



Spinal Cord Tumors and Its Surgical Outcomes. Our Initial Experiences in Tertiary Center in Eastern Nepal

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Abstract

Background: Spinal tumor has a great morbidity that does not only account for structural abnormality but also the functional ability of human body. Surgery plays a very important role in management of spinal tumor, thus providing immediate symptomatic relief to the patient. The main aim of this study is to analyze the surgical outcome of the spinal cord tumor.

Methods: The 37 patients with spinal tumor surgery in 2 years from 2020 to 2022 were reviewed prospectively in our institute BPKIHS. All patient has done X-ray and MRI. All patient underwent surgery through posterior midline approach. All were evaluated by clinical examination up to 6 months of follow up subsequently.

Results: Female population was more affected by spinal tumor in our study with age group 50 to 60 being the most predominant ones. Pain was the most common initial symptoms with 59.45% whereas spasticity being the most common sign involved (37.83%). Sphincter disturbances was noted in 5.4% being the least. Thoracic spine was the most common location with predilection of 43.24% whereas Schwannoma was the most common histopathological findings with 37.83%. Gross total resection was achieved in 26 (70.20%) and clinical improvement was seen mostly in 1 week of surgery about 54.05%. Complications was seen in 13.5% of cases as wound infection (8.1%) and (5.40%) being CSF leak.

Conclusion: Spinal tumor required early surgical intervention and excision of whole tumor such that patient will recover well from their structural and functional disability without any residual effect and with less complications.

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Introduction

Spinal tumors are the abnormal mass of tissue within or surrounding the spinal cord or spinal column. Most of the spinal tumors falls into the differential diagnosis of various other conditions like cervical spondylitis myelopathy, radiculopathy, lumbar disc herniation and pelvic pathologies. The cellular types of the spinal tumor are quite similar to the intracranial type in histopathology records [1].

Spinal tumors are generally classified into 3 groups, extradural (55%), intradural extra medullary (40%) and intramedullary spinal cord tumors (5%). Benign and malignant neoplasms may arise from intraspinal structures like meninges, spinal cord, nerve roots, vertebrae other tissues [2].

Space occupying lesions in the spinal canal causes compression of the structures with consequent neurological deficits. Rapidly growing lesions cause severe loss of function, as there is no time for the spinal cord to adjust itself. The presence of a tumor interferes with the normal movements of the cord, which occur during movements of the spinal column. Such impairment contributes to cord damage. In long standing tumors, there may be gliosis in the spinal cord due to ischemia and recovery may be incomplete despite total tumor resection [3].

Pain being the most common clinical presentation followed by motor disturbances, non-painful sensory disturbances, sphincter disturbances along with scoliosis, subarachnoid hemorrhage and visible mass over spine [4].

Different diagnostic studies like plain radiographs, lumbar puncture, myelography, CT scan, spinal angiography is there to diagnose the spinal tumor, but still MRI remains the main stay [5].

Surgery should be performed as soon as possible (generally not as an emergency) after diagnosis since surgical results correlate with the preoperative neurological conditions. Surgical outcome

varies due to various factors that includes site of tumor, extent of compression, the histological characteristics of tumor and patient's age, comorbidity, tumor extension, involvement of neighboring structures etc. [6].

Fortunately, the most common spinal tumors are benign in nature and surgical resection of such tumors are found to be more positive rather than negative with gross total resection approaching 100 percent with less mortality and morbidity with very few complications [7].

Materials and Methods

The 37 patients with spinal tumor surgery in 2 years from 2020 to 2022 were reviewed prospectively in our institute BPKIHS. All patient has done X-ray and MRI. All patient underwent surgery through posterior midline approach. All were evaluated by clinical examination up to 6 months of follow up subsequently.

Inclusion criterion

Primary and secondary tumors of the spine diagnosed by MRI.

Exclusion criterion

Vascular malformations.

Infective pathologies including Potts spine.

The patients with inadequate record.

Follow-up <2 months after surgery were excluded from the study.

Each patient's medical history, findings of the physical examination performed in an in/out-patient department, radiological examination records were investigated. All patients were examined by contrast magnetic resonance imaging of the whole spine. Appropriate radiology was obtained during follow-up to assess the extent of resection and recurrences.

Most common age group being: 50-60 years (32.43%), with female being the most predominant sex group with 56.75%, pain is the most common symptom with (59.45%) whereas spasticity (37.83%) is the most common sign involved in our study group (Table 1, 2).

Results

Many factors have influenced the outcome of surgery, most important being the histopathological grading, spinal segment affected, degree of removal of tumor

Thoracic spine was the most common location in our study about 43.24% in our study (Table 3).

Schwannoma is the most common histopathology finding about 37.83% in our study (Table 4).

Gross total removal was achieved in 70.27 percent of population with spinal tumor (Table 5).

Most of the clinical improvement was achieved in less than a week after surgery in most of the patients being 54.05% (Table 6).

Wound infection being the most common complication in our study being 3 (8.10%) (Table 7).

Discussion

In our study, we found the spinal tumor predilection for female is more compare to the male which is similar to the study done by Duong et al. and most of the western research but quite different from

Table 1: Distribution of patient according to their characteristics.

Variables	Numbers (%)
Age (years)	
<10	3 (8.10%)
10-20	2 (5.40%)
20-30	2 (5.40%)
30-40	6 (16.21%)
40-50	11 (29.72%)
50-60	12 (32.43%)
60-70	1 (2.70%)
>70	0 (0%)
Sex	
Male	16 (43.24%)
Female	21 (56.75%)
Symptoms	
Pain	22 (59.45%)
Motor deficit	13 (35.13%)
Sensory deficit	9 (24.32%)
Sphincter dysfunction	2 (5.40%)
(2 or more symptoms present in single patient)	
Signs	
Spasticity	14 (37.83%)
Sensory loss	12 (32.43%)
Muscle weakness	11 (29.72%)
Impaired joint position and vibration	8 (21.62%)
Sensation	4 (10.81%)
Impaired two-point discrimination (multiple occurrences of signs)	

Table 2: Distribution of patient according to types.

Types	Numbers (%)
Extradural	13 (35.13%)
Intradural extramedullary	21 (56.75%)
intramedullary	3 (8.1%)

Table 3: Distribution of patient according to spinal level locations.

Locations of spinal tumor	Number (%)
Cervical	7 (18.91%)
Thoracic	16 (43.24%)
Lumbar	6 (16.2%)
Cervicothoracic	3 (8.1%)
Thoracolumbar	2 (5.4%)
Lumbosacral	3 (8.1%)

the different Asian studies. In most of the studies the preponderance of male to female ratio is quite similar which is different from our studies.

Chamberlain et al. [8] in their studies found about 2/3rd of population belongs to the intradural extramedullary tumors mostly Schwannoma and 1/3rd being the intramedullary tumors which is different from our studies which also shows extradural spinal tumor. This may be due to our epidemiological trend in our population. But histopathological diagnosis in our study is similar to the above study,

Table 4: Distribution of patients according to histopathology.

Histopathology	Number (%)
Schwannoma	14 (37.83%)
Meningioma	11 (29.72%)
Neurofibroma	4 (10.8%)
Ependymoma	2 (5.40%)
Astrocytoma	1 (2.70%)
Hemangioblastoma	1 (2.70%)
Arachnoid cyst	2 (5.40%)
Lipoma	1 (2.70%)
Metastasis	1 (2.70%)

Table 5: Distribution of patient according to removal of tumor.

Degree of removal of tumor	Number (%)
Gross total	26 (70.27%)
Near total	8 (21.62%)
Subtotal	2 (5.40%)
Biopsy only	1 (2.71%)

Table 6: Distribution of patient according to clinical improvement.

Clinical improvement	Number (%)
Immediate	9 (24.32%)
<1 week	20 (54.05%)
At first month	5 (13.85%)
No improvement	1 (2.71%)
Deterioration	1 (2.71%)
Death	1 (2.71%)

Table 7: Distribution of patient according to complications.

Complications	Number (%)
Wound infection	3 (8.10%)
CSF leak	2 (5.40%)



Figure 1: Spinal Schwannoma protruding out at t11/12 level.

Schwannoma being 37.83%.

Ependymoma and the Astrocytoma was the most common intramedullary tumor in our study and Schwannoma is the most common intradural extramedullary tumor which is comparable to the study done by Basal et al. and Chaurasia et al. [9,10] the data of



Figure 2: Myelogram showing the cutoff sign IDEM.

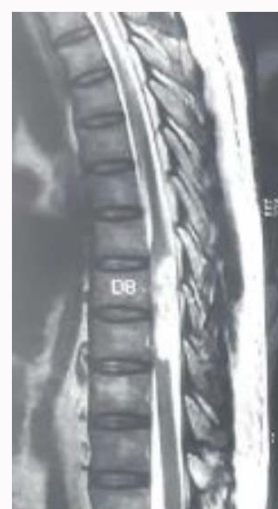


Figure 3: MRI showing the tumor extending from d8 to d9 level.



Figure 4: Meningioma at the d8/d9 level.

ours is similar with the literature listed.

The extent of tumor removal correlates directly with the good clinical outcome. In our study we achieved a gross total resection in 26 patients i.e., about 70.27 percentage which correlates with good clinical outcome in the patient. Near total resection, subtotal resection and biopsy were taken in 21.62%, 5.40% and 2.7% respectively. We found similar type of data percentage in Das et al. study as well [11,12].

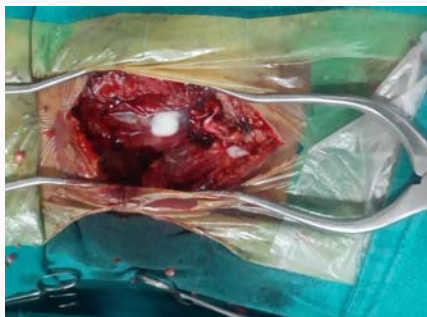


Figure 5: Pus coming out from the lumbar T1/2 level region after incision in dura mater.



Figure 6: Intramedullary tumor at thoracic (d3-d7).

In our study we found the clinical improvement in first week of surgery about 54.05% of patients, immediate improvement in 24.32%, first month 13.85%, deterioration in 2.7% of the cases. Similar type of results was found in Mondo et al. as well [13,14].

Postoperative complications vary from 10% to 40%. In our study wound infection was the complication which was about 8.10% whereas CSF leak was found in 5.40% [15,16].

Conclusion

In conclusion, we found older age group are more prone to spinal tumors, thoracic spinal level being the most common location with Schwannoma as the frequent histopathologic findings. Each spinal tumor required early surgical intervention and excision of whole tumor meticulously with good anatomical dissection, such that patient will recover well from their structural and functional disability without any residual defect and with less complications. Early mobilization and rehabilitation are essential for good clinical outcome.

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