Original Article

Surgical Outcome of Spinal Tumour: Our Experience in Dhaka Medical College & Hospital

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Abstract:

Introduction: *Surgical outcome of spinal tumour 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.*

Materials & Methods: *The 86 patients with spinal tumour underwent surgery by our team in 7 years (2011-2018) were reviewed retrospectively.*

Discussion: *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 86 patients with spinal tumour, extradural tumour comprises 18, intradural tumour 56 and intramedullary tumour 12.*

Conclusion: *The aim of this study is to analyze the data to made conclusion for more effective strategy as per site, size, type, resectibility and histological variety to establish and 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.*

Key Words: *Spinal tumours, spinal cord compression,surgical outcome, intramedullay, extramedullary.*

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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 [1]. Treatment options are surgery, radiation therapy and chemotherapy [2]. This study was conducted to analyze factors with impact on the functional outcome in a series of 86 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 over

time before diagnosis [3]. The benign nature of ordinary spinal schwannomas is well documented [4-7]. Total surgical removal can usually be achieved and short-term outcome is favorable in those who are not too severely crippled before operation [5,7].

Intradural-extramedullary (ID-EM) tumours are the most commonly observed intradural spinal tumours, comprising over 60% of tumours found within the spinal canal [8]. While consisting of a heterogeneous group of pathological entities, the vast majority of these lesions are one of three types: meningiomas, schwannoma or neurofibroma[9].

Fortunately, the more common tumours are typically benign and surgical excision represents the possibility of a curative result[10]. 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 [11,12].

Materials & Methods:

The 86 patients with spinal tumour underwent surgery by our team in 7 years (2011-2018) were reviewed retrospectively.

Distribution of the patients:

Extradural (ED)	28
Intradural extramedullary (IDEM)	46
Intramedullary (IM)	12

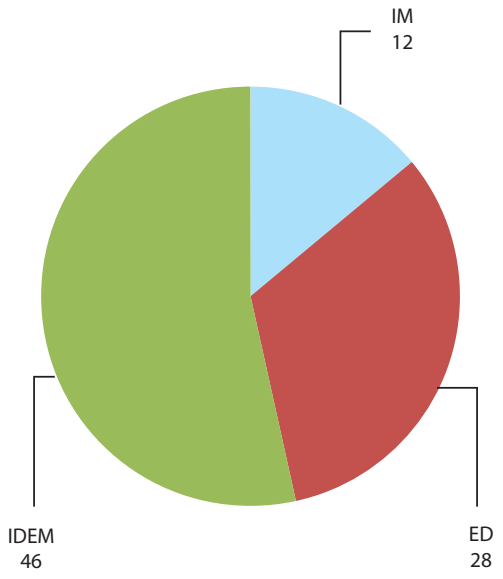

Fig.-1: Pie chart of distribution of patients.

Tablle-I

Characteristics of patients

Variable	Number (%)
Age	
<20	5 (5.81%)
21-40	27 (31.39%)
41-60	41 (47.67%)
61-80	13 (15.11%)
Sex	
Male	44 (51.16%)
Female	42 (48.83%)
Presenting Symptom	
Pain	86 (100%)
Numbness	64 (74.41%)
Paraparesis	28 (32.55%)
Paraplegia	15 (17.44%)
Quadriparesis	8 (9.30%)
Cauda equine syndrome	3 (3.48%)
Neuro-imaging	
Plain X-ray	86 (100%)
CT scan	8 (9.30%)
MRI	86 (100%)
Co-morbidity	
Hypertension	58 (67.44%)
Diabetes	27 (31.39%)
COPD	13 (15.11%)
Heart failure	3 (3.48%)
Lung Carcinoma	3 (3.48%)
Breast carcinoma	2 (2.32%)
Thyroid gland carcinoma	1 (1.16%)
Bowel adenocarcinoma	1 (1.16%)

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.

Results:

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-II
Segment involved & nature of tumour

Trait	Number (%)
Spinal level	
Cervicomedullary Junction	7 (8.13%)
Cervical	19 (22.09%)
Cervico-dorsal junction	18 (20.93%)
Dorsal spine	35 (40.69%)
Conus level	7 (8.13%)
Nature	
Metastasis	20 (23.25%)
Meningioma	17 (19.76%)
Schwannoma	16 (18.60%)
Neurofibroma	10 (11.62%)
Ependymoma	6 (6.97%)
Sarcoma	3 (3.48%)
Astrocytoma	2 (2.32%)
Lipoma	2 (2.32%)
Multiple Myeloma	2 (2.32%)
Lymphoma	1 (1.16%)
V. Haemangioma	1 (1.16%)
Haemangioblastoma	1 (1.16%)
Cavernoma	1 (1.16%)
Arachnoid Cyst	1 (1.16%)

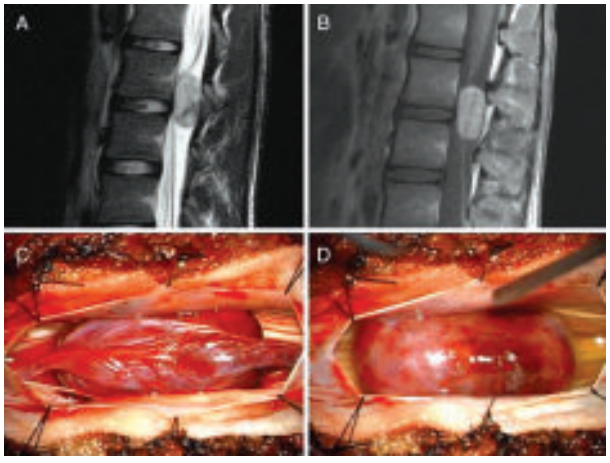

Fig.-2: *Intrdural Extramedullary (IDEM) Spinal Tumour*

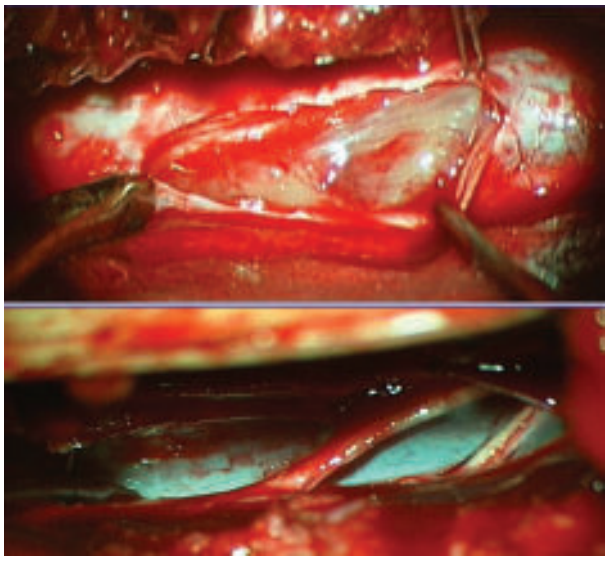

Fig.-3: *Intramedullary Spinal Cord Tumour (IMSCT)*

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-III
Surgical resection

Trait	Number (%)
Gross total	60 (69.76%)
Near total	16 (18.60%)
Subtotal	7 (8.14%)
Biopsy only	3 (3.49%)

Table-IV
Clinical improvement

Trait	Number (%)
Immediate improvement	21 (24.42 %)
Improvement at discharge (7 days)	29 (33.72%)
Improvement at first month follow-up	12 (13.95%)
No improvement	3 (3.48%)
Deterioration	7 (8.13%)
Death	2 (2.33%)

The most frequent difficulties encountered during surgery were the per operative bleeding, anesthetic hazard in previously pulmonary compromised patient, difficulties when undergoing spinal instrumentation due to tumour infiltration etc.

Table-V
Postoperative complications include

Complication	Number (%)
CSF leakage	3 (3.48%)
Wound infection	3 (3.48%)
Pseudo-meningocele	1(1.16%)
Stabilization failure	2(2.33%)
Deformity	1(1.16%)
Pneumonia	1(1.16%)

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 dorsal 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 [13].

In our study, the most of the patients were male (51.16%) and belong to the age group of 41-60 years (47.67%). Similar scenario regarding age and sex was reported in Islam MR et al [2].

The respondents of our study presented with variable types of symptoms, among which pain contributes as 100% and numbness as 74.41%. In our study 35 cases were at dorsal spine involvement which was highest in location (40.69%). Regarding nature of tumour the most frequent cases were metastasis (23.25%) followed by meningioma (19.76%), Schwannoma (18.60%) and neurofibroma (11.62%).

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 60 cases (69.76%) were underwent operation with gross total removal of tumour, 16 cases (18.60%) were underwent operation with near-total removal of tumour, 7 cases (8.14%) were underwent operation with sub-total resection of tumour and in case of rest 3 cases (3.49%) only biopsy were taken.

In our study 29 patients (33.72%) were discharged at 7th post-operative day with significant improvement. In 21 patients (24.42%) of our study, immediate post-operative improvement were observed. There was no post-operative improvement in 3 cases (4.48%), deterioration in 7 cases (8.13%) and 2 patients died (2.32%) due to severe post-operative complications.

Postoperative complications vary 10-52% [14-29]. In our study there were different type of post-operative complication like CSF leakage in 3 cases (3.48%), wound infection in 3 cases (3.48%), pseudo-meningocele in 1 case (1.16%), stabilization failure in 2 cases (2.33%), deformity in 1 case (1.16%) and pneumonia in 1 case (1.16%).

Conclusion:

To bring good surgical outcome, to reduce postoperative mortality and peri-operative morbidity in case of spinal tumours, each neurosurgeon has to perform meticulous anatomical dissection mandatorily.

Besides this, thorough perioperative planning, meticulous microsurgical techniques and early mobilization & rehabilitation are essential for good clinical outcome[30].

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.

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