



## SPINAL TUMORS

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### ABSTRACT

**Aim:** Our aim is to evaluate patients whom operated for spinal tumor according to symptoms, pathology, level of tumor, grade of tumor and demographic data's.

**Material and Method:** We inspected patients whom operated for spinal tumor for the last five years retrospectively. Data collected from the patient files and radiology PACS system. Spinal tumors inspected according to symptoms, pathology, level of tumor, grade of tumor and demographic data of patients.

**Results:** A total of 37 patients were included in this study. The mean age of the participants was 50.8 ± 15.7 years, and 54.1 % of the population were males. Most frequent complaints were weakness in legs (24.3 %), low back pain (35.1 %), arm/leg pain (35.1 %), and gait disturbance (16.2 %). Accordingly, most frequent pathological diagnoses were meningioma (29.7 %), schwannoma (27 %), and ependymomas (10.8 %); most frequent disease grade was 1 (76.7 %), and most frequent sites of localization were L2 and L3 (21.6 % each). Accordingly, only age was significantly higher in men than women (p=0,029), and remaining characteristics of patients were similar between genders (p>0.05 for all).

**Conclusion:** Total resection of spinal tumors improve recovery of neurological deficits, reduce symptoms and give a chance for oncological treatment modalities.

**Key words:** Spinal tumors, spinal mass, spinal malignancies

**Level of Evidence:** Retrospective clinical study, Level III

### INTRODUCTION

Spinal tumors are classified as extradural, intramedullary and intradural-extradural. Primary spinal tumors make up less than 5 % of spinal column tumors, but these lesions offer spinal oncologists the opportunity to induce a surgical cure<sup>(2)</sup>. Surgical treatment is palliative in patients with metastatic disease. Skeletal metastases are a frequent issue because 10 % of patients with cancer will develop symptomatic spinal metastases; of these, 50 % will require treatment due to pain or neurological deficit<sup>(1,5,9)</sup>. The most common solid primary tumors to metastasize to the spine are those in the breast, lung, prostate, and colon<sup>(4)</sup>.

Preserving neurological function must be the goal of spinal tumor surgery and

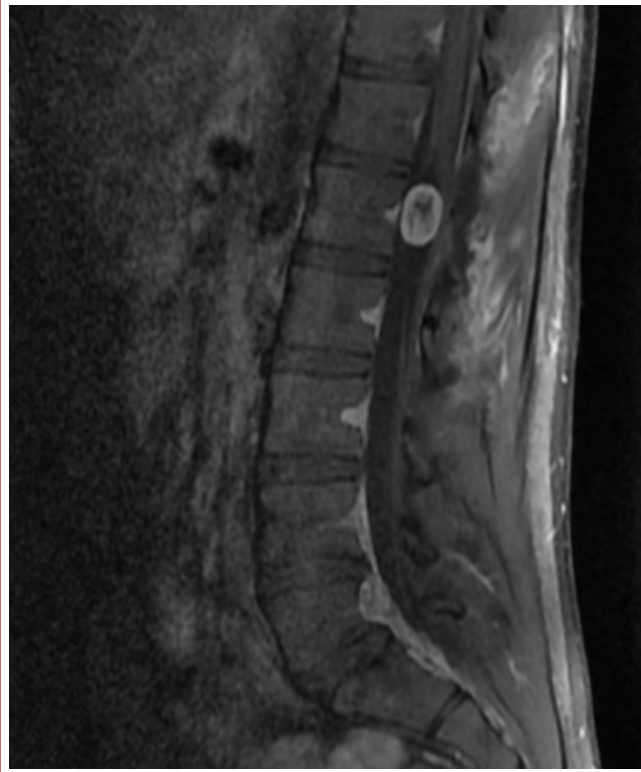
surgical decompression of neurological elements and stabilization of the spinal column are the key points of surgery. Timing of surgery is also important because spinal cord or nerve compressions could result with deficit so that early and complete spinal cord decompression and spinal column stabilization must be done to preserve or restore ambulation and continence, reduce pain and maximize quality of life<sup>(4,6,8,10)</sup>.

In our study we try to analyse the spinal tumors operated in our clinic for 5 years.

### MATERIAL AND METHOD

We inspected patients whom operated for spinal tumor for the last five years retrospectively. Data collected from the patient files and radiology PACS system (Figure-1,2,3,4).

Spinal tumors inspected according to symptoms, pathology, level of tumor, grade of tumor and demographic data of patients.



**Figure-1.** Preoperative lumbar spinal tumor sagittal MRI image



**Figure-3.** Postoperative lumbar spinal tumor sagittal MRI image



**Figure-2.** Preoperative lumbar spinal tumor axial MRI image



**Figure-4.** Postoperative lumbar spinal tumor sagittal MRI image

## STATISTICAL ANALYSES

Numerical variables were presented as mean and standard deviation, and categorical variables were presented as frequency and percent. The comparisons between independent groups were conducted by Mann-Whitney U test for numerical variables, and Chi-square test for categorical variables. A Type-I error level of 5% was considered as statistical significance in all analyses. The SPSS 21 software (IBM Inc., Armonk, NY, USA) was used for the statistical analyses in this study.

## RESULTS

A total of 37 patients were included in this study. The mean age of the participants was  $50.8 \pm 15.7$  years, and 54.1 % of the population were males. Most frequent complaints were weakness in legs (24.3 %), low back pain (35.1 %), arm/leg pain (35.1 %), and gait disturbance (16.2 %). The general characteristics of patients are presented in Table-1.

Clinical characteristics of patients are presented in Table-2. Accordingly, most frequent pathological diagnoses were meningioma (29.7 %), schwannoma (27 %), and ependymoma (10.8 %); most frequent disease grade was 1 (76.7 %), and most frequent sites of localization were L2 and L3 (21.6 % each).

The comparisons of general and clinical characteristics of patients are presented in Table-3 and Table-4, respectively. Accordingly, only age was significantly higher in men than women ( $p=0,029$ ), and remaining characteristics of patients were similar between genders ( $p>0.05$  for all).

	Mean	Standard Deviation
Age (year)	50.8	15.7
	n	%
Cinsiyet		
Erkek	20	54.1
Kadın	17	45.9
Complaint		
Weakness in legs	9	24.3
Low back pain	13	35.1
Gait disturbance	6	16.2
Arm/Leg pain	13	35.1

	n	%
Pathology		
Adenocarcinoma metastasis	2	5.4
Dermoid tumor	1	2.7
Ependymoma	4	10.8
Epidermoid tumor	2	5.4
Hemangioperisitoma	1	2.7
Carcinoma metastasis	1	2.7
Lymphoma	2	5.4
Melanocytoma	1	2.7
Meningioma	11	29.7
Myxopapillary ependymoma	1	2.7
Paraganglioma	1	2.7
Schwannoma	10	27
Grade		
0	2	6.7
1	23	76.7
2	4	13.3
3	1	3.3
Localization		
C1	1	2.7
C2	4	10.8
C3	3	8.1
C4	1	2.7
C5	1	2.7
T1	1	2.7
T2	3	8.1
T4	2	5.4
T5	4	10.8
T6	3	8.1
T7	2	5.4
T8	3	8.1
T9	3	8.1
T10	1	2.7
T11	3	8.1
T12	5	13.5
L1	5	13.5
L2	8	21.6
L3	8	21.6
L4	1	2.7
L5	1	2.7
S1	1	2.7

**Table-3.** General characteristics of patients according to gender

	Male		Female		P
	Mean	SD	Mean	SD	
Age (year)	46.5	13.3	55.8	17.2	0.029
	n	%	n	%	
Complaint					
Weakness in legs	5	25	4	23.5	1.000
Low back pain	7	35	6	35.3	1.000
Gait disturbance	2	10	4	23.5	0.383
Arm/Leg pain	7	35	6	35.3	0.383

**Table-4.** Clinical characteristics of patients according to gender

	Male		Female		P
	n	%	n	%	
Pathology					0.389
Adenocarcinoma metastasis	2	10	-	-	
Dermoid tumor	1	5	-	-	
Ependymoma	3	15	1	5.9	
Epidermoid tumor	1	5	1	5.9	
Hemangioperisitoma	1	5	-	-	
Carcinoma metastasis	1	5	-	-	
Lymphoma	1	5	1	5.9	
Melanocytoma	-	-	1	5.9	
Meningioma	3	15	8	47.1	
Myxopapillary ependymoma	1	5	-	-	
Paraganglioma	-	-	1	5.9	
Schwannoma	6	30	4	23.5	
Grade					0.645
0	1	6.7	1	6.7	
1	10	66.7	13	86.7	
2	3	20	1	6.7	
3	1	6.7	-	-	
Localization					
C1	1	5	-	-	
C2	3	15	1	5.9	
C3	2	10	1	5.9	
C4	1	5	-	-	
C5	1	5	-	-	
T1	1	5	-	-	
T2	2	10	1	5.9	
T4	1	5	1	5.9	
T5	2	10	2	11.8	
T6	2	10	1	5.9	
T7	2	10	-	-	
T8	2	10	1	5.9	
T9	2	10	1	5.9	
T10	1	5	-	-	
T11	-	-	3	17.6	
T12	4	20	1	5.9	
L1	4	20	1	5.9	
L2	3	15	5	29.4	
L3	3	15	5	29.4	
L4	1	5	-	-	
L5	-	-	1	5.9	
S1	-	-	1	5.9	

## DISCUSSION

Spinal tumors are classified as extradural, intramedullary and intradural extramedullary tumors. Extradural tumors are metastatic, multiple myeloma, condrosarcoma, chordoma, aneurismal bone cyst, osteoid osteoma, osteoblastoma, osteochondroma, hemangioma, granuloma and giant cell tumor. Intramedullary tumors are astrocytoma, ependymoma and hemangioblastoma. Intradural-extramedullary tumors are meningioma, neuronoma and neurofibroma. Symptoms of spinal cord lesions include bilateral motor and sensory symptoms not involving the head and face, often with other upper motor neuron symptoms consistent with a myelopathic syndrome <sup>(7)</sup>.

Radiographic evaluation is necessary to determine the location and extent of tumor involvement and may help to differentiate between lesions. A role still exists for plain radiographs in evaluation as they can illustrate bony erosions or evaluate for scoliosis. Magnetic resonance imaging with contrast agent is the gold standard for detecting spinal tumors.

Management of primary and metastatic tumors is quite complex and requires a multidisciplinary understanding of tumor type, location, extension, and overall preoperative and neurological conditions <sup>(11)</sup>. Precise and timely diagnosis with a history, physical examination, imaging, and biopsy are critical first steps. Preoperative planning for en bloc surgical resection of spinal tumors is necessary for improved patient outcomes as well as to minimize any intraoperative and postoperative complications such as cerebrospinal fluid leakage, infection and reconstruction failure.

Biologics and immunotherapy are the new advances in cancer treatment over the past decade, such as improving patient outcomes and consequently life expectancy. The most common sites for metastases in the general population with cancer are the liver and lungs, followed by bone <sup>(3)</sup>. Considering bone metastases, the majority will affect the spine. Primary spine tumors are rare neoplasms that can lead to significant patient morbidity and mortality <sup>(7)</sup>. Intramedullary spinal cord tumors are the rarest of these neoplasms and can potentially lead to severe neurologic deterioration, decreased function, poor quality of life, or death <sup>(10)</sup>.

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