

## ENDOSCOPICALLY CHECKED TRANSPEDICULAR SCREW INSERTION

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**INTRODUCTION:** Transpedicular screws are one of the most important components of the posterior segmental fixation systems. The most feared complication of transpedicular screw insertion is the possibility of neural damage due to contact during insertion process or continuous irritation of the malpositioned screw on the neural structures. There are many reports in the literature about complications related directly to malpositioning of the transpedicular screws. Currently the position of the screws is checked by palpation of the pedicle walls by the help of a guide wire and fluoroscopic control. Our objective was to inspect the screw hole endoscopically would prevent malpositioning of the transpedicular screws and decrease complications related to them.

**MATERIALS AND METHODS:** Between 2003 and 2004, 20 consecutive patients who underwent segmental spinal fixation by transpedicular screws for a variety of reasons were included. A total of 76 screw holes were endoscopically examined prior to insertion of the screws.

**RESULTS:** In three screws anterior penetration of the holethrough the corpuscular wall was detected and a shorter screw was inserted. Lateral penetration of the vertebra was observed in one case and screw hole was re-routed. In another case osteopenic bone was visualized and the pedicle was grafted before insertion of the screw.

**CONCLUSIONS:** Complications due to malpositioned screws can be prevented by endoscopic visualization of the screw hole. Direct visualization of the hole aids in prevention of complications related to insertion of the screw through defective area. We believe, although it adds to the total operative time, avoiding the unpredictable complications worth the time spent.

Fig-1 Endoscopical view of intact bony lamellae.

Fig-2 Endoscopical view of anterior penetration of corpuscular wall.

## SAFETY AND SUCCESS OF PEDICLE SCREW INSERTION FOR HIGH AND MIDDLE THORACIC PATHOLOGIES

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**INTRODUCTION:** Pedicle screw fixation enables enhanced correction of spinal deformities. However, most authors prefer hook application in the high and middle thoracic levels for fear of neurologic complications with screws.

**MATERIAL AND METHODS:** Position of 99 screws applied in high and middle thoracic levels (T2 to T8) in 21 patients were retrospectively analyzed with radiographies and computed tomographies. Biplanar fluoroscopy was used at the T5 and above, and only lateral fluoroscopy could be used more distal levels because of the characteristics of the operation table. Diagnosis of the patients were spinal fractures in 8 patients, vertebral tumors in 8, and spondylitis in 5. Forty-nine screws were inserted into T2 to T5 (group 1), and 50 screws were inserted into the T6 to T8 (group 2).

**RESULTS:** There were 20 screw malpositions (20,2%) in 12 patients (57,1%). Ten of these were at T2 to T5, and 10 were at T6 to T8. Malposition rate was not statistically signi-

ficant between two groups in spite of advantage of biplanar fluoroscopy at the T5 and above ( $p=0,95$ ). The malpositions were inferior to the pedicle in one screw, lateral in 12, superior in one, and medial in three. All of these screws were located in the bodies of the vertebrae. However, 3 malpositioned screws were lateral to the pedicle and to the body.

There was not screw related neurologic complication. In one patient, 3 screws were revised because one of them was in the spinal canal. In the other patients, revision did not required for an average 14,3 months follow-up. Five patients with spinal metastasis were died 6 to 15 months after operation because of their primary disease. There was one dural tear (4,7%), and it was treated by lumbar spinal drainage. There was one superficial infection (4,7%), also.

**CONCLUSIONS:** Thoracic pedicle screw fixation in high and middle thoracic levels may be a reliable method of treating spinal pathologies in routinely used operation conditions.

**NEW TRANSPEDICULAR SCREW TECHNIQUE YIELDS VERY ACCURATE  
PLACEMENT, WITHOUT AN ASSIST DEVICE: EVALUATION OF 1636  
TRANSPEDICULAR SCREWS**

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This study reports a new transpedicular screw insertion point which resulted in a very low screw malposition rate in the placement of 1636 transpedicular screws

From 1997-2005, transpedicular screw-rod fixation systems were used in 327 patients with thoracolumbar and lumbar spine pathology (spondylolisthesis, trauma, tumor, infection, and congenital deformities). In these patients, we inserted the transpedicular screws in a new location, at the lowest portion of the lateral (superior) facet joint that would allow for screw insertion. Using this new location, 1636 transpedicular screws were placed under lateral and anteroposterior fluoroscopic guidance.

Positions of all screws were evaluated on the first postoperative day with screw-CT scans and direct x-rays. Screw location was categorized according to Youkilis's classification system. Only fourteen of 1636 screws (0.8%) significantly (class III) violated the pedicle wall: three medially and three laterally.

Transpedicular screw insertion at the lowest point possible on the lateral (superior) facet joint, without the use of any assist devices, results in a very low screw malposition rate. Assist devices are expensive, and are not necessary to achieve very low screw malposition rates.

## THE INCIDENCE OF LUMBOSACRAL TRANSITIONAL VERTEBRAE (ANATOMIC AND RADIOGRAPHIC STUDY)

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**OBJECTIVE:** Lumbosacral transitional vertebrae (LSTV) is a common finding in general population with a reported prevalence of 4-21 %. Their clinical significance is controversial with no consensus as to their relationship to low back pain or disc prolapse. A LSTV is one in which the last lumbar vertebra shows elongation of its transverse process, with varying degrees of fusion to the "first" sacral segment. The term LSTV is used to avoid having to decide whether the vertebra is a "sacralized L5" or a "lumbarized S1". In 1982, a classification system for LSTV was proposed by Castellvi et al., based on plain radiographic appearances. The purpose of this study was to determine the incidence of LSTV in our region.

**METHODS:** Lumbar anteroposterior radiographs of 223 patients attended to orthopaedics and neurosurgery outpatient clinics were evaluated for detection of LSTV. 28 of the patients were male and 195 were female. The mean age was 55.9 (range of age: 15-84) years. In addition to radiographic examination, 96 dry sacrum bones were also evaluated for LSTV.

**RESULTS:** Radiologic changes related to LSTV in the lumbar spine were noted 45 radiographs of 223 patients (20.1 %). Sacralization was detected in 21 patients (9.4%), and

lumbarization was detected in 24 patients (10.7%). Distribution of radiographically detected LSTV according to Castelvı classification system is below.

**Sacralization:  
21 (9.4%)**

Type 1a:A  
Type 1b:3  
Type 2a:8  
Type 2b:1  
Type 3a:0  
Type 3b:3  
Type 4:2

**Lumbarization:  
24 (10.7%)**

Type1:11  
Type 2a:4  
Type 2b:1  
Type 3a:2  
Type 3bA  
Type 4:2

Sacralization was determined in 9 of 96 dry sacrum bones. According to Castellvi classification system 2 sacrum were of type 4 and 7 sacrum belonged to type 3b.

**CONCLUSION:** Detailed evaluation of preoperative lumbosacral graphies in view of LSTV is essential in order to prevent unsuccessful surgery due to performing the operation in wrong space during lumbar disc surgery.

## OUR EXPERIENCES ABOUT PEDICULAR SCREWING TECHNIQUES

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**INTRODUCTION:** Spinal instrumentation is a progressive and a separate branch in vertebral surgery. In spinal surgery, surgeon must know the spinal anatomy and the vertebral structure well, because of the fact that the vertebral column's special structure and the relationship between the vertebral body and the neuronal components. Complications seen in vertebral surgery are about % 40. Decreasing the numbers of these complications depends on the surgeon's knowledge and experiences.

**MATERIALS AND METHODS:** In this retrospective study we have evaluated 8 patients (5 male-3 female) with the average age of 37.5 years (10-65) to whom revision operation applied. Patients had been operated in different clinics. Posterior fusion had been applied to all patients for the reason of fracture in five cases, scoliosis in two cases and spondylolisthesis in one case.

Fracture was detected at transpedicular screws and roots because of pseudoarthrosis caused by insufficient fusion and segment in five cases, separation between screws and the

vertebral body was detected in one case, pain and neurologic deficits caused by abnormal applying of transpedicular screws (extracorporeal, intervertebral disc, canalis medullaris, neuronal roots) were detected in four cases.

**FINDINGS:** Sufficient fusion in 3 cases, revision and reimplantation in 5 cases were seen in intraoperatively. Implants were taken out. Pain relieved in postoperative period; neurologic deficits disappeared in postoperative 3 months.

**CONCLUSION:** Pedicular screwing procedures used in vertebral fractures, spondylolisthesis, scoliosis, lordosis, kyphosis must be applied with a preoperative well planning and multidisciplinary approach. Although high technologic monitoring and imaging techniques are available, surgeon is face to face with patient and anatomic guides in operation. Knowledge and experimentation of surgeon comes will decrease the number of complications in pedicular screwing procedures.

## **PRELIMINARY EXPERIENCE WITH VERTEBROPLASTY IN THE TREATMENT OF DIFFERENT TYPES OF THORACO-LUMBAR FRACTURES**

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Although percutaneous treatment of osteoporotic fractures of the thoraco-lumbar area is at least two decades old, it has received widespread interest over the last five years.

Our group during the period January-December 2004 treated 20 patients with this technique using in all the cases Cortoss (Orthovita) that is known to have the same mechanical properties of human bone. Twelve patients were females, the mean age was 65 (range 59-83).

The majority of patients were treated for osteoporotic fractures (12 cases), 4 patients suffered from neoplastic fractures, three for acute compression fractures (grade A 1 in the Magerl classification) and one for vertebral angioma. The only clinical indication for treatment was local pain. A preoperative MRI or CT excluded the presence of bone fragment inside the canal and of a significant canal narrowing. Among the patients with osteoporotic fractures 3 had three levels treated, and 5 had two levels treated during the same procedure. All

the cases were performed under local anesthesia. Patient's outcome was scored using the VAS score obtained preoperatively, and at 1 and 3 months follow up. Overall 19 of 20 patients improved (95 %) significantly. The only failure was observed in a patient with multiple levels osteoporotic fractures. In acute traumatic fractures mobilization was achieved during the second postoperative day without bracing and at follow-up (mean 9 months) no kyphosis was observed. The whole group showed a significant ( $p < 0.001$ ) decrease in pain score was observed (9 preoperative vs 3 postoperative).

Extravasation of cement in the perivertebral veins was observed in 9 cases (45 %) and spread of cement to the lungs occurred in 2 cases (10 %). No cases of canal migration of the cement was observed. The technique of vertebroplasty can in our experience be used in different types of vertebral fractures with significant success if the endpoint of treatment is pain control, and side effects of cement migration seem to be negligible.

## **FRACTURES OF THE CERVICAL SPINE IN PATIENTS WITH SPONDYLITIS ANKYLOSANS- SURGICAL SOLUTIONS FOR A DANGEROUS SITUATION**

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**INTRODUCTION:** The cervical spine of a patient with spondylitis ankylosans (Bechterew's disease) is exposed to maximal risk by physical load. Even minor trauma leads to fractures due to the poor elastic behaviour ("bamboo spine")

**MATERIAL AND METHODS:** Between 1990 and 2004, 36 patients were surgically treated. All patients were examined pre- and postoperatively, when leaving trauma unit for rehabilitation. Single (n=11), two session dorsoventral stabilisations (n=11), ventral stabilisations (n=11), dorsal procedures and one laminectomy alone were performed. The injury pattern, segments involved, pre-and postoperative neurostatus due to Frankel's Score as well as complications were analysed.

**RESULTS:** Preoperative neurodeficits occurred in 35 patients. All cases showed improvement, the operation did not result in a neurological deterioration in any case. Thus, patients with delayed treatment due to late diagnosis showed a more severe level of preope-

orative neurodeficit and lower improvement. The cause of 3 patients with fatal outcome were ARDS and cerebral ischemia. With 12 (33%) perioperative complication we saw 3 infections, one vein thrombosis, 5 implant failures with the need of revision and the 3 fatalities.

**DISCUSSION:** Standard procedure for these lesions intends to be open reduction of fracture dislocation, anterior decompression and autograf fusion, followed by dorsoventral stabilisation (one or two sessions) respecting instrumentation level at least one segment above and below fusion. Diagnostics involve CT or MRI of whole spine, as additional injuries are common. Causative trauma may be very slight. As consequence, late diagnosis, overlooked injury and misinterpretation of plain radiographs is not rare. These patients only come to treatment with neurodeficits ("fatal pause"); this leads to more severe neurolesions, complications and lower improvement after surgery.

## **TRANSITORY INSIPID DIABETES CAUSED BY CERVICAL-CORD INJURIES**

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A high percentage of patients with cervical spine injury and consequent quadriplegia or paraplegia had significant disorders of hypothalamus function-transitory insipid diabetes.

On our Clinic during 2000 year we treated 6 patients out of 8 developed this complication. In most cases occurred after 5 days since being injured. There arose central hyperthermia (infection reasons were excluded) which was very resistant to all the medicaments as well as the measures for lowering body temperature. Several days after hyperthermia there appeared extreme polyuria (patients urinated over 15l per 24h.). By laboratory analysis there was stated a decreased specific weight of urine (1001-1003) which indicated to insipid diabetes. Such metabolic disorder led to a more difficult general state of patients (somnia, electrolytic disbalance and to more serious threat on life). We introduced vasopressin pills or spray into therapy which was followed and corrected in accordance with clinical and laboratory parameters. In direct correlation with it

there was normalizing of body temperature and improving of the patient's general state.

A clear pathophysiological mechanism of this disorder has not been completely explained. Consulting literature, pathophysiology, pharmacology. We think that these changes occur in the following way. By the decomposition of polymorphonuclears (macrophages), which phagocytated the decomposing products on the place of spinal-cord lesion endogenous pyrogen is liberated, raising the body temperature by directly affecting the center for thermoregulation in hypothalamus. Due to continuous excitation on hypothalamus its supraoptical nuclei responsible for ADH secretion are included. There appears the reduction of its concentration in blood and consequent polyuria. A dehydration added to the previous disorders leads to significant rise of temperature (aggravated sweating and a direct influence on hypothalamus), that enables establishing "vicious circle" of metabolic changes.

## NON-OPERATIVE TREATMENT OF THORACOLUMBAR BURST FRACTURES: A MIDDLE TERM FOLLOW UP STUDY

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**INTRODUCTION:** The aim of this retrospective study was to assess the clinical and radiological results of the nonoperatively treated thoracolumbar burst fractures without neurological deficit.

**MATERIAL AND METHODS:** Sixteen thoracolumbar burst fractures which admitted to our clinic and treated nonoperatively from 1997 to 2002 were included in this study. None of those patients had neurological deficit. There were eight male and eight female patients. Mean age was thirty-eight years (range between eighteen to sixty-four years). The average duration of follow-up was thirty months (minimum twenty-four months, maximum forty-eight months). The mechanisms of the injury were: falling from high more than two meters in seven, pedestrian accidents in five, vehicular accidents in four patients. Twelve AO type A, four type B burst fractures were noted. All patients treated with a thoracolumbar orthosis. At the final follow-up, patients were evaluated with Denis Pain and Work

Scale system. Radiological follow-up evaluation consisted of measurements of local kyphosis angle and determining the amount of spinal canal encroachment rate.

**RESULTS:** At the final follow-up, five patients recorded as P1 and W1, eight patients recorded as P2 and W2, three patients recorded as P3 and W3 according to Denis scale system. When compared with the preinjury values, significant increase in local kyphosis angle ( $p=0.022$ ) and significant decrease in the rate of spinal canal encroachment ( $p=0.024$ ) were detected at the final radiological examinations.

**CONCLUSION:** Besides the increased angle of kyphosis after the treatment of thoracolumbar burst fractures without neurological deficit, the clinical outcome is satisfactory. On the other hand, the ratio of spinal canal encroachment rate is improved by nonoperative treatment. Our study suggests that nonoperative treatment of those types of fractures gives good clinical results.

## NON-OPERATIVE TREATMENT OF THORACOLUMBAR FRACTURES: CLINICAL AND RADIOLOGICAL OUTCOMES

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**INTRODUCTION:** The aim of this retrospective study was to analyze the clinical and radiological results of nonoperative treatment in the thoracolumbar fractures without neurological deficit.

**MATERIAL and METHODS:** Thirty-five patients with thoracolumbar fractures, who were treated and followed at least twenty-four months between 1997-2002, were included in this study. No patient had associated neurological findings before treatment. There were eighteen male and seventeen female patients. Mean age was thirty-nine years (range between eighteen and seventy-two years). Mechanisms of the injury were falling from high more than two meters in eighteen, pedestrian traffic accident in seven, simple falling in six, vehicular traffic accident in four cases. According to Denis Pain and Work Scale system, nineteen fractures were compression while sixteen fractures were burst type fractures. After a careful neurological examination, all patients were managed non-operatively. (Thoracolumbar

orthosis in twenty-eight cases bed-rest in seven cases). Latest follow-up evaluation consisted of a questionnaire with a performed complete clinical examination as recommended by Denis. Radiological examination consisted of the measurement of local angle of kyphosis, sagittal index, anterior vertebral height and anterior vertebral compression angle.

**RESULTS:** Eleven patients recorded as P1 and W1, seventeen patients recorded as P2 and W2 and seven patients recorded as P3 and W3 according to Denis rating system. A significant increase in the angles measured was found in the latest radiological examinations ( $p=0.001$ ).

**CONCLUSION:** On the basis of our study we have found that, besides the poor radiological results, clinical outcomes are satisfactory. We recommend non-operative treatment in thoracolumbar compression and burst fractures, which do not have neurological dysfunction.

## PEDIATRIC AND ADOLESCENT SPINE FRACTURES

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**OBJECTIVE:** Spine fractures in growing ages differ from those in adults as far as the anatomy, biomechanics and results are concerned. A series of pediatric and adolescent patients with spinal fractures was studied.

**MATERIAL AND METHODS:** Between January 1995 and January 2000, 66 patients (<18 years old) were treated either with conservative or operative treatment modalities in our clinic. In this series common causes of injuries were motor vehicle accident and fall from a height.

**RESULTS:** The thoracic region was commonly injured, accounting 25 fractures

(37.8%) followed by the thoracolumbar junction with 22 fractures (33.3%) and the lumbar region with 19 fractures (28.7%). Radiologic evaluation at initial and follow up examination showed that in the patients treated nonoperatively. Kphosis progressed an average of 11 degrees and in the patients treated operatively, scoliosis progressed an average of 14 degrees.

**CONCLUSIONS:** The study discusses the clinical presentation, treatment and some of the complications of injuries of the thoracic and lumbar spine in pediatric and adolescent patients.

## PERCUTANEOUS VERTEBROPLASTY

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Spontaneous vertebral compression fractures are important health problem of elderly people of aging population. Main in causes are osteoporosis and metastatic spinal tumours. A minimal invasive procedure, vertebroplasty is used for the last several years for the management of cases.

In this study, 19 patients which are treated with percutaneous vertebroplasty at Dokuz Eylül University Hospital Neurosurgery Clinic are presented with clinical and radiological results.

Of 19 patients, 16 were osteoporotic and 3 were pathologic compression fractures due to

metastatic spinal tumours. Mean age of patients is 71.8 y.o. (60-84 years) and 13 are women and 8 are men. Mean visual analogue score (VAS) was 8.1 before vertebroplasty. Percutaneous vertebroplasty was performed for one level in 14 patients and for two level in 5 patients. Postoperative mean VAS score was determined as 1.8. Methyl metacrilate leakage is seen in four cases, three to the disc space without any problem, one to the spinal canal with resultant paraplegia.

Percutaneous vertebroplasty is a minimal invasive procedure that can be used for management of spontaneous vertebral compression fractures with succesful results.

## VASCULAR COMPLICATIONS IN SPINAL TRAUMA: ROLE OF ENDOVASCULAR THERAPY

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**OBJECTIVES:** Vascular injury associated with spinal trauma is uncommon and can cause life-threatening clinical conditions. We retrospectively reviewed all vascular injuries encountered after spinal trauma that were diagnosed during the last 5 years in our institution.

**METHODS:** We reviewed 14 patients with a mean age of 47 years (5 to 65 years) having spinal trauma who were diagnosed as associated vascular injuries by means of catheter angiography. All patients were suspicious for vascular injury after initial radiological (CT, MRI, Doppler US) and clinical work-up.

**RESULTS:** Two patients were asymptomatic, while the remaining 12 had some symptoms related to vascular injury at the time of admission. Among 12 symptomatic patients, 6 had neurologic symptoms, and the remaining 6 had symptoms unrelated to nervous

system. Vascular injuries were located in the cervical region in 11 patients, and in the lumbar region in 3 patients. There were arteriovenous fistula in 5, pseudoaneurysm in 5, and arterial dissection in 4 patients. The mechanism of vascular injury included penetrating trauma in 6 patients, nonpenetrating trauma in 4, and iatrogenic penetrating injury in the remaining 4 patients. Ten patients were treated endovascularly with persistent elimination of the vascular lesions associated with symptom-free clinical follow-up, two patients were managed with medical therapy only with good clinical follow-up, and the remaining two were managed symptomatically.

**CONCLUSION:** Although vascular injury after spinal trauma is very rare, endovascular therapy allows to eliminate majority of these potentially dangerous lesions with good long-term clinical follow-up.

## PERCUTANEOUS REDUCTION AND STABILIZATION OF THORACOLUMBAR FRACTURES WITHOUT NEUROLOGICAL DEFICIT: A NEW TECHNIQUE

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**INTRODUCTION:** The consequences of traumatic thoracolumbar vertebral fractures include pain related to the fracture, progressive collapse of the fractured vertebral body leading to spinal kyphosis. Because of the inherent risks and invasive nature, surgical treatment of traumatic vertebra fractures has been limited to cases in which there is concurrent spinal instability or neurological compromise. The purpose of this study is to evaluate early patient outcomes of a new technique in which traumatic thoracolumbar vertebral fractures were treated by kyphoplasty with use of autogenous bone graft plus biphasic calcium phosphate granules instead of bone cement and combination of percutaneous instrumentation.

**MATERIALS AND METHODS:** The technique was applied to 6 patients. The ages of the patients range from 24 to 81, average of 53 years. Fracture level was Th12 in 2 patients, L1 in 2 patients, L2 in one patient and L1 and L4 in one patient. The cavity created by

kyphoplasty balloon was filled with mixture of autogenous bone graft harvested from posterior superior iliac spine and biphasic calcium phosphate granules (SCP). After filling, pedicle screws and rods were inserted percutaneously to one above and one below levels.

**RESULTS:** All the patients were satisfied with the procedure. The average follow-up time was 6 months. The correction rate in local kyphosis angle was measured as 4.8 degrees and loss of correction at the latest follow-up was 17 %.

**CONCLUSION:** As a minimal invasive procedure, kyphoplasty seems to be a reliable and effective method for the treatment of osteoporotic, metastatic and many traumatic thoracolumbar fractures. The use of autogenous bone graft instead of bone cement is a promising method to prevent neurological deficit and thermal effects related with cement application. Bone graft placement into the kyphoplasty cavity promotes the bony healing.

## TRAUMATIC LUMBAR NERVE ROOT AVULSION: CASE REPORT

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Lumbosacral root avulsion was first described at 1955 and very few cases have been reported since then. In this report, we present a multiple trauma case with inappropriate lower extremity neurologic deficit.

**CASE:** A 9 years old boy strucked by a car had been refered to our center with multiple injury. There were right humerus proximal fracture, bilateral pubis rami fracture and suspicious sacrum fracture on grafies. Neurological examination was normal except his resistance to move the left lower extremity due to pain, as his explanation, although our strong insistence. We planned conservative treatment and follow up for the fractures. At second day he was stili unable to move the extremity although willing to do. He could not dorsiflex the ankle and foot fingers, could flex the lesser toes, could not extend and flex the knee and also the hip. Sensorial examination could not be defined clearly because of the patients unreliable answers, but roughly he was feeling the

extremity although there were some unclear hi-poesthetic regions. We made computed tomography scanning of the pelvis with suspicious of sacrum fracture. At CT, there was sacrum fracture on left side with minimal rotation. MRI had reported as hematoma at L2 level on the left side. We performed laminectomy at L2 level to drain, but saw dura lesion and left sided root avulsion. At second week, hip flexors and extensors gained grade 3 motor power, while knee extensor and flexors were grade 4. Unfortunately, great toe extension and ankle dorsiflexion was absent. Patient was discharged from hospital with home rehabilitation program. Lumbar nevre root avulsion and streching was a rare condition due to the solidity and strength of pelvis. In our case we thought that the lateral hiperflexion of the patient due to the sudden strike might have caused the streching of the lumbar nevre root to stretch and avulse. Although this type of injury is uncommon to be faced, it should be in mind that in patients wirth pelvis fracture.

## BONE SCAN WITH SPECT AS A GUIDE TO KYPHOPLASTY

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**PURPOSE:** To evaluate the utility of bone scan with SPECT in identifying compression fractures of the spine responsible for back pain of which kyphoplasty would lead to significant improvement of the symptoms.

**MATERIALS AND METHODS:** 27 consecutive patients with back pain due to compression fractures were included. All patients underwent prospectively plain XRays, MRI and bone scan with SPECT. All the patients had kyphoplasty at the levels that demonstrated significant tracer uptake on the bone scan. All patients completed a pain and function questionnaire (SF-36) before the kyphoplasty, immediately following the procedure and 1 month later. The change in the pain score was compared between the patients who had concordant findings on the bone scan and the MRI and the patients who had discordant findings on the two studies.

**RESULTS:** The bone scan identified a total of 142 compression fractures while the MRI identified a total of 51 compression fractures. Eighteen patients had the same levels identified by both bone scan and MRI (Group A). Nine patients had an additional compression fracture identified on the MRI (Group B). All patients had significant relief of the symptoms following the kyphoplasty. The change in pain score immediately following the procedure and at one month was similar in both groups ( $p=0.36$  and  $P=0.46$  respectively).

**CONCLUSIONS:** Bone scan with SPECT can help identify the levels of compression fracture responsible for back pain. Kyphoplasty at these levels can alleviate the symptoms of the patients.

## NEUROLOGIC DEFICIENCY IN THORACOLUMBAR VERTEBRAE FRACTURES: A RETROSPECTIVE STUDY IN A SERIES OF 26 PATIENTS

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**INTRODUCTION:** A retrospective clinical examination of all patients with neuromuscular deficit accompanying fractures of vertebrae who underwent an anterior or posterolateral decompression and posterior fusion was completed.

**MATERIAL AND METHODS:** Between 1996 and 2002, 26 patients (16 men and 10 women) underwent surgical treatment for post-traumatic paralysis caused by thoracolumbar fractures. Mean follow up period was 4.5 years (6-1). Clinical data of 26 patients were reviewed. ASIA impairment scala was used for determination criteria. Totally, 26 patients having positive bulbocavernos reflex and being categorized as ASIA-A were included into study. In an average operation duration of 16 hours anterior or posterolateral decompression were completed successfully in all cases. In addition to decompression we had done duramater repairment in 14 cases. Posterior fusion had applied to all patients for stabilisation. IV methylprednisolone was used to all patients.

**RESULTS:** When the patients had come to their last clinical controls we detected 8 cases as ASIA-A, 4 cases as ASIA-B, 4 cases as ASIA-C, 2 cases as ASIA-D and 8 cases as having normal sensory motor functions (ASIA-E) As a complication decubitus ulcer in need of reconstructive surgery were come into existence in 4 cases having no any neurological impairment.

**CONCLUSION:** The surgical management of the thoracolumbar fractures with neurological deficit must be individualized based upon fracture anatomy and neurologic status of the patients. This retrospective study showed that effectiveness of decompressive surgery on thoracolumbar fracture with neurologic deficiency was not time dependent. We believe that paraplegic patients may get benefit from decompression in optimal situations without any time restriction. And we also believe that decompression should have done in cases further than 72 hours after injury. Moreover immediate decompression must be applied to cases.

## THE RESULTS OF PEDICLE SCREW APPLICATION TO THE FRACTURED VERTEBRAE IN THORACOLOMBAR FRACTURES

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**INTRODUCTION:** There are numerous fixation and grafting methods for the treatment vertebral fractures. Newer techniques and principles overtake the old in due time. Screwing of the fractured vertebrae provides; 1- strengthening of the system, 2- stabilisation of the fragments, 3- volume expansion in vertebral body, 4- restoration of the canal. The aim of this study is to present the results of pedicle screw application to the fractured vertebrae in a group of our patients.

**METHOD:** Between 1995-2004, pedicle screw application was performed to 78 of 230 patients operated on due to vertebral fractures. In 35 of cases single screw, in 43 of 2 screws were applied to the fractured vertebrae. This choice depends on whether the pedicle is damaged or not. 43 of the cases were male and 35 were female. The mean age was 40,2 years (16-71). 33 fractures were burst type, 42 were compression and 3 were fracture-dislocations. The fracture levels were as follows: T8 fracture in 1, T11 fracture in 2, T12

fracture in 17, L1 fracture in 29, L2 fracture in 17, L3 fracture in 7, L4 fracture in 5.

**RESULTS:** The mean follow-up period was 3,5 years (1-9). The complications were screw fracture (1 case) and loss of correction (1 case). Neurologic disorder was present in 18 cases and the average improvement according to Frankel's classifications was at least one degree in the follow-up period. The average increase in vertebral body angle was 2,5 degree and the average improvement in canal diameter was % 40 postoperatively.

**DISCUSSION:** The aim of the surgery in thoracolumbar fractures are to obtain the stability of the vertebrae, to prevent deformity, to correct the deformity and to decompress the spinal canal. We observed strengthening of the system, increasing of the canal diameter and prevention of correction loss. The satisfactory surgical results and positive feed-back we obtained from our patients implies that pedicle screw application to the fractured vertebrae can be accepted as a beneficial procedure.

## OUTCOMES OF CONSERVATIVE TREATMENT IN THORACOLUMBAR FRACTURES

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**PURPOSE:** Incidence of vertebral fractures increase by development of technology 90% of these are thoracolumbar fractures. Both operative methods are the advised treatment methods according to the indications. In this study we aimed to review the results of thoracolumbar fractures treated by conservative methods.

**MATERIALS AND METHODS:** Between January 1999 and December 2002, 49 patients with thoracolumbar fractures were treated conservatively in our clinic. All of these fractures were treated by TLSO. Patients were evaluated by measurement of kyphosis angle, sagittal index, loss of height by using AP and lateral roentgenography and computerized tomography at the beginning of the treatment and during the follow up. And at the last examination that Dennis pain and work scale were used.

**FINDINGS:** Patients were followed average of 42 months (24-72 months). There were 20 female and 29 male. Fracture etiology consist of 27 (55 %) traffic accident, 17 (35 %) falling from a height, 3 (6 %) after a near fall, 2 (4 %) direct trauma. Mostly accompaniment pathology consist of cranial trauma 5 (10 %) and calcaneus fractures 5 (10 %). Thirty-one (63 %) of these were compression fracture, 18 (37 %) were burst fracture. Before treatment mean kyphosis angle was 19.2 degrees, at the last examination was 21.2°. Mean sagittal index was 16.4° before treatment and 16.5° at the last examination. Mean loss of height was 21.6 % before treatment and 25.1 % at the last examination.

**DISCUSSION:** With proper indication, thoracolumbar fractures can successfully be treated by conservative methods avoiding from surgical complications and high costs.

## POSTERIOR INSTRUMENTATION FOR THORACOLUMBAR FRACTURES: A 5-YEAR CONSECUTIVE SERIES

MEHMET TATLI, ASLAN GÜZEL (Dicle University, Turkey)

**INTRODUCTION:** Thoracolumbar fractures are relatively common injuries. Numerous classification systems have been developed to characterize these fractures and their prognostic and therapeutic implications. The treatment of unstable thoracolumbar spine fractures remains controversial. Theoretical biomechanical advantages of transpedicular screw fixation include three-column control of vertebral segments and fixation of a vertebral segment in the absence of intact posterior elements.

**METHODS:** The series consisted of 58 consecutive patients, with 68 fractures treated with transpedicular bone-anchored instrumentation and arthrodesis from 2000 through 2005. Plain radiographs were available in all cases; CT scans and MRI were obtained in 50 and 43 cases, respectively.

**RESULTS:** Most fractures were located on thoracolumbar (43 %) and lumbar (36 %) regions. Multilevel fractures were detected in eight patients (13 %). The principal problem encountered was screw malposition, which occurred in 8 of the 68 (11 %) instrumented fractures. No major acute complications such as death, paralysis, or infection occurred. Neurologic function improved in 40 of 58 patients (68 %) and did not worsen in any.

**CONCLUSION:** Posterior stabilization can be effective with Chance fractures and flexion-distraction injuries that have marked kyphosis and in translational or shear injuries. Advances in understanding both biomechanics and types of fixation have influenced the development of reliable systems that can effectively stabilize these fractures and permit early mobilization.

## EARLY RESULTS OF THE TWO CASES WITH FRACTURES-FACET DISLOCATION AT THE THORACIC VERTEBRA TREATED WITH ANTERIOR-POSTERIOR SURGERY AT THE SAME SESSION

MEHMET BÜLENT BALIOĞLU (Ankara Atatürk Education and Research Hospital, Turkey)

**SUMMARY:** Two neglected cases who had high energy traumatic fractures of the thoracic spine with facet dislocations and with columna vertebralis deformity were surgically stabilized with anterior discectomies, posterior instrumentation and fusion in the same session applied at a later time. The cases were evaluated postoperatively with clinical and radiological findings.

**MATERIAL AND METHOD:** Two cases with high energy trauma at the thoracic columna vertebralis because of falling from high places and in road traffic accidents were evaluated. There were multiple fractures at the thoracic vertebra and facet dislocation without neurological deficit in these two cases. In these two cases there were inadequate conservative treatment post traumatically and inadequate stabilization with corset usage. Total duration until surgery after the trauma was 1 month (man) to 29 months (woman). Their mean age range was 25 (20-30). The level for the facet dislocation and vertebra translation was between the T9-10 and T8-9. Intervertebral disc

releasement and graft were applied anterior surgery. At the same session 2 rods were fixed by transverse connectors with the help of pedicle screws and hooks involving the T6-L1 and T4-L1 vertebra levels from the posterior aspect. Compression is applied to correct the kyphosis and translation is applied to correct the scoliotic deformity. An allograft and autogenous graft is added from the posterior. The clinical and radiological appearances of the cases after the follow-up period were evaluated.

**FINDINGS AND RESULTS:** Preoperative and postoperative follow-up measurements were done to evaluate the prominent sagittal plane deformity of the cases. Thus the kyphosis angle had been corrected at % 41.6 by regressing from 77 to 45 and in the second case had been corrected at % 14 by regressing from 45 to 39. There were not a loss of correction, pseudoarthrosis, infection, neurological deficit and back pain affecting the daily activities adversely in neither of the cases.

## TRAUMATIC VERTICAL ATLANTOAXIAL DISLOCATION: CASE REPORT

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MERT ÇİFTDEMİR

**INTRODUCTION:** Traumatic vertical atlantoaxial dislocation is rare but serious injury. It occurs in only 1-2 % of patients admitted to hospitals with acute cervical injuries.

**MATERIAL AND METHOD:** A 6-year-old girl was delivered to the emergency service, after pedestrian injury by a motor vehicle accident. A neurologic examination at that time showed quadriplegia. She was noted to have swelling in left leg. Respiration was irregular and the patient was intubated by intensive unit team. Plain radiographs showed a wide separation between the atlas and axis and fractures of pelvis and left femur. Computed tomographic scans demonstrated vertical dislocation of atlantoaxial joint. The patient immediately underwent surgery. Posterior midline approach was used. The facet capsules and ligamentum flavum were completely disrupted at C1-2 level. The dura was noted to be ruptured. The spinal cord was contused and hemo-

ragic. The dura was repaired and posterior atlantoaxial fixation performed using sublaminary wiring. Femur fracture was stabilized by external fixateur. She regained consciousness on fourth day after the trauma. After four weeks, quadriplegia slightly decreased; the left upper extremity had 2 over 5 strength. But a paralyzed diaphragm required long-term pulmonary support. The patient never discharged from the intensive care unit and died 18 months after the trauma.

**CONCLUSION:** It has been generally accepted that all atlantoaxial instability require immobilization. It can be achieved with skeletal traction and followed by C1-C2 fusion. However, severe ligamentous disruption with a high risk of neurological deterioration if skeletal traction is applied. So axial compression is safety method to achieved reduction by posterior approach.

## THE IMPACT OF PSEUDOARTHROSIS ON CLINICAL OUTCOME IN ISOLATED SPINOUS PROCESS FRACTURES OF SIX ADJACENT LEVEL THORACIC VERTEBRAE: REPORT OF A CASE

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Spinous process fractures are rare injuries of polytraumatized patients and are most often seen in C1 vertebra. Isolated spinous process fractures are extremely rare especially in the thoracic region. Also the management of multilevel spinous process fractures is unclear. We present a case with isolated spinous process fractures of six adjacent levels in the thoracic spine from T5 to T10.

**MATERIALS AND METHODS:** 58 year old male being hit by an automobile presented with back pain which worsened upon lying on his back. His examination revealed tenderness over the spinous processes over most of the thoracic spine with crepitation and paravertebral muscle spasm. There were no motor or sensory deficits. Anteroposterior (AP) and lateral X-rays failed to show the spinous processes in the thoracic region. CT scan of entire thoracic vertebrae revealed isolated spinous process fractures at all levels from T5 to T10 (Figure-1). There was no compression of vertebral bodies or narrowing of the canal. Patient was treated with a brace. Control CT

scans were obtained at 6th and 12th months. Backpain was evaluated subjectively using visual analog scale (VAS) and spinous process compressions for each fractured level (Table-1).

**RESULTS:** V.A.S. scores decreased from 8 to 2 at three months but all spinous processes were tender. At 6 months no tenderness was detected and V.A.S. was 0. CT scans of 12th month revealed pseudoarthroses at all 6 spinous processes (Figure-2). At 2 years follow-up it was seen that he had no loss of range of motion. He can flex, extend and also lie on his back without pain.

**CONCLUSION:** Even multiple spinous process fractures are minor injuries. Superimposing ribs prevent detection of thoracic spinous processes on X-rays and CT can be used for diagnosis. Osseous union is not the sole determinant of clinical outcome. Pseudoarthrosis of multiple spinous process fractures can be totally symptom free which makes this nonunion insignificant clinically.

## THE COMPLICATIONS OF MINIMAL INVASIVE PERCUTANEOUS TREATMENT (BALLOON KYPHOPLASTY) OF OSTEOPORATIC VERTEBRAE FRACTURES

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Fractures of the osteoporotic vertebrae are common seen in elderly patients. The treatment modalities of these fractures have been argued in many years. Patients with these fractures become depended because of pain. Respiratuar and gastrointestinal complications are also seen in these patients. Depression and death are not rare.

Minimal invasive treatment modalities became very popular last years.

In our clinic, between June 2001 and December 2004, we performed balloon kyphoplasty in 35 vertebrae of 28 patients. The 15 of the patients are women and 13 of the patient are men. Balloon kyphoplasty was performed in 1 patient's 3 segments and 5 patients' 2 segments. The rest of the patients single segments.

The fractures were, between T6 - L5 vertebrae. T12- L1 vertebral segments were the most seen (48 %).

We did not notice any neurological complications. Intradiscal cement noticed in 6 pati-

ents. We performed anterior decompression and fusion one of these 6 patients because of the discitis, caused by intradiscal cement. In the two patients, cement noticed by the perispinal region. In the one of the patients, we noticed another fractured segment the day after surgery. But the patient did not accept another operation.

In the literature, it was found that the fracture probability of the one segment upper, and one segment inferior of the performed vertebral fractures is 30%. Intradiscal cement invasion is also common complication.

The complications of balloon kyphoplasty are not rare although, suitable patients and experienced surgeon. Besides the neurological complications, the others are not so important and can be managed easily.

We, propose the balloon kyphoplasty, because of it's being minimal invasive method, no much more alternatives and patients' happiness.

## LONG TERM PROGNOSIS OF THE PRIMARY SPINAL TUMORS

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MUSTAFA AKÇETİN, MUSTAFA ERAS, CENGİZ ACAR, TURGAY BİLGE**

**OBJECT:** Primary spinal tumors are rare lesions that comprise 0.4 % of all tumors. Also 10 % of primary bone tumors arise from the vertebral column. The ratio between primary spinal tumors to metastatic spinal tumors is 1/10-20. We presented a clinical series of patients with primary spinal tumors.

**METHOD:** Between January 1996 and December 2004, 29 patients (19 female, 10 male) with primary spinal tumors were treated in our department. The mean patient age was 40.4 years (range 12 - 75 years). Of these patients, 10 (34.5 %) were plasmocytoma, 4 (13.8 %) were Paget's disease, 3 (10.4 %) were chordomas, 3 (10.4 %) were hemangiomas, 2 (6.9%) were osteosarcomas, 2 (6.9 %) were osteoblastomas, 2 (6.9 %) were osteoid osteomas, 1 (3.4 %) was non-Hodgkin lenfoma, 1 (3.4 %) was aneurysmal bone cyst, 1 (3.4 %) was condrosarcoma. Of these patients 17 (58.6 %) were malign and 12 (41.4 %) were benign tumors. Surgical treatment was preferred in 79.4 % of the cases (approached anteriorly in 7, approached posteriorly in 9, appro-

ached from both ways in 6 and approached transcondylarly in 1 of the patients). Additionally, 21.7 % of the surgical cases got radiotherapy and chemotherapy. Mean follow up time was 2.9 years (range 3 months-8 years). Communication with one of the patients was lost during the follow-up. Seven patients (25 %) were dead. Among these patients, three were plasmocytomas, two were chordomas, one was a chondrosarcoma and another one was osteosareoma. One of the plasmocytomas transformed into multiple myeloma in the fourth year of the follow-up and her paresis deteriorated into paraplegia. Tetraplegia developed in the end of the first year in another patient with osteosarcoma on C1-2 levels.

**CONCLUSION:** The optimal management of the primary spinal tumors is surgery. The goal of the surgery should be complete removal whenever possible. When tumor excision results in an instability of the vertebral column, concurrent spinal stabilization and fusion should be performed.

## INTRADURAL SPINAL TUMORS: RETROSPECTIVE ANALYSIS AND EARLY-TERM OUTCOME OF 28 CONSECUTIVELY OPERATED CASES

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ÇOBANOĞLU, ÖMÜR KASIMCAN, EMRE YAĞLI, ALI RIZA ÖZCAN, RECEP ÖZGÜN,  
CELAL KILIÇ

**INTRODUCTION:** In this study the results of 28 intradural spinal tumor cases which were operated in our clinic between 2000-2004 are analysed. The retrospective analysis of the clinical, radiological, pathological and early-term surgical outcomes are aimed.

**MATERIAL - METHOD:** The diagnosis in all cases have been evaluated under history clinicopathological and neuroradiological factors. Preoperative neurological state of the cases have been evaluated with Mc Cormick Scala. In statistical comparisons; chi-square importance test and in duration and age comparisons, Kruscal-Wallis Test were used. The degree of importance was taken as  $p=0.05$ .

**RESULTS:** Of the patients 50% (14) were female, 50 % (14) were male. Average age was  $41,9\pm 19,1$  (8-84 age range). The most frequent symptoms were pain and motor deficit 39.3 % (11). Localizations were thoraeal 57.1 % (16), cervical 25% (7), lumbosacral 17.9 % (5). The average symptom duration was  $49.7\pm 58.3$  weeks.

Preoperative neurological states in Mc Cormick Scale were grade 1 42.9 % (12) and gra-

de-2 21.4 % (6). The proportion of intramedullary-extramedullary was 25 % / 75%. In pathological diagnosis, meningioma, schwannoma were sited mostly in extramedullary and ependymoma in intramedullary. In females; meningioma 75 %, in males; schwannoma 62.5 % and ependymoma 75 % were mostly seen. Total 64 % (18), gross total 35 % (10) resections were made. In early-term surgical outcomes, total and partial recovery was observed in 57.1 % of the cases. These proportions were 62.5 % and 66.7% in meningioma and schwannoma, 42.9 % in ependymoma.

**CONCLUSION:** The positive factors of the prognosis are early diagnosis, good preoperative neurological state, effective surgery and total resection. There is no meaningful difference in comparison of early term surgical outcome with age, sex, symptom duration, localization, neurological state, tumor-dura relation, pathological diagnosis and surgical technique. ( $p=0.984$ ,  $p=0.471$ ,  $p=0.531$ ,  $p=0.146$ ,  $p=0.184$ ,  $p=0.677$ ,  $p=0.462$ ,  $r=0.333$ )

## ANEURYSMAL BONE CYST OF THE UPPER THORACIC SPINE

FATİH DİKİCİ (TDV 29 Mayıs Hospital, Turkey) ÜNSAL DOMANIÇ

**PURPOSE:** Aneurysmal bone cyst (ABC) is an uncommon benign, expansive, osteolytic lesion, capable both of rapid enlargement and spontaneous resolution. It is generally observed in young adolescents, in a spinal localisation in 10 % of the cases. These lesions may easily be mistaken for a malignant tumor both radiographically and pathologically. In the spine, it usually grows rapidly and can cause extensive bone destruction and compress neural structures with eventual vertebral collapse. Operative management of such a lesion may be complicated by profuse hemorrhage. We report an aneurysmal cyst in a 14-year-old girl who had an acute exacerbation of spinal cord compression because of an ABC in the second thoracic spine.

**MATERIALS-METHODS:** Surgical access to T2 vertebral body through standard cervical approach may be difficult and extensive. Adequate exposure of this area can be achieved in children, using a partial manubrial sternotomy. This procedure was successfully performed in a 14-year-old girl whose T2 ver-

tebra had been completely replaced by a large aneurysmal bone cyst that had produced major paraparesis. Surgical treatment was facilitated by preoperative embolization of the highly vascular tumor. In the first stage, excision of the tumor was performed with posterior approach without extensive intraoperative blood loss, transpedicular stabilization of the spinal column was achieved. In the second stage, anterior approach was performed with excision of the vertebral body, restoration of the anterior column with cage and plate-screw fixation. Spinal fusion resulted in complete restoration of neurologic function, eradication of the cyst, and stabilization of the cervicothoracic spine.

**DISCUSSION:** At the 12 month follow-up examination, he was neurologically intact and without any leg pain or gait disturbance. The limited manubrial split approach to T2 vertebra is recommended. We conclude that embolization of ABC reduce intraoperative bleeding thus enhancing resectability.

## COMBINED POSTERIOR CERVICOTHORACIC FUSION WITH FIBULA GRAFT AND IMPLANT: A TECHNICAL ALTERNATIVE IN COMPLICATED CASES

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**INTRODUCTION:** Stability of the cervicohoracic region in complicated cases with aetiologies such as trauma and tumours may bring the need for combined anterior and posterior instrumentation and fusion. The fusion of the cervical spine through anterior procedures had been discussed widely, however, fusion through posterior approaches had been less frequently reported.

**METHODS:** A 49 years-old female patient with the known diagnosis of thyroid papillary carcinoma was referred to neurosurgery clinic. Her neurological examination demonstrated the involvement of the right C7, C8 and T1 nerve roots. The magnetic resonance imaging showed, the metastatic involvement of the C6-T2 vertebral anterior and posterior elements. There was also metastatic soft tissue component at the T1-2 level causing posterolateral spinal cord compression. A two-stage surgery was planned depending on the long life expectancy of the primary tumour. The first stage was the posterior approach because of the

posterolateral spinal cord compression caused by the extradural mass lesion. The second stage was anterior C6-T2 corpectomies and stabilisation.

**RESULTS:** At the first stage of the surgical treatment, the patient underwent C6-T2 laminectomies, foraminotomies and subtotal tumour removal at T1 and T2 and decompression of the spinal cord. To maintain stabilisation, bilateral C4-5 lateral mass screws, T3-4 transpedicular screws with bilateral rods and fibula allograft between C6-T2 spinous processes were introduced. The fibula graft was drilled and a tunnel was formed to attach to the rods by a transverse bar. At the same time, the proximal and distal ends of the fibula graft were drilled to form a saw tooth to fit onto the spinous processes and bilateral to laminae. The spinous processes and neighbouring bony tissues were decorticated to facilitate bone fusion. The postoperative period was uneventful.

## DIAGNOSE AND TREATMENT PLANNING IN BENIGN VERTEBRAL TUMOURS

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**INTRODUCTION:** Primary vertebral tumours are usually rare. %04 of all neoplasms and % 10 of all musculoskeletal tumours are seen in vertebral column. Primary vertebral tumours have more privileges from other musculoskeletal neoplasms. Non-morbid benign tumours seen in extravertebral locations may cause serious clinical and surgical complications when diagnosed in columna vertebralis because of the spesific vertebral structure and strict relation between the neuronal componets and vertebral column. Patients with benign vertebral tumours usually have a non-spesific pain which is not relieved with nonsteroidal and rest.

**MATERIALS AND METHODS:** In this retrospective study we have evaluated 15 patients (13 male-2 female) with the average age of 28 years (5-53 years.) who were treated in our clinic between January 1995-January 2000. All of them had pain and were treated conservatively. They all evaluated with conventional roentgenograms, CAT, MRI and ra-

dionuclear imaging. Laboratory results were non-spesific. The tumours of all patients were excised. Posterior instrumentation and fusion applicated to four of patients after excision.

**FINDINGS:** Microscopic findings were concordant with osteoid osteoma in five cases, hemangioma in two cases, osteoblastoma in two cases, aneursymal bone cyst in one case and benign fibrous osteoma in one case. Microscopic findings of two patients were diagnosed as chronic osteomyelitis. After postoperative period, the pain relieved in all patients. No recurrence seen in 2 year follow-up.

**RESULTS:** Although vertebral benign tumours are rarely seen, they may appear with pain and progressive neurologic deficits. Carefull clinical and radiologic evaluation must be done by paying attention for the possibility of tumoural lesions, for the patients with chronic lumbago. A multidisciplinary approach including surgeon,radiologist and pathologist must be done in vertebral tumours.

## **METASTATIC VERTEBRAL OSTEOSARCOMA WITHOUT PULMONARY METASTASIS**

**ŞEVKI ERDEM (Erciyes University, Turkey), FUAT DUYGULU, MAHMUT ARGUN, ALİ BAKTİR**

Primary osteogenic sarcoma metastasis to bone very rarely without pulmonary involvement. Importance of our case is presentation of the patient with neurologic signs due to spinal metastasis of osteogenic sarcoma without pulmonary metastasis.

We present a case (16 year - old male) of metastatic vertebral osteosarcoma without pulmonary involvement. The patient presented with severe back pain, urinary incontinence and loss of movement of legs two years after initial treatment of osteosarcoma of left proximal femur. Bone scintigraphy and magnetic resonance imaging of vertebral column showed single metastasis in the 10th thoracic

vertebra. The tenth vertebra with pedicles, intervertebral discs of upper and lower region and pleura in close proximity were resected by an anterior approach. Four cycles of chemotherapy were administered in postoperative period. The patient died of infection 13 months after detection of metastases.

In conclusion, this case documents that extrapulmonary metastases of osteosarcoma might develop in patients other than pulmonary metastases. It should be kept in mind that unusual metastatic sites without pulmonary involvement can be observed in osteosarcoma cases.

## HAEMANGIOMA OF L1 VERTEBRAL BODY: TREATMENT WITH PERCUTANEUS POLYMETHYLMETHACRYLATE VERTEBROPLASTY

EROL YALNIZ (Trakya University, Turkey), MERT ÇİFTDEMİR, SABRİ BALIK

**INTRODUCTION:** Haemangioma is the benign tumor that is most frequently localized in the spine. Radiotherapy or surgical excision are treatment options for symptomatic haemangioma. Minimal invasive augmentation techniques of vertebral bodies have been recommended to treat osteoporotic vertebral fractures and neoplastic vertebral collapse. Vertebral haemangiomas can be treated with this technique in selective cases.

**CASE:** A 59-year-old female patient admitted to our clinic with 4 years history of back pain. Orthopaedic and neurologic evaluations revealed slightly loss of power in right hip flexion and no sensory deficit was found. Results of routine laboratory tests were normal. Radiographic examinations revealed thickening of L1 vertebral trabeculae. MRI of the lumbar spine documented a hyperintense nodular formation (haemangioma) at right paramedian L1 vertebral body. Visual Analogue Scale (VAS) was

used for quantitative measurement of pain. Preoperative VAS revealed 8 points. At surgery, a posterior percutaneous transpedicular approach was used for reaching L1 vertebral body of the patient under local anaesthesia. 14 mm canulla introduced to the L1 vertebral body under fluoroscopic guidance. Low viscosity, radiopaque, 1.5 cc PMMA bone cement applied into the cavity. No early complications were seen.

**RESULTS:** Postoperative radiographs and CT scan demonstrated successful filling of the cavity. Postoperative VAS revealed 1 point. Patient discharged from hospital at postoperative first day on foot.

**CONCLUSIONS:** Percutaneous vertebroplasty can be considered asafe, effective, inexpensive, semi-invasive method for symptomatic vertebral haemangioma. However, a careful technique is required.

## **SYNCHRONOUS SPINAL CORD AND THORACAL SPINAL VERTEBRA WITH SOFT TISSUE METASTASES FROM FOLLICULAR THYROID CARCINOMA**

**MEHMET TATLI (Dicle University, Turkey), ASLAN GÜZEL**

Follicular thyroid carcinoma (FTC) rarely manifests itself as distant metastatic lesion, and when present, is usually found in foot bones. A soft tissue metastasis is extremely rare, and synchronous metastases to spinal cord, thoracal vertebra and soft tissue is not reported in the literature so far.

A 45-year-old male presented with paraparesis of 4 months of duration with swelling on the interscapular area started 6 months ago. On examination general condition and vital signs were normal. Neurologic examination revealed severe spastic paraparesis and hypoaesthesia below of fourth thoracal dermatoma. Magnetic resonance imaging (MRI) demonstrated a space-occupying lesions involving tho-

racal epidural space, lamina and corpus of T5-T6 vertebrae with serious cord compression and paraspinal soft tissue. No other metastases were found with CT scan of thorax, abdomen and brain. We performed a laminectomy and tumor excision. Histopathologic examination demonstrated metastatic FTC. The patient underwent thyroidectomy and began medical treatments. He also received radiation therapy as part of his treatment.

This case of follicular thyroid carcinoma reported because of its rarity. Early diagnosis (by MRI) is important; with progressive weakness or sphincter disturbances the prognosis worsens.

## **SIMULTANEOUS CEREBRAL, SPINAL AND LUNGS METASTASES FROM CHORIOCARCINOMA**

**ASLAN GÜZEL (Dicle University, Turkey), MEHMET TATLI**

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Choriocarcinoma is a malignant form of gestational trophoblastic neoplasia (GTN). Cerebral metastasis have been reported in 3 to 28% of patients with choriocarcinoma.

A 20-year-old woman presented with back pain and motor weakness of lower extremity that started about seven days ago. Neurologic examination revealed a spastic paraplegia and sensory deficit below T4. Serum alfa fetoproteine was 12.000 IU/ml. Pulmonary computed tomography showed bilateral multiple lesions in the lungs. Thoracal magnetic resonance imaging revealed extradural lesion at the level of T2-3 vertebrae. Also, cranial magnetic

resonance imaging demonstrated multiple metastatic cerebral lesions with hemorrhage. The patient was operated and T1-T4 laminectomy was performed. The hemorrhagic vascular mass was subtotally removed. Histopathologic features of the specimen revealed choriocarcinoma.

Cerebral metastasis from choriocarcinoma is a cause of poor outcome in GTN. To our knowledge, no cases of metastases in the cerebral and the thoracal spine with lungs metastases coexistence have been reported in the literature.

