

## Spinal Tumor Surgery- Our Experiences of 35 Cases in a Peripheral Hospital in Bangladesh

Md. Mohsin Ali Farazi\*<sup>1</sup>, Md. Ibrahim Khalil<sup>2</sup>, Shyamol Pal<sup>3</sup>, M. Belal Uddin<sup>4</sup>, Moutusi Sorowar<sup>5</sup>

### Abstract

**Introduction:** Surgical outcome of spinal tumour varies depending on a number of factors such as: site of the tumour, compression within the spinal canal, the histological characteristics of the tumour, the neurological progression and initial response to corticosteroid therapy, patient's age, comorbidity, tumour extension, involvement of neighboring structures and organs etc. **Materials & Methods:** The 35 patients with spinal tumour underwent surgery by our team in 10 years (January 2009 - December 2018) were reviewed retrospectively. **Results:** Analysis of the surgical outcome of our spinal tumour patients was done on different variables like age, sex, presenting symptoms, neuroimaging, comorbidities etc. The aim of surgery was decompression of the spinal cord, total removal of the tumour when possible and spinal stabilization when needed. Out of our 35 patients with spinal tumour, extradural tumour comprises 8, intradural extramedullary tumour 25 and intramedullary tumour 2. **Conclusion:** The aim of this study is to analyze the data to make conclusion for more effective strategy as per site, size, type, resectibility and histological variety to establish an effective treatment protocol and prevention of per-operative and post-operative complications. Intradural extramedullary tumour can be radically resected with no mortality and minimal peri-operative morbidity. But resection of intramedullary spinal tumour is difficult, hazardous and usually incomplete, so needs much more skilled and meticulous surgical hands.

**Keywords:** Spinal tumours, Spinal cord compression, Surgical outcome, Intramedullary, Extradural.

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### \*1. Corresponding Author:

#### Dr. Md. Mohsin Ali Farazi

Assistant Professor  
Department of Neurosurgery  
Shaheed Sheikh Abu Naser Specialized Hospital,  
Khulna, Bangladesh.  
E-mail-mohsinfarazi@yahoo.com  
Mobile: 880 01711964550

### 2. Dr. Md. Ibrahim Khalil

Junior Consultant  
Department of Neurosurgery  
Shaheed Sheikh Abu Naser Specialized Hospital,  
Khulna, Bangladesh.

### 3. Dr. Shyamol Pal

Assistant Registrar  
Department of Neurosurgery  
Shaheed Sheikh Abu Naser Specialized Hospital,  
Khulna, Bangladesh.

### 4. Dr. M. Belal Uddin

Assistant Professor  
Department of Anesthesiology  
Shaheed Sheikh Abu Naser Specialized Hospital,  
Khulna, Bangladesh.

### 5. Dr. Moutusi Sorowar

Assistant Professor  
Department of Anesthesiology  
Khulna Medical College, Khulna, Bangladesh.

### Introduction:

Surgical outcome of spinal tumours varies depending on a number of factors such as: site of tumour, compression within the spinal canal, the histological characteristics of tumour, the neurological progression and initial response to corticosteroid therapy, patient's age, comorbidity, tumour extension, involvement of neighboring structures and organs etc. Treatment of spine and spinal cord tumour is complex and a multidisciplinary approach is required<sup>1</sup>. Treatment options are surgery, radiation therapy and chemotherapy<sup>2</sup>. This study was conducted to analyze factors with impact on the functional outcome in a series of 35 surgically treated patients with spinal tumour and to point out the characteristics of the different histological entities. The signs and symptoms of intradural extramedullary tumour are not specific to tumours and are similar to those caused by any spinal disorder that produces symptoms of spinal cord or nerve root compression. Because of the slow growth of these tumours, symptoms may be subtle and progress slowly overtime before diagnosis<sup>3</sup>. The benign nature of ordinary spinal schwannomas is well documented<sup>4,7</sup>. Total surgical removal can usually be achieved and shortterm outcome is favorable in those who are not too severely crippled before operation<sup>5,7</sup>.

Intradural-extradural (ID-EM) tumours are the most commonly observed intradural spinal tumours, comprising over 60% of tumours found within the spinal canal<sup>8</sup>. While consisting of a heterogeneous group of pathological entities, the vast majority of these lesions are one of three types: meningiomas, schwannoma or neurofibroma<sup>9</sup>. Fortunately, the more common tumours are typically benign and surgical excision represents the possibility of a curative result<sup>10</sup>. Surgical outcomes have generally been quite

positive, with multiple studies quoting gross total resection rates approaching 100% with minimal morbidity and mortality regardless of histologic subtype<sup>11,12</sup>.

**Materials & Methods:**

A descriptive cross sectional study was conducted from January 2009 to December 2018 where 35 patients with spinal tumour underwent surgery by our team, among those 19 were male and 16 were female in were reviewed retrospectively.

**Results:**

**Table-I: (Distribution of the patients: (According to the site).**

Site	No of Patients
Extradural (ED)	08 (22.85%)
Intradural extramedullary (IDEM)	25 (71.42%)
Intramedullary (IM)	02 (5.71%)

**Table-II: (Distribution of the patient according to age).**

Age	No of Patients
<20	04 (11.43%)
21-40	17 (48.57%)
41-60	10 (28.57%)
61-80	04 (11.43%)

**Table-III: (Distribution of the patient according to sex).**

Sex	No of Patients
Male	19 (54.28%)
Female	16 (45.72%)

**Table -IV: (Distribution of the patient according to the region in the spinal column).**

Region in the spinal column	No of Patients
Cervical	09 (25.71%)
Dorsal	18 (51.43%)
Lumbar	07 (20%)
Sacral	02 (5.71%)
Conus	01(2.85%)

**Table-V: (Distribution of the patient according to the symptoms).**

Presenting symptoms	No of Patients
Pain	35 (100%)
Numbness	30 (94.28%)
Paraparesis	18 (51.43%)
Paraplegia	05 (14.28%)
Quadriparesis	09 (25.71%)
Cauda equine syndrome	02 (5.71%)

**Neuro-imaging**

Plain X-ray 35 (100%)

MRI 35 (100%)

The aim of surgery was decompression of the spinal cord, total removal of the tumour when possible and spinal stabilization when needed. Most of the cases were done by laminectomy or laminoplasty.

Many factors have influenced the outcome of surgical treatment. The most important are the histological characteristics of tumour, spinal segment affected and the degree of decompression.

**Table-VI:**

Histological characters	No of Patients
Schwannoma	14 (40%)
Meningioma	7 (20%)
Ependymoma	2 (5.71%)
Chordoma	2 (5.71%)
Metastatic (adenocarcinoma)	2 (5.71%)
Ganglioglioma	1 (2.86%)
Hemangioma	1 (2.86%)
Arachnoid cyst	1 (2.86%)
Clear cell tumor	1 (2.86%)
Cavernoma	1(2.86%)
Plasma cell tumor	1(2.86%)
Neurofibroma	2 (5.71%)

Satisfactory postoperative outcome corresponds with the degree of decompression (e.g. total removal of meningioma or neurofibroma leads to full recovery), but decompression in cases of primary intramedullary tumours and metastases were not always satisfactory.

**Extent of tumour resection:**

**Table-A**

**Surgical resection**

Trait	Number (%)
Gross total	22 (62.86%)
Near total	08 (22.86%)
Subtotal	03 (8.57%)
Biopsy only	02 (5.71%)

**Table-B**

**Clinical improvement**

Trait	Number (%)
Immediate improvement	07 (20%)
Improvement at discharge (7 days)	12 (34.28%)
Improvement at first month follow-up	10 (28.57%)
No improvement	02 (5.71%)
Deterioration	03 (8.57%)
Death	01 (2.85%)

The most frequent difficulties encountered during surgery was the per operative bleeding, anesthetic hazard in previously pulmonary compromised patient etc.



Fig.-1: Intradural Extramedullary (IDEM) Spinal Tumour



Fig.-2: Per Operative finding of Intradural Extramedullary tuumor

Postoperative complications includes CSF leakage 2 (5.71%), Wound infection 1 (2.85%), Deformity 1(2.85%), Pneumonia 1(2.85%).

#### Discussion:

The optimal surgical approach provides maximal exposure with the least manipulation of the neural elements. For most intradural extramedullary tumours, resection can be accomplished with a midline approach. As a general rule, lesions dorsal to the spinal cord can be reached easily using a dorsal midline approach, whereas lesions ventral and lateral to the spinal cord may require resection to provide the best trajectory to the tumour<sup>13</sup>. In our study, the most of the patients were male 19 (54.28%) and belong to the age group of 21-40 years 17 (48.57%). Similar scenario regarding age and sex was reported in Islam MR et al<sup>2</sup>. Our study presented with variable types of symptoms, among which pain contributes as 100% and numbness as 94.28%. In our study 18 cases were at dorsal spine involvement which was highest in location (51.42%). Regarding nature of tumour the most frequent cases were Schwannoma 14 (40%) followed by meningioma 7 (20%). The extent of tumour resection and decompression correlates directly with a good outcome. The extent of excision either incomplete or biopsy was found to positively correlate with postoperative improvement. In our study 22 cases (62.86%) were underwent operation with gross total removal of tumour, 08 cases (22.86%) were underwent operation with near-total removal of tumour, 03 cases (8.57%) were underwent operation with sub-total resection of tumour and in rest 02 cases (5.71%) only biopsy were taken. In our study 12 patients (34.28%) were discharged at 7th post-operative day with significant improvement. In 07 patients (20%) of our study, immediate postoperative improvement were observed. There was no post-operative improvement in 2 cases (5.71%), deterioration in 03 cases (8.57%) and 01 patients died (2.85%) due to severe cardiac complications. Post-operative complications varies from 10-50%<sup>14-29</sup>. In our study there were different type of post-operative complication like CSF leakage in 2 cases (5.71%), wound infection in 1 case (2.85%), deformity in 1 case (2.85%) and pneumonia in 1 case (2.85%).

#### Conclusion:

To achieve good surgical outcome, reduce postoperative mortality and peri-operative morbidity in case of spinal tumours, each neurosurgeon has to perform meticulous anatomical dissection mandatorily with modern sophisticated instruments like operating microscope. Besides this, early mobilization & rehabilitation are essential for good clinical outcome<sup>30</sup>. CSF leak and pseudomeningocele formation may be prevented with meticulous dural closure, fat grafting for obliteration of the dead space and 48 hours postoperative bed rest. Patients tend to completely recover their preoperative neurologic deficits even in the case of longstanding preoperative neurological deficit.

**Conflict of Interest:** None.

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Study was performed in the Department of Neurosurgery, Shaheed Sheikh Abu Naser Specialized Hospital, Khulna, Bangladesh.

All the patients were examined and reviewed separately with verbal and written consent.

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