Of these cases, 6 were male and 4 were female and the mean age was 8. The presenting complaint was progressive scoliosis in 6 cases and hypertrichosis in 4. Nevrological examination was found within normal limits in 50% of the patients. Hypoactive anal reflex and reduced tonus were noted in one case.
In addition to routine, direct X-rays, CT, myelography, myelo-CT and MRI were utilized in all cases. These investigations demonstrated the details of specule and arachnoid structure. Also, it was noted that all patients had a shortened and thickened filum terminale.
Surgical approach was applied to all cases and excision of bony specule, duraplasty and incision of filum terminale were performed. The mild, preoperative neurological findings did not regress postoperatively.
Conclusion
1.When diastematomyelia cases are considered, CT is superior for demonstration of bony specule and arachnoid structure. MRI, on the contrary, is superior for exhibition of additional spiral anomalies.
2.All patients with established diagnosis of diastemalomyelia should be operated. It is noted that correction of already developed neurologic loss is very difficult.
3.Incision of filum terminale should be added to the excision of bony specule during the surgical procedure.

P10

GRADE V SPONDYLOLISTHESIS ASSOCIATED WITH PARAAORTIC NEROFIBROMA (A CASE REPORT)

E. ACAROĞLU, M. YAZICI, A. SURAT

HACETTEPE, ANKARA- TURKEY

A twenty year old female patient was seen with the complaints of low-back pain and gait disturbance. She had a history of two attempted fusions for her pain. Her physical examination revealed tightness of hamstring muscles on both sides and no motor, sensory or sphincteric neurologic findings. Grade V spondylolisthesis was seen on plain X-ray examination, CT and MRI were performed but no underlying pathology could be detected.

The patient was decided to be operated on so as to improve her gait and obtain fusion. The first stage of the operation consisted of posterior ileo-sacro-lumbar instrumentation and postero-lateral fusion. For the second stage a trans-peritoneal lumbosacral fusion was planned but as the operation commenced, a firm paraaortic mass extending from the aortic bifurcation up to the retrogastric area was encountered. The tumor could only be excised partially due to its extension and the anterior fusion performed. The patients recovery was uneventful for the six months follow up period and the histologic examination of the lesion revealed a neurofibroma.

Neurofibromatosis is known to be associated with distrophic changes in the vertebral column and severe vertebral deformities but this case is the only patient to our knowledge presenting with a paraaortic neurofibroma and severe spondylolisthesis. Whether the deformity is caused by the tumor of the association is only incidental is very hard to decide.

P11

A CASE REPORT TRAUMATIC RETROLISTHESIS OF L5-S1

T. YAZAR, İ. ÇETİN, D. DİNÇER, B. ERDEMLİ, T. TACAL

DEPARTMENT OF ORTHOPAEDIC SURGERY OF ANKARA UNIVERSITY FACULTY OF MEDICINE, IBNI SINA HOSPITAL, ANKARA-TURKEY

On august 1990, aged 22 male patient who fell from a height and have spinal injury on July 1990 was admitted to Ibni Sina Hospital of Ankara University, Department of Orthopaedic Surgery and Traumatology with the diagnosis of retrolisthesis L5-S1.

On his preoperative neurological examination his right side was Frankel D and left side Frankel C. He had urinary and anal incontinence. In his X-rays and CT examination traumatic L5-S1 retrolisthesis was observed. Listhesis was reduced and with the help of AO Internal Fixator posterior stabilisation was achieved.

On his postoperative 19 months neurological examination, it was seen that his right side was Frankel D, left side was Frankel B. Both of the incontinences were continuing.

GÖRECEKSİNİZ... SİZ DE KREDİ KARTINIZI DEĞİŞTİRECEKSİNİZ!

BANK24 PAMUKBANK

Bu kartın mülkiyeti Pamukbank T.A.Ş.'ne aittir ve istendiğinde iade edilmesi zorunludur. Bu kart başkasına devredilemez.
PAMUKBANK T.A.Ş., Büyükdere Caddesi No: 82 Gayrettepe 80450 İSTANBUL, TÜRKİYE

YETKİLİ İMZA (AUTHORIZED SIGNATURE)

ALO 24, telefon bankacılığında bir numara: (1) 288 24 24

Türkiye'de sadece Pamukbank'ın sunduğu bu kart, başka hiçbir kredi kartının yapamadığını yapacak: Fotoğrafınızı taşıyacak! Sizin kim olduğunuzu gösterecek! Kendisinin kime ait olduğunu gösterecek, ayrıca kimlik gerektirmeyecek! **Kesin güvenlik, provizyonsuz kullanım, gerçek prestij sağlayacak!**

Bu kart, Pamukbank Prestige kartıdır.

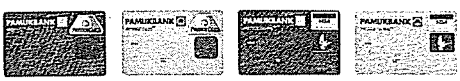
Kredi kartınız Prestige olunca, kaybolma ve çalınma riskine karşı kesin güvence sağlar! Güvence sağlar, çünkü sizin, sadece sizin fotoğrafınızı taşır!

Kredi kartınız Prestige olunca, sizden başkası kullanamaz! Kullanamaz, çünkü renkli fotoğrafınız kart üzerine termografi tekniğiyle basılmıştır. Sökülemez, taklit ve tahrif edilemez!

Kredi kartınız Prestige olunca, kimlik sorulmaz!* Sorulmaz, çünkü kime ait olduğu bellidir. Kartınızın kendisi kimlik yerine geçer. Sorgusuz-sualsiz kabul görür.

Kredi kartınız Prestige olunca, provizyon beklenmez!* Beklenmez, çünkü kredi kartınızın kredi limiti ve kartınızı kullandığınız işyerinin provizyon limiti yüksektir! Provizyon, doğrudan doğruya Pamukbank'tan alınır, işlem hızla tamamlanır.

Ayrıntılı bilgi, randevulu hizmet ve başvurularınız için Pamukbank Prestige Hizmet Ekibi'ni yılın 365 günü, günün 24 saati arayabilirsiniz: (1) 288 14 14



Prestige | Prestige Gold | Prestige Global | Prestige Global Gold

* Prestige ve Prestige Gold için geçerlidir.

PAMUKBANK PRESTIGE
KESİN GÜVENLİK • PROVİZYONSUZ KULLANIM • GERÇEK PRESTİJ

PAMUKBANK

P12

SURGICAL MANAGEMENT OF THE CONGENITAL SPONDYLOLISTHESIS OF THE UPPER PART OF THE VERTEBRAL COLUMN: A REPORT OF TWO CASES

M. TOKGÖZOĞLU, M. ALPASLAN

DEPARTMENT OF ORTHOPEDICS AND TRAUMATOLOGY, HACETTEPE UNIVERSITY FACULTY OF MEDICINE, HACETTEPE, ANKARA, TURKEY

Congenital spondylolisthesis of the upper part of the spinal column is an extremely rare anomaly and it usually presents with severe neurological compromise (1,2). Posterior elements of the involved vertebrae are found to be defective in most cases (2). Two skeletally immature individuals with this anomaly presented to our clinic with severe neurological compromise. The spondylolisthesis was through the thoracal first and second vertebrae in the first case and through the cervical sixth and seventh vertebrae in the second case. The amount of slip was greater than seventy-five percent in both cases.

These two patients were initially treated with first posterior and then anterior decompression with improvement in their neurological compromise. After these procedures the patients were kept in halo traction to improve the deformity and neurological status. After improvement a posterior fusion was performed in both cases. The first case was kept in a halo cast for three months, while the second case which was an older patient was fixed internally with a contoured Luque rod and sublaminar wiring. Both patients improved dramatically following surgery and now after a minimum follow-up of one year, are independent ambulators.

This severe deformity usually associated with severe neurological compromise, requires a prompt and aggressive management which includes both anterior and posterior decompression and fusion for treatment.

References: 1. Perlman R, Hawes LL: Cervical spondylolisthesis. J Bone Joint Surg., 33-A 1012-1013, 1951.
2. Moseley I.: Neural arch dysplasia of the sixth vertebra. "Congenital cervical sponylolisthesis" Br J Radiol., 49: 81-83, 1976.

P13

SPINAL CORD MONITORING OF PATIENTS WITH NEUROLOGICAL DEFICITS

M. ZİLELİ, H. MİRZAİ, E. TUNÇBAY

EGE UNIVERSITY FACULTY OF MEDICINE, DEPARTMENT OF NEUROSURGERY, IZMIR, TURKEY

Intraoperative monitoring of spinal cord function with evoked potentials is a useful tool to decrease the potential risk of neural damage particularly in intradural and intramedullary surgery. However, most of the experience on spinal cord monitoring in the literature is a collection of the cases without neurological deficits and with relatively low risk of morbidity. It seems very difficult to make a reliable monitoring of the cases with neurological deficits and preoperative evoked potential abnormalities.

This is a report of our first experience with spinal cord monitoring in 9 patients (2 intradural tumor, 2 intramedullary tumor, 1 clivus tumor, 3 tethered cord syndrome, 1 cervical spondylolic myelopathy). Cortical and intradural spinal somatosensory evoked potentials after stimulation of tibial and median nerves were monitored in all cases.

5 cases showed good correlation with evoked potential changes. There were 1 false positivity and 2 false negatives. In one case with lipomeningocel, stimulation of the spinal cord gave useful information in identifying functional tissue from nonfunctional part.

We experienced some pitfalls, which should be addressed to offer reliable information to the surgeon. An appropriate selection and combination of evoked potentials is an important factor to carry out effective spinal cord monitoring especially in the cases with neurological deficits.

P14

SURGICAL TREATMENT OF CERVICAL RIB WITH NEUROVASCULAR COMPRESSION SYNDROME

A. DOĞAN*, Ö. Ş. ŞAVK**, A. AKBAŞ**, T. ÜNSALDI**

* DEPARTMENT OF THORACIC AND CARDIOVASCULAR SURGERY, FACULTY OF MEDICINE, CUMHURİYET UNIVERSITY
** DEPARTMENT OF ORTHOPAEDICS AND TRAUMATOLOGY, FACULTY OF MEDICINE, CUMHURİYET UNIVERSITY, SIVAS, TURKEY

We reviewed the result of operative treatment in patients who had neurovascular compression syndrome with cervical rib between 1988-1991 nine patients were treated for cervical rib, at the Department of Thoracic and Cardiovascular Surgery, and Department of Orthopaedics and Traumatology, Faculty of Medicine, Cumhuriyet University in Sivas. There were eight women and one man. The average age at the presentation was 32 years (range 22 to 50 years) with an average duration of follow up 18 months. All of these cases had pain, paresthesia and weakness of the muscles had done in five patients preoperatively and ulnar nerve conduction velocity had been decreased in all of them. Five of nine cervical ribs were resected by supraclavicular approach and the rest of them were resected by transaxillary approach. Scalenus anticus muscles were divided from its inferior attachment in all of the cases. At the most recent follow-up three satisfactory results (all of the symptoms were subsided) and the other five were shown various rate of recurrence of symptoms and the rest one was shown increasing of the symptoms.

It was concluded that resection of cervical rib is not adequate. According to literature, in almost every instance the first rib is a factor and resection of it is often included in the operation.

P15

CERVICAL INTERVERTEBRAL DISC HERNIATION

A.F.ÖZER, M.N. PAMİR, M. M. ÖZEK, T. ÖKTENOĞLU

MEDICAL FACULTY OF MARMARA UNIVERSITY, DEPARTMENT OF NEUROSURGERY

45 cervical disc hernia have been diagnosed and operated at the Medical Faculty of Marmara University, Department of Neurosurgery between 1986 and 1991. Of the cases 17 were female and 28 were male and the mean age was 45 (range 26-56).

35 patients were complaining of neck pain radiating to arms, two had imbalance and difficulty in walking, and pain with limitation of neck motion was present at the rest of the patients. Neurological examination has yielded radicular compression findings in 35, spinal cord compression in two and normal neurological findings at the rest of the patients.

Direct x-rays, myelography, CT and MRI have been performed for the diagnosis and, additionally, eiectrophysiological studies were applied on each case. Radiological findings were confirmative in all cases and narrowed spinal canal was recognized in neurologically intact ones. Excluding the latter group, electrophysiological studies confirmed the clinical findings.

Anterior approach was used in all but one case. The rare, intradural rupture of cervical disc was found in the case that posterior approach was utilized. All patients have benefited from surgical treatment and no mortality and morbidity was recognized.

P16

TRANSPEDICULAR DRAINAGE OF POTT'S ABCESS

O. GÜVEN, S. YALÇIN, M. KARAHAN, T. ESEMENLİ

MARMARA UNIVERSITY FACULTY OF MEDICINE DEPARTMENT OF ORTHOPAEDICS AND TRAUMATOLOGY, ISTANBUL, TURKEY

Two selected patients with tuberculous spondylitis were treated by a single stage posterior instumentation and fusion without anterior debridement. The paravertebral abcesses were located at L4 and L5 vertebral bodies respectively. After the exposure of posterior elements the pedicular entrance points were determined. Cannulation of the pedicle was performed by a blunt technique using special curettes. Image intensifier confirmation was done during evacuation of the abcess. 80 and 100 mililiters of yellowish gray purulent discharge was obtained respectively. Suction drains were inserted into the abcesses via pedicular tunnels. Posterior fusion and transpedicular screw fixation was performed thereafter. The patients healed uneventfully. In carefully selected cases with lower thoracal or lumbar Pott's disease this technique seems to be an effective alternative to anterior debridement and grafting with its low morbidity and complication rate.

P17

NEW TREATMENT PROTOCOL IN SPINAL TUBERCULOSIS

M. CANİKLİOĞLU, C. MİRZANLI, D. ALGÜN, N. AZAR, H. GÜLHAN, H. GÜNGÖR

During the period 1988-1991 20 spinal tuberculosis patients were treated by anti-tuberculous chemotherapy, radical surgical resection and fusion along with posterior instrumentation, reduction of deformity and stabilization operations in Taksim Devlet Hastanesi and SSK İstanbul Hastanesi II nd Clinic of Orthopedics and Traumatology.

Preoperative definitive diagnosis were reached by laboratory tests, plane radiographic examinations, CT and MRI methods. Local kyphosis and scoliosis angles were also evaluated before the operations. Neurological examinations of patients were evaluated according to Frankel Scale and preoperative and postoperative conditions of patients according to Denis pain and work scale.

Out of the 20 cases, 10 had presented extreme degree of destruction and kyphotic deformity. Those patients received anterior radical resection and fusion together with posterior instrumentation, correction and fusion operation in the same session.

Eight patients presenting moderate degree of destruction and kyphosis operated only by posterior approach and posterolateral radical resection, grafting and posterolateral fusion operations were performed.

Two patients diagnosed as having had extreme degree of cold abscess but minimal destruction and deformity treated by posterolateral drainage and debridement of abscess, and posterior stabilization and fusion operation.

Three drug combination antituberculous chemotherapy prescibed to all cases preoperatively.

The follow up periods ranged from 6 months to 4 years and the average was 18 months.

Fusion was detected at about 6,5 months in all cases.

Local kyphosis angle, anterior height of vertebral body, pain and work scale, and Frankel's neurologic scale demonstrated improvement towards relief in all cases. None of the cases received postoperative bracing or other external support instruments and bed rest is not suggested.

This new treatment approach towards spinal tuberculosis offers not an alternative method to previous ones but an important new step in progress of treatment methods.

P18

MRI DIAGNOSIS OF SPINAL TUBERCULOSIS

S. BAHAR, N. BAŞIBÜYÜK, M. DİNÇER, Y. TEMELLİ, B. O. TEMOÇİN

ISTANBUL MEDICAL SCHOOL DEPARTMENTS OF NEUROLOGY AND ORTHOPAEDIC SURGERY, ISTANBUL, TURKEY
EMAR MEDICAL IMAGING CENTER, ISTANBUL, TURKEY

In spite of countrywide prevention means tuberculosis keeps being an important health problem in Turkey.

MRI findings of 10 surgically proven cases of spinal tuberculosis are presented. Three females, 10 patients between 2.5 and 75 years of age, are the material of this study.

İnvolvement of multiple vertebrae, causing marked kyphosis at upper dorsal region, was observed at 3 cases whose are between 2.5-12. These cases had spinal cord compression due to anterior epidural mass effect. Two of the three cases with involvement of two adjacent dorsal vertebrae, intervertebral disk was spared. One of these two cases had spread under the anterior longitudinal ligament, intervertebral disk lesion was observed only at one level. One of the two lumbar tuberculous cases had right psoas abscess which is a diagnostic finding for the disease. Posterior and lateral elements of vertebra were never involved. The lesions showed no specific MR signal intensity change. No pathological signal alteration of the spinal cord was noted in the 6 cases with compression.

P19

SPINE TUMORS (RESULTS OF 31 CASES)

C. İSLAM, Y. SAĞLIK, T. YAZAR, M. DOĞAN, S. SÖZEN

DEPARTMENT OF ORTHOPAEDIC SURGERY AND TRAUMATOLOGY IBNI SINA HOSPITAL, ANKARA UNIVERSITY FACULTY OF MEDICINE, ANKARA, TURKEY

From September-1986 to June-1992 , 29 of 31 patients with spinal tumoral lesions have been operated in our clinic. 19 Malign (10 metastatic) and 12 benign tumors were localized on cervical (3), cervicothoracal (2), thoracal (11), thoracolumbar (1), lumbar (9), lumbosacral (2), sacral (2) and coccygeal (1) regions. 31 Operations have been performed to 29 patients and we applied anterior or posterior instruments in 13 patients. The mean follow-up was 16 months and 5 deaths have been observed in this period.

P20

CERVICAL OSTEOCHONDROMA

E. Z. BERKMAN, C. ENSON, G. KOÇ, T. DERİNKÖK, D. ÖZCAN

SSK OKMEYDANI HASTANESİ, ISTANBUL, TURKEY

According to Lichtenstein's classification osteochondroma represent 11% of all the benign bone tumors. Among the osteochondroma 1-3% is located on cervical spine. It is generally diagnosed after spinal cord compression of root, arterial compression. In this text 30 years old female patient with osteochondroma on the level C_1 with spinal cord compression and root irritation has been presented and this rare entity is reviewed regarding the literature.

P21

SURGICAL TREATMENT FOR PRIMARY TUMORS OF THE SPINE

A. HAMZAOĞLU, H. DURMAZ, Ü. DOMANİÇ, C. ŞAR

UNIVERSITY OF ISTANBUL, ISTANBUL MEDICAL FACULTY, DEPARTMENT OF ORTHOPAEDICS AND TRAUMATOLOGY, TURKEY

11 cases having primary tumors of the spine have been surgically treated between July 1989 and June 1992.

Average age was 12.5 and distribution according to the diagnosis was one aneurysmal bone cyst, one eosinophilic granuloma, one fibrous dysplasia, four osteoid osteoma and four osteoblastoma.

Posterior approach was utilized for osteoid osteoma and osteoblastoma with pedicle and lamina localization. Anterior and posterior approaches were applied to the remaining three cases which showed vertebral body involvement.

Pain or scoliosis with pain was the most common symptom in cases of osteoid osteoma and osteoblastoma which formed 72% of our cases. In case we see an adolescent with scoliosis and pain we think that it would be wise to determine the apex of the curve and accordingly investigate one segment upper and lower for osteoid osteoma and osteoblastoma by conventional tomography, radioisotope scanning and computed tomography.

P22

HYDATIC DISEASE OF THE VERTEBRAL COLUMN

M. TOKGÖZOĞLU, M. ALPASLAN, E. ACAROĞLU, N. TOKGÖZOĞLU, A. SURAT

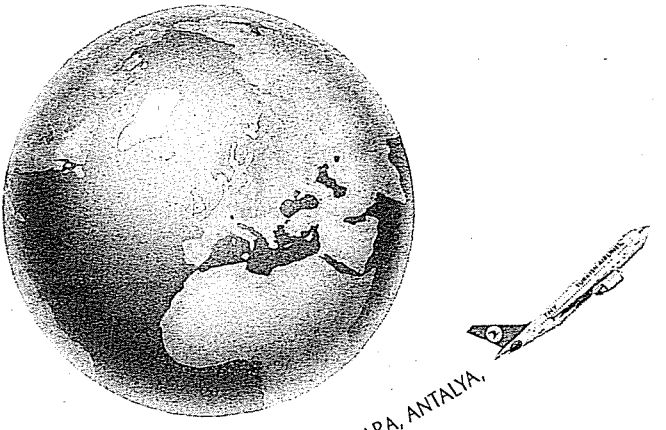
HACETTEPE, ANKARA, TURKEY

Hydatic disease, though encountered only sporadically, still cause significant morbitidy and even mortality in the effected individuals. Only a small percentage of the patients present with skeletal involvement and involvement of the vertebral column is much less rare.

Five patients that were treated in our clinic for hydatic disease of the vertebral column is presented. Three of the patients were female and two were male. Mean age was 48.8 years ranging between 12 and 63. All patients complained of pain and four had neurologic involvement.

Surgical resection of the lesions were attempted for all patients but clear surgical margins could not be obtained in any of them. The average follow-up period is 55.8 months and fifteen operations had to be performed for the five patients. The average blood loss was 2500 ccs. None of the patients were completely free of disease at the last follow-up examinations.

The results of the treatment for spinal hydatic disease are comparable to spinal malignant neoplasms. Temporary improvements in neurologic functions can be achieved by surgical interventions but complete excision of the lesions is almost impossible. Medical treatment did not have any beneficial effects on the prevention of recurrences in our experience.



ABU-DHABI, ADANA, ALMA ATA, AMMAN, AMSTERDAM, ANKARA, ANTALYA,
ATHENS, BAHREIN, BAKU, BANGKOK, BASLE, BEIRUT, BELGRADE, BERLIN, BOMBAY,
BRUSSELS, CAIRO, COLOGNE, COPENHAGEN, DALAMAN, DAMASCUS, DENIZLI,
DIYARBAKIR, DUBAI, DUSSELDORF, ERZURUM, FRANKFURT, GAZIANTEP, GENEVA,
HAMBURG, HANNOVER, HELSINKI, ISTANBUL, IZMIR, JEDDAH, KARACHI,
KUWAIT, LEFKOŞA, LONDON, LYON, MADRID, MALATYA, MILAN, MOSCOW,
MUNICH, NEW YORK, NICE, NURNBERG, PARIS, RIYADH, ROME, SINGAPORE,
STOCKHOLM, STRASBOURG, STUTTGART, TASHKENT,
TEHRAN, TEL AVIV, TOKYO, TRABZON,
TRIPOLI, TUNIS, VAN, VIENNA, ZURICH

QUOVADIS?

Wherever your destination may be, fly Turkish Airlines to 66 destinations across 5 continents. On our "Business Class" you'll enjoy a level of comfort and care usually available only on "First Class". Well, this is the traditional Turkish hospitality, and a little bit more...
Quo vadis? Your destination is our destination.

TURKISH AIRLINES

"The hospitality you'll never forget"

P23

HYDATID CYST OF COLUMNA VERTEBRALIS

N. AYDOĞAN, S. KAPICIOĞLU, M. ALTINMAKAS, S. TUNAY, C. SOLAKOĞLU

ORTHOPAEDICS AND TRAUMATOLOGY DEPARTMENT OF GÜLHANE MILITARY MEDICAL ACADEMY, ANKARA, TURKEY

Hydatid cyst is commonly seen at the bones. Especially columna vertebralis, femur, tibia and pelvis are mostly affected. Hydatic cyst is a parasitary disease which takes place in an environment with poor hygienic conditions. A 62 year-old female patient who was previously misdiagnosed as metastasis to columna vertebralis and terated by radiotherapy. She was consulted in Orthopaedics and Traumatology Department of Gülhane Military Medical Academy. She was operated by anterior approach and we excised the corpus and applied anterior grafting. Correct diagnosis was done intraoperatively as Hydatid cyst. Later on posterior fixation and grafting were added to the previous procedure. The patient had taken under Mebendazol treatment and we did not observe any complications after surgery.

P24

VERTEBRAL HYDATIC CYST LEADING TO PARAPLEGIA

Ş. ULUER, C. ENSON

AMERICAN BRISTOL HOSPITAL, ISTANBUL, TURKEY

Patient aged 24 years; has been diagnosed as L_{3-4} disc protrusion revealed clinically and by myelography. After the operation the symptoms subsided but six months later developed again. Before second operation the radiography showed aneurysmal bone cyst like lesion of L_3. During the second operation many cysts were explored extradurally. Following five operations the patient is paraplegic now with extradural hydatic cyst formations.

P25

COLUMNA VERTEBRALIS PROBLEMS IN OSTEOPOROSIS

M. ALTINMAKAS, N. AYDOĞAN, S. TUNAY, C. SOLAKOĞLU

ORTHOPEDICS AND TRAUMATOLOGY DEPARTMENT OF GÜLHANE MILITARY MEDICAL ACADEMY, ANKARA, TURKEY

We performed a study on 104 osteoporotic patients with an age range between 50 and 74 years old at Orthopedics and Traumatology Department of GMMA between 1989-1992. 65 patients had been suffering from severe low back pain. In 70% of patients, osteoporosis were determined after the evaluation of the X-rays by Meunier index and by BMD. 39 patients, hospitalized for hip-region fractures had been evaluated for osteoporosis by Meunier index and by BMD; 90% of these patients were osteoporotic. All of these patients with low-back pain were treated by medical osteoporosis treatment regimen and 35% of them use also prescribed for brace usage. There was relief in pain in all patients, after 6 months follow-up period BMD changed to normal levels. The patients with hip region fractures were treated surgicaly and they were medically treated by osteoporosis treatment regimen. The bone quality and clinical appearence changed dramatically to near normal levels.

P26

BONE SPECT IN PATIENTS WITH PERSISTENT BACK PAIN AFTER LUMBAR SPINE SURGERY

Y. GÖKÇE-KUTSAL*, B. ERBAŞ**, E. VAROĞLU**, R. ÖZKER*, C. F. BEKDİK**

DEPTS. OF PHYSICAL MEDICINE AND REHABILITATION* AND NUCLEAR MEDICINE**
SCHOOL OF MEDICINE, HACETTEPE UNIVERSITY, ANKARA, TURKEY

Recurrence of low-back pain after lumbar spine surgery may be a result of a different cause than the one that produce the initial pain. It is recognized that laminectomy, particularly over multiple levels, may cause instability and therefore place stress on articular facets. If instability persist, slippage of one vertebral body on another may occur. The facets are innervated by pain fibers and facet derived pain is main cause of low-back pain. Seventeen patients with back pain after lumbar spine surgery were evaluated by Planar Bone Scintigraphy (PBS) and Single Photon Emission Computed Tomography (SPECT). The types of surgery were; laminectomy, discectomy, foraminatomy and facetectomy. There were seven patients who had positive PBS, but all of our patients had positive SPECT results. According to the results of this study it appeared that the SPECT studies useful in those instances were there is the greatest likehood for stress on the articular facets, because the new dimension that has been added by SPECT scanning of the spine is that a more accurate delineation can be made of the level of involvement than could be previously by conventional X-ray or CT scan.

P27

POSTERIOR OSTEOTOMY OF THE SPINE IN THE SURGICAL TREATMENT FOR LOCALIZED KYPHOSIS

Ü. DOMANİÇ, C. ŞAR, M. DEMİRHAN, H. DURMAZ

UNIVERSITY OF ISTANBUL, ISTANBUL MEDICAL FACULTY, DEPARTMENT OF ORTHOPAEDICS AND TRAUMATOLOGY, TURKEY

Posterior spinal osteotomy and CD instrumentation have been performed in 8 cases who were surgically treated in our clinic, for localized kyphosis due to different etiologies during the period between April 1990 and June 1992.

It is a wedge-resection-type osteotomy based posteriorly and its apex lies either in the vertebral body or ends at the anterior longitudinal ligament. The osteotomy results in shortened posterior column but no tension in spinal cord. One foramen intervertebrale contains two spinal nerves at each resection level.

Average follow-up in these cases is 18.2 months and average preoperative angle of kyphosis of 85.3° (60-110) is found to be 26.2° (20-42) post-operatively. Fusion is achieved in all cases but one in which follow-up is inadequate for fusion determination.

It has been found to be an effective method which combines anterior and posterior procedures for severe localized kyphosis and kyphoscoliosis and provides a one-stage solution and good correction.

P28

TRANSPEDICULAR FIXATION IN THE TREATMENT OF THORACO-LUMBAR FRACTURES COMPARISON OF TWO INSTRUMENTATION SYSTEMS

M. ALPASLAN, G. LEBLEBİCİOĞLU, A. SURAT, E. ACAROĞLU, M. YAZICI

HACETTEPE, ANKARA, TURKEY

Forty-one patients that had thoraco-lumbar fractures and had been treated with transpedicular fixation systems in our hospital were evaluated retrospectively. Average patient age was 32.8 years, the operations were performed in the period between September 1987 and May 1992.

The patients were divided into two groups according to the instrumentation system used. The first group consisted of 13 patients that had been instrumented with spinal plates and AO screws. Second group consisted of the rest of the patients that had been instrumented with screw-rod systems.

Two screw failures were noted in the second group. The first group had significantly more vertebral segments fused. There were no differences in post-operative rehabilition programmes and functional outcomes. It was concluded that spinal plates may offer a very good alternative to screw-rod systems.

P29

THE EARLY RESULTS OF THE SPINAL INTERNAL FIXATOR IN THE SURGICAL TREATMENT OF THORACOLUMBAR BURST FRACTURES

S. AKALIN, M. KIŞ, İ. T. BENLİ, Ş. SOLAK, M. ÇITAK, F. İ. PESTİLCİ

The potential for clinical instability following thoracolumbar fractures has evoked a progressive increase in interest in the surgical treatment of unstable thoracolumbar fractures.

From September 1990 to October 1991, 22 thoracolumbar burst fractures were treated surgically by the AO Spinal Intermal Fixator at the Orthopaedics and Traumatology Clinics of Ankara Social Security Hospital. Mean follow-up period was 13.7 (7-20 m.) months. Fourteen (63.5%) of the patients were male and 8 (36.5%) were female.

Postoperatively, mean anterior vertebral height loss and spinal canal compromise were corrected by 36.05% and 33.37% respectively. Also postoperatively 16° of improvement was obtained in the mean kyphosis angle. In light of these data, it is suggested that the AO Spinal Internal Fixator effectively restores three dimensional alignment of the spine and provides a rigid fixation.

P30

COMPARISON OF TWO DIFFERENT PEDICULAR INSTRUMENTATION

T. TACAL, S. TURANLI

S.B. M.Ü. ACİL YARDIM VE TRAVMATOLOJİ HASTANESİ ORTOPEDİ VE TRAVMATOLOJİ KLİNİĞİ, ANKARA, TURKEY

21 patients with unstable thoracolumbar fractures were treated with two different pedicular instrumentation and posterior fusion. 10 of them were treated with AO spinal fixator, 11 of them with Alıcı spinal instrumentation. The follow-up period was 9-14 months. Age distribution of the patients were similar. The amount of the correction of the local kyphosis is not different from each other in two groups. However in group 2 an average of 7 degree loss of correction was observed which was not seen in group 1. In group 2 schanz screw bending was seen in two patients. In group 1,4 schanz screws were fractured 2 of them were in same case and the same level. This condition did not cause any loss of height at the fractured vertebra. This may be because of the well done posterior bony fusion.

Fractures or bending of the schanz screws shows the forces over the screws. Fracture of the screw of the patient with insufficient posterior fusion or before bony fusion occured may cause any damage? Loss of vertebral height? Or bending of the schanz screws can protect from that possible damage? It is not easy to answer these questions. In this article we reviewed and discussed cases with two different instrumentation. We faced with these questions that has to be answered during the follow up of these patients.

P31

C_1 FRACTURE WITH ROTARY SUBLUXATION AND OVERDIAGNOSIS

C. ENSON, Ş. ULUER, Ç. ÖNER

AMERICAN BRISTOL HOSPITAL, ISTANBUL, TURKEY

C_1 fracture and rotary subluxation of C_1 on C_2 has been sustained for a patient 14 years old, after a surf accident. On CT examination C_1 right arch fracture and atlantoaxial dislocation has been observed. On final examination control CT revealed no fracture but the rotary subluxation persisted. Depsite rotary subluxation the patients' neck movements were painless and range of motion was full. We presented this uncommon feature which led us to review the literature about the radiology and clinical anatomy of atlantoaxial dislocation and rotary subluxations.

P32

THE RESULTS OF CONSERVATIVE TREATMENT OF COMPRESSION FRACTURES IN THORACOLUMBAR SPINE

İ. E. KAÇAN, O. DURAKBAŞA, H. BOMBACI, İ. M. TÜRKMEN

HAYDARPAŞA NUMUNE STATE HOSPITAL, ISTANBUL, TURKEY

27 compression and 4 burst fractures in 25 patients without neurologic deficit were managed by non-operative method without any reposition attempt. Bed rest average for 9 weeks followed by 20 weeks mobilization in a thoracolumbar orthosis, either a plaster cast or a reclination brace resulted in an increase of 7 degrees kyphosis and 10 percent compression.

After mean 2 years follow-up, all but 2 patients returned to their activities that they had been doing before. 11 patients had more than 30 degrees kyphosis and 30 percent compression at the last examination. In all, no neurological deterioration occured.

Conservative treatment can be a method in the management of thoracolumbar injuries of compression type with an angle up to 25 degrees kyphosis and 30 percemt compression. On the other hand 9 of 11 patients who had post-traumatic kyphosis at the last examination did rot require surgical intervention.

P33

ADVANTAGES OF INTERNAL FIXATOR IN SHORT SEGMENTED VERTEBRA FRACTURES CAUSING KYPHOSIS DEFORMITY

Ö. KAYMAK, A. SARLAK

GAZİ ÜNİVERSİTESİ TIP FAKÜLTESİ ORTOPEDİ VE TRAVMATOLOJİ ANA BİLİM DALI, ANKARA, TURKEY

In recent time, types of osteosynthesis instruments increase and develop in modern surgery, especially in orthopedics. Similar development can also be seen in vertebral surgery. Vertebral operations which were abstained before, are frequently and necessarily done today.

Although osteosynthesis instruments used in vertebral operations depend upon the same principle it is more to use appropriate different instruments for various vertebral pathologies instead of using the same type for all. It is necessary to use an osteosynthesis instrument which will correct the kyphosis caused by the short segmented compression fracture of corpus vertebra distal to T8.

In this article we try to indicate the advantages of using internal fixator to other types of osteosynthesis instruments like C-D, T.S.R.H., Isola Ability to correct the kyphosis and mating distraction properties of internal fixator are the factors that provide the superiority of it.

It is possible to restore the kyphosis by corrective distraction or compression with axial rotation of rods which are necessarily curved and montaged. But during this rotation the pressure of rods to the fractured posterior elements of vertebra is unavoidable. In addition if the hooks proximal and distal to the fracture are single the rotation will have no effect of correcting the kyphosis. By using internal fixator the restoration of deformity can easily be done with the lever system and without pressure to the posterior elements.

Places to visit.

While in Turkey, you'll visit many places. Yapı Kredi Automated Teller Machines may very well rank among your favorites, for any number of good reasons.

Only Yapı Kredi ATMs are connected with international VISA, MasterCard/Eurocard, Plus System and Cirrus. Yapı Kredi ATMs are at your service 24 hours a day all over Turkey and in the Turkish Republic of Northern Cyprus. And only Yapı Kredi ATMs operate at Turkey's airports.

No matter where you are in Turkey, you can withdraw money at any time from Yapı Kredi ATMs. You'll find Yapı Kredi ATMs at 410 locations, including intercity motorways, vacation destinations, shopping centers, airports, bus and train stations, and ferry and seabus quays.

Have a great vacation!

YAPI KREDI
A dedication to deliver.

P34

TREATMENT OF THE UNSTABLE THORACOLUMBAR VERTEBRAL FRACTURES WITH THE PEDICLE SCREW-ROD SYSTEM

M. A. KAYGUSUZ, İ. ESENKAYA, H. BOMBACI, İ. M. TÜRKMEN

HAYDARPAŞA NUMUNE HOSPITAL, ISTANBUL, TURKEY

In our clinic, 11 patients with thocacolumbar vertebral fracture have been operated on from May 1991 to April 1992. There were 6 female patients and 5 male patients whose ages ranged from 18 to 63 years (mean 35.4). The mean follow-up was 6.6 months (range, 2 to 13 months). Fracture were in 2 cases at the level of T12 segment, in 4 cases at the level of L1 segment, in 2 cases at the level of L2 segment and in 3 cases at the level of L3 segment. Two patients had 2 and 3 segment fractures. Two of the patients had paraparesis. In the radiological examination we performed standard AP and lateral x-rays and CT scanning. While assessing the stability we used Farcy and Weidenbaum's criteria. Under the level of L2 short-segment instrumentation upper the level of L2 long-segment instrumentation have been used. While the mean angle of local kyphosis was 21.2 degree, postoperative this angle became 6.1 degree. Paraparesis that was seen in two patients before operation, dissappeared in the early postoperative period. The complications we have seen in our cases are breaking of the pedicle screw (in one case) and mild lowback pain (in two cases).

P35

ALICI SPINAL INSTRUMENTATION IN PATIENTS WITH TOTAL PARAPLEGIA

C. GÖKÇE, C. KOŞAY, O. GİRGİN

ANKARA NUMUNE HOSPITAL I. ORTHOPEDICS AND TRAUMATOLOGY CLİNIC, ANKARA, TURKEY

Between June 1990 and May 1992, 35 patients with paraplegia due to thoracolumbar fractures were treated by posterior fusion and Alıcı spinal instrumentation.

Neurologic deficits, progression of kyphosis and the reduction at the course of rehabilitation were recorded and evaluated.

It was concluded that posterior fusion with spinal instrumentation is a procedure that should be appplied in the patients with total paraplegia.

P36

ACUTE SURGICAL TREATMENT OF THORACOLUMBAR UNSTABLE FRACTURES WITH TRANSPEDICULAR FIXATION SYSTEMS

M. A. TÜMÖZ, U. GÜNEL, A. CILIZ, A. UTKAN

NUMUNE HOSPITAL, 2ND ORTHOPEDIC AND TRAUMATOLOGY CLINICS, ANKARA, TURKEY

Transpedicular systems named as Dick and Alıcı were performed on forty-one patients with the unstable thoracolumbar fractures at Ankara Numune Hospital 2nd Orthopeadic and Traumatology Clinic between May 1989 and January 1992. Twenty-nine were male and twelve were female, whose ages at operation ranged from 16 to 59 years old, with an average of 39 years old. Mean kyphotic deformity in the 41 cases before operation was 15°, mean residual kyphosis after instrumentation was 4.5°. The average time between the injury and operation was 3 days.

As a conclusion for acute cases the restoration of the medullary canal and reduction of the bone can be achieved for the first week after the fracture.

P37

SURGICAL TREATMENT OF VERTEBRAL FRACTURES

M. ALTINMAKAS, N. AYDOĞAN, A. ŞEHİRLİOĞLU, S. KAPICIOĞLU, C. SOLAKOĞLU

ORTHOPAEDICS AND TRAUMATOLOGY DEPARTMENT OF GÜLHANE MILITARY MEDICAL ACADEMY, ANKARA, TURKEY

Today, surgical treatment of the fractures of columna vertebralis still keeps its importance. We applied surgical treatment to 28 patients with traumatic fractures of columna vertebralis in Orthopaedics and Traumatology Department of Gülhane Military Medical Academy between 1989 and 1992. We obtained satisfactory results in patients who were treated with transpedicular system after suitable surgical reduction and fusion. In this study we introduce the results of our surgical treatments.

P38

SATISTICAL ANALYSIS OF THE FACTORS AFFECTING THE OUTCOME OF VERTEBROMEDULLARY INJURIES

M. HANCI, C. KUDAY, E. SAYIN

UNIVERSITY OF ISTANBUL CERRAHPAŞA MEDICAL FACULTY DEPARTMENT OF NEUROSURGERY

Between 1982-1991, 194 patients were treated for cervical vertebromedullary injuries in department of neurosurgery Cerrahpaşa medical faculty of University of Istanbul. The data of these patients were evaluated by multiple regression method using SPSS/PC statistical package to predict the factors influencing the outcome. 43.8% of patients were in the first three decade, male/female fatio being 2.3/1. Traffic accident (41.2%) and fall from height (30.4%) were the most frequent etiologic factors. In the initial neurologic examination, motor deficit was detected in 63.4% of the patients where as sensorial deficit in 53.6%, bladder disturbances in 38.1% and respiratory failure in 12.9%. Radiologic examinations revealed upper cervical injury in 23.2% of the patients and lower cervical injury in 71.1%, 46.4% of the patients were treated surgically and 53.6 medically. Evaluating the findings and outcome by Frankel scale, no change in deterioration in 19.1%, mortality rate being 18.6%.

R= 0.70 and F= 24.9 were found in statistical analysis using multiple regression method which showed that regression is statistically significant. DW= 1.92 revealed no multicol Linearity among independent variables, standardized residual histogram shows normal distribution from meaning that results are statistically acceptable {p(0.001)}.

It can be told that, the main factor predicting the outcome of the patients with vertebromedullary injury is the initial neurologic status, the other parameters having secondary importance.

P39

MULTI-LEVEL SPINAL FRACTURES

N. ALTUN, E. CİLA, E. ŞENER, A. ŞİMŞEK

GAZİ UNIVERSITY MEDICAL SCHOOL, ANKARA, TURKEY

Publications related to multi-level spinal fractures is very limited. As of September 1990, we have treated 45 patients with vertebral fractures at the Department of Orthopedics and Traumatology of Gazi University Medical School. 13 patients were treated for multi-level fractures. The characteristics of these patients are being discussed with emphasis on incidence, distribution and other associated injuries. The majority of multiple spinal fractures occur in the thoracolumbar junction and are generally associated with mechanical and neurological problems. Treatment of these fractures is complicated, applications of implants is difficult and we belive that the general criteria for stabilization of vertebral fractures are inadequate for multi-level fractures and should be reviewed.

P40

REDUCTION AND STABILIZATION OF THRORACOLUMBAR FRACTURES WITH ALICI SPINAL SYSTEM

E. KUTLUAY, E. CANSUNAR, A. SEBİK, E. GİLİM, N. EREL

BUCA SSK HOSPITAL, ORT. & TRAVM. DEPT., IZMIR, TURKEY

During 1990-92, the system has been applied to 23 patients with thoracolumbar fractures at the Buca SSK Hospital.

Sex: 9 females, 14 males; **Average age:** 33 (22-44); **Accident type:** 10 traffic accidents, 13 falls from a height; **Distr. of fractures:** 1 at Th7, 2 at Th11, 3 at Th12, 8 at L1, 6 at L2, 3 at L3; **Type/mechanism:** 6 Burst A w/axial load, 7 Burst B w/ axial load plus flex., 6 ant. compress. type w/ant. flex., 4 flex. distract. w/ant. flex.

CT was applied pre and post-op. to check the spinal canal.

Neurol. findings accdg. to Frankel: 2 type A, 2 of type C, 6 of type D, 13 of type E. **Indications for surgery:** Vertbr. instability, neurol. finding, loss of corpus and. height of > 50%, fracture dislocation of the spine. **Time of operation after trauma:** avg. 6 hrs. (2-10); **Duration of operation:** 3.5 hrs (2-5); **Blood transfusion:** avg. 3 units (2-5). The Alıcı spinal system was applied with transpedicular screws, hooks and rods.

Ant. Corpus Height: Pre-op. avg. 2.1 cm (1.5-2.7); Post-op. avg. 2.7 cm (2.0-3.5) **Ant. kyphosis angles:** Pre-op. avg. 21.1° (4°-39°); Post-op. avg. 11.5° (0°-23°). Of 10 patients w/neurol. findings, 6 showed no change, 4 switched from Frankel Type D to E. Last control showed 17 patients w/o pain carrying daily activities; 6 patients w/ slight pain. The system is evaluated as a good choice for thoracic and lumbar fractures.

P41

THE RESULTS OF COTREL-DUBOUSSET INSTRUMENTATION FOR THORACAL AND LUMBAR SPINAL FRACTURES

E. F. MUMCU, İ. T. BENLİ, M. KIŞ, S. AKALIN, A. GÜRBÜZ, M. ÇITAK

With better understanding of spinal biomechanics and use of computed tomography, knowledge about the vertebral fractures has increased. Since 15 years, poor results of the conservative methods has increased the surgeons' interest for surgical treatment of the spinal column fractures.

In this study an average of 27.3 months' follow-up results of 20 unstable thoracal and lumbar vertebra fractures which were treated by Cotrel-Dubousset Instrumentation at the 1st Orthopaedics and Traumatology Clinic of Ankara Social Security Hospital from December 1988 to June 1991 were evaluted. 29.2° of mean preoperative sagittal index angle was corrected by 61.4% and in 75% of the patients thoracolumbar junction angle was carried to normal limits. Neurological improvement occured in 15% of the patients and remaining persisted the present neurological status.

In light of these findings, it is thought that besides providing vertebral stability by building a rigid frame, Cotrel-Dubouet Instrumentation also restores thoracal and lumbar postural curves with high correction rates in the sagittal plane.

P42

THE TREATMENT OF THE THORACAL AND THE LUMBAR FRACTURES WITH ALICI SPINAL SYSTEM

H. C. KÖSEOĞLU, Ö.K. ÜLKÜ, S. BERBER, V. KARATOSUN, T. BEYATLI

İZMİR STATE HOSPITAL 1. ORTHOPAEDICS CLINIC, İZMİR, TURKEY

This study was performed between February 1990- February 1992 in the I. Orthopaedic Clinic of İzmir State Hospital.

32 cases, 19 male (60%) and 13 female (40%) were treated. An average age of patients was 32.87 (16-65). The mechanism of the injury was as follows. 1) 20 cases falling from height (62%), 2) 12 cases were traffic accidents (38%).

In 32 cases the number of fractured vertebrae were 45. In all cases preop. and postop. conventional X-Rays are taken both AP. and Lat.. Preop. and Postop. CAT were taken only for 16 cases.

The most commonly fractured sites were the L_1 region (16 cases) and the thoracolumbar junction. Among the operated fractures 22 cases had burst fractures (69%), 4 cases had compression fractures (12%) and 6 cases; had fracture-dislocation (19%). The neurologic status of the cases were determined according to the FRANKEL Classification. 18 cases were Frankel E, 1 was Frankel D, 5 were Frankel C, 4 were Frankel B and 4 were Frankel A, just before the operation.

Burst fractures, unstable fractures (according to Dennis), fractures-dislocations and more than 50% anteriorly depressed compression fractures and the patients who had neurologic deficits were selected for the study.

The mean operation time was 235 min. (150-360) and the mean blood amount transfused was 2.68 Unite (0-6).

The postop. neurologic status of the patients according to the Frankel were as follows.

Preoperative	Postoperative
Frankel A (4)	Frankel A (3)
Frankel B (4)	Frankel B (2)
Frankel C (5)	Frankel C (2)
Frankel D (1)	Frankel D (4)
Frankel E (18)	Frankel E (21)

6 cases had decubitis wound, 2 cases had superficial skin infection and 6 had urinary tract infection. These complication were treated medically.

The cases were followed for 17 months and the late complications were seen in 2 cases, the system was removed because of the loosening of the upper hooks. One of these had electroshock therapy and only in this case the loss of correction was observed. At the latest controls; 19 cases were pain free, 9 had little pain 2 had mild, 1 had severe pain.

As a conclusion the Alıcı system had a good success in the management of the vertebral fractures.

P43

COMPARISON OF CD AND ROD-SLEEVE METHODS IN THE SURGICAL TREATMENT FOR VERTEBRAL FRACTURES

C. ŞAR, Ü. DOMANİÇ, İ. ESENKAYA, M. DEMİRHAN

UNIVERSITY OF ISTANBUL, ISTANBUL MEDICAL FACULTY, DEPARTMENT OF ORTHOPAEDICS AND TRAUMATOLOGY, TURKEY

A total number of 101 cases have been surgically treated for burst fracture of the thoracolumbar spine between June 1987 and June 1992. Of these cases 38 had rod sleeve, 63 had CD instrumentation applied for reduction and stabilization.

Patients in rod-sleeve group have been followed-up for an average of 3.7 years and 15.5° (range 3 to 30) of correction loss in local kyphosis angle has been encountered. In CD group with 2.1 years of follow-up the mean loss of correction was 4.5° (1-10).

As complication seven hook dislocations, four fractures of the lamina and two pseudarthrosis were noticed in rod sleeve group. No such complication was found in CD group.

Evaluation of these results has led us to conclude that CD instrumentation is much more effective for reconstructing and preserving the sagittal contour of the spine and also for stabilization.