

## PRIMARY AND METASTATIC TUMORS OF THE SPINE

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### ABSTRACT:

Twelve patients with tumors involving the osseous spine that were treated in Trakya University Hospital between 1991-1995 were evaluated retrospectively. The series included one osteosarcoma, one fibrosarcoma, one aneurysmal bone cyst, two osteoblastomas, one osteochondroma, and six metastatic tumors. These tumors were localized in cervical spine (1 case), thoracic spine (5 cases), lumbar spine (6 cases), both lumbar and thoracic spine (1 case). No patient with benign tumors died. Two patients with osteosarcoma and fibrosarcoma were alive at the average 33 months after surgery. At the time of the review, in the group of metastatic tumors, there were 2 alive with an average follow-up of 14 months.

The aims of the surgical treatment of spinal tumors are excision of the tumor, decompression of neural elements, stabilization of the spine, and improving the quality of survival.

**Key Words:** Benign, malignant, metastatic tumor, spine.

Spinal tumors, benign or malignant and primary or metastatic are challenging problem. Spinal tumors may lead to destruction of the vertebral body and posterior elements, resulting in spinal instability. Canal compromising owing to the vertebral collapse or expansion causes neural deficits. Primary tumors of the vertebral column are uncommon as compared with vertebral metastasis. 89% of vertebral tumors are metastatic (32).

The nonsurgical treatment of vertebral tumors with radiotherapy and chemotherapy which effected in relieving the pain and in improving the neurologic condition has been reported (5, 14, 16). Recently, most of the authors advising surgical treatment of vertebral tumors had emphasized decompression of spinal canal, and surgical stabilization of the vertebral column (11, 13, 15, 29).

In this study, surgical treatment of primary and metastatic spinal tumors in 12 patients is presented.

### MATERIALS and METHODS

A retrospective analysis of 12 patients with primary and metastatic tumors of the spine that were treated at Trakya University, Departments of Orthopaedics and Neurosurgery between 1991-1995, was carried out. There were 11 men and 1 woman. Ages ranged from 17 to 70 years, with mean of 45.9 years. The mean follow-up was 17.2 months (range 1-40 months). No patient was lost during the follow-up period. The summary of those 12 cases were listed in

Table 1. There were six primary and six metastatic tumors. Of the 6 primary lesions, 4 were benign; osteoblastoma (2 cases), osteochondroma, aneurysmal bone cyst, and 2 were malignant; osteosarcoma and fibrosarcoma. Metastatic tumors were from primary lesions of the lung (3 cases), larynx, prostate, and unknown origins. The affected level were cervical in 1 case, thoracic in 4 cases, lumbar in 6 cases and both thoracic and lumbar in 1 case.

The common clinical symptom was back pain. Five patients had neurologic deficits secondary to spinal cord or nerve root compression. 18 operations have been performed to 12 patients. A posterior surgical approach was used in 6 patients, a posterolateral approach in 2, an anterior approach in 2, and combined anterior and posterior approach in 2. Histologic evaluation of the spinal lesion was made by biopsy in all cases. The route and type of biopsy were determined by location of tumor and presumptive diagnosis. In this series, 3 of the biopsies were excisional, and 9 incisional. Two patients had significant degree of spinal deformity due to the lesion at the time of the initial evaluation. Instrumentation surgery were performed on 4 patients; Alici spinal instrumentation were used in 2 patients, CD instrumentation in 2. Radiotherapy was combined with surgical treatment in two cases, chemotherapy in one, and radiotherapy and chemotherapy in one.

### RESULTS

In the group of benign tumors, three patients with neurological deficit showed improvement after posterior decompression. Two osteoblastomas had soft-tissue components in the epidural space, necessitating

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Table 1.

&	Name	Age	Sex	Tumor	Location	Vertebral involvement	Neurol. deficit	Treatment	Follow-up (month)	Result
1	H.K.	29	M	Osteochondroma	T10	Ver. Body	-	Excision	25	No recurrence
2	A.Ö	38	M	Osteoblastoma	T11	Post.arch	+	Post.decomp.	6	Neur. improve
3	H.T	17	M	Osteoblastoma	L3	Post.arch	+	Post.decomp.	27	Neur. improve
4	H.K.	65	M	Aneurysmal bone cyst	T12	Post.arch+	+	Post.decomp.	30	Neur. improve
5	A.V.	53	M	Fibrosarcoma	T7-L1	Post.arch+ body	+	Post.decomp. Post.inst. Chemotherapy	40	Alive
6	R.D.	27	F	Osteosarcoma	L4	Ver.body	+	Ant.Resection Post.ins. Chemotherapy Radiotherapy	26	Alive
7	A.Y	56	M	Metastasis (lung)	C2	Post.arch+ body	-	Partial resection	10	Alive
8	I.P.	35	M	Metastasis (unknown)	L2-3	Ver. body	-	Biopsi	1	Death
9	H.Ç	56	M	Metastasis (larynx)	L1	Ver. body	-	Ant.resection Ant.inst	11	Death
10	A.K.	63	M	Metastasis (lung)	T6	Ver. body	-	Biopsi	1	Death
11	H.K.	42	M	Metastasis (lung)	L1	Ver. body	-	Ant.resection Post.inst. Radiotherapy	12	Death
12	M.Ç.	70	M	Metastasis (prostate)	L3	Ver.body	-	Biopsi Radiotherapy	18	Alive

dissection of the tumor from dura (Fig. 1). In case with aneurysmal bone cyst, limited surgical excision was performed because of the bleeding. No recurrence was observed in patients with osteoblastoma and osteochondroma during the follow-up period.

Two patients with primary malignant tumor; one osteosarcoma and one fibrosarcoma were alive and mean survival period was 33 months. Fibrosarcoma was the malignant transformation of poliostotic type fibrous dysplasia of the spine. This patient complained back pain and weakness. After the posterior decom-

pression and posterior spinal instrumentation, he had a significant neurologic recovery. The patient with osteosarcoma had scoliosis due to destruction of vertebral body. This deformity was corrected by combined anterior and posterior surgical procedures.

The primary lesions of the patients with metastatic tumors had not been diagnosed and treated previously, except the twelfth one as shown in Table 1. This patient had been operated for prostate cancer. The lumbar spine was the most common site for metastatic tumors (66.6%). Two patients (33.3%) presented with

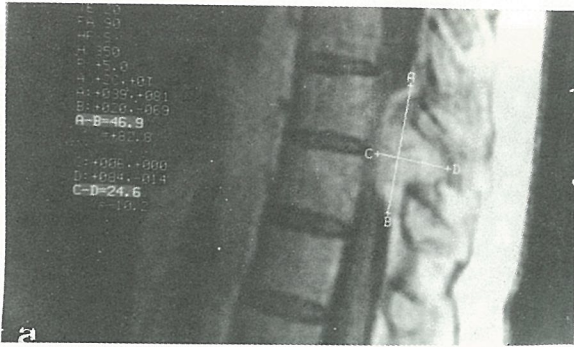


Figure 1 - a

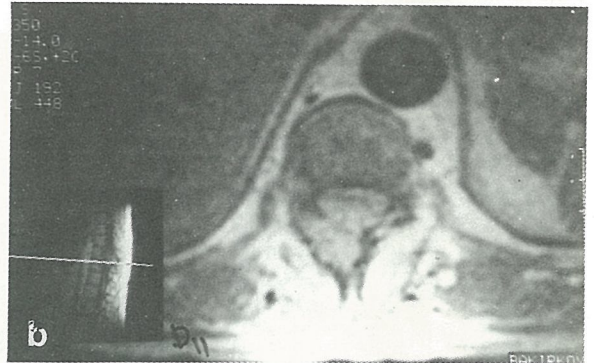


Figure 1 - b

**Figure 1 a, b:** Lateral and axial views of the spine in the patient with osteoblastoma. Note the contact between soft tissue component of tumor and dura.

multiple levels of vertebral involvement. In this group, destructive lesions were most commonly detected in the vertebral body (5 cases in body, 1 case in both body and posterior arch). Two patients underwent surgical stabilization. One was treated by anterior tumor resection and anterior instrumentation (Fig. 2). In other patient, methylmethacrylate was replaced after removal of tumor by anterior approach and posterior spinal instrumentation applied. These two patients were able to recover functional ambulation after the operations. All patients with metastatic spinal tumors but two died because of the disease, with a median length of survival of 8.9 months (range, 1-18 months).

In one patient, failure of the instrumentation (bending in two screws) occurred secondary to resorption of the anterior bone graft. The graft was removed and replaced with methylmethacrylate. No patient experienced neurological deterioration because of the surgical intervention. External support with a thoracolumbosacral orthosis was added for ambulatory patients as tolerated.

## DISCUSSION

Benign spinal tumors are more common in children and young adults and their presenting symptoms is almost invariably back pain at tumor level, pain radiating from the affected nerve root, or both (2, 26, 31). Benign osteoblastoma and osteoid osteoma may cause scoliosis because of the pain (2, 17). Osteoblastomas require completely excision to prevent recurrence and malignant transformation (7, 30). In our series, there were two osteoblastomas. Both occurred in

the posterior elements. They were treated by total laminectomy. We haven't seen any recurrence during the follow-up period.

Osteochondroma is about 30-40% of benign bone tumors and up to 15% of all primary tumors of the skeleton. 1-4% of osteochondromas occur in the spine (1, 24). In our case, the tumor was solitary and located on the anterolateral region of the vertebral body. Total excision of the tumor was performed by posterolateral approach.

Primary osteosarcoma of the spine is quite rare making up 0.85% to 2% of all osteogenic sarcomas (20). Tigani et al. (28) reported only 11 cases from the Tumor Centre at the Rizzoli Orthopaedic Institute between 1904 and 1986. Most of the studies regarding with spinal osteosarcoma are limited to few cases (3, 8, 13, 19). Treatment of this tumor in the vertebral column is difficult and the result is poor. Complete surgical resection of the tumor by vertebrectomy and combination chemotherapy and radiotherapy is the best method for management of osteosarcoma of the spine. In spite of the combined treatment survival was poor. Göğüş et al. (9) reported five case with average length of survival 8.6 months (range, 1 to 16 months). Sundaresan et al. (25) compared limited excision with aggressive surgical resection and observed that the failure to obtain local control was the major cause of treatment failure. Our case had no history of previous radiotherapy or precursor lesion. She admitted severe back pain and scoliosis secondary to the destruction of L4. Tumor had large soft tissue mass both anterior and posteriorly. The stage of the tumor was IIB. She underwent anterior tumor excision with replacement the