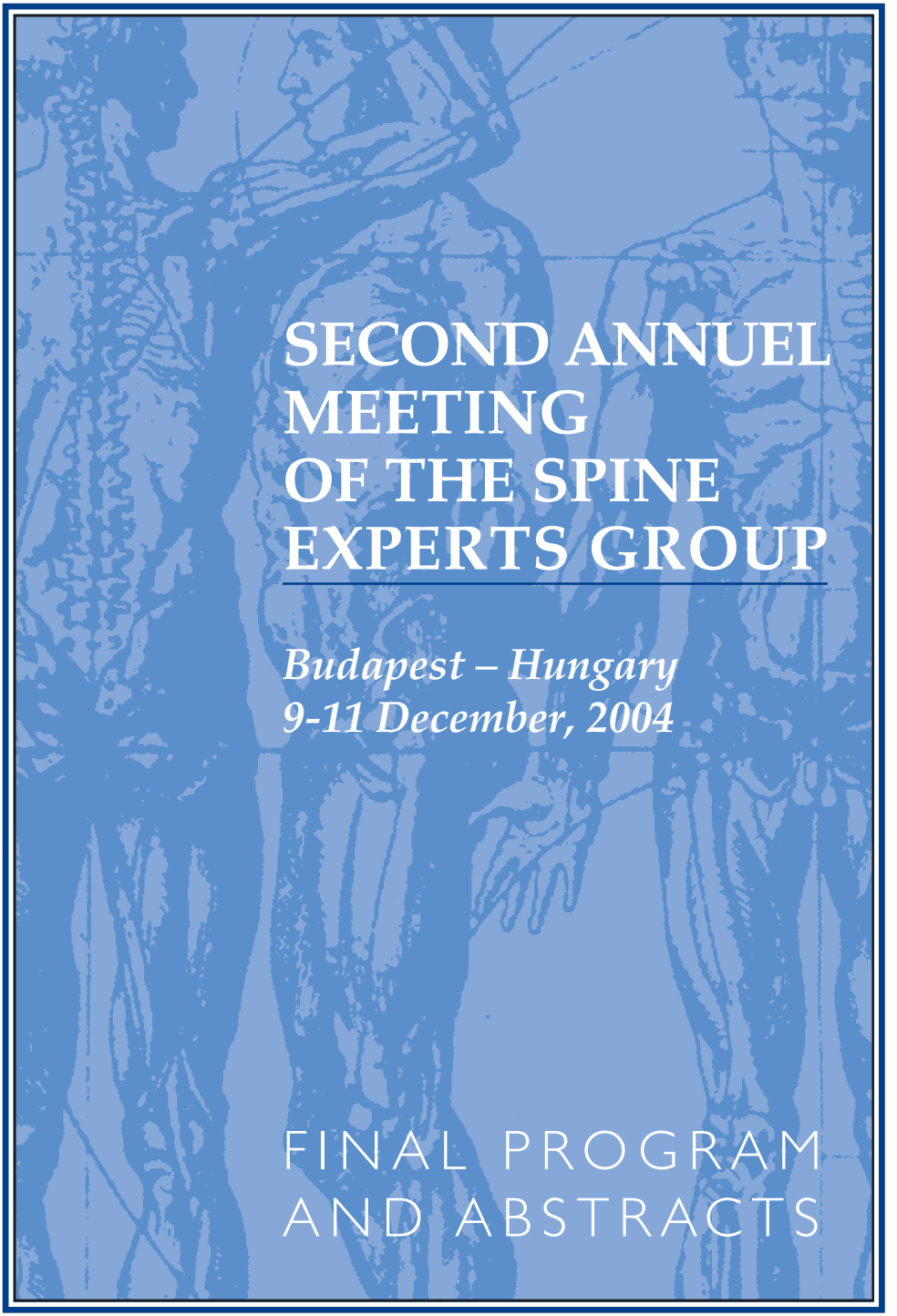

SECOND ANNUEL MEETING OF THE SPINE EXPERTS GROUP

Budapest – Hungary
9-11 December, 2004

FINAL PROGRAM AND ABSTRACTS

Dear Colleagues and Friends,

With great pleasure I welcome you to the 2nd annual Spine Experts Group Meeting, this time in wonderful Budapest. Much has happened since our first meeting last year at Castle Mokrice in Slovenia, I am very happy to see that our initiative of an exchange of ideas and knowledge within our region has really taken forth, we are visiting each other, learning from each other and helping each other solve problems and at the same time developing friendships. This was our goal when we started however as with most things we can do more, I hope this meeting will open even more lines of communication, we have a wonderful source of knowledge amongst each other and we should continue to take full advantage of it.

Special thanks to Peter Varga for organizing this meeting, I am sure we will take much away from this conference, including memories of another good time spent with friends.

I wish all of you a successful and constructive meeting, looking forward to seeing you throughout the coming year and to our next gathering in Thessalonica, Greece.

Prof. Zdeslav-Zdenko B. Milinkovic
President
Spine Experts Group

Dear Collegues!

It is a honour and privilege for the community of the Hungarian spine surgeons to host The Second Annual Meeting of the Spine Experts Group in Budapest.

However our city shows its best shape during the Springtime, but December (close to Christmas) also has a special athmosphere here. The quiet and nice picture of the capital divided by Danube is remarkable for all of the foreign visitors.

The Organising Committe collected good quality lectures from the participants, and we have several new collegues from new countries too.

I hope, you will save good memories and experience not only on the scientific programme, but the Hungarian people and our capital as well.

I whising you a pleasant stay here,

Peter Paul Varga, MD

S.E.G. MEETING

Friday, December 10th

08.30 **Opening**
Z.B. Milinkovic, P.P. Varga

08.40 **Deformity I.**
Chairman: *Prof. Milinkovic Z. B., Prof. Tanchev P.*

1. 08.40 ***SURGICAL TREATMENT OF IDIOPATHIC SCOLIOSIS: ANTERIOR VERSUS POSTERIOR PROCEDURES***
Dezső Jeszenszky
Zürich, Switzerland

2. 09.05 ***COMPARISON BETWEEN ANTERIOR AND POSTERIOR SURGERY IN MANAGEMENT OF IDIOPATHIC SCOLIOSIS***
Vladimir Kovac, Miljenko Frani and Mislav Imi
Zagreb, Croatia

3. 09.25 ***ANTERIOR STABILISATION IN SCOLIOSIS SURGERY***
Pawel Michalski
Warsaw, Poland

4. 09.50 ***CORRECTION WITH MOSS-MIAMI PEDICLE SCREW SYSTEM***
Anastasios Christodoulou
Thessaloniki, Greece

5. 10.05 ***INSTRUMENTAL CORRECTION OF LONG COLLAPSING DEFORMITIES IN OUR EXPERIENCE***
Z.B. Milinkovic, A. Curcic, B. Jesic, V. Basara, V. Lalosevic
Spinal Center, Institute Banjica, University of Belgrad
Belgrad, Serbia and Montenegro

10.20 ***Discussion***

10.45 Deformity II

Chairman: *Prof. Csernátony Z., Prof. Christodoulou A.*

6. 10.45 ***CONGENITAL SPINE DEFORMITITES. LONG TERM RESULTS OF TWO OPERATIONS EXCISION OF HAEMIVERTHEBRA AND SIMULTANEOUS CONVEX ANTERIOR AND POSTERIOR HAEMIEPIPHYSIODESIS (SCAPH)***

Z.B. Milinkovic

Spinal Center, Institute Banjica, University of Belgrade Belgrad, Serbia and Montenegro

7. 11.00 ***COMPARISON OF TWO TECHNIQUES IN HEMIVERTEBRA RESECTION***

U. Aydinli, C. Öztürk, A. Temiz, B. Akesen

Bursa, Turkey

8. 11.15 ***LONG-TERM RESULTS OF SURGICAL TREATMENT IN 361 PATIENTS WITH IDIOPATHIC SCOLIOSIS (IS)***

Tanchev P., L. Stefanov, L. Stokov, D. Dikov, A. Dzherov, A. Parushev, L. Ivanova

Gorna Bania University Hospital of Orthopaedics Spine Surgery Department Sofia, Bulgaria

9. 11.30 ***OUR EXPERIENCE IN SURGICAL TREATMENT OF DORSAL HÍPERKIPHOSIS USING MOSS-MIAMI POSTERIOR SEGMENTAL INSTRUMENTATION***

M. Jianu, A. Thiery, B. Frumuseanu, A. Ulici

Bucharest, Ruminia

10. 11.45 ***SAGITTAL CURVES OF THE SPINE AFTER CDI AND VDS FOR THORACIC AND LUMBAR IDIOPATHIC SCOLIOSIS***

Albena Maneva-Krstevska

Skopje, Macedonia

11. 12.00 ***CONVEX HEMIEPIPHYSIODESIS, HEMIVERTEBRECTOMY AND COMPRESSION INSTRUMENTATION FOR CONGENITAL SCOLIOSIS***

Djerov, A., L. Stokov, A. Parushev, D. Dikov, P. Tanchev

University Hospital for Orthopedics - Sofia, Bulgaria

12.15 ***Discussion***

13.00-14.00 ***Lunch***

14.00 Deformity III

Chairman: *Prof. Michalski P. – Prof. Kovac V.*

12. 14.00 ***PREVENTION PROGRAM IN PHYSICAL EDUCATION IN SCHOOLS – ACTION OF THE HUNGARIAN GOVERNMENT: „NATIONAL PUBLIC HEALTH PROGRAM"***

Somhegyi A. (1), Tóth J. (2), Gardi Zs. (3), Makszin I. (4), Varga P. P. (5),
(1) Ministry of Health, Budapest, Hungary,
(2) Réthy Pál Hospital, Orthopedic Department, Békéscsaba, Hungary
(3) Association of Hungarian Physiotherapists, Budapest, Hungary
(4) Semmelweis University, Faculty of Physical Education and Sport Sciences, Budapest, Hungary
(5) National Center of Spinal Diseases, Budapest, Hungary

13. 14.10 ***BENEFIT AND PROBLEMS OF THE SCOLIOSIS SURGERY BY ISOLA INSTRUMENTATION***

Rehák L., Horváth J., Tisovsky P.
University of Debrecen, Debrecen, Hungary,
Bratislava, Slovak Republik

14. 14.25 ***THE CAB HOOK AND THE „SPINE KNOWS BETTER" TECHNIQUE IN SCOLIOSIS SURGERY***

Dr. Csernátony Zoltán, Manó Sándor, Pálinkás Judit
University of Debrecen, Debrecen, Hungary

15. 14.50 ***SURGICAL TREATMENT OF THE ADULT IDIOPATHIC SCOLIOSIS WITH SEGMENTARY INSTRUMENTATION***

Traian U., G. Nedelea, D. Antonescu
Foisor Orthopaedics Hospital, Bucharest, Romania

16. 15.00 ***PARTIAL SACRALISATION OF L5-DIAGNOSIS, CLASSIFICATION AND TREATMENT***

Parushev A., P. Tanchev, L. Stokov, D. Dikov, A. Djerov
University Hospital of Orthopaedics and Traumatology, Sofia, Bulgaria

15.15 ***Discussion***

15.45 **Aging Spine**
Chairman: *Prof. Ufuk Aydinli*

17. 15.45 ***SPINE SURGERY OF THE ELDERLY***
R. Cavagna MD
France

18. 16.05 ***SEMIRIGID STABILIZATION OF THE AGING SPINE***
P. P. Varga
National Center for Spinal Disorders, Budapest, Hungary

19. 16.30 ***SURGICAL TREATMENT OF DEGENERATIVE LUMBAR SPINAL STENOSIS***
Dražen Kvesi
University Hospital for Traumatology, Zagreb, Croatia

20. 16.45 ***CANTILEVER TLIF FOR DEGENERATIVE PATHOLOGIES***
R. Rusz, P. P. Varga
National Center for Spinal Disorders, Budapest, Hungary

21. 17.00 ***OPERATIVE TREATMENT OF DEGENERATIVE LUMBAR SPINAL STENOSIS IN OUR EXPERIENCE***
V. Lalosevic, Z.B. Milinkovic, Z. Poleksic, A. Curcic, O. Krneta
Spine Center Institute for Surgical and Orthopaedic Diseases Banjica University of Belgrade, Belgrad, Serbia and Montenegro

17. 15 ***Discussion***

19.30 ***Bankett Dinner in the „Náncsi Néni" Restaurant with traditional hungarian cuisine***

Pick up at the Hotel Flamenco at 19.00.

Saturday, December 11th

08.30 **Various I.**

Chairman:
Prof. Saveski J., Dr. Jakab G.

22. 08.30 ***LASER DISC DECOMPRESSION***
G. Jakab
National Center for Spinal Disorders, Budapest

23. 08.40 ***CHARITÉ LUMBAR DISC PROSTHESIS***
M.Gorensek, J.Vengust
Ljubljana, Slovenia, Intriusic Therapeutics, Inc., Boston, USA

24. 08.50 ***NOVEL APPROACH TO MEASURE INTERVERTEBRAL DISC HEIGHT***
Emir Kamaric, Oscar Yeh
Intriusic Therapeutics, Inc., Boston, USA

25. 09. 00 ***DISC COLLAPSE FOLLOWING DISCECTOMY USING A NOVEL APPROACH TO MEASURE INTERVERTEBRAL DISC HEIGHT***
Milorad Vilendecic, Emir Kamaric, Oscar Yeh
Klinica Bolnica Debrava, Zagreb, Croatia

09.15 ***Discussion***

26. 09.30 ***IS THE ANTERIOR DECOMPRESSION SUFFICIENT FOR NEUROLOGICAL RECOVERY IN ALL LOW LUMBAR BURST FRACTURES?***
Ufuk Aydinli, C. Ozturk, S. Ersozlu, O. Ozer, B. Akesen
Bursa, Turkey

27. 09.45 ***ANTERIOR SPINAL PATHOLOGY TO THE UPPER THORACIC (T2-T4) SEGMENT-SHOW SHOULD IT BE APPROACHED***
J. Saveski
Skopje, Macedonia

28. 10.05 ***INTEROBSERVER RELIABILITY IN EVALUATING THE PEDICLE SCREW POSITION IN A MODIFIED TECHNIQUE FOR PEDICLE SCREW INSERTION***
B. Akesen, U. Aydinli, C. Öztürk, S. Ersözlü
Bursa, Turkey

29. 10.15 ***OUR TRIPLE STEP OPERATIVE TREATMENT OF THE FRACTURES IN LUMBAR REGION***
A. Curcic, Z. B. Milinkovic, V. Lalosevic, O. Krneta, Z. Poleksic
Spinal Center, Institute Banjica, University of Belgrade
Belgrad, Serbia and Montenegro

30. 10.30 ***THE IMPORTANCE OF REDUCTION OF ANTERIOR SLIP OF VERTEBRAL BODY IN SPONDYLOLISTHESIS OF THE LOWER LUMBAR SPINE***
Zvonko Kejla, Drazen Kvesic, Darko Perovic
University Clinic for Trauma, Zagreb, Croatia

10.45 ***Discussion***

Tumor I.

Chairmen: *Prof. Gorensek*

31. 11.10 ***SURGICAL TREATMENT OF SPINAL METASTASES***
P. P. Varga
National Center for Spinal Disorders, Budapest, Hungary

32. 11.35 ***SURGICAL TREATMENT OF SACROCOCCYGEAL CHORDOMA***
A. Bánk, P. P. Varga
National Center for Spinal Disorders, Budapest, Hungary

33. 11.50 ***POSSIBILITIES OF THE BODY WALL RECONSTRUCTION AFTER EXTENDED RESECTION OF SACROCOCCYGEAL TUMOURS***
A. Fekete
Central Military Hospital, Budapest, Hungary

34. 12.10 ***INITIAL EXPERIENCE OF PERCUTANOUS VERTEBROPLASTY***
Zs. Kulcsár, I. Szikora, R. Veres, I. Nyári
National Institute of Neurosurgery, Budapest, Hungary

12.25 ***Discussion***

13.00 - 14.00 ***Lunch***

14.00 Cervical spine

Chairman: *prof. Dóczy T., Dr. Baranowski P.*

35. 14.00 ***ASSESMENT OF 20 YEARS EXPERIENCE WITH DEGENERATIVE CERVICAL SPINE***

Pawel Baranowski M.D.

Neuroortopedic Clinic of Rehabilitation Centre in Konstancin, Poland

36. 14.25 ***MANAGEMENT OF C1-C2 INSTABILITY***

Róbert Veres

National Center for Spinal Disorders, Budapest, Hungary

37. 14.45 ***STABILISATION AND CORRECTION OF CERVICAL SPINAL DEFORMITIES IN DIFFERENCT SPINE PATHOLOGIES***

Z. B. Milinkovic, M. Filipovic, D. Dozic

Spinal Center, Institute Banjica, University of Belgrade, Belgrad, Serbia and Montenegro

38. 15.00 ***BRYAN DISC PROSTHESIS FOR CERVICAL DEGENERATIVE PATHOLOGY***

B. Szöllősi, P. P. Varga

National Center for Spinal Disorders, Budapest, Hungary

39. 15.10 ***MICRO-FORAMINOTOMY EXTENDED WITH PARTIAL PEDICULOTOMY FOR MINIMALLY INVASIVE TREATMENT OF DEGENERATIVE CERVICOBRACHIALGIA***

T. Dóczy

University Of Pécs, department of the Neurosurgery, Pécs, Hungary

15.25 ***Discussion***

16.00 **Tumor II.**
Chairman: Dr. Varga P. P.

40. 16.00 ***MULTIPLE MYELOMA OF THE SPINE***
M. Rónay
National Center for Spinal Disorders, Budapest, Hungary

41. 16.15 ***PRIMARY TUMOURS OF CERVICAL SPINE***
P. Tanchev, I. Andreeff
Gorna Bania University Hospital of Orthopaedics Spine Surgery Department, Sofia, Bulgaria

42. 16. 30 ***ANEURYSMAL BONE CYST OF THE CERVICAL SPINE***
Gavrankapetanovic I.
Clinic Center Sarajevo, Sarajevo, Bosnia Hercegovina

43. 16.15 ***SURGICAL TREATMENT OF THE VERTEBRAL HAEMANGIOMAS***
Sz. Berey
National Center for Spinal Disorders, Budapest, Hungary

44. 16.25 ***PRIMARY SPINE TUMOURS OF THE CHILDHOOD***
B. Szirtes
National Center for Spinal Disorders, Budapest, Hungary

16.35 ***Discussion***

16.45 ***GENERAL ASSEMBLY OF SPINE EXPERTS GROUP***

19.00 ***Dinner in the Hotel Flamenco.***

S.E.G. MEETING – ABSTRACTS

Friday, December 10th

001

SURGICAL TREATMENT OF THE IDIOPATHIC SCOLIOSIS ANTERIOR VERSUS POSTERIOR SURGERY

Dezső Jeszenszky M.D.

The surgical treatment of the idiopathic scoliosis is one of the routinely performed procedures for the treatment of the deformities, in our days. The majority of the surgeries is performed through a posterior approach. This is based on surgery-hystorical as well as on training purposes, on the one hand, and is based on the different types of scoliosis, on the other.

The analysis of the scoliotic deformities shows that some types need the surgical solution done from a posterior approach, some types do need the anterior approach, however. There are cases, of course where a combined solution is the correct way to choose.

In our lecture, when doing posterior approaches, we prefer the multisegmental polyaxial screw – double rod system, while in the anterior surgeries we prefer the monoaxial screw – single rod system.

The surgeries are to be planned according to the individual pathology for the benefit of the patients.

In our lecture, the indication, surgical planning, differentiated surgical treatment will be introduced, according to our experience.

002

COMPARISON BETWEEN ANTERIOR AND POSTERIOR SURGERY IN MANAGEMENT OF IDIOPATHIC SCOLIOSIS

Vladimir Kova, Miljenko Frani and Mislav imi

Idiopathic scoliosis is not only a structural 3D deformity. It is a torsional trunk deformity too. The goal of the treatment is not only the spinal correction, but as well the correction of anterior and posterior trunk correction. There is still a controversy in the literature about the most appropriate treatment. To make the difference objective, a randomized retrospective analysis was performed. Two, nearly identical groups of patients with thoracic idiopathic scoliosis, one (group A) receiving anterior instrumentation, and the other (group B) receiving posterior instrumentation were analyzed. Twenty-five patients who underwent an anterior spinal instrumentation (modification of ventral derotation system) were analyzed and compared to 25 patients who underwent posterior spinal instrumentation (multi hook-screw-rod systems).
The minimum duration of follow up for all patients were 24 months. There were 6 segments $\pm$ 0.5 fused in group A and 9.48$\pm$1.56 in group B.
Duration of the procedure was 154 min. $\pm$ 31 for group A and 173$\pm$42 for group B. Intraoperative bleeding; A: 442$\pm$220, B: 471$\pm$153. Hospitalization; A: 10.16 days $\pm$2.27, B: 17.96$\pm$23.18.
Average coronal correction of thoracic curve was 78% in the anterior group and 55% in the posterior group. Analysis of sagittal contour showed equal results in both groups. Horizontal correction was 62% in anterior versus 12% in posterior group. Postoperative balance was equal in both groups.
Rib hump correction was 70,93% in anterior versus 48,4% in posterior group. Postoperative rib valley correction was equal. Prominence correction was 66,42% in anterior versus 51,82% correction in posterior group. Coronal, horizontal, rib hump and prominence correction were better in anterior group. Sagittal, rib valley and disbalance correction were equal in both groups.
From this retrospective study we can conclude that anterior instrumentation is superior in three-dimensional correction of idiopathic thoracic scoliosis than posterior instrumentation.
The superior results in anterior surgery led to different criteria in indications of adult scoliosis surgery in our institution. Operative technique is changed as well in surgery of double curves, in osteoporotic curves and in early onset severe curves.

003

ANTERIOR STABILISANION IN SCOLIOSIS SURGERY

Pawel Michalski
Department of Orthopaedics Medical University – Warsaw, Poland
Head: Prof. A. Gorecki

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 instrumentation (Cotrel-Dubousset–Hopf /CDH/ or Antares system) enables additionally: short spinal fusion and saving of spinal segments.

Anterior blocs, the use of a segmental wedge locked double-rod fixation, the prevention of dislocation of the cancellous bone screw and the segmental crosslink principle are the main characteristics of the device: CDH and Antares systems.
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^{o}.
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.

004

CORRECTION WITH MOSS-MIAMI PEDICLE SCREW SYSTEM

Anastasios Christodoulou, *Thessaloniki, Greece*

005

INSTRUMENTAL CORRECTION OF LONG COLAPSING DEFORMITIES OUR EXPIRIENCE

Z.B. Milinkovic, A. Curcic, B. Jesic, V. Basara, V.Lalosevic
Spinal Center, Institute Banjica, University of Belgrade

Long collapsing spine deformities in children are present in our everyday practice as specific entity. Since 1969 Harrington instrumentation served as armentarium for correction of such deformities. These instrumentation was in late 70s replaced by Luque and SSI instrumentation in order to obtain better and stronger correction and avoid postoperative imobilization

Disadvantages of these procedures were to long fusion and correction area and difficulties in treating walking patients With introduction of pedicle fixation most of this obstacles were solved.

The aim and purpose of this paper is to present our experiences with combination of transpedicular fixation and sublaminar wiring in selected patients

Since 2001 total of 246 instrumentation of Miami Moss were done in correction of spinal deformities. Among these patients 8 were operated due to different methabolitic, paralytic and neuromuscular long collapsing spine deformities in children. All these children were operated with modified operative procedure consisted of combination of different corrective and anchor points with screws, hooks and sublaminar wires in operated segments. 8 of them were walkers and 2 sitters. Our modification proved to be effective with good correction and obtained balance without postoperative immobilization. There were no complications.

006

CONGENITAL SPINE DEFORMITIES. LONG TERM RESULTS OF TWO OPERATIONS EXCISION OF HAEMIVERTHEBRA AND SIMULTANEOUS CONVEX ANTERIOR AND POSTERIOR HAEMIEPIPHYSIODESIS (SCAPH)

Z. B.Milinkovic

Spinal center, Institute Banjica, University of Belgrade

In review of all operated spine disorders between 1969/ 1995 total of 315 patients were operated due to the existing congenital spine anomalies. Among these patients 17 patients were operated by SCAPH and 12 with hemivertebra excision. All operated patients were reviewed after rather long follow up regarding stabilization of deformities during the growth with special attention to final outcome of this treatment toward the end of the growth.

These procedures are discussed according to our up to date knowledge and existing operative procedures.

007

COMPARISON OF TWO TECHNIQUES IN HEMIVERTEBRA RESECTION

Ufuk Aydinli, M.D., Cagatay Ozturk, M.D., Aytun Temiz, M.D., Burak Akesen, M.D.

Uludag University Faculty of Medicine Department of Orthopedic Surgery, Bursa, Turkey

INTRODUCTION: Hemivertebrae are the most frequent cause of congenital scoliosis. They have growth potential similar to normal vertebra, creating wedge-shaped deformity that progresses during further spinal growth. This study aims to compare the interventions for hemivertebrae resections in congenital scoliosis by posterior approach only and with combined anterior and posterior approach.

PATIENTS and METHODS: Ten patients who underwent hemivertebra resection between 1995 and 2002 were evaluated by retrospective charts and radiographic views. Mean follow-up time was 32 months (range; 12 to 48). Except one patient, all were female and mean age at surgery was 7 years (range; 3 to 13). Resection was performed by posterior approach in 5 patients (Group I) and by combined anterior and posterior approach in 5 patients (Group II). All patients had a single non-incarcerated hemivertebra and the locations of the hemivertebra were Th7, Th8, Th11, Th12, L2 in group I and Th7, Th10, L1, L4, L5 in group II.

RESULTS: The average operation time was 3 hours in group I and 6 hours in group II ($p<0.05$). The number of instrumented vertebrae was 4 for group I and 6 for group II. Blood loss during the operation for group I and II was meanly 354 cc and 500 cc respectively ($p<0.05$). The mean Cobb angle was measured as 37^0 before surgery, 18^0 after surgery and 21^0 at the latest follow-up for group I; 32^0, 14^0 and 17^0 for group II. The correction ratio was 51% in group I and 56% ($p>0.05$). The loss of correction was 8% in group I and 9% in group II ($p>0.05$). No intra-operative complications were noted and no implant failure was verified at the final radiographic evaluations.

CONCLUSION: Transpedicular eggshell osteotomy is a technique that should be considered for older patients who have congenital scoliosis with multiplanar spinal abnormalities. It is a technically demanding procedure that provides an effective correction in selected patients.

008

LONG-TERM RESULTS OF SURGICAL TREATMENT IN 361 PATIENTS WITH IDIOPATHIC SCOLIOSIS (IS)

Tanchev P., L. Stefanov, L. Stokov, D. Dikov, A. Dzherov, A. Parushev, L. Ivanova
Gorna Bania University Hospital of Orthopaedics Spine Surgery Department
Sofia, Bulgaria

PURPOSE: This study is aimed at assessing the real efficiency of surgery for IS using three different techniques on a long-term basis.
MATERIALS AND METHODS: A series of 311 patients with IS was operated on (1987-2003) using the instrumentations of Tanchev-Stefanov (TSI) in 286 cases and Cotrel-Dubousset (CDI) in 25 cases. A control group of 50 patients treated with Harrington rods (HI) before 1987 was included for comparative purpose, making a total of 361.
To ensure long-term follow-up and outcome validity, only the patients operated on till December 31, 1998 (n=265) were evaluated retrospectively in this study. The implant systems used included HI (n=50), TSI (n=190) and CDI (n=25). Average preoperative coronal angles were 72∞, 67∞and 79∞, respectively. Average follow-up time was 180, 70 and 67 months, respectively. Final clinical and radiological outcomes, bony fusion rate, complication rate, subjective patient appraisal, characteristics of implants applied, role of thoracoplasty and cost-effectiveness of treatment were assessed.
RESULTS: Final coronal correction obtained was 24.5% for HI, being significantly lower ($p<0.05$) than that in the TSI-group (43%) and CDI-group (45%). TSI and CDI revealed statistically equal results ($p>0.05$). Sagittal correction was also comparable – 36% and 34%, respectively ($p>0.05$). Minor derotative effect (4.5∞) was found for both instrumenations. Primary bony fusion was achieved in 82% of HI-group, 95% of TSI-group, and 92% of CDI-group. Complications were more frequent when using HI (30%), while the complication rates were lower in TSI-patients (14%) and CDI (12%). The subjective patient appraisal of treatment outcome was positive – 82% for HI, 91% for TSI, and 92% for CDI.
CONCLUSIONS: TSI and CDI provide equally favourable late results at a lower complication rate as compared to those obtained by using HI. TSI, introduced and practised routinely by the authors, is an adequate, safe and cost-effective instrumentation for operative treatment of IS on a long-term basis.

009

OUR EXPERIENCE IN SURGICAL TREATMENT OF DORSAL HIPERKIPHOSIS USING MOSS MIAMI POSTERIOR SEGMENTAR INSTRUMENTATION

Prof. Mihail Jianu, Alexandru Thiery MD, Beatrice Frumuseanu MD, Alexandru Ulici MD

At children and teenagers, the axial deformities of the spine represent the main chapter of spinal pathology, closely followed by trauma and tumor pathology.
The lack of an efficient national screening methods for early diagnosis of axial spinal deformities leads to a large number of patients with severe kyphosis and scoliosis. Therefore, at the first medical control many patients show up with spine angulations in frontal and sagital plane that are much over the values generally accepted for surgical treatment initiation.
In the last 6 years, in the Emergency Clinical Hospital for Children from Bucharest have been examined 11.870 children with axial spine deformities, with ages from 0 to 18 years. Of those, 382 have been operated.
27 (7%) cases were diagnosed and treated for correcting the dorsal hiperkyphosis and the remaining 93% for deformities in frontal plane, scoliosis.
We have been using the Moss Miami instrumentation for 2 years and we have reached the conclusion that in comparison with other instrumentation systems that we use, Moss Miami offered the best results for treatment of dorsal hiperkyphosis.
The paper describes 3 cases treated with Moss Miami instrumentation and highlight the benefits that this instrumentation offers against other techniques.

010

SAGITTAL CURVES OF THE SPINE AFTER CD AND VDS INSTRUMENTATION FOR THORACIC AND LUMBAR IDIOPATHIC ADOLESCENT SCOLIOSIS

Albena Maneva Krstevsk, *Private medical Offices, Skopje*

INTRODUCTION: Restauration of the spinal balance remains the ultimate goal of spinal surgery in scoliotic deformities. With CD or other segmental instrumentation we can realize fusion achieving sagittal realignement of the spine.
The analysis of several radiographic parameters was done in order to monitor in the long term, the new biomechanical balance of the spine and to focus the possible onset of disc disease at lower end of the fusion.
Aim of the study was to evaluate the mechanical compensatory changes after CD and VDS Instrumantation located at the lower end of the fusion area.
MATERIALS AND METHODS: The study group comprised 15 girls and 7 boys. Average age at surgery was 14 years/min. 11, max. 21/, while current average age is 17/min. 13 and max. 25/.
Instrumentation was performed using hooks, screws by anterior or posterior approach.
Men follow-up was 36 months.
For all patients, a comparison was made using x-rays made before and after surgery.
Radiographic parameters: Primary curve angle/Cobb method/, frontal tilting of L4, Kyphosis curve value,Lordosis curve vaslue, Sagital tilting of sacral endplate,Lumbar discal angles.

RESULTS

1. The initial angle of primary curves was 61 degrees, reached values of 32 degrees post-operatively and 38 degrees at the last check-up. Compensatory lumbar curve with initial value of 45 degrees was reduced to 24 post operatively and to 27 at the last x-rays. There is a statistically significant difference between the means the 3 variables at the 95% confidence lavel.
2. Frontal tilting angle of L4 from initial value of 15, reached 9 post operatively, 11 at the last check-up. T- test shows significant differences amongst the column means.
3. Initial angle of kyphosis was 13 and the last value 29. There is a statistically significant T-test for kyphosis and not for lordosis.
4. The angle between the endplate of sacrum and horizontal plane was in all cases within the normal range with an average value of 43 degrees.
5. In all cases the datas on the values of different lumbar discs angles before and after surgery, show increase which is statistically not significant, except the values of L5-S1

CONCLUSIONS: Fusion surgery performed using segmental instrumentation, imposis on the spine brusque biomechanical changes in the instrumented area and thereafter in the areas above and below.
Post-operatively the trunk re-balance is obtained mainly within the first six months and generally continues for up to two years. Postoperative changes of lumbar spine under CD and VDS Instrumentation is in direct relation with new mechanical conditions. Progressive discal re-expansion reduces the risc of a degenerative disease of the discs under segmental instrumentation.

011

CONVEX HEMIEPIPHYSIODESIS, HEMIVCERTEBRECTOMY AND COMPRESSION INSTRUMENTION FOR CONGENITAL SCOLIOSIS

Djerov, A., L. Stokov, A. Parushev, D. Dikov, P. Tanchev
University Hospital For Orthopedics – Sofia, Bulgaria

The authors shear their experience with surgical treatment of congenital scoloisis. A group of 19 patients is reviewed. The average age is 8 y. and 6m. (ranged from 3 y.to 14y). The patients have been treated using Eggshell procedure and Zielke instrumentation.. The follow up is from 3 to 86 mts. This postoperative follow up shows scoliotic curve arrest and maintaining of received correction.

012

PREVENTION PROGRAM IN PHYSICAL EDUCATION IN SCHOOLS – ACTION OF THE HUNGARIAN GOVERNMENT: „NATIONAL PUBLIC HEALTH PROGRAM"

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PURPOSE: The „National Public Health Program" was launched by the Hungarian Government in 2001. This includes beside others a prevention program for school-children, in which teachers of physical education are taught posture correcting exercises, so that they use them regularly in physical education, to automize and maintain the correct posture of all school children. To show efficacy of regularly made posture correcting exercises, a controlled study was made in school-year 2001/2002 in Békéscsaba.
RELEVANCE: The special exercises focusing on the correct position of the pelvis and on the proper muscle balance, were developed by the Association of Hungarian Physiotherapists. The prevention program is supported by the Ministry of Health since 1995, leader of the prevention program is the Hungarian Spine Society. Till 2004. January 7772 teachers of physical education from 3715 schools and kindergartens have learned the preventive exercises, and 51.475 muscle tests of 32.831 children show, that only 11 % of tested children had correct muscle balance (www.gerinces.hu).
SUBJECTS: The exercise material is based on 12, muscle-testing exercises, to show if postural muscles are short or weak. These muscle tests were done in 418 school-children, from which 201 regularly made posture correcting exercises in physical education, the other 217 school-children took part in physical education without posture correcting exercises.
METHODS AND MATERIALS: In each child 12 test-exercises of postural muscles were done by an independent physiotherapist twice in the school-year 2201/2002; two teachers of physical education made posture correcting exercises with children in the test group as part of usual physical education, one teacher of physical education was doing usual program in physical education without posture correcting exercises.
ANALYSES: Data were collected by testing physiotherapist, after computer-assisted summarization khi square test was done.
RESULTS: 187 (97 %) of children doing postural exercises showed improvement in their muscle-status, while only 83 (38%) improved in control group. The improvement according to regularly applied postural exercises used in physical education for school-children was significant (p less than 0,01).
CONCLUSION: The Hungarian initiative to reduce risks of sedentary lifestyle in childhood with a general settling available for all children is quite unique as it bases on teachers of physical education. Target setting of the prevention program – to apply posture correcting exercises in physical education in all schools – prooved to be correct.

013

BENEFIT AND PROBLEMS OF THE SCOLIOSIS SURGERY BY ISOLA INSTRUMENTATION.

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INTRODUCTION: It has been found that adolescent idiopathic scoliosis (AIS) progressed above 40° Cobb angle is significantly corrected by ISOLA instrumentation with fusion . The main Principe of correction is sagittal translation. Goals of surgery are coronal and sagittal correction short fusion , spine , shoulder and pelvis balance and rib hump reduction.

PURPOSE: In retrospective study ISOLA instrumented idiopathic scoliotic patients were reviewed to evaluate curve size correction, benefit and problems of instrumentation in 5 years follow up. We observe waiting time for operation too.

Patients and Methods: 36 (6 male, 30 female) AIS patients were surgically treated using posterior ISOLA instrumentation during 1999. The distribution of patients according King –Moe(KM) classification was: KM I type-3 , KM type II -12, KM type III-12, KM type IV-5, KM type V- 4. All instrumented spines were evaluated clinically and size of curve measured on AP and lateral X-rays by Cobb-Lippman method preoperatively , post surgically and 5 years follow up. Postoperative bracing was for 6 months.

RESULTS: Mean age at operation of 36 patients was 15, 5 (12-16, 5) years. Cobb angle at indication time was 57, 2° (37-98°). Mean waiting time for surgery was 15, 5 (6-34) months. Worsening of curves during this time was mean on the curve size 69, 2° (45-112°) preop. Mean correction of curves was 33, 7° (21-62°) on postoperative X-rays. 5-years follow up mean corrected curve was 33, 7° (13- 60°). Loss of correction in 5 years follow up was mean 3° (0-19°). Complication were 2 upper hook loosening, 1 wire break , 1 superficial wound infection and 1 L4 nerve root partial lesion in 6 weeks recovered.

CONCLUSION: We indicated patients for surgery immediately after clinical evaluation in our department. Many patients were coming with large curves for the first visit and insufficiency of financial covering of instrumentations was prolonged waiting time for operation. Problems of ISOLA instrumentation can be loosening of upper hooks, small or no derotation correction, relative higher profile of transpedicular screws, small concave rod rotation during correction into the curve concavity. Benefits are gradual translational curve correction, elasticity of instrumentation, possibility to install it T1-S2 and very small metalosis.

014

THE CAB HOOK AND THE "SPINE KNOWS BETTER" TECHNIQUE IN SCOLIOSIS SURGERY.

Dr. Csernátony Zoltán, Manó Sándor, Pálinkás Judit

AIM: Cotrel and Dubousset introduced the concept of derotation in scoliosis surgery and presented the CD system in 1984. Its aim was correction of curvatures using implants linked to two longitudinal rods, which are first rotated then interconnected. Since then numerous systems following the CD principle have appeared in clinical practice, which have resulted in further improvement of both implants and surgical technique. Even with these new techniques in several series a significant amount of residual postoperative pathological rotation has been reported. The point of the surgery is the placement of different hooks on the vertebrae, then adapting them to two longitudinal rods placed on either side of the spine, then rotating and in situ modeling of the rods, and finally securing the rods to the hooks and to each other. It must be borne in mind that by significantly reducing the frontal and sagittal plane curvatures of scoliosis, the relative rotation is often increased.

METHOD: We report on the design concept, initial biomechanical assessment and surgical technique related to a new type of dorsal complementary implant that can be used with all systems based on the CD principle. It provides simultaneous correction of all components of the three dimensional displacements of the vertebrae and also simplifies the surgical technique. Based on the abbreviation of its French name: "Crochets à Appui Bilatéral" (Bilaterally Pushing Hooks) the implant has been called the CAB.

RESULTS: During the development of the so called CAB hooks it became obvious that the new implant requires a new surgical technique. Its aim is aligning the spine by aligning the CAB hooks inserted at all instrumented levels into the same anatomical structures, and by exerting a continuous force. That way the soft tissue relaxation assures a less stressing correctional displacement.

CONCLUSION: This way it's not the surgeon, but the spine which decides what segment of the spine at which moment will yield under a constant correcting force. That is the reason we gave the name "The Spine Knows Better (SKB)" to our technique.

015

SURGICAL TREATMENT OF THE ADULT IDIOPATHIC SCOLIOSIS WITH SEGMENTARY INSTRUMENTATION

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The segmentary instrumentation was introduced for the first time in our country in 1996 by Prof. Antonescu at Foisor Hospital. Since then we have been using as implants the USS and the XIA (actually the two major world trends regarding the derotation). The adult idiopathic scoliosis brings along difficult indication problems of operation and treatment different from the adolescent idiopathic scoliosis. We have been operating on 48 adult scoliosis between 1996-2003.

The patients were observed preoperatory for organizing the criteria of surgical indication and after surgery they were followed clinically and with x-rays at 3, 6 months and 1 year, and then regularly each year. The scoliosis curve was classified according to Lenke and Clements criteria and the fusion zone was elected by using the Cotrel Dubousset criteria modified for the adult.

The correction obtained was of at least 10% and at most 62% with a mean of 48%. At the annual follow-up the loss of correction was at 5%. The loss of correction was not noticed after the first year.

The study is presenting our experience in the adult idiopathic scoliosis.

016

PARTIAL SACRALISATION OF L5- DIAGNOSIS, CLASSIFICATION AND TREATMENT

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The aim of current presentation is to focus on some problems related to partial sacralisation of L5. We have used Borsalino's classification of the morphological types of this condition. Two new methods added to the classical operative technique of Putti-Skaglieti are described. Those are related to a surgical approach and osteoplastic desinsertion of the lumbar muscles with an aim to preserve the sensory innervation in the gluteal region and to ensure better reinsertion of the lumbar muscles.

017

SPINE SURGERY OF THE ELDERLY

R Cavagna MD

Surgery of the aged spine is a new challenge for the future. The quality of life and the medicine advances allow to more and more old patients to be operated for severe spine diseases.

This surgery offers a new and difficult challenge. The local conditions are very poor because the degenerative evolution: on articular processes, discs, ligaments, muscles. In addition the osteoporosis is frequent and severe.

For these reasons it is often difficult to reduce and/or stabilize the deformations with classical instrumentations.

An other point is the frequent apparition of side effects (fracture, discopathy, and arthropathy) after a rigid instrumentation.

A first experimentation between 1992 and 1998 was made on more than 400 cases with thin rods (3mm diameter) and seemed to be a possible solution on degenerative spine diseases. But because a high rate of failure (8 %) we decided to develop a new instrumentation with Medtronic adapted for poor local conditions.

This instrumentation is based on thin rods (3.6mm) and special screws allowing a solid but less rigid fixation. The research was performed with finite element analysis and mechanical tests. The clinical study began in 2001 and after more than 150 cases seems to be an available solution.

We observed on theses cases a great possibility of correction and stabilization with a low rate of failures and side effects. The clinical results are also very encouraging with a significative decrease of back pain after surgery.

The last point is the indication and the technical approach of the correction of deformations which is particular in aged spine. The targets are different in old patients and younger. The main goal in the elderly is a pain free stabilization and not a perfect correction of the spine.

The development of this special surgery for the next years is a very exciting challenge for spine surgeons.

018

SEMIRIGID STABILIZATION OF THE AGING SPINE

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019

SURGICAL TREATMENT OF DEGENERATIVE LUMBAR SPINAL STENOSIS

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The classic clinical findings of middle-aged and older adults with lumbar spinal stenosis are back and leg pain during standing and walking. Leg pain is increased with more walking ("neurogenic claudication") and aggravated by hyperextension of lumbar spine.

Many pathologic changes can cause lumbar spinal stenosis. Degenerative stenosis is a progressive narrowing of the lumbar spinal canal caused by facet and ligamentum flavum hypertrophy and dorsal osteophyte formation.

Only patients with clinically mild and moderate lumbar stenosis can be treated conservatively.

Considering surgical treatment, we decided to use a concept from Hansraj and co-workers, and divide patients with lumbar spinal stenosis into two groups.

Typical lumbar spinal stenosis is classified in patients who did not undergo previous lumbar spinal surgery, who do not have radiographic evidence of instability, who have degenerative spondylolisthesis at most grade 1, without instability, and who have degenerative scoliosis with a curve less than 20°. These patients are treated with decompressive surgery only.

Complex lumbar spinal stenosis is classified in patients with previous lumbar spine operations with evidence of radiographic instability, radiographic evidence of adjacent segment stenosis after surgery, radiographic evidence of preoperative instability or intraoperative creation of iatrogenic instability, degenerative spondylolisthesis more than grade 1, with instability and degenerative scoliosis, with a curve greater than 20°. These patients are treated with decompression, fusion and instrumentation.

Current techniques of decompression of the lumbar spine and some controversies about surgical treatment are discussed.

020

CANTILEVER-TLIF" FOR DEGENERATIVE PATHOLOGIES

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AIMS: The „Cantilever-TLIF" is the standard technique of transforaminal interbody lumbar fusions in our institute. Our presentation shows the indication, the surgical technique of „Cantilever-TLIF" in details and the combinations of IBS (Interbody Spacer) and flexible transpedicular implantation system performed by us.

METHODS: In the well-known TLIF procedure intervertebral spacer (Interbody Spacer-IBS) ensures the continuity of ventral support of the spinal column and behind the spacer morsalised bone graft ensures the bony fusion in the disc space. We choose to analyse the result of those 164 operations (1995-2003) which we are performed at single level primary degenerative cases in L-IV/V segment, the follow up of which was minimum 4 years. Also the technical pitfalls and the postoperative complications were analysed.

RESULTS: The radiological evaluation showed 92% bony fusion within one year in correlation with good clinical result.

CONCLUSIONS: The „Cantilever-TLIF" surgical technique using combinations of IBS, bone graft and flexible transpedicular implant ensures optimal biomechanical environment for ventral support (IBS) and the bony incorporation (bone graft).

021

OPERATIVE TREATEMENT OF DEGENERATIVE LUMBAR SPINAL STENOSIS OUR EXPIRIENCE

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INTRODUCTION: Verbiest introduced the concept of spinal stenosis and brought it to the attention of the medical world. Degenerative lumbar spinal stenosis is clinical condition and not a radiologic finding or diagnosis. With aging of the population, the incidence of surgical treatement of the lumbar spinal stenosis will go up. In spinal stenosis with degenerative spondylolisthesis, degenerative scoliosis and instabiliti, several studies have shown that decompression combined with stabilisation and fusion significantly improves patient outcome as compared to decompression alone.
Materials and methods: In the period of 2001-2003 years, 40 patients (9 males,31 females, mean age 56 years)with degenerative lumbar spinal stenosis underwent two separate and different decompressive , stabilisation and fusion procedures (PLIF and posterior decompression stabilisation and intertransversal fusion). In all patients, pre operative plain X-ray, CT, MRI or lumbar myelogram were obtained. 15 aquired stenosis, 12 spondylolisthesis, 6 degenerative scoliosis and 7 postoperative instabilities with stenosis(failed back surgery). The Oswestry disabling index, neurological status, 3 question depressive scale,plain films, CT pre and post OP were used in all patients to evaluate the surgical outcome.
RESULTS: The average duration of the pre operative simptoms are 14 months.
The simptoms can be (pain, numbness, restriction of exstension movement of the lumbosacral spine, weakness of the calf and peroneal musculature). All patients had prolonged medication and phisical therapy treatement before surgery and 7 patinets had laminectomy due too discus hernia.
10 patinets had PLIF instrumentation and the others 30 patinets had posterior decompression transpedicular stabilisation and intertransversal fusion.
Complete follow up of type of spinal stenosis surgery, lenght of hospital stay, complication rate, lost of blood during and after the operation, duration of operative time, neurological status and disability status pre and post OP are evaluate.
CONCLUSION: These two separate and different surgical procedures proved to be effective in the treatement of the DLSS.There is no significantly differences between them comparing lenght of hospital stay, lost of blood, duration of the operating time,neurological status and disability status pre and post OP.

022

LASER DISC DECOMPRESSION

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AIMS: A summary of the patient selection criteria, the method and two year results are presented.
METHODS: We have used Holmium Laser to decompress contained lumbar disc bulges at our unit since 1997. The patient selection was careful, included physical, psychological, MRI and discographic asessment.
RESULTS: We operated on 92 discs of 87 patients with this method. 73 patients fulfilled the two-year follow-up. Non of the patiens become worse and 71 percent become significantly better.
CONCLUSION: We offer this method to be used on selected patient group. It may be an alternative for longstanding conservative tretment.

023

CHARITÉ LUMBAR DISC PROSTHESIS

M.Gorensek, J.Vengust
(Ljubljana, Slovenia)

024

NOVEL APPROACH TO MEASURE INTERVERTEBRAL DISC HEIGHT

Emir Kamaric, Oscar Yeh

Disc height is important clinically because it has been associated with multiple variables of lower back pain; however there are a number of difficulties involved with its accurate measurement. Disc height varies spatially throughout the transverse plane and is largely dependent on the orientation of the imaging equipment relative to the patient. While normalizing methods have been introduced to correct for obliqued images, it is generally accepted that there are errors involved with making precise measurements from 2D radiographs. Further, this lack of repeatability makes it difficult to perform serial studies of disc height. CT reconstructions can address these inaccuracies by providing a complete 3D description of the inter-vertebral space that permits calculations of disc height at any location as well as total disc volume. We applied this approach to study post-operative disc height changes in discectomy patients using a single, effective measure by associating disc volume with disc height. CT based disc volume and height were calculated for 20 discectomy patients at multiple follow-ups. While moderately correlated with traditional disc height measurements from radiographs (r=0.71 for volume and 0.78 for height), the advantage of this CT based method is that it is independent of patient position and void of the inaccuracies associated with measurements from 2D radiographs. For functional assessment, CT scans should be obtained in combination with a loading frame that simulates the standing position.

025

DISC

COLLAPSE FOLLOWING DISCECTOMY USING A NOVEL APPROACH TO MEASURE INTERVERTEBRAL DISC HEIGHT

Milorad Vilendecic, Emir Kamaric, Oscar Yeh

Disc height is important clinically because it has been associated with multiple variables of lower back pain; however there are a number of difficulties involved with its accurate measurement. Disc height varies spatially throughout the transverse plane and is largely dependent on the orientation of the imaging equipment relative to the patient. CT reconstructions can address these inaccuracies by providing a complete 3D description of the inter-vertebral space that permits calculations of disc height at any location as well as total disc volume. We applied this approach, in combination with associating disc volume with disc height, to study post-operative disc height changes in discectomy patients.

Accuracy of our CT based disc height measurement was verified using a cadaveric spine. Scans were obtained oblique to the endplate, and the maximum distance between transverse processes at each level from L1 to L4 was calculated and then compared with physical caliper measurements. Average error in all measurements of the cadaveric spine was less than 0.5%. CT scans of 20 discectomy patients were obtained pre-operatively, and at 6 weeks, 3 months, 6 months, and 9 months post-operatively. Six height measurements were calculated at different locations within the transverse plane of the disc and then averaged together.

Patients undergoing discectomies lost disc height following surgery. The average initial collapse of approximately 25% occurred within the initial 6 weeks. By 9 months, nearly 40% of the pre-operative disc height was lost.

As studies have associated low disc height with back pain, our data warrant therapies or devices that are able to maintain disc height. We are currently gaining initial clinical experience that suggest that an annular closure device can successfully maintain, or even increase, disc height in discectomy patients.

026

IS THE ANTERIOR DECOMPRESSION SUFFICIENT FOR NEUROLOGICAL RECOVERY IN ALL LOW LUMBAR BURST FRACTURES?

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INTRODUCTION: Low lumbar burst fractures (L3-L5) represents the small percentage of all spine fractures. Treatment of fractures involving low lumbar spine has been controversial. The aim of this retrospective study was to determine the incidence of dural tear in patients who had low lumbar burst fractures with greenstick lamina fractures and the importance of greenstick lamina fractures in choosing treatment modality.

PATIENTS AND METHODS: Twenty-six patients with low lumbar burst fractures were treated from 1995 through 2001. All the patients with burst fractures with greenstick lamina fracture were explored by the open book laminoplasty technique with the posterior approach; then, if there was any dural tear and nerve root entrapment, it was repaired. After the posterior stabilization (if indicated) anterior decompression and fusion were performed. Functional results for all patients were based on comparison of the patients' occupational and recreational status before the injury and after it. These results were classified as excellent, good, fair or poor according to Smiley-Webster Scale.

RESULTS: Twenty-six patients (twenty-eight low lumbar burst fractures) were treated with an average follow-up of 40 months (12-80 months). Female to male ratio was 5/21 and mean age was 37 years (17-64). Five of the patients were treated conservatively by immobilization for averagely 3 months in a thoracolumbar orthosis. The remaining cases underwent surgery. Indications for surgery were neurological impairment in 9 patients and/or instability/deformity in 14 patients. Of the surgically treated group, 2 patients were treated with anterior, 10 patients with posterior and 9 patients with combined approach. Seven patients with low lumbar burst fractures had traumatic dural tears and extravasation of the nerve roots outside the dural sac which were entrapped between the edges of green stick lamina fractures. All patients with green stick lamina fractures underwent open book laminectomy, replacement of the roots within the dural sac and primary dural repair in addition to instrumentation and fusion procedures. Six patients showed complete neurological recovery in follow-up and one was neurologically intact prior to surgery and remained same. The functional outcome of the entire study group was assessed using the Smiley-Webster Scale. Good to excellent results were obtained in 24 (92%) of 26 patients (100% for nonoperative group, 90% for operative group).

CONCLUSION: Lumbar burst fractures with greenstick lamina fractures occur mostly in the L2-L4 area. In the surgical treatment, any reduction maneuver will close the greenstick lamina fracture and crush the entrapped neural elements. So, it is very important to explore the greenstick lamina fracture whether there is any neural entrapment or not before any reduction maneuver is done.

027

ANTERIOR SPINAL PATHOLOGY TO THE UPPER THORACIC (T2-T4) SEGMENT-HOW SHOULD IT BE APPROACHED

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Anterior spinal pathology of the upper thoracic (T2-T4) segment is rare. The surgical approach is still controversial. Anterior neck approach with partial osteotomy of the sternum and high latero-posterior thoracotomy are insufficient to approach this segment. THE PURPOSE of this study is to present our experience with sternotomy as a approach in the surgical treatment of spinal pathology in the upper thoracic (T1-T4) segment.
MATERIAL AND METHODS: Between 2000 and 2003, seven patients with anterior spinal pathology in the upper thoracic segment were surgically treated. From all patients, 4 were female and 3 male. The age ranged from 52 to 62 years.
The anterior spinal pathology localisation was in 3 patient in T2, in 2 in T3 and in other 2 patients in both T2 and T3. Neurologic deficit was evaluated by Frankel Scale (one case was graded as grade A2; 2 patients as B; 3 as C and one as grade D). The diagnosis in all patients was done by protocol which included: standard radiographic films (AP and lateral view); CT; MRI; bone scan and other rutine investigations. Sternotomy as a approach was used in all patients to expose the upper thoracic (T2-T4) segment. Corporectomy, extirpation of the local tumorous mass; decompression of the spinal canal and neural elements was done. The defect between T1 and T3-T4 was bridget with threecortical iliac crest bone graft. In 4 cases fixation with anterior plate was also done. Histologically in 2 patients was found metastasis of carcinoma of thyroid gland foliculocellularis type; in 3 patient solitary plasmocytoma, one giant cell tumor and one invasive chondroma. All patients after surgery were transfered to the Oncology Center for other treatment. Neurologic recovery was registered in all patients except one. The patient with grade A2 and B transfered to grade D; the patient with grade C and D to grade E. One patient died 2 months after surgery. The solid fusion happened in all patients except one.
CONCLUSION:

- Sternotomy is a safe approach to the upper thoracic (T2-T4) segment with possibility of direct visualisation of pathologic process and radical extirpation of the tumorous mass.
- Early decompression of the spinal canal and neural elements by corporectomy and extirpation of tumorous mass is mandatory for neurologic recovery.

028

INTEROBSERVER RELIABILITY IN EVALUATING THE PEDICLE SCREW POSITION IN A MODIFIED TECHNIQUE FOR PEDICLE SCREW INSERTION

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BACKGROUND CONTEXT: In order to determine the spinal pedicle anatomy and safe techniques to insert pedicle screws numerous cadaveric and radiological studies are reported. In this study, a modified technique to insert pedicle screw is described and the reliability is assessed with plain radiographs and computed tomography (CT) scans.

PURPOSE: The aim of this study is to modify pedicle screw insertion technique which does not necessitate high cost equipments and to show inter-observer reliability in assessing pedicle screw position and assess the inter-observer reliability in determining the pedicle screw position either with plain radiographs and CT scans.

STUDY DESIGN: This technique is applied to 27 patients with various pathologies. Totally 201 pedicle screws were inserted. After preparation of pedicle entry holes, drawing pins with 6 mm spike and head with 5 mm radius are inserted into the entry holes and fluoroscopic control was done. A 1.2 mm semi-flexible K-wire with 1.6 mm ball at the end was tapped into the trabecular bone of the pedicle manually. Cannulated tapper was used to prepare the pedicle screw pathway. Pedicle feeler is used to control the pathway. After insertion of all screws, anterior and posterior fluoroscopy control was used to asses screw positions.

PATIENT SAMPLE: Mean age of the patients was 33 years (range, 3-63).

OUTCOME MEASURES: Postoperatively all x-rays and CT scans were reviewed by two independent radiologists and by two independent orthopedic surgeons blindly.

RESULTS: The range of mal-positioned screws is between 6.5% and 32.8% in plain radiographs and is between 3.5% and 6.5% in CT scans according to each observer. In plain radiographs rate of mal-positioned screws in upper thoracic, lower thoracic and lumbosacral spine segments are between 3.8% - 39.6%, 10.0% - 36.3%, 4.4% - 23.5% respectively. In CT scans rate of mal-positioned screws in upper thoracic, thoracic and lumbosacral spine segments are between 3.8% - 13.2%, 2.5% - 8.8%, 0% respectively.

CONCLUSION: We believe that this modified technique is simple and suitable for the orthopedic surgeons. However, it is unreliable to assess the screw positions especially only with plain radiographs so that the rate of mal-positioned screws may be high when assessed by different observers.

029

OUR TRIPLE STEP OPERATIVE TREATMENT OF THE FRACTURES IN LUMBAR REGION

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Trauma of lumbar spine is a part of our everyday practice in Spinal Center
Since sixties double Harrington instrumentation served as a main device fixation for stabilization of spinal traumatic disorders. In mean time various instrumental fixation were used. Since 2001 in our Institute 34 patients with lumbar spine fractures were treated using pedicle screw fixation combined with decompression of spinal canal and inter transversal fusion.
Among these patients 10 had associated injuries 5 with multi level spinal fractures 9 were with neurological deficit of various outstanding
In preoperative planning we used standard radiographs, tomograms, CT or NMR imaging to assess the dural sac, the neural elements, and include the presence or absence of disco-ligamentous injury
Aim of our treatment was to provide stabile fixation using only adjacent and fractured segment if possibly, with good decompression and to obtained solid fusion.
If there were no neurological deficit after operation early physical therapy were performed. In some cases where the heavy burst fractured occurred we performed external fixation with lumbar orthosis until fusion was complete.
After two years we performed extraction of instrumentation applied on lumbar spine
Our triple step: pedicle screw fixation, inter transversal fusion and decompression in patient with neurological malfunction give good result with no complication such as braking screw and neurological worsening Despite risks it is our experience that when performed properly and for the right indications it is long term reliable and safe method of treatment the traumatized spine.

030

THE IMPORTANCE OF REDUCTION OF ANTERIOR SLIP OF VERTEBRAL BODY IN SPONDYLOLISTHESIS OF THE LOWER LUMBAR SPINE

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The anterior slip of vertebral body in lover lumbar spine area leads to significant changes in the position of body weight centre line, and consequently to the changes in the whole body balance. This condition causes significant shear forces in involved vertebral dynamic segment. Mathematical model shows that the results of operative fusion could be better in the case of complete reduction of anterior vertebral body slip. We made a retrospective analysis of the results of operative treatment of patients with grade II or I spondylolisthesis of lover lumbar spine.

During five-year period we treated 122 patients with spondylolisthesis of the lover lumbar spine. 83 patients had anterolisthesis of L5/S1 segment and 39 patients had the same change in L4/5 segment. Average slip was 19 mm. We treated operatively 58 patients. 39 patients had instrumentation in involved and cranial adjacent dynamic segment, while 19 patients had instrumentation in just one segment. 50 patients had circumferential fusion in involved dynamic segment.

By seventeen patients the zero correction was achieved. Achievement of full correction was more frequent in later phase of patient series. There was no correlation between the initial slip and zero correction achievement. In patients with full correction there was less incidence of instrumentation failure, shortened was the time needed for anterior inter-body block formation, with significant reduction in duration of postoperative restrictions.

We conclude that it is highly recommendable to try to achieve a complete reduction of anterior slip of vertebral body, considering that the reduction manoeuvre can be finished with compression of the segment with presumed reduction and fusion, having in consideration restoration of normal lumbar lordosis. Full correction will minimize the shear forces in instrumented segment, with potentially earlier functional recovery and early restoration of full load bearing capacity.

031

SURGICAL TREATMENT OF SPINAL METASTASES

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032

SURGICAL TREATMENT OF SACROCOCCYGEAL CHORDOMA

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AIMS: Chordoma is an uncommon malignant tumour with developing the remnants of notochord and usually manifesting itself in patients in their forties and fifties, aggressive local tumour in some cases resulting metastatic progression and might its histological picture show malignancy in long-lived patients. The objective are the presentation of the surgical technique of wide resection in the sacrococcygeal region, discuss the technical aspects of body wall reconstruction and presentation the long-term results of the surgical treatment of sacrococcygeal chordoma in our department.
METHODS: Although we have treated 48 patients surgically between 1992 and 2004, this lecture includes 37 patients with at least 2 years follow-up. We applied wide resection in all cases and if it was necessary, reconstruction of the body wall was performed by inserting metal wire frame and artificial fascia layer.
RESULTS: We performed 48 wide resection, in 28 cases combined with reconstruction. Most of the patients have had local pain and 26 patients have had preoperatíve neurological symptoms. It was attained significant local pain relief in 90 percent of the patients and in 77 percent of the patients improvement of the neurological symptoms. Due to radiologically proved local recurrence of the tumour in twelve cases we had to perform second, and in two cases third surgery.
CONCLUSION: The wide resection of sacrococcygeal chordoma following with reconstruction of the body wall is a well designed and safe surgical procedure which results long survival in combining in certain cases with chemotherapy.

033

POSSIBILITIES OF THE BODY WALL RECONSTRUCTION AFTER EXTENDED RESECTION OF SACROCOCCYGEAL TUMOURS

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Soft tissues of sacroccoccygeal region are often involved by tumors of this region. During resection of these inifiltrative growing tumors we have to create a very closed operation plan apapted to the physical status of patient. Covering of soft tissue defects after resection can be very difficult in some of cases.In our clinic we created a group in wich orthopedic, spinal, and plastic surgeon work in very closed cooperation in individual cases of extended resection of sacrococcygeal tumors. In our presentation we show some cases from our cooperative practical work.

034

INITIAL EXPERIENCE OF PERCUTANOUS VERTEBROPLASTY

Zs. Kulcsár, I. Szikora, R. Veres, I. Nyári
(Budapest, Hungary)

035

ASSESMENT OF 20 YEARS EXPERIENCE WITH DEGENERATIVE CERVICAL SPINE

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Cervical spondylosis is a result of degenerative processes in the soft tissue and bone structure of the cervical spine. These changes are largely related to population at 50 years of age.

Our clinical experience with the treatment of degenerative cervical spine is over 20 years. During this time was operated in the clinic more than 1400 patients and out of this group about 800 hundred presented sever clinical symptoms. Practically all patients with problems in the region of cervical spine were treated as spondylosis, however in this material we didn't included patients with simple soft disc. Patients with soft disc are statistically younger and they are more determinated for surgery than the patients with degenerative spine. Decision to perform surgical treatment is difficult but in a case of spine compression is necessary. For clinical evaluation all operated patients in this retrospective study were divided into three group:

I - patients with radiculopathy symptoms
II - patients with myelopathy symptoms
III - patients with radiculo-myelopathy symptoms

We choose an anterior approach as a best from the pathoanatomy presents. Posterior decompression was reserved only for secondary surgery in case when posterior elements compress the spine, but always after anterior decompression and stabilization. The results of treatment are very difficult to presents in one scale because are so many parameters to measure but for the patient most important is the level of neurological recovery. For us very important is not only to reach neurological improvement but also in very late cases to retain progress of disease.

In conclusion:

1. Anterior wide decompression and fusion is the best method
2. iI necessary - multilevel vertebrectomy must be performed
3. Not wait so long for symptoms – early treatment given better results

In a case of sever stenosis – posterior decompression as secondary

036

MANAGEMENT OF C1-C2 INSTABILITY

Robert Veres, MD, PhD

The occipital bone around the foramen magnum, the atlas and the axis forms a functional unit, the cranio-vertebral junction (CVJ). Advances in surgical techniques in the past decade substantially improved the treatment options and the surgical outcome. Various pathological processes of this region can lead to compression of neural elements and to instability. Therefore the aim of intervention is restoration of original anatomical conditions, keeping the functional performances as close to the physiological as possible.
Basics of CVJ biomechanics is discussed in detail elsewhere.
Etiological classification of the diseases of the craniocervical junction:

- Trauma
    - Atlanto-occipital instability
    - Fracture of the occipital condyle
    - Atlanto-axial instability (rotatory subluxation, anterior dislocation)
    - C1 fractures, Jefferson
    - C2 fractures: odontoid fractures, hangman's fractures, miscellaneous fractures
- Developmental anomalies and metabolic disorders (odontoid aplasia, assimilation of the atlas, transverse ligament laxity, Down syndrome, Klippel-Feil syndrome, skeletal dysplasias, osteogenesis imperfecta, neurofibromatosis, congenital scoliosis, Morquio sy.)
- Degenerative and inflammatory processes (e.g. Rheumatoid Arthritis, ankylosing spondylitis, psoriatic arthritis)
- Infections and specific inflammatory processes (e.g. pyogenic infection, TB, Aspergillosis)
- Tumors
    - Primary and metastatic bone tumors
    - Intradural, extramedullary tumors
    - Intramedullary tumors
- Iatrogenic instability

Diagnosis is based on clinical and radiological findings (X-ray, CT and MRI). Conservative treatment can be achieved by using external orthoses (collar, halo device). Surgical procedures include the following:

- C1-C2 fixation
    - Brook's, Gallie, Sonntag
    - C1-C2 transarticular screw fixation
    - C1 massa lateral screws, C2 transpedicular screws
    - Anterior fixation devices

Occipito-cervical desis

- Cable-rod constructs
- Screw-rod constructs

037

STABILISATION AND CORRECTION OF CERVICAL SPINAL DEFORMITIES IN DIFFERENT SPINE PATHOLOGIES

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Spinal deformities in cervical region are rather common after inadequate conservative or operative treatment in different pathologic conditions in cervical region.
The aim of this presentation is to present cases in children and adults where severe spinal deformities in cervical spine were treated with different operative procedure including halo traction and anterior or posterior surgery.

The final outcome and result proved that these procedures are effective and can stand the test of time. Since we did not have any complications they can be advocated as solutions for different conditions in cervical spine pathologies

038

BRYAN DISC PROSTHESIS FOR CERVICAL DEGENERATIVE PATHOLOGY

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AIMS: The Bryan Cervical Disc Prosthesis a new possibility of the surgical treatment of the degenerative disc disease. The concept of accelerated degeneration of adjacent disc levels as a consequence of increased stress caused byinterbody fusion of the cervical spine has been widely postulated. Therefore using this prosthesis should offer the same benefits as fusion, while simultaneously providing segmental motion.
METHODS: The Bryan Cervical Disc Prosthesis consists of a polyurethane nucleus which fits between two titanium alloy surface. At scheduled follow-up periods, the effectiveness of the device was characterized by evaluating patient's pain, neurological function.

RESULTS: Analysis included data regarding 19 operated patients. At six months follow there was no neurological deficit. No devise have been explanted or surgically revised.

CONCLUSIONS: Implantation of the cervical disc prosthesis is safe and the patients recover quickly. Restrictive postoperative management is not necessary. However, only after a long-terme follow up of at least 5 years will it becom clear whether the device remains functional.

039

MICRO-FORAMINOTOMY EXTENDED WITH PARTIAL PEDICULOTOMY FOR MINIMALLY INVASIVE TREATMENT OF DEGENERATIVE CERVICOBRACHIALGIA

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Currently the posterior approach undertaken to perform cervical foraminotomy provides sufficient exposure to treat the majority of lateral soft-disc herniations (sequestered) or osteophytes causing radiculopathy. Though the compressive disease is anterior to the nerve root, in most cases, the small exposure provided by the standard micro-foraminotomy is adequate to excise the offending disc fragment or osteophyte without disruption of the epidural venous plexus or without requiring undue retraction on the nerve root. The risk of developing adjacent-level disease is also minimized as no subsequent fusion is performed.

In a significant number of cases, however, complete resection of soft-disc fragments and osteophytes cannot be performed without excessive retraction on the nerve root, which may exacerbate the preexisting radiculopathy or increase intraoperative blood loss, obscuring the surgical field.

When this occurs, partial removal of the superomedial portion of the inferior pedicle allows for easier and more complete excision of the compressive lesion and, additionally, enlarges the neural foramen and provides a more complete decompression in cases of ostephytic foraminal stenosis.

INDICATIONS: The posterior minimally invasive cervical approach is favored, at our institution, in patients in whom only neck and arm pain are present and in whom physical examination suggests a stenotic neural foramen, which is caused by a herniated nucleus pulposus (sequestrated) or uncovertebral joint spondylosis and confirmed by magnetic resonance imaging.

Patients who experience bilateral arm pain without myelopathy undergo bilateral foraminotomies.

Patients suffering from myelopathy or from a large central disc herniation or osteophyte causing either significant spinal cord compression and/or cord signal change on T2-weighted MRI are considered for anterior discectomy and instrumented fusion.

040

MULTIPLE MYELOMA OF THE SPINE

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AIMS: The autors report on the clinical course of 30 patients surgically treated for multiple myeloma of the spine. The objectives was to present the surgical technic and to evaluate neurological function, life quality and survival after surgery.
METHODS: Depending on compression alone of spinal cord and/or secondary instability of the spine, the 30 patients had undergone dorsal decompression, decompression and dorsal stabilization or intervertebral prothesis implantation and stabilization.
RESULTS: The impovement of life quality (evaluated by the Oswestry index), the pain relief using the visual analog scale and the changes in the neurological status are presented.
CONCLUSION: Surgical treatment of multiple myeloma of the spine seems to be an effective method to relaeve pain and improve life quality wich is very important rather than patients with multiple myeloma have much better survival perspectives than with vertebral metastasis from other malignancys.

041

PRIMARY TUMOURS OF CERVICAL SPINE

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SUMMARY

PURPOSE: This series presents a many-sided overview of the 40-years-experience of the Spine Surgery Department in collaboration with the Onco-orthopaedic Department of our hospital with the very rare primary tumours of the cervical spine.
MATERIALS AND METHODS: The study is a retrospective clinical and radiological analysis of all primary bone tumours (n=17) of the cervical spine treated in the period 1962-2002. The incidence was calculated on the basis of 2508 cases with primary bone tumours treated surgically in the period 1962-1992 (n=14). In the next 10 years 3 more cases were observed, making a total of 17. The diagnosis was confirmed histologically in every case. All the patients were treated surgically using vertebrectomy and anterior fusion (6 cases), vertebrectomy and combined anterior and posterior fusion (4 cases) and excison/curettage with or without posterior fusion/plombage (7 cases). Incidence, age and sex distribution, localization predilection, diagnosis making, surgical techniques, complications and outcome results were analysed.
RESULTS: An incidence of 0.56% for the primary bone tumours of the cervical spine was found. We observed 5 aneurysmal bone cysts (28 %), 3 osteochondromas (18 %), 2 solitary bone cysts (12%), 2 osteoblastomas (12%), 2 giant cell tumours (12%), 1 chordoma (6 %), 1 myeloma (6 %) and 1 chondromyxoid fibroma (6%). The localization was characteristic for some of the tumours: aneurysmal cysts – vertebral body and posterior elements, osteochondromas – posterior elements and transverse processes, osteoblastomas – posterior elements, chordoma – vertebral body, myeloma— vertebral body.
The surgical treatment provided good complication-free results in 70% (n = 12) of the patients, recurrences requiring reoperations with good end results – 12% (n=2), immediate postoperative - and late mortality rate - 18% (n=3).
CONCLUSION: Primary bone tumours of the cervical spine are extremely rare. Successful treatment requires prompt diagnosis, qualified surgery and postoperative care. Radical excision and adequate stabilization contribute to obtaining better results.

042

ANEURYSMAL BONE CYST OF THE CERVICAL SPINE – CASE REPORT

Ismet Gavrankapetanovic
Sarajevo

We presenting a case of 7 year old boy M.S. form Srebrenica (East Bosnia) admitted at hospital as painfull neck syndrome. We preformed rutinelly CT and MRI scan an they rewieiled tumor in region of body of 2nd cervical vertebrae Tumor destructed body of C2 .
TERATEMENT: We approached this region transorally and took specimen fo biopsy. Pathologist repost come as agresive anuerismatic bonny cist.
At secend step we perforemd couretage of the cyst and filling with bone plug. Consecutive irradiation then steped in. Child was imobilised with Minerva cast. Control MRI has shown filling of bonny defect.
Our dilema, we want to discuss with colleges is should we perform fixation or to follow the patient.

043

SURGICAL TREATMENT OF VERTEBRAL ANGIOMAS

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AIMS: According to statistics, vertebral angiomas are found in 10 to 15 % of the population. Despite the relatively high incidence, symptoms are rarely caused, usually it is diagnosed accidentally in patients who undergo investigations because of LBP.
METHODS: Surgical treatment in the cases of symptomatic vertebral haemangiomas is the same as the other pathologic fractures of the spine. Resection, replacement an stabilisation (depending on the localisation of the pathology) is the surgery of choice.
RESULTS: Between 1995 and 2003 we performed surgical treatment in vertebral angiomas in 24 cases. This presentation gives the details of the praeoperative symptoms, radiological and clinical results, with at least 2 yrs follow up.
CONCULIONS: Surgical treatment of vertebral angiomas causing neurological symptoms and/or pathological fractures is obvious. In all other cases the choice of treatment is subject to invidual jugdement.

044

PRIMARY SPINE TUMOURS OF THE CHILDHOOD

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