SRS REGIONAL COURSE AND EUROPA-MIDDLE EAST MEETING, ISTANBUL, MAY 25-27, 2006*
POSTER PRESENTATIONS

SAFETY OF PEDICLE SCREW PLACEMENT WITH EVOKED EMG.

Prasit NIMITYONGSKUL, Clinton W. HOWARD

The complication rate associated with pedicle screw insertion in spine surgery varies from 1 to 33 %. Three main utilities are used in the placement of pedicle screw to decrease this potential: probing of the pedicle track, use of fluoroscopy, and evoked EMG.

Purpose: To demonstrate whether evoked EMG is a reliable guide for safety of pedicle screw insertion.

Study Design/Setting: A retrospective review was undertaken. Patient history, preoperative physical examination, intraoperative anesthesia, spinal cord monitoring records and the postoperative course were reviewed.

Methods: A total of 24 consecutive posterior thoracolumbar spine surgeries with transpedicular screws were reviewed. There were 24 patients (9 male and 15 female). A total of 118 pedicle screws were placed. Fifty seven percent of the patients had a principal preoperative diagnosis of idiopathic scoliosis. Other common diagnoses were neuromuscular scoliosis, kyphosis, and spondylolisthesis. All pedicle screws were placed with the assistance of fluoroscopy. After insertion of the transpedicular screws, the integrity of the pedicle cortex was tested by stimulating each screw head and recording evoked EMG.

Results: Five of 118 screws (4 %) had evoked EMG potentials of less than 7 uA. This threshold was used based on previous studies to be indicative of pedicle wall breach. There was one patient with postoperative radiculopathy and severe pain in the corresponding nerve root distinct from preoperative presentations. Consequently, this pedicle screw was revised and patient had symptom resolution. Ninety-nine percent of screws that were inserted with evoked EMG and fluoroscopy were without clinical consequence.

Conclusion: The use of evoked EMG in evaluating pedicle screw placement is safe and reproducible. A combination of fluoroscopy and EMG monitoring provides excellent intraoperative recognition of neurologic injury.

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POSTER PRESENTATION

THE BROOKS TECHNIQUE FOR ATLANTOAXIAL STABILIZATION IN CHILDREN

Prasit NIMITYONGSKUL, Matthew D. BARBER

Despite advances in screw fixation techniques for the upper cervical spine, the atlantoaxial arthrodesis method presented by Brooks in 1978 still represents a safe, reliable technique for stabilization of C1-C2 instability without the increased risks of neurological or vertebral artery injury seen with transarticular screw fixation or pedicle screw/rod fixation.

Purpose: To demonstrate the safety and efficacy of Brooks type C1-C2 fusion.

Materials & Method: Three clinical cases illustrate the effectiveness of this technique. Each patient has minimum follow up of 2 years:

(1) 20 year old female with Down's syndrome. X-rays and CT sean demonstrated anterior translation of C1 with canal compromise as well as an old odontoid fracture with malunion. A Brooks type fusion was performed using C1-C2 sublaminar wire, fibular allograft and iliac erest bone graft; (2) 10 year old female presented six months after a neek trauma with an os odontoideum likely secondary to odontoid fracture nonunion. This patient had obvious C1-C2 instability on flexion/extension films and exhibited some hyperreflexia and clonus. Stability was established using C1-C2 Brooks type fusion; (3) 2 year old male involved in a motor vehicle accident sustained a C1-C2 translation which rendered him quadriplegic with total ventilator dependence. MRI demonstrated a severe spinal cord contusionjust behind the odontoid consistent with SCIWORA injury. He underwent a Brooks type C1-C2 stabilization. Some recovery of neurologic control ofhis head, neck and shoulders was noted.

Conclusion: The authors acknowledge that the use of facet screws/pedicle screws in fusion of the upper cervical spine has earned its place in the surgeon's armamentarium with its greater biomechanical strength; however, the difficulty as well as the potential neurologic and vascular complications should be well considered. The authors' experience indicated that the Brooks method of C1-C2 fusion is safe, simple and reliable.

POSTER PRESENTATION

SINGLE-STAGE POSTERIOR TRANSPEDICULAR APPROACH VERTEBRA COLUMN RESECTION AND CIRCUMFERENTIAL RECONSTRUCTION IN THORACICOLUMBAR BURST FRACTURE: EARLY CLINICAL RESULTS IN 12 PATIENTS

Yan WANG, Xeusong ZHANG, Zheng WANG

Introduction: An burst thoracolumbar fracture with incomplete neurologic deficit requires decompression and stabilization. In a patient with an burst fracture of L1 or T12 with dorsal retropulsion of fragments into the spinal canal, 1 or 2 staged ventral plus dorsal approach for thoracolumbar arthrodesis is needed. But the ventral approach to TL junction means more injury compare to single dorsal approach. We innovated a new way to finish circumferential arthrodesis through only posterior approach.

Methods: From September 2004 to December 2005, 12 patients with thoracolumbar burst fracture underwent the single stage posterior transpedicular vertebra column resection and circumferential reconstruction. Retrospective review of all available clinical and radiographic data was used to evaluating for neurologic changes, spinal canal compromise, preoperative and postoperative segmental angulation, and arthrodesis rate.

Result: The median operative time was 4.1 hours, the median blood loss was 1650 ml, and the median hospital stay was 10 days. Nerve root injury during operation occurred in 3 patients. There were no cases of neurologic deterioration, and 10 (83.3 %) patients with incomplete neurologic deficits improved by at least one modified Frankel grade. Mean preoperative segmental kyphosis of 23.6° was improved to an early mean of 3.4°. All patients went on to apparently stable arthrodesis.

Conclusions: Single-stage posterior transpedicular vertebra column resection and circumferential reconstruction allows circumferential epidural decompression and immediate spinal stability. This technique achieved a high success rate for neurological preservation and arthrodesise, while avoiding the morbidity associated with combined approaches.

POSTER PRESENTATION

ANESTHESIA FOR SPINAL & SCOLIOSIS SURGERY: WHAT SURGEONS SHOULD KNOW?

Amr Mahmoud MONTASSER

The scope of spinal sugery is considerable, patients who would have been declined surgery 20 years ago are now offered extensive procedures. Those patients have many comorbidities. The objective of this instructional course lecture is to explain the basic concepts of safe anesthesia for spinal & scoliosis sugery, how to reduce blood loss & how to maintain spinal cord integrity. Their perioperative management is going to be reviewed.

The advent of techniques to monitor spinal cord function has reduced postoperative neurological morbidity in these patients & anesthesia plays a major role in facilitating these methods of monitoring.

Spinal surgery imposes further stresses of significant blood loss, prolonged anesthesia & problematic postoperative pain management. All of these fundamental issues are going to be explained.

This much needed interaction between surgeons & anesthesiologists is essential for the progress of spinal sugery which the ultimate goal of the SRS.

POSTER PRESENTATION

IS A SINGLE DOSE OF RHBMP-2 AN EFFICACIOUS ALTERNATIVE TO ILIAC BONE GRAFT IN ONE AND TWO LEVEL LUMBAR FUSION?

Rolando Figueroa ROBERTO, Munish Chandra GUPTA, Daniel BENSON

A retrospective review was performed investigating the efficacy of a 12 mg dose of rhBMP-2 (Infuse) as an alternative to iliac bone graft in one or two level lumbar fusion.

Inclusion criteria were one and two level posterolateral lumbar fusion with minimum radiographie follow up of 6 months. All patients received a single 12 mg dose of rhBMP-2 combined with 30 cc cancellous allograft, laminar autograft (when laminectomy was performed) and instrumentation.

Patients were excluded iliac crest graft was used in addition to rhBMP-2 or if radiographie follow-up was less than 6 months.

Twenty five patients met study inclusion criteria. The mean age was 57 years (range 18-80), there were 18 females and 7 males. The diagnoses included isthmic and degenerative spondylolisthesis (3 and 8 patients respectively), lumbar degenerative disc disease (5 pts), transition syndrome (4 pts), lumbar spinal stenosis (4pts) and pseudoarthrosis (1 pt).

There were 20 single level and 5 two level fusions. Average radiographie follow-up was 10 mos. (range 6-24). Xrays were reviewed by a single surgeon (RFR) and fusion status was graded using the seheme as devised by Bridwell, Lenke et al.

Results: All patients obtained successful fusion. There were 15 grade one fusions (solid bilateral fusion) and ten grade two fusions (thick fusion unilateral). There were no symptomatic pseudoarthroses and no complications related to the use of rhBMP-2.

Conclusion: A single 12 mg dose of rhBMP-2 can successfully induce formation of a solid posterolateral fusion mass in one level fusion.

POSTER PRESENTATION

POSTEROLATERAL DECOMPRESSION AND POSTERIOR INSTRUMENTED FUSION FOR SPINAL TUBERCULOSIS.

Hossam SALAH, Youssry EL HAWARY

Twenty-eight patients with spinal tuberculosis underwent posterolateral decompression and posterior instrumented fusion. Seventeen were males and eleven females. The mean age at the time of surgery was 28.2 years. All patients presented with local back pain, in addition 19 suffered a neurological deficit.

The mean duration of follow up was 49 months (27-59). At latest follow up, 25 patients were completely relieved from their pain, while the remaining three reported mild occasional pain. In addition, 18 out of the 19 with a neurological deficit showed improvement in their Frankel grading. No patient was down graded neurologically by the surgery. Disease control was achieved in 96 % of patients. Minimal complications were reported in this series.

In conclusion, posterolateral decompression and posterior instrumented fusion is a useful procedure in the management of selected cases of spinal tuberculosis. It allows adequate debridement and decompression of the spinal canal, correction of the kyphosis and stabilization of the motion segments that is necessary for the healing of the infection process. In addition, it avoids the added morbidity of an anterior approach, is considered of choice in cases with extensive multilevel epidural compression, multilevel contiguous or non-contiguous affection, in the upper dorsal and cervicothoracic junction affection where an anterior approach is either limited or requires an extensive approach and in those with significant respiratory compromise where a thoracotomy may be hazardous.

POSTER PRESENTATION

RELIABILITY AND CONCURRENT VALIDITY OF THE ADAPTED CHINESE VERSION OF SCOLIOSIS RESEARCH SOCIETY-22 (SRS-22) QUESTIONNAIRE

Alpaslan SENKOYLU, Y. GENE, A. ALANAY, S. LAU, S. CHAN, K. YEUNG, K. LUK, K. CHEUNG

Introduction: SRS-22 questionnaire was proven to be a way of evaluating scoliotic patients in terms of health-related quality of life. It is important to use this outcome instrument in not only in English speaking countries but also all other countries for globalization of knowledge. Aim of this study is assessment of the concurrent validity and reliability of translated Chinese version of SRS-22 outcome instrument.

Methods: The adapted SRS-22 questionnaire was administered to 48 patients. 36 (75 %) percent of patients responded second set of questionnaire. Mean age of 36 (4 male, 32 female) patients as 16.5. Later, adapted SRS-22 questionnaire and previously validated Short Form-36 were administered to a different group of patients (n=51). One patient discarded because of incorrect input. Mean age of second group of patients (4 male, 46 female) was 21. Internal consistency, reproducibility and concurrent validity were determined with Cronbach's α coefficient, interclass correlation coefficient and Pearson correlation coefficient, respectively.

Results: Cronbach's a coefficient for the four domains (function, activity, pain, self-image/appearance and mental health) were high. However, Cronbach's a coefficient of satisfaction with management domain was 0.53 which was considerably lower then the previous udies. Intraclass correlation was found excellent for all domains of SRS-22 questionnaire. In terms of concurrent validity, excellent (one domain), good (12 domains), moderate (three domains) and poor (one domain) correlations can be observed within the 17 relevant domains. Poor and moderate correlations were related with satisfaction with management domain.

Conclusions: Both cultural adaptation and linguistic translation are essential in any attempt to use a HRQL questionnaire across cultures. The Chinese version of SRS-22 outcome instrument is satisfactory internal consistency and excellent reproducibility. It is ready to use for clinical studies about idiopathic scoliosis in Chinese population.

Table 1. Descriptive Statistics on Individual Domain Scores (n=50)

Questionnaire/Domain(No. Questions)		Domain Means (SD)	Floor Score Minimum+	% With Floor Effect	% With Ceiling Effect
SRS-22*					
	Function/activity (5)	4.5 (0.69)	1.8	2.0	44.0
	Pain (5)	4.4 (0.73)	1.6	2.0	30.0
	Self-image/appearance (5)	3.8 (0.64)	2.2	4.0	2.0
	Mental health (5)	4.1 (0.80)	1.8	4.0	18.0
	Satisfaction with management (2)	3.9 (0.75)	1.0	2.0	10.0
SF-36**					
	Physical functioning (10)	81.7 (20.5)	35	6.0	32.0
	Role-physical (4)	70.5 (38.4)	0	16.0	54.0
	Pain index (2)	77.3 (25.3)	22.5	2.0	40.0
	General health perceptions (5)	64.3 (22.1)	5	2.0	4.0
	Vitality (4)	61.4 (18.5)	5	2.0	2.0
	Social functioning (2)	76.5 (23.4)	12.5	2.0	42.0
	Role-emotional (3)	72.0 (36.5)	0	14.0	54.0
	Mental health index (5)	71.4 (17.6)	12	2.0	2.0

*SRS-22 scale 5=best; 1 =worst.

**SF-36 scale 100=best; 0 =worst.

+In each domain a ceiling score, 100 for SF-36 and 5 for SRS-22 except Self-image/appearance domain (4.8).

Table 2. Distribution of the SRS-22 and SF -36 Domain Scores by Quantiles

Quantiles	Pain	Self-Image	Function/ Activity	Mental Health	Satisfaction with Management
SRS-22 Domains					
100%	100	96	100	100	100
75%	100	85	100	96	90
50%	88	78	96	86	80
25%	84	68	87	76	70
0%	32	44	36	36	20

Quantiles	Physical Function	Role Physical	Pain	General Health	Vitality	Social Function	Role Emotional	Mental Health
SF-36 Domains								
100%	100	100	100	100	100	100	100	100
75%	100	100	100	80	71.25	100	100	84
50%	85	100	90	65	62.5	75	100	72
25%	73.8	50	57.5	53.8	50	50	58.33	59
0%	35	0	22.5	5	5	12.5	0	12

Table 3. Internal Consistency Reliability (Cronbach's a)

SRS-22 Domain	μ	SF-36 Domain	μ
Function/activity	0.86	Physical functioning	0.90
Pain	0.87	Role-physical	0.85
Self-image/appearance	0.78	Pain index	0.87
Mental health	0.87	General health perceptions	0.85
Satisfaction with management	0.53	Vitality	0.75
		Social functioning	0.64
		Role-emotional	0.74
		Mental health index	0.83

Table 4. Test/Retest Reproducibility as Determined by the Intraclass Correlation Coefficien (n=36)

SRS-22 Domain	ICC
Function/activity	0.83
Pain	0.76
Self-image/appearance	0.79
Mental health	0.84
Satisfaction with management	0.82

Table 5. Concurrent Validity of SRS-22 Domains with Relevant SF-36 Domains as Determined by Pearson Correlation Coefficients (n=50)

SRS-22 Domain	SF -36 Domain	Pearson r
Function/activitv	Role-Physical	0.77
	Physical functioning	0.73
	Pain index	0.62
	General health perceptions	0.59
Pain	Pain index	0.72
	Role-physical	0.54
	Physical functioning	0.68
Self-image/appearance	General health perceptions	0.62
	Social functioning	0.59
	Physical functioning	0.50
Mental health	Mental health index	0.67
	Social functioning	0.57
	Vitality	0.66
Satisfaction with management	Physical functioning	0.25*
	Role-physical	0.24*
	Pain index	0.18*
	General health perceptions	0.49

*Not Significant (p>0.05)

POSTER PRESENTATION

SPONTENAOUSE ROTATIONAL CORRECTION SECONDARY TO CORONAL CURVE CORRECTION IN IDIOPATBIC SCOLIOSIS

Alpaslan SENKOYLU, K. LUK, YW. WONG, K. CHEUNG

Study Design: Retrospective cross-sectional study.

Objective: To demonstrate spontaneous correction of rotation when curves were corrected in the coronal plane.

Summary of Background Data: Scoliosis is a three-dimensional deformity, therefore curve correction in one plane likely to have a coupled effect in another plane. Ideal correction of scoliotic deformity must be addressed not only coronal and sagittal planes but also horizontal plane.

Methods: Fulcrum bending was used, as a pure side bending maneuver. In 39 surgically treated patients with lumbar or thoracolumbar idiopathic scoliosis fulerum bending was compared with apical rotation pre and postoperatively. Student t-test was used for statistical analysis.

Results: Fulcrum bending shows spontaneous rotational correction (p<O.05).

Conclusions: Rotational correction can be due to two reasons (1) coupled effect (2) surgical technique. This study demonstrates there was a definite coupled effect comparing apical rotation measured in preoperative A-P standing x-ray and fulerum bending x-ray. However there may be also a surgical effect. May be with flexible curves, where you can get excellent coronal correction, excellent apical derotation will also occur and no apical derotation is necessary.

Table 1. Cumulative data of the patients.

Patient No.	Age	Gender	Curve Tyne	Cobb (A-P)	Cobb (FB*)	Cobb (Poston)	Ap. Rot.** (A-P)	Ap. Rot. (FB)	Ap. Rot. (Postop)
1.	11	F	5CN	80	30	5	30	20	0
2.	11	F	5CN	48	17	0	30	30	10
3.	14	F	5CN	64	20	10	25	15	5
4.	13	F	5CN	46	20	20	10	10	0
5.	13	F	5CN	47	14	4	15	10	5
6.	14	F	5CN	49	17	15	15	15	5
7.	14	F	5CN	56	24	28	25	10	20
8.	23	F	5CN	70	40	8	25	25	10
9.	15	M	5C+	64	30	14	20	25	10
10.	13	F	5C-	55	18	3	40	40	20
11.	14	F	5CN	61	2	4	15	15	5
12.	20	F	5C+	45	2	7	25	0	15
13.	14	F	5CN	45	10	12	20	20	10
14.	21	F	5CN	47	14	21	30	20	15
15.	15	F	5CN	48	5	2	10	10	0
16.	17	F	5CN	44	10	21	15	5	10
17.	23	F	5CN	56	10	18	25	15	15
18.	15	F	5C-	55	21	2	20	15	5
19.	11	F	5CN	57	23	4	25	15	5
20.	24	F	5AN	56	8	0	35	45	10
21.	12	F	5CN	49	15	10	15	5	5
22.	15	F	5CN	60	20	10	35	30	20
23.	12	F	5C-	44	10	15	15	5	10
24.	19	F	5CN	62	8	14	25	10	15
25.	15	M	5CN	50	22	18	15	15	10
26.	16	F	5CN	50	16	0	20	15	10
27.	14	F	5CN	47	18	16	20	20	10
28.	11	F	5CN	45	16	2	25	20	5
29.	16	M	5CN	50	13	1	20	5	10
30.	13	F	5CN	43	2	11	20	20	20
31.	20	M	5CN	52	23	9	35	20	20
32.	15	F	5CN	48	9	6	20	5	0
33.	20	F	5CN	43	5	5	15	10	10
34.	13	F	5CN	48	5	12	20	20	12
35.	20	F	5C-	52	11	2	20	5	10
36.	16	F	5CN	44	7	2	30	25	20
37.	33	F	5CN	46	4	2	30	25	20
38.	16	F	5CN	53	9	10	20	15	15
39.	11	F	5AN	70	34	23	20	15	10

***FB**=Fulcrum Bending, ** **Ap.Rot**=Apical Rotation measured with Perdriolle's Method

POSTER PRESENTATION

COMPARISON OF RESULTS OF MULTIHOOK AND SUBLAMINAR WIRING METHODS FOR TREATMENT OF ADOLESCENT IDIOPATHIC SCOLIOSIS:MINIMUM 5 YEARS FOLLOW-UP

Alpaslan SENKOYLU, U. KANATLI, A. SIMSEK, M.A. DEVECI, N. ALTUN

At least 5 - year follow up results of adolescent idiopathic scoliosis, those were treated using multihook instrumentation (MI) and sublaminar wiring (SW) methods were reviewed retrospectively.

29 patients were included in the study. Fourteen of patients were treated using MI and fifteen were treated with SW method. Preoperatively primary curves were measured using Cobb method, revealing a mean of 50 degrees for MI group and 56 degrees for SW group. At the end of follow up, mean Cobb value was 15 for CDI group and 19 for sublaminar group.

Statistical analysis revealed that there is no difference between these two methods ($p>0.05$). Two patients in MI group pull-out of proximal hook were encountered. In one of these patients revision was performed.

From aspects of correction of deformity and its maintenance, comparison of MI and SW method showed that there is no significant difference at the end of follow up period.

POSTER PRESENTATION

TWO STAGED CORRECTION OF AMBULANT POLIOMYELITIC PATIENTS WITHOUT PELVIC INSTRUMENTATION

H.B. ELSEBAIE, Y.H. ELMILIGUI, W.M.T. KOPTAN

Study Design: A retrospective clinical and radiographic review.

Objectives: To study the results and complications of patients who had spinal fusion for poliomyelitis patients with scoliosis.

Summary of Background Data: The reported literature on poliomyelitis patients with scoliosis is very little. Nevertheless, the reported complication rate in the management of neuromuscular scoliosis ranges from 44 % to 62 %.

Methods: A retrospective review of 34 ambulant patients with poliomyelitic spinal deformities. The average age at surgery was 15 years and 8 months, with an average follow-up of 32 months (minimum, 24 months). All patients had a two staged procedure; the first of which was an anterior release and grafting. The second stage was posterior instrumentation, correction and fusion and was performed on an average of 6 days latter.

Results: Preoperatively, the mean major curve measured 81 degrees, which was corrected on side bending views to an average of 43 degrees. At the last follow-up, the curve had an average of 32 degrees with an average correction of 61 %. There were no neurologic complications.

Conclusions: The results for spinal fusion for neuromuscular scoliosis are better with this protocol of management and the complications were acceptable.

POSTER PRESENTATION

MULTIPLE LEVEL FUSION MASS OSTEOTOMIES IN FAILED UNORTHODOX SCOLIOSIS SURGERY

Y. ELMILIGUI, W. M. T. KOPTAN, H. B. ELSEBAIE

Summary of Background Data: Surgical treatment of spinal deformities requires proper understanding, preoperative planning and precise execution. Failure to abide to these guidelines results in catastrophic outcomes, solid fusion in these patients adds a great difficulty in rectifying these problems.

Objectives: To study the technique of multiple level fusion mass osteotomies in fifteen patients referred to our centre, who had previous procedures to correct their spinal deformities. It is important to emphasize that their primary surgeries were not beyond criticism.

Methods: The age at surgery had an average of 19 years. The dorsal curves ranged from 36° to 98° with an average of 58.4°. The lumbar curves ranged from 24° to 70° with an average of 38.5°. All patients had a double staged procedure. The first stage was an anterior release. Posteriorly, the old implants were removed and correction was achieved by performing multiple level osteotomies (4 in average) in the fusion mass. The patients were re-instrumented and fusion was performed.

Results: Post-operatively, the curves were corrected to an average of 29.4° and 26.3° respectively. Patients were followed up for an average of 2.5 years. Overall, there was no postoperative neurological deficit and the complications were acceptable.

Conclusions: Spinal osteotomies appear to be both safe and efficient in obtaining a good correction of these deformities.

POSTER PRESENTATION

EFFICACY OF PARS REPAIR WITH A CABLE-SCREW CONSTRUCT IN GRADE I OR LESS SPONDYLOLISTHESIS FOR ADOLESCENTS AND YOUNG ADULTS

W. M. T. KOPTAN, H. B. ELSEBAIE, Y. H. ELMILIGUI

Study Design: To evaluate the results of pars interarticularis repair with a cable-screw construct.

Objectives: To assess the results of a recently described technique for direct osteosynthesis of the pars interarticularis and to evaluate its efficacy in grade one slips.

Summary of Background Data: The management of symptomatic spondylolysis or spondylolisthesis with minimal displacement is controversial. Several procedures have been proposed; Buck (1970), Morscher (1984) and Nicole and Scott (1986).

Methods: The study included ten patients with Grade I or less spondylolisthesis. The average age was 18.5 years (range, 13-32 years). All patients complained of low back pain unresponsive to conservative treatment and the average duration of symptoms was 18 months. Preoperative MRI was mandatory to confirm the absence of any signs of degeneration. The surgical technique involved thorough debridement of the pseudarthrosis; impacting a tricortical iliac crest graft and rigid fixation by a special pedicle screw-cable construct.

Results: The minimum follow-up was 26 months. The results in seven were rated as excellent two as good and one as fair and all of the defects except one went to solid union. There were no implant failures.

Conclusion; The results of this technique are encouraging and above all offers the treatment of choice to Grade I lytic slips meeting the selection criteria for motion segment preservation in such a young age group.

POSTER PRESENTATION

TWO STAGED RESECTION WITH POSTERIOR INSTRUMENTATION FOR CORRECTION OF ANGULAR CONGENITAL SPINAL DEFORMITIES

Y.H. ELMILIGUI, W.M.T. KOPTAN, H. B. ELSEBAIE

Objectives: To study the results of 22 patients of with congenital spinal deformities who underwent surgical correction.

Summary of Background Data: The management of neglected angular congenital spinal deformities has been one of the most challenging procedures in this field. Spinal osteotomies have been the cornerstone of surgical treatment. Several hazards and complications were reported with these major techniques.

Methods: Ten patients had a hemivertebra, 4 had an unsegmented bar, 3 mixed anomalies and five could not be classified. Resection was performed using an anterior approach followed one week latter by completion of the resection, posterior correction and instrumentation.

Results: The mean Cobb angle of the main curve was 75° before surgery which was corrected to 29°. There was at least a 2-year follow-up period. Overall, there were no persistent postoperative neurological insults. The complications were minimal and acceptable.

Conclusions: This technique is a safe and promising procedure that offers significant advantages for controlling congenital deformity: excellent correction in frontal and sagittal planes, high stability and low neurological risk.

POSTER PRESENTATION

EARLY RESULTS OF A NOVEL SACROILIAC JOINT STABILISATION TECHNIQUE

A. AL KHAYER, J. HEGARTY, D. HAHN, M.P. GREVITT

Summary of Background Data: A variety of techniques for SH arthrodesis or stabilisation have been previously reported. There is no universally accepted technique.

Objective: To report the early results of a novel percutaneous procedure for stabilisation of sacroiliac joint (SIJ) with the aid of a Hollow Modular Anchorage (HMA) screw for SIJ related pain.

Methods: We included patients who underwent SIJ stabilisation by the novel technique with minimum 6 months follow-up. Preoperative and postoperative Oswestry Disability Index, Visual Analogue Score for pain, and postoperative subjectiye patients' satisfaction were assessed for all patients.

Results: Nine patients satisfied the inclusion criteria, on whom 12 SIJ stabilisation were performed. Average age of 42.4 years (35-56), mean follow-up of 26 months (6-58). Clinically and statistically significant improvement were achieved; mean VAS value dropped from 8.1 (7 to 9) preoperatively to 4.6 (3 to 7) postoperatively $p \leq 0.002$. Mean 001 value dropped from 59 (34 to 70) preoperatively to 45 (28 to 60) postoperatively $p \leq 0.005$. Good patients' satisfaction was evident as well.

Conclusions: To the author's knowledge this is the first procedure that combines: safe minimal surgical exposure, instrumented fixation for primary stability and bone grafting for long-term stability. And this is the first paper that documents improvement and satisfaction in 3 different validated outcome measures.

POSTER PRESENTATION

LONG TERM FOLLOW-UP OF PERCUTANEOUS COBLATION NUCLEOPLASTY IN CONTAINED DISC HERNIATION

Viviana Franca PALIOTTA, L. ALESSANDRO, Ospedale S.EUGENIO

Aims: Percutaneous coblation nucleoplasty is a technique recently introduced in the treatment of symptomatic contained disc herniation. It allows centrally decompressing the disc, then reducing the peripheral herniation. Only local anaesthesia is needed and then patients do not need to be hospitalized. No brace is needed.

Methods: Since 2002 we have introduced this technique in our hospital in patients suffering for low back pain due to contained disc herniation. 21 cases were performed in the period 2002-2003. Mean age was 43 years. Mean follow is now 3 years and 9 months. Patients were studied with X-Ray and MRI. All of them were previously treated by means of medical and physical therapy without recovering.

Results: No serious complication was observed. Short follow-up was excellent, all patients recovered but 2 that underwent open discectomy 6 and 8 months after nucleoplasty. In 4 cases mild back pain persisted, without impairing daily life activities. Long term follow-up of these first cases is too good: only 3 more cases complained of mild low back pain after hard working and only one patient needed surgery after 3 years follow -up

Conclusions: Long term follow-up confirms that percutaneous coblation nucleoplasty is a worthwhile alternative procedure in the treatment of low back pain due to contained disc herniation. The procedure is quite safe. Pain relief and recovery to previous daily life activities is achieved in a short time and the results last in the years.

POSTER PRESENTATION

CERVICAL ANTERIOR RECONSTRUCTION WITH TITANIUM MESH CAGE (TMC) FILLED WITH AUTOGENOUS BONE GRAFT, AGF AND ANTERIOR PLATE IN THE SURGICAL TREATMENT OF DEGENERATIVE CERVICAL MYELOPATHY

Viviana Franca PALIOTTA, B. MAGLIOZZI, L. ALESSANDRO

The use of titanium mesh cages (TMCs) is actually preferred to the tricortical iliac grafting for reconstruction following anterior cervical corpectomy in degenerative myelopathy.

Methods: 12 patients with myelopathy due to multilevel cervical spondylosis were treated by anterior corpectomy, titanium mesh cage (TMC) filled with autogenous bone graft, AGF and anterior plate. Mean follow-up was 31 months. Mean age was 62 years. Patients were evaluated preoperatively and postoperatively according to the JOA score. In all cases plain and dynamic cervical X-rays and M.R.I. were performed preoperatively. Postoperative X-ray examination was carried out at 1, 3 and 6 months after the operation. M.R.I. and neurological examination was performed at 6 months postoperatively.

Results: Mean hospitalization days were 9. No severe complication was observed. All patients improved neurologically at least of 1-2 points according to JOA scores. Transient postoperative neurological worsening was present in 1 patient. In 1 case a mild local infection recovered after local surgical revision. Solid fusion was achieved in all cases.

Conclusions: In conclusion anterior corpectomy and Titanium mesh cage (TMC) filled with autogenous bone graft, AGF and anterior plate seems to be aquite safe and effective surgical treatment in degenerative multilevel myelopathy. TMC and anterior plate provide good structural support, and earlier solid fusion can be achieved combining AGF to the bone graft.

POSTER PRESENTATION

LUMBOSACRAL JUNCTION ANOMALIES AND SPONDYLOLISTHESIS

Kamran AGAYEV; Burcak BILGINER; Burce Ozgen MOCAN; Atilla AKBAY; Gokhan BOZKURT; Selcuk PALAOGLU

Introduction: It is well known that lumbosacral anomalies, especially sacralization accelerate development of dejenerative lumbar disease, by increasing load to neightboring segments. However, there is al most no papers adressing association between spondylolisthesis and lumbosacral anomalies. This study was designed to research this association.

Materials And Methods: In this study 38 symptomatic spondylolisthesis cases had been analyzed retrospectively. 30 (78.95 %) were found to have certain lumbosacral anomalies. 3 patients were male, 27 female, age range was 34-82, average age was 59.18.

Grade I spondylolisthesis was find in 18, grade 11 in 12 cases. Degenerative spondylolisthesis occured in 9, and type lytic type in 21 patients. Stabilization by posterior transpedicular screw and rod fixation were performed in all patients.

Results: From total 30 patients with spondylolisthesis and lumbosacral anomalies:

2 had spondylolisthesis at L3-4 level, from which: 2 had L5 sacralization.

16 had spondylolisthesis at L4-5 level, from which: 14 had L5 sacralization, 7 had decreased hight at the posterior wedge of L4 vertebrae, 1 had S1 lumbalisation.

12 had spondylolisthesis at L5-S1 level, from which: 9 had decreased posterior wedge of L5 vertelrae, 3 had S1 lumbalization.

From 9 patients with degenerative spondylolisthesis 6 had sacralizations (66.66 %).

From 21 patients with lytic spondylolisthesis 4 had decreased posterior wedge hight of superior vertebrae at spondylolisthesis level (66.66 %). 10 had sacralizations (47.62 %).

Discussion: It had been widely accepted that lumbosacral anomalies, which causes restriction of movement, accelerate progression of lumbar dejenerative disease. However, association between spondylolisthesis and lumbosacral anomalies has not been studied. We found interestingly high incidense of anomalies in patients with spondylolisthesis (78.95 %), from which 53.33 % were sacralizations. The most common anomaly occured with degenerative spondylolisthesis was sacralization (66.66 %). However, lytic type spondylolistesis most commonly occured with decreased posterior wedge hight of superior vertebrae (66.66 %).

According to this results we can say that lumbosacral anomalies play role in development of spondylolisthesis.

POSTER PRESENTATION

IDIOPATHIC SCOLIOSIS

K. ZAHARIOU; G.H.KELALIS; A.SIDERAKIS; A.KALAMPOKIS; L.KOLLINTZAS;

Purpose: The study of postoperative correction of idiopathic scoliosis in patients who were surgically treated in our department with posterior fixation and derotation technique.

Materials And Methods: Between January 2001 and October 2005, 145 patients (116 female and 29 male), aged 12-57 y.o (average 18,9 y.o) were subjected to surgical correction of idiopathic scoliosis in our department with derotation technique. We studied their preoperative AP, Lateral and Dynamic X-Rays as well as the immediate postoperative X-Rays and those obtained after 6 and 12 months.

Results: We recorded 69,3 % correction of the thoracic curvature and 70,5% correction of the lumbar curvature at the immediate postoperative period. In 74,3 % of the patients we observed improvement of the vertebral rotation while there was a significant increase of kyphosis which usually is below normal in idiopathic scoliosis. Six months postoperative we recorded a decrease of curvature correction by 4, 4 % while the rotational correction remained the same.

Conclusion: The technique of rod derotation during surgical treatment of idiopathic scoliosis corrects significantly the scoliotic curvature as well as kyphosis, mainly due to the properties of the new instrumentation devices.

POSTER PRESENTATION

INTRAOPERATIVE NEUROPHYSIOLOGICAL MONITORING IN THE SURGICAL TREATMENT OF SCOLIOSIS

Kostantinos ZACLIARIOU; G.H KELALIS; K.PAPADOPOULOS; P.AGGOURAKIS; M.PANTAZI; Kifissia ATHENS

PURPOSE: A study of the use of neurophysiological monitoring in the surgical treatment of scoliosis with posterior fixation and derotation technique.

MATERIAL AND METHODS: From January 2004 until December 2005, 86 patients (22 men and 64 women) aged 15-48 years old (average 18,4 years old) were treated in our department due to scoliosis. In all eases we perform posterior fixation with rods and screws or claws and derotation. In all cases we used Multimodal Intraoperative Neurophysiological Monitoring (SSEP's, TcMEP's, spEMG, Free-Run EMG and Triggered EMG with monopolar probe stimulator). Both SSEP's and TcMEP's were used as an index for neurophysiologie improvement while the EMG modalities were used to record intraoperative pressure to nervous or adjacent tissue so as to avoid damage.

RESULTS: In all cases after the derotation and the insertion of the fırst rod we observed an intraoperative decline of the SSEP's amplitude that recovered without any intervention in 5-10 minutes. In 3 patients we detected intraoperative ischemia of the neural tissue (Both SSEP's and TcMEP's changes that remained more than ten minutes) so we corrected the curvature of the rod.

CONCLUSION: In our up-to-date experience the use of intraoperative neurophysiological monitoring seems to be a highly satisfactory adjunct method in the surgical treatment of scoliosis.

POSTER PRESENTATION

EVALUATION OF MECHANICAL STABILITY OF SCOLIOTIC CONSTRUCTS USING SUBLAMINAR AND SUBTRANSVERSE WIRING

Surendra BANDI, A GADGIL; A RAHMATALLA; V JASANI; E B AHMED

Introduction: Segmental spinal fixation is commonly used to correct various types of scoliosis. Sublaminar wiring is a widely used posterior segmental fixation technique for long posterior fusions especially in thoracic spine. But this is associated with various complications such as dural tears, cerebrospinal fluid leak, neurological deficit and late peridural fibrosis. The most serious drawback of the sublaminar wiring is the risk of neurologic injury especially with the passage of sublaminar wires in the thoracic and thoracolumbar spine. To over come these set backs. Kemal et al used subtransverse wiring and reported that it is strong enough to correct scoliotic curves and requires less operative time and skill and is neurologically safe. There are no studies in literature comparing the stability achieved by these two techniques.

Materials and Methods: Mechanical stability under torsional strain of five specimens of each of two construct designs was compared by static and fatigue testing, using an electroservohydraulic testing machine. In construct A, a contoured hartshill rectangle was used from T2-L2, with sublaminar wires passed at every level. In construct B, subtranseverse wires were used instead of sublaminar wires. Industrially fabricated spine models were used to prepare these constructs. The intervertebral motion within the construct was measured using the Fatrack magnetic field sensor device.

Results: Static testing - Comparing the rotational displacement (in degrees) produced in the fıve samples of each of the two types of construct us ing students t-test, the displacement in construct A was found to be more than the construct B and the difference in the displacement was statistically significant ($p<0.001$).

Fatigue testing - All samples in both the constructs withstood three million cycles.

Conclusion: We conclude that subtransverse wiring offers better rotational stability and has the advantages of avoiding neurological complications associated with sublaminar wiring in addition to the case application leading to less operative time.

POSTER PRESENTATION

SCHEUERMANN'S DISEASE: INDICATION FOR SURGERY AND TRANSLATION OF THE SRS-22 INTO GERMAN.

Ulf MUZZULINI, H. WEYDT; C.BÖHM; W. HEIN; A. ZEH

Pupose: The indication for surgery of Scheuermann's disease is not clearly defined. In the presented study, the indications are outlined with respect of our own experience and a review of the literature. To assess the quality oflife, the SRS-22 was translated into German.

Methods: Retrospective study of 15 patients. Translation of the SRS-22 into German.

8 male and 7 female patients with Scheuermann's disease were eligible. Age at time of surgery 16.2 (14-19 years). Average kyphosis 78°. Dorsal approach in 4 cases, open dorsoventral in 11 cases. Examined were all hospital and outpatient charts. Follow up included clinical exam, standing x-ray of the whole spine and the SRS-22. The average follow-up was 4.4 (0.5-10) years.

Results: The average correction of kyphosis was 42°. No significant loss of correction. Erection of lumbar lordosis from 65° to 46°.

A risk for a proximal junctional kyphosis was stopping the instrumentation at T4 or below.

The SRS-22 results showed a significant improvement of the domains self image/appearance and mental health as well as a high score in the satisfaction with management. In contrast the domains function/activity and pain showed no significant improvement.

33 % of the x-rays showed degenerative changes of the lumbar spine at an average of 3 years.

Discussion: The natural history of Scheuermann's disease is not known. It is not known whether it necessarily leads to an early degeneration of the lumbar spine nor whether surgery can avoid this. The pain occurs mainly during the adolescent growth spurt and generally subsides with bony maturity and therefore can also not be used as indication for surgery. Kyphosis progression again is only vaguely defined.

Conclusion: According to our results, a highly significant improvement is achieved only in the self image/appearance and mental health and thus is the main factor leading to a high satisfaction with surgery.

POSTER PRESENTATION

SLOW GROWING MELANOMA OF THE DURA WITH PARAPLEGIA DUE TO ANTICOAGULATION AND DELAYED DECOMPRESSION: A CASE REPORT

Ulf MUZZULINI, W.HEIN; A. ZEH

Purpose: The question of: Oral anticoagulation in patients with spinal anomaly.

Timing of spinal decompression in acute cauda equina. A rare case of a dural melanoma

Case Report: A 65 year old patient was admitted with acute onset of lumbar pain radiating into his right leg and a senso-motoric deficit of L5. Four 4 years earlier he had asimilar episode when an MRI scan revealed a large cystic tumor of the lumbar spine. A few month earlier the patient was started on Warfarin for non valvular atrial fibrillation (NVAF).

On presentation the patients INR was 4.2. The MRI showed a mainly unchanged tumour compared with 4 years ago. Due to it's size and its local expansion in relation with the neural structures the tumour was classified as inoperable.

In spite of a successful reversal of the anticoagulation a progressive worsening of the neurological deficit developed. The patient became partially paraplegie, lost control over his bowl and urinary functions and was unable to walk. After seven days the patient decided to go along with a high risk spinal decompression.

Intraoperatively there were no identifiable cauda equina fibres. The histo-chemical examination revealed a slowly growing melanoma originating from the dura. He underwent an intensiye rehabilitation program, regaining his ability to walk and his bowl control.

Discussion: Timing in patients with an acute cauda equina syndrome remains controversial. In the presented case a 7 days delayed decompression lead to good neurological recovery.

Melanomas originating from the dura are only rarely described. This case is unique in that it has no signs of progression or metastatic spread.

Conclusion: With a steadily increasing number of orally anticoagulated patients the overall number of bleeding complications will also increase. It is crucially important to define risk factors and contraindications. We think any intraspinal pathology has to be considered as a contraindication for oral anticoagulation.

SAFETY AND EFFICACY OF POSTERIOR SEGMENTAL INSTRUMENTATION AND FUSION FOR DYSTROPHIC SPINAL DEFORMITY IN PATIENTS WITH NEUROFIBROMATOSIS TYPE I

Mehmet AYVAZ, Muharrem YAZICI, İbrahim AKEL, Ahmet ALANAY, Rifat Emre ACAROGLU

Purpose: To evaluate the safety and efficacy of third generation posterior segmental instrumentation of dystrophic spinal deformities in patients with Neurofibromatosis type I.

Materials and Methods: The records of 18 patients with diagnosis of neurofibromatosis type I and spinal deformity were reviewed. The patients with dystrophic spinal deformity treated with third generation posterior instrumentation were included. Ten patients (4 female, 6 male) with an average age of 10 years (4-17) and follow-up of 45, 1 months (24-120) formed the subjects of this study. Four patients had previous subcutaneous rod and one patient had Luque instrumentation.

Five patients had dural ectasia. All patients were neurologically intact before surgery. All patients had posterior instrumentation and nine had additional anterior release and fusion. Halo traction was used in 2 patients. Sublaminar wiring was used in five and spinous process wiring was used in four patients. Intracanal anchorage by sublaminar wires or laminar hooks at the level of intraspinal pathology is avoided. Allograft was used for fusion in all patients

Results: The major curve was corrected from preoperative average of 79°(60°-115°) to postoperative 36,2° (16°-78°) (54,1 %). Hyperkyphosis was normalized in eight patients. Sagittal and coronal balance restored to normal or improved. No neurological complication or infection was observed. In one patient instrumentation was revised due to inappropriate caudal end vertebra selection. The average correction loss was 3,2° at the last f/up.

Conclusion: Third generation posterior instrumentation of dystrophic spinal deformities in neurofibromatosis type I can be done safely and corrections comparable with idiopathic curves can be achieved and maintained. Even the dystrophic vertebra can be instrumented with versatility of third generation posterior systems.

POSTER PRESENTATION

OUTCOME OF ADOLESCENT IDIOPATHIC SCOLIOSIS CORRECTION WITH AVOIDANEE OF ANTERIOR RELEASE USING TRACTION RADIOGRAPHY

Surendra BANDI, BJ DAVIS; J TRIVEDI; EB AHMED

Introdudion: Pre-operative traction radiography under general anaesthesia has been shown to have a superior role over supine bending radiography to assess the curve flexibility, to decide whether a concomitant anterior surgery can be avoided and to predict the post-operative correction, in patients with adolescent idiopathic scoliosis. To our knowledge, there are no follow up studies in the literature assessing the post-operative outcome in such patients. The objective this paper is to evaluate the post-operative outcome in patients with late-onset idiopathic scoliosis, in whom a decision was taken to avoid concomitant anterior surgery and to perform only posterior surgery after assessing the curve flexibility using traction radiography.

Methods: Anterior release was avoided in patients with curves correctable to less than 40 degrees with traction radiography under general anaesthesia. Antero-posterior and lateral radiographs were taken in the immediate post operative period and at the time of follow up. Cobb angle was measured at 2 years in each patient and compared with the post operative cobb angle, to assess the progression of the curve.

Results: Out of thirteen patients planned for anterior release surgery and posterior instrumentation, anterior release was avoided in eleven patients after review of the traction radiography. Mean loss of correction at the end ofa minimum of two years follow up was 2.

Conclusion: In patients with adolescent idiopathic scoliosis, traction radiography is a safe and reliable technique which helps in decision making to avoid anterior release and has several advantages including decrease in operative time and blood loss and better post-operative recovery.

POSTER PRESENTATION

TREATMENT OR THORACIC CONGENITAL SCOLIOSIS BY CHEST WALL COMPRESSION AND HEMIEPIPHYSIODESIS: A CASE REPORT

Selim YALCIN, Baris KOCAOGLU, Ahmet Hamdi AKGULLE

Purpose: Our purpose is to give middle term follow-up results of a patient with thoracic congenital scoliosis. Chest wall constrictors were used in this patient for the correction of both scoliosis and hemi-thorax deformity.

Methods: Four year old girl with thoracic congenital scoliosis associated with thorax deformity and fused ribs had both convex side posterior hemiepiphysiodesis and closing wedge thoracotomy at one session. The thoracotomy was performed by us ing two chest wall compressors which are known as vertical compressible prosthetic titanium rib. Hemiepiphysiodesis were done only at the apex. Radiographs were used to analyze the correction of the scoliosis as indicated by a change in the Cobb angle and the height of concave hemi-thorax compared with the height of the convex hemi-thorax. Patient was followed at duration of 20 months at out-patient clinics with a period of 6 months.

Results: The patient had progressive congenital scoliosis with a mean increase of 10° per year before the operation. The Cobb angle decreased from 38° preoperatively to 25° at the time of the latest follow-up. The height ratio between concave and convex side the improved significantly. There was no significant change in primary or secondary respiration as measured by the change in the chest or abdominal circumference with breathing. Blood oxygen saturation levels also showed no significant chances.

Conclusion: In this study, we combined two techniques for the treatment of convex hemi-thorax; the correction of the rib cage deformity and scoliosis by chest wall constrictors at the convex side and the control of the scoliosis by hemiepiphyisiodesis. Closed wedge thoracotomy at the convex side corrects both the rib cage deformity and the congenital scoliosis. Hemiepiphyisiodesis at the apex of the convex side controlled the progression of the disease without affecting the growth of the whole thoracic spine.

POSTER PRESENTATION

EFFICACY OF LIGAMENT LAXITY ON SURGICAL TREATMENT OF THE SURGICAL TREATMENT OF IDIOPATHIC SCOLIOSIS

Brahim Ghayem HASSANKHANI, Mohamad Taghi PAYVANDI; Ali REZAEE

Back ground: Many factors affect on management of this disorder. The purpose of this study is evaluation of the efficacy of ligament laxity on surgical treatment of the idiopathic scoliosis.

Material and method: 36 patients, 9 male (5 %) and 27 female (75 %) with idiopathic scoliosis were studied between 2000 and 2004. The mean age was 16 years (from 12 to 22 years). Follow up time was 1.5-4 years. Nineteen (52.7 %) patients had ligament laxity. Ten patients with ligament laxity had posterior spinal fusion and instrumentation (four of them had Cobb angle of more than 65 degree) and nine had anterior spinal fusion, posterior spinal fusion and instrumentation.

Thirteen patients without ligament laxity had posterior spinal fusion and instrumentation, and four had anterior spinal fusion, posterior spinal fusion and instrumentation.

Ten patients with ligament laxity had instrumentation by Cotrel - Dubousset system (C.D) and nine by distraction rod and sublaminar wiring system (D.R + S.L.W).

Ten patients without ligament laxity had instrumentation by C.D and seven by D.R + S.L.W.

Results: The mean time of operation was 3.95 hours (SD = 0.31) in patients with ligament laxity and 4. 26 hours (SD= 0.56) in patient without ligament laxity.

Curve correction was 73.3 % in patients with ligament laxity and 57.1 % in patients without ligament laxity. There was a significant difference between two groups (p = 0.001).

Conclusion: Ligament laxity not only has an important effect on surgical correction of curvature but also in cases with curves more than 60°, anterior release and fusion is not needed.

POSTER PRESENTATION

THE IMPORTANCE OF COLLABORATION OF ORTHOPAEDIC AND NEUROSURGEON IN THE SURGICAL TREATMENT OF CONGENITAL SCOLIOSIS (PRELIMINARY REPORT)

Abtullah MILCAN, Celal BAGDATOGLU; Irfan AYAN; Ahmet KARACOR

Aim: To elucidate the importance of collaboration of orthopaedic and neurosurgeon in the surgical treatment of congenital scoliosis.

Patients and Methods: Eight patients (1 male, and 7 females) who were operated for congenital scoliosis in our Orthopaedics Department in the last three years were included in the study. Four of the patients had intraspinal pathology detected by MRI, and were operated by the same neurosurgeon (co-author). After a period of three weeks scoliosis surgery was performed.

Results: Two patients had tethered cord, and another two had diastometamyelia. Intraspinal pathologies were addressed prior to curve correction. One patient had hemivertebra excision, another one patient had posterior hemiepiphysodesis and anterior-posterior arthrodesis, and six patients had insitu fusion, two with posterior instrumentation. There was no neurological deficit or infection.

Conclusion: Unless intraspinal pathology is treated prior to the surgical treatment ofthe curve neurological deficit emerges as the most frequent complication. Neurosurgical treatment of intraspinal pathology preceding the surgical treatment of congenital scoliosis renders uncomplicated scoliosis surgery after three weeks.

POSTER PRESENTATION

OPERATIVE TREATMENT OF 4TH-DEGREE SCOLIOSIS

Kolban MACIEJ, Zaeha SLAWOMIR, Michal CHMIELNICKI

Satisfactory results following the operative treatment of scoliosis in which the Cobb angle exceeds 90° are very difficult to achieve. Anterior release followed by posterior spondylodesis only slightly improves the possibility of the deformity's being corrected. However, left untreated, scoliosis of that degree may have a detrimental effect on the patient's respiratory and circulatory system.

Aim: The aim of the study was to evaluate the degree of correction in patients with 4th-degree scoliosis in which the curve was greater than 90° before surgery.

Material and Methods: Radiographs of 14 patients with 4th-degree scoliosis, operated on between 1999 and 2001, were reviewed retrospectively. The follow-up period was at least 24 months. The Cobb angle was between 90° and 134° (mean angle 97°) in the thoracic region and 45° in the lumbar region. The average value of kyphosis in the thoracic -lumbar region measured on radiographs in the sagittal plane was 9°. In 2 cases, in the first stage anterior release was performed, which was followed by distraction of the scoliosis and posterior spondylodesis. During surgery the rib hump was partially removed by resection of between 5 and 7 ribs.

The average Cobb angle in the thoracic region directly following surgery was 43.3° and 20.4° in the lumbar region, and lordosis in the thoracic-lumbar region was 6°. The angles after 2 years of follow-up was 48.7° in the thoracic region, 26.8° in the lumbar region and 4.3° in the thoracolumbar region.

Conclusion: All patients are satisfied with the result of surgery, despite significant residual deformity. Correct balancing of both curvatures and correction of the rib hump lead to a good cosmetic and functional result.

POSTER PRESENTATION

STAGED OPERATIVE TREATMENT OF IDIOPATHIC SCOLIOSIS IN YOUNGER CHILDREN

Kolban MACIEJ, Zacha SLAWOMIR, Michal CHMIELNICKI

According to the available literature and the authors' experience, the optimal time for correction of a deformity with spondylodesis is when the Risser test is in stage 2 or 3, and for female patients when they have been menstruating for 1.5 to 2 years. However, patients with a significant progression of curvature, without signs of skeletal maturity, require an earlier operative intervention to prevent further progression.

Aim: The aim of the study was to review the results of staged operative treatment of scoliosis in younger children.

Material and Methods: A group of 43 patients operated on between 1999 and 2002 were included in the study. Partial correction of scoliosis was performed using C-D instrumentation (hooks and one rod). The age of patients was between 6 and 13 years (average age -10.3 years). The average Cobb angle in the thoracic region was 59° and in the lumbar region - 44°. At the follow-up examination 46 % correction in the thoracic region was observed and 43 % in the lumbar region.

The early introduction of operative treatment followed by the staged correction of scoliosis enables progression to be kept under control and allows appropriate distraction, until patients have reached the required skeletal maturity to perform a final correction of the deformity along with the fusion of the posterior column of the spine.

Conclusions: 1. Staged operative distraction of idiopathic scoliosis in younger children results in a good outcome, and prevents an increase of the deformity during growth.

2. Staged operative distraction of idiopathic scoliosis in younger children prevents the development of the crankshaft phenomenon.

POSTER PRESENTATION

CHRONIC RECURRENT MULTIFOCAL OSTEOMYELITIS PRESENTING AS ACUTE SCOLIOSIS - A CASE REPORT

Kedar DEOGAONKAR; Adel GHANDOUR; Alwyn JONES; Sashin AHUJA; Kathleen LYONS

Chronic relapsing multifocal osteomyelitis (CRMO) is an inflammatory bone disease of unknown aetiology characterised by exacerbations and spontaneous remissions. It occurs during childhood and adolescence.

CRMO presenting as acute onset scoliosis is a rare thing and only one such case has been reported before.

We present a case of a young girl presenting with acute onset scoliosis with mild backache. On investigation it turned out to be a case of CRMO involving multiple vertebrae.

Examination of her back and spine revealed a marked thoracic scoliosis with convexity to the right. She had significantly restricted spine movements.

All blood parameters were normal & cultures were negative.

X-ray revealed slight collapse of the body of T10 with minimal sclerosis. There was a right convex scoliosis with the apex of the curve at the level of T10. The curve was 22 as measured by the Cobb angle method. We think that the particular pattern of scoliosis was a protective mechanism to offload the right sided T10 vertebral pedicle.

MRI revealed abnormal signal in T10, L2 and L3 vertebral bodies, with some compression of T10 body and extension into the right pedicle. The discs were of normal appearance. There was no intra-spinal or extra-osseous component.

CT scan revealed lytic lesions of the right side of body and right pedicle of T10, bodies of L2 and L3.

Trans-pedicular biopsy of T10 & L2 showed loose fibrous tissue with plasmacytosis' - highly suggestive of CRMO.

She was managed with analgesics for pain relief and no external splintage. The lesions have subsided and the patient is symptomatically improving at 10 month follow up. The scoliosis has improved uneventfully.

We report this case due to the unusual nature of this condition and to highlight the importance of diagnosis before treating acute onset painful scoliosis in adolescents.

POSTER PRESENTATION

IDIOPATHIC SCOLIOSIS TREATMENT WITH ANTERIOR STABILISATION

Pawel Jerry MICHALSKI, Grzegorz MOEZKO

All modern posterior stabilisation systems for scoliosis treatment give:

- good three-dimensional correction of a spine

- excellent stability

- no need for postoperative external immobilisation.

All modern systems for an anterior spinal stabilisation enables additionally: short spinal fusion and saving of spinal segments.

Anterior blocs or staples the use of a segmental wedge locked double or single rod fixation, the prevention of dislocation of the cancellous bone screw and the segmental cross-link principle are the main characteristics of modern devices.

The systems relates to the three-dimensional anatomy of the spine by the application of distraction, compression and rotational forces.

We have been using anterior double-rod fixation systems since 1993.

Our special modification - direct fusion ("cheek to cheek technique") we have been using since 1996.

376 patients with thoracic, thoracolumbar and lumbar scoliosis were treated.

During the observation period no revision surgery was necessary.

Mean preoperative angle 65°.

Mean operation time 143 min.

Average intraoperative blood loss 80 ml.

Mean correction of the frontal deformity 74 %

Anterior spine correction and stabilisation is the method of choice for some thoracic, lumbar and thoracolumbar scoliosis.

POSTER PRESENTATION

DYNAMIC STABILIZATION OF THE LUMBAR SPINE

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Objetive: A retrospective study was conduced to review the results ofa pedicle screw system dynamic stabilization, consisting of titanium alloy screws connected by an elastic synthetic compaund (Dynesys).

Materials and Methods: Our retrospective study included 59 patients (39 females, 20 males) treated at our Department from 2002 to 2004 using Dynesys instrumentation. The average age at operation time was 53.3 years (range, 25 to 78 years). Twenty-two cases (37.2 %) had a previous failed low back pain surgery (15 discectomy and 7 bilaterallaminectomy). All patients presented a lumbar instability (in 7 of them a degenerative grade I spondylolisthesis and in 3 an early degenerative scoliosis) combined in 43 cases with a severe stenosis.

All patients were treated using Dynesys pedicular instrumentation without fusion, combined with laminectomy in 42 procedures: 23 cases received a one level stabilization, 27 two levels, 8 three levels and 1 patient 4 levels. All patients completed the Oswestry Disability Index (ODI), the SF-36 and the VAS questionnaires.

Results: At an average follow-up of 38 months (range: 14 to 45), the ODI score (32.6 vs 47.6), the SF-36 (Physical Function; Mental Function) and the VAS score (leg pain 50 vs 63.9; back pain vs 70.7) appeared significantly better versus the preoperative values. The mean values of the lumbar lordosis, preoperatively and postoperatively, resulted unchanged (-54.8 vs -50.3).

An additional surgery was necessary in 2 patients . In 1 case a seroma had to be drained 2 weeks later. In another case, for unresolved persisting low back pain, the removal of Dynesys instrumentation was performed.

Conclusions: These preliminary results showed very encouraging clinical and radiographic outcomes by using Dynesys associated to bilateral laminectomy (73% of cases) for a narrow canal in old patients.

POSTER PRESENTATION

SAGITTAL PLANE AND LUMBOSACROPELVIC JUNCTION ANALYSIS IN PATIENTS WITH SEVERE LOCALIZED KYPHOSIS

Olcay GÜLER; Ufuk TALU, Cüneyt ŞAR, Azmi HAMZAOğLU, Ünsal DOMANIÇ

Introduction: Radiological parameters related to the sagittal balance of the spine and lumbosacropelvic junction in healthy individuals have been extensively analyzed and normal range of values have been defined. However, to our knowledge, these parameters have not been investigated in a population ofpatients with pure sagittal plane deformity.

The purpose of this study is to analyze all positional and anatomic radiological parameters related to the sagittal plane in patients with severe localized kyphosis and determine the reciprocal interference of these parameters with special emphasis on lumbosacropelvic junction.

Methods: All positional [local kyphosis (LK), cervicallordosis (CL), thoracic kyphosis (TK), lumbar lordosis (LL), sagittal plumbline (PL), pelvic tilt (PT), sacral slope (SS), lumbosacral angle (LSA), L5-incidence angle (IL5), pelvic-radius SI angle (PRSI)] and anatomic [sacral inclination angle (SI), pelvic incidence (PI)] radiological parameters were measured by two independent spine surgeons in 20 patients with severe, angular, lower thoracic or thoracolumbar kyphotic deformity secondary to trauma in 5, healed infection in 4 and congenital malformation in 11 patients. Average age was 30.4 (18-48) years. Measurements obtained in this pathologic population were compared to the established normal values in healthy individuals in the literature. Statistical analyses were performed by paired t-test with significance at $p<0.05$.

Results: LK at lower thoracic or TL spine was 62.6° (19° -120°). Parameters affected by the deformity and changed for compensation were determined and measured. Those were CL: - 26.4°(-75°-20°), PT: 9.7°(-18°-38°), SS: 27.6°(-3°-48°), LSA: 19.8°(5°-34°), IL5: 1I.4°(-10°-48°), PRSI: 41°(7°- 64°), SI: 43°(22°-64°), PI: 36.2°(7° -82°).

Conclusion: In patients with severe lower thoracic or thoracolumbar kyphotic deformity, average LL is noted to remain within normal limits but the deformity is initially compensated with decreased average TK. Despite normal average LL in these patients SS and PI are decreased compared to healthy population. There is no compensatory increase in LL because of the structural changes but instead the pelvis is tilted resulting in decrased SS and PI.

POSTER PRESENTATION

BIOMECHANICAL ANALYSIS OF A NOVEL POLYAXIAL PEDICLE SCREW LOCKING MECHANISM

John I. Williams, John P. KOSTUIK, Richard W. WOODS; Michael C. BARRUS; John HAMMILL

Production: The development of polyaxial pedicle screws to facilitate spinal fusions has evolved to include a multitude of mechanisms for locking rods to screws at the varying angles necessary to accommodate human anatomy.

Purpose: The purpose of this study was to evaluate the biomechanical performance of a new low-profile polyaxial pedicle screw that utilizes dual locking tapers to lock rod to screw without necessity of separate locking elements.

Methods used: Mechanical component interface and construct testing in a vertebrectomy model : conducted in accordance with ASTM standards F1717-04 and ASTM F1798, including 5 million cycle compression bending fatigue.

The applicability and use of these constructs was validated in human cadaveric implantations with fluoroscopic imaging used to measure profiles of standard screws vs. the proposed design.

Reults and Conclusion: The constructs surpassed 5 million cycles with no evidence of rod disengagement and exhibited implanted profiles up to 4 mm lower than standard screw designs, dating it's use as a viable altemative to currently available pedicle screws.

POSTER PRESENTATION

SURGICAL MANAGEMENT OF LUMBAR DEGENERATIVE SPINAL STENOSIS WITH LAMINECTOMY AND POSTERIOR PEDICLE SCREW INSTRUMENTATION

Okay GÜLER, Fatih DIKICI; Ufuk TALU, Cüneyt ŞAR, Azmi HAMZAOGLU, Ünsal DOMANIÇ

Introduction: Degenerative lumbar spinal stenosis was commonly treated with laminectomy, with or without arthrodesis. Recent reviews demonstrated that arthrodesis with instrumentation have incremental clinical benefit.

Purpose: The purpose of the study was to evaluate the clinical results of decompression with laminectomy and posterior instrumentation and fusion of the patients with lumbar degenerative spinal stenosis.

Materials And Methods: Bilateral posterior titanium pedicle screw fixation with laminectomy was performed in seventy patients with lumbar degenerative spinal stenosis. 56 females and 14 males with an average age of 62.6 (range 35-85) were evaluated. Mean follow-up was 35.8 months (range 24-96). Bilateral posterolateral arthrodesis with allogenous bone graft was performed. Solid fusion was analyzed clinically, and roentgenographically. Clinical symptoms were assessed based on the Japanese Orthopaedic Association Back Score (JOA score) and Oswestry disability index (ODI).

Results: Fourteen patients had spondylolysis or spondylolysthesis additionally. Decompression levels were between Tl2 and Sl vertebrae. Decompressions of one level in 12 patients, two levels in 19 patients, three levels in 22 patients, four levels in 8 patients, five levels in 9 patients were performed respectively. Intraoperative and postoperative complications were seen in 14 (20 %) patients. These were 3 deep, 1 superficial wound infections, 2 sterile drainage, 5 dural injury, 2 transient root irritation, and 1 hematoma. There was no reoperation. Solid bone fusion was observed roentgenographically in all patients. The ODI improved from a preoperative of 50 (+/-7) to a 16 (+/-3) at last follow-up. Clinical outcome was excellent or good in 58 (82.8 %) of patients.

Conclusion: Decompressive surgery with laminectomy is the standard surgical procedure for patients with spinal stenosis. Fusion with instrumentation should be considered when spinal stenosis is accompanied by spondylolysthesis or having any suspicion of instability after decompression procedures.

POSTER PRESENTATION

CORRECTION OF SCHEUERMANN'S KYPHOSIS BY POSTERIOR ONLY THORACIC PEDICLE SCREW FIXATION

Caner GÜNERBÜYÜK; Fatih DIKICI; Ufuk TALU, Cüneyt ŞAR, Azmi HAMZAOGLU, Yasemin SONUK; Ünsal DOMANIÇ

Summary: A retrospective review of patients who underwent posterior fusion with segmental thoracic pedicle screw fixation for Scheuermann's kyphosis was conducted.

Purpose: The purpose of this study was to evaluate correction of sagittal alignment, maintenance of correction with junctional kyphosis.

Materials And Methods: This retrospective study used data submitted for posterior segmental titanium pedicle screw fixation performed from 2001-2005. Kyphosis, lordosis, C7 sagittal plumbline, junctional sagittal alignment were assessed.

Results: Of the 14 patients operated with pedicle serew fixation 8 were female, 6 were male. Mean age was 17.7 years (range 13-35 years). Mean follow-up was 27.6 months (range 11-60 months). Median preoperative thoracic length was 208 mm (168-235 mm) and lumbar length 166 mm (range 140-220 mm). Median postoperative thoracic and lumbar lengths were 263 mm (ran ge 217-302 mm) and 187 mm (range 154-249 mm) respectively. Median preoperative thoracic kyphosis was 79.5 degrees (range 62-105 degrees) and median preoperative lumbar lordosis was 71.1 degrees (range 65-80 degrees). At final follow-up, the median thoracic kyphosis was 41.4 degrees (range 30-58 degrees) and lumbar lordosis was 46 degrees (range 28-61 degrees). Median preoperative and postoperative C7 sagittal plumbline were -23 mm and -12.3 mm respectively. There was no sagittal imbalance during last follow-up. In all patients solid clinical and radiological fusions were achieved with no loss of correction.

Conclusion: This study demonstrates that surgical treatment of Scheuermann's kyphosis with pedicle screw fixation maintain good and satisfactory correction.

POSTER PRESENTATION

SURGICAL THERAPY OF HEMIVERTEBRAE SCOLIOSIS AND KYPHOSIS: A RETROSPECTIVE ANALYSIS OF 27 CASES

Fuad OKEN; Ozgur YILDIRIM; Vuslat S. UNAL; Murat GULCEK; Zafer SOYDAN; Ahmet UCANER; Korhan OZLU

Aim Of The Study: We performed a retrospective analysis of the results of operative treatment of 27 patients with congenital scoliosis (n = 24) or kyphosis (n = 3) due to hemivertebrae.

Patients And Methods: The mean age of the patients (16 girls and 11 boys) at the time of the initial examination was 7 years. Surgical treatment was carried out on average at the age of 9 years. Follow-up examinations were carried out up to a mean 6.5 (3-9) years.

Results: The results of operative treatment depended on the localization of the hemivertebrae and the surgical technique. Progression of scoliosis due to a thoracic hemivertebra was halted, but the scoliosis could not be corrected (Cobb angle at initial examination mean 48 degrees at follow-up mean 36 degrees). Surgery without instrumentation led to worse results than did surgery with instrumentation with thoracic scoliosis. We performed anterior or posterior procedures with resection of the hemivertebra or without resection of the hemivertebra. Surgical correction of kyphosis associated with dorsal hemivertebrae was performed by means of dorsal or dorsoventral spondylodesis with hemivertebra resection (preoperative kyphosis mean 60 degrees, at follow-up mean 44 degrees).

Conclusion: Spondylodesis without instrumentation is associated with an unsure prognosis with respect to effects on the progression of the scoliosis, even if it is performed on very young patients. In contrast, spondylodesis with instrumentation can achieve better and longer-lasting corrections of scoliosis even with larger initial curvatures. Scoliosis due to distal thoracic hemivertebrae is more amenable to surgical correction than thoracic scoliosis due to hemivertebrae.

POSTER PRESENTATION

EARLY RESULTS OF TOTAL DISC ARTHROPLASTY FOR SYMPTOMATIC CERVICAL DEGENERATIVE DISC DISEASE

Mehmet AYDOGAN, Ufuk TALU, Cuneyt MIRZANLI, Mehmet TEZER, Azmi HAMZAOGLU

Introduction: Cervical anterior decompression and total disc replacement is currently being investigated as an altemative treatment in patients with symptomatic intervertebral cervical losis with and without radiculopathy. Motion preservation and prevention of adjacent disc ration are the two theoretical advantages of disc arthroplasty compared to fusion . The purpose of this study was to investigate the efficacy of cervical disc prosthesis and short term of this procedure.

Materials and Method: 21 total disc arthroplasty was performed between August 2004-September 2005 in 14 patients (6 female, 8 male) with symptomatic cervical degenerative disc. The average age was 41.4 (35- 47) years. Level of surgery was C3-C4 in one, C4-5 in 4, C5-C6 10, C6-C7 in 4 and C7-T1 in 2 patients. Overall 16 one level and 5 two or more level procedures were performed. JOA criteria were used for clinical evaluation. Dynamic radiographs were used to determine motion at levels with prosthesis and motion at adjacent levels.

Results: The JOA scores improved by 65 % after surgery. The average range of motion at levels, with disc replacement was 12.8 degrees before surgery and 10.7 degrees after surgery in sagittal direction. The average range of motion at adjacent intervertebral disc spaces was 10.7 degrees before and 9.2 degrees after surgery. No surgery-or device-related complications were confronted either intraoperatively or post-operatively and none of the patients developed heterotrophic ossification.

Conclusion: Analysis of preliminary results involving cervical disc arthroplasty indicates ant improvement İn pain and functional outcome scores despite decreased segmental after surgery. Studies involving larger patient populations and having long term follow-up are necessary for formuiating definitive recommendations.

POSTER PRESENTATION

THE EFFECT OF PARTIAL FACETECTOMY VS. NO FACETECTOMY ON VERTEBRAL PURCHASE OF COLORADO-2 PEDICLE HOOKS

Nazir Cihangir ISLAM, Thomas STEFFEN; Ensor E. TRANSFELDT, James D. SCHWENDER, Lara COHEN

Introduction: Partial facetectomy can improve the seating of the hook on the pedicle by different ways. The recommended pedicle hook placement in Colorado-2 system is without facetectomy. There is no biomechanical study in the literature comparing the strength of hook/laminar interface between the parti al facetectomy and no facetectomy in the Colorado-2 pedicle hook (C2PH) design against 45 degrees posterolateral pull-out force.

Methods: T4, TS, T8, and T9 levels of 5 fresh frozen human cadavers were instrumented with C2PH. Half of the implant sites were undergone to facetectomy. The potted specimens, embedded in U shaped metal profile fılled by PMMA, were mounted with a 45 degrees of angle to the lower platform of MTS Mini Bionix Model Machine and a pull-out force 45 degrees posterolateral to the specimen was applied by the upper arm of the MTS machine. The lower platform was blocked and the upper arm permitted only for hinge movement between the rod and instrument during the posterolateral pull-outs.

Results: All of the no facetectomy cases (100 %) showed gap between pedicle and the hook and medialization in the x-rays. Half of the facetectomy cases showed ideal seating while the others showed some medialization or gap. The failure forces and failure patterns of no facetectomy (609 N) and facetectomy (636 N) groups were quite similar. But a trend of difference appeared when the ideally seated facetectomy group (778 N) compared with the other cases (493 N) of this group ($p<0.1$).

Conclusion: Facetectomy can reduce the strength of the lamina in cases which the hook does not seat ideally. This effect probably due to destruction of the integrity of the lamina and facetectomy can become a risky procedure if the hook misses the pedicle. But facetectomy can facilitate the ideal seat of the pedicle hook onto the pedicle in Colorado-2 pedicular hooks and contribute more strength even without using any additional tools.

POSTER PRESENTATION

SURGICAL TREATMENT FOR TANDEM (CONCURRENT) CERVICAL AND LUMBAR SPINAL STENOSIS

Cuneyt MIRZANLI; Ufuk TALU; Omer KARATOPRAK; Mehmet KORKMAZ; Azmi HAMZAOGLU

Introduction: Tandem spinal stenosis is a rare disorder which affects cervical and lumbar spine. Primary manifestations include neurological claudication, gait disturbance and a mixture of findings of myelopathy and polyradiculopathy in both upper and lower extremities due to simultaneous involvement of cervical and lumbar spine. The purpose of this retrospective study was to evaluate the results of two stage surgical treatment for tandem spinal stenosis.

Method: Between 1998 and 2004, 8 patients were diagnosed with tandem spinal stenosis in a series of 230 patients who underwent surgery for spinal stenosis (frequency of 3.4%). The mean age was 68 (51-80) years. All patients underwent staged surgical treatment to address both pathologies. Clinical findings dictated which region had the priority for surgery (cervical in 5, lumbar in 3). The second surgical procedure for either cervical or lumbar spine was performed 2 to 8 weeks after the index procedure. Decompression with instrumented fusion was the preferred surgical treatment. The mean follow-up was 34.6 months. The clinical results were evaluated according to the Japanese Orthopedic Association (JOA) scoring system.

Results: The JOA score of all patients improved from an average of 8.1 points preoperatively to an average of 11.8 points at the time of discharge and to an average of 12.7 points at final follow-up. None of the patients developed infection. Pre and postoperative complications included one dural tear and one deep venous thrombosis. Excellent or good results were obtained in all patients and none of the patients had deterioration of neurologic functions.

Conclusion: Staged surgery for tandem spinal stenosis is a safe and effective treatment option. Advanced cervical myelopathy may require earlier surgical consideration. Our results reveal that proper diagnosis and management in these patients provide satisfactory outcomes.

POSTER PRESENTATION

THORACIC SPINAL STENOSIS ABOVE SEVERE THORACOLUMBAR KYPHOSIS CAUSING NEUROLOGICAL DEFICIT

C. OZTURK; U. TALU; MK. CAMURDAN; O. KARATOPRAK; A. HAMZAOGLU

Purpose: We describe a new entity of neurological deficit mechanism due to the thoracic spinal stenosis produced above the severe thoracolumbar kyphosis. Our aim is to define exact reason of neurological deficit in 3 patients with a severe thoracolumbar kyphotic deformity.

Cases: First patient was a 53-year-old man with history of spinal tuberculosis, spastic paraparesia and urinary incontinence with a thoracolumbar kyphosis ofmore than 90 and compensatory thoracic lordosis with spinal canal stenosis at the lordotic segment. Posterior decompressive surgery was performed and the cord was adequately decompressed. The patient was neurologically asymptomatic now. The second patient was a 78-year-old woman with a spinal elaudication previously operated due to the degenerative disc disease and osteoporotic Th12 vertebra fracture. She suffered from upper and lower motor neuron signs. The radiological examination revealed thoracolumbar kyphosis involving Th11-L1 vertebrae and compensatory thoracic lordosis. She underwent Th12 total vertebrectomy; instrumentation and fusion were performed through Th2 to lumbopelvic junction. The patient was asymptomatic now. The last patient was a 34-year-old man presented with a spastic paraparesia with a kyphotic deformity of 90, corresponding thoracic lordosis above the deformity and L1 hemivertebra. Posterior hemivertebrectomy and decompressive surgery is being planned.

Discussion: We believe in that facet orientation change and direction of them towards spinal canal cause spinal canal stenosis and foraminal stenosis in the transition zone from the severe kyphotic segment to the compensatory lordotic segment above. These changes result in shearing stresses in long period and cause facet hypertrophy and spinal canal narrowing. We would like to remind the surgeons that survey of the spine above the kyphotic segment, especially transition zone from kyphotic segment to the proximal lordotic segment should be done to identify the cause of neurological deficit in patients with severe thoracolumbar or upper lumbar kyphosis of different etiologies.

POSTER PRESENTATION

CONTROLLABLE FACTORS ON DURATION OF SURGERY AND BLOOD LOSS IN ANTERIOR SPINE SURGERIES

Nazir Cihangir ISLAM, Necdet SAGLAM; Osman EKINCI; İlhan OCAK

Introduction: The purpose of this retrospective analytic study is to explore which factors influence duration of anterior surgery/blood loss and determine whether they are controllable factors by the surgeon/surgical team or not.

Methods: Mean age of the patients (n=30) underwent anterior surgery by the same surgical team during last 12 month-period was 43. Fifty-three percent were male. 20 % of the patients suffered from trauma,10 % from deformity, 40 % from degenerative diseases, 17% from neoplastic diseases and 13 % from infectious diseases. Mean number of corpectomies and discectomies were 1.23 and 0.73. Mean intubation-extubation time was 254 min and mean blood loss was 1906 ml. Mean blood pressure was measured as 92 preoperatively. The effects of age, sex, number of discectomy and corpectomy levels, primary or revision surgery, diagnosis, type of cage, no of screws, high speed burr use, and mean blood pressure on both duration of surgery and blood loss were studied.

Results: Pearson's Correlation coefficient was 0.79 (p=0.000) between duration of surgery and blood loss; 0.43 (p=0.019) between number of corpectomy levels and duration of surgery; and 0.54 (p=0.002) between number of corpectomy levels and blood loss. Differences in blood loss between deformity cases (992) and neoplastic cases (3380).

Conclusion: Two controllable factors for decreasing blood loss in anterior spine surgeries are the use of high-speed burr and expansible cages instead of regular cages.

POSTER PRESENTATION

POSTERIOR VERTEBRECTOMY IN KYPHOSIS, KYPHOSCOLIOSIS AND SCOLIOSIS CAUSED BY HEMIVERTEBRA

Ömer KARATOPRAK; Ufuk TALU; Mehmet Nuri ERDEM; Cagatay OZTURK; Azmi HAMZAOGLU

Purpose: Purpose of this study is to evaluate the clinical and radiological results of hemivertebrectomy and instrumentation only via posterior approach in sagittal, frontal plane and combined spinal deformities.

Method: Between the years of 1998 and 2003, 19 patients (3 scoliosis, 5 kyphosis, 11 kyphoscoliosis) underwent hemivertebrectomy and interbody fusion using posterior instrumentation with titanium mesh cage (TMC) via only posterior approach. The age of the patients ranged from 2 to 22 and hemivertebrectomy was performed at thoracallevel in 6, thoracolumbar in 8 and lumbar in 5 patients. TMC was used for anterior column support and interbody fusion in patients who had residual anterior gap preventing bone to bone contact. Correction and stabilization were achieved by posterior polyaxial pedicle screws.

Results: Average follow-up is 4.6 (3-7) years. The degree of scoliosis of main curve in average preoperatively was 47° and 90° postoperatively (correction rate of 81 %); the degree of kyphosis in average preoperatively was 29° and 60° postoperatively (correction rate of 79 %). We did not confront any loss of correction, pseudoarthrosis, and TMC collapse or implant failure.

Conclusion: As the procedure shortens the vertebral column, it increases the effectiveness of additional neurosurgical procedures. However, there are some disadvantages of the technique. There is some difficulty to perform enough decompression in the opposite site by this method. And the major disadvantage compared to standard posterior and combined procedures is the possibility of significant bleeding. As a conclusion; hemivertebrectomy and instrumentation via posterior approach only is a good one-stage surgical treatment option which avoids the surgical trauma and morbidity related to anterior surgery. However, it is a technically demanding surgical procedure requiring extreme care and experience in spine surgery.

POSTER PRESENTATION

CONTROLLABLE FACTORS ON DURATION OF SURGERY AND BLOOD LOSS IN POSTERIOR SPINE SURGERIES

Nazir Cihangir ISLAM, Necdet SAGLAM, Osman EKINCI, İlhan OCAK

Introduction: The purpose of this retrospective analytic study is to explore which factors influence duration of posterior surgery/the blood loss and determine whether they are controllable or not.

Methods: Mean age of the patients (n=56) underwent posterior surgery by the same surgical team during last 12 month-period was 34.46 % were male. 41 % suffered from trauma, 9 % from deformity, 34 % from degenerative diseases, 7 % from neoplastic diseases and 9 % from infectious diseases. Mean number of screws and hooks used in the fixation system were 8 and 1 respectively. Mean intubation-extubation time was 293min and mean blood loss was 2151 ml. Mean blood pressure was measured as 89 mmHg preoperatively.

Results: Pearson's Correelation Coefficient was 0.85 (p=0.000) between duration of surgery and blood loss; 0.47 (p=0.000)between number of screws and duration of surgery; and 0.50 (p=0.000) between number of screws and blood loss. Differences in duration of surgery between deformity and trauma cases.

Conclusion: Controllable factors for shortening duration of surgery/decreasing blood loss for posterior spine surgeries are the number of screws, the use of high-speed burrs and the use of allografts/synthetic bone grafts.