

# Spinal Tumor Surgery 6 Month Follow up in 34 Cases

Islam MR<sup>1</sup>, Siddique MSA<sup>2</sup>, Ahmed M<sup>3</sup>, Khan AS<sup>4</sup>, Afreen S<sup>5</sup>, Das S<sup>6</sup>, Sarker AC<sup>7</sup>

### Abstract:

*The 34 spinal tumor surgery done by our team in last 2 years were reviewed retrospectively. 29 (85.29%) of them had significant episodes of radicular pain, 32(94.12%) -motor deficit and 4(11.76%) – bladder dysfunction. X-ray and MRI were done in all patients. Plain and contrast MRI effectively determined the tumor location and assumption of nature of tumor to some extent that helped us planning of surgery. Over all treatment lead to improvement of pain 31 (91.18%) and motor deficit 20 patents. Radicular pain, infection, motor deficit, bladder dysfunction, bed sore and anesthetic hazard in long time bed ridden patient with post-operative pneumonia and/or deep vein thrombosis were the major problem. The mortality rate in our series is 2 in 6 month follow up. There was no operative mortality, only due to disease process (2). Optimum timing of treatment such as surgery, radiation therapy and chemotherapy in selected cases especially early surgery might be improve over all outcome.*

**Key word:** Spinal tumors, spinal cord compression, surgical treatment, laminectomy, transpedicular fixation, post operative complications.

*Bang. J Neurosurgery 2014; 3(2): 46-50*

### Introduction:

Treatment of spine and spinal cord tumors is complex and a multidisciplinary approach is required. Treatment options are surgery, radiation therapy and chemotherapy outcome depends on a number of factors include the site of tumor compression with in the spinal canal, the histological characteristics of tumors, the neurologic progression and initial response to corticosteroid therapy, patient age, comorbidity, tumor extension, involvement of neighbor structures and organs etc. spinal cord tumors constitute 2 % of all tumors and 1-3% of tumors of

central nervous system. Approximately 25% of spinal cord tumors are extramedullary (25 % neurinoma and 20% meningioma); primary intramedullary tumors comprise 10-15% and metastatic tumors 40-80%<sup>1-3,7-9,12,15,17,23-27,33-39</sup>. Ambulatory patients who received surgery (decompression and stabilization of the spine when needed), are more likely to show improvement<sup>3,6,9,12-14,17-21</sup>. Bilsky and Hufana reported improvement in 90 % of cases with extramedullary benign tumors when totally extirpated. On the other hand for the spinal metastases the outlook remains poor, in these cases surgery is palliative. Postoperative mortality have varied from 8-11%<sup>3,10,17,21,25</sup>. The major factors influencing postoperative complications include deficits and co morbidity. Postoperative complications incidence as per Bilsky varies from 10 to 52% and the most frequent are the venous thromboembolism, infarct, infection, broncho-pneumonia, failure of the stabilization and pain. The aim of this study is to analyze the data gathered, for the patients with spine and spinal cord tumors, treated in our clinic, in order to make the necessary conclusions for more effective treatment and prevention of intra and postoperative complication.

1. Dr Md Rafiqul Islam, Assistant Professor, Department of Neurosurgery, Dhaka Medical College & Hospital.
2. Dr Md Shamiul Alam Siddique, Indoor Medical Officer, Department of Neurosurgery, Dhaka Medical College & Hospital.
3. Dr Mansur Ahmed, Thesis Part Student (MS Neurosurgery), Department of Neurosurgery, Dhaka Medical College & Hospital.
4. Dr Arif Salam Khan, Associate Professor of Surgery, Bangabandhu Shaikh Mujib Medical University.
5. Shamantha Afreen, Resident, Neurosurgery, Dhaka Medical College & Hospital.
6. Dr. Sukriti Das, Associate Professor, Department of Neurosurgery, Dhaka Medical College & Hospital.
7. Dr Asit Chandra Sarker, Associate Professor, Department of Neurosurgery, Dhaka Medical College & Hospital.

**Address of Correspondence:** Dr Md Rafiqul Islam, Assistant Professor, Department of Neurosurgery, Dhaka Medical College & Hospital.

**Methods:**

The records of 34 patients with spine and spinal cord tumors, who received surgery for the period 2013-2015 were retrospectively reviewed.

**Characteristics of patients:**

Variable	Number
Age	
<20	3 (8.82%)
21-40	9 (26.47%)
41-60	18 (52.94%)
61-80	4 (11.76%)
Sex	
Male	11 (32.35%)
Female	23 (67.64%)
Presenting Symptom	
pain	29 (85.29%)
Numbness	27 (79.41%)
Paraparesis	11 (32.35%)
Paraplegia	7 (20.59%)
Quadriparesis	3 (8.82%)
Cauda equine syndrome	4 (11.76%)
Neuroimaging	
Plain X-ray	34 (100%)
CT scan	4 (11.76%)
MRI	34 (100%)
Co morbidity	
Hypertention	8 (23.53%)
Heart failure	2 (5.88%)
Diabetes	9 (26.47%)
COPD	1 (2.94%)
Lung Carcinoma	1 (2.94%)
Bowel adenocarcinoma	1 (2.94%)
Breast carcinoma	1 (2.94%)
Thyroid gland carcinoma	1 (2.94%)

The aim of surgery was decompression of the spinal cord, total removal of the tumor when possible and spinal stabilization when needed. The surgery performed is outlined below:

Laminectomy	32 (94.12%)
Transpedicular stabilizaion	2 (5.88%)
Laminoplasty	2 (5.88%)

**Results:**

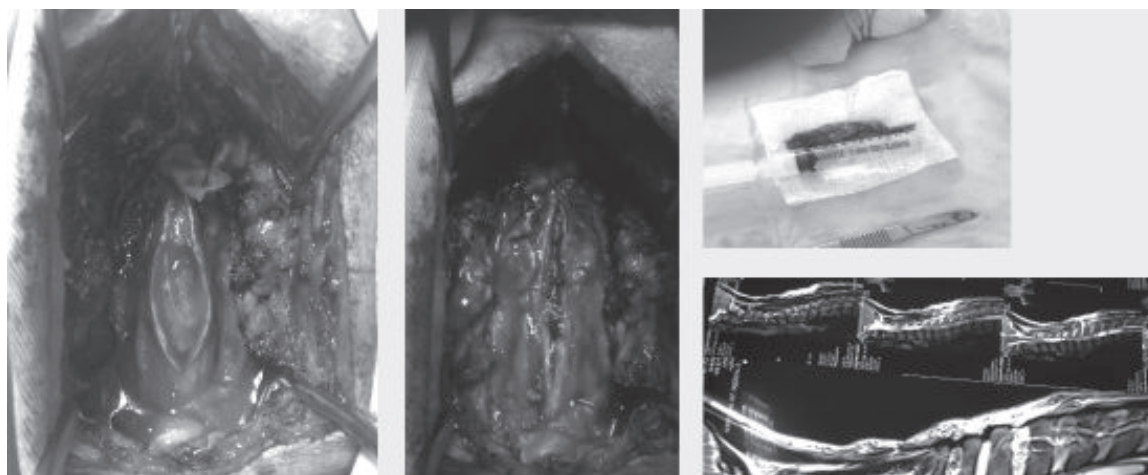
Many factors have influenced the outcome of surgical treatment. The most important are the histological characteristics of tumor, spinal segment affected and the degree of decompression.

**Spinal level**

Cervicomedullary Junction	2 (5.88%)
Cervical	5 (14.70%)
Cervico dorsal junction	1 (2.94%)
Dorsal spine	14 (41.18%)
At the level of cauda equina	12 (35.29%)

**Nature**

Neurofibroma	8 (23.53%)
Meningioma	7 (20.59%)
Astrocytoma	5 (14.70%)
Ependymoma	7 (20.59%)
Metastasis	5 (14.70%)
Fibro sarcoma	1 (2.94%)
Lymphoma	1 (2.94%)

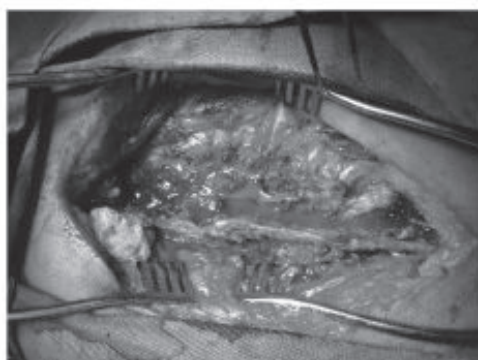
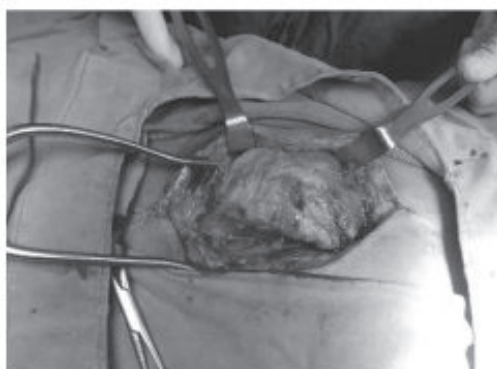
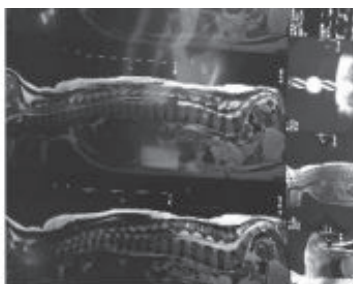
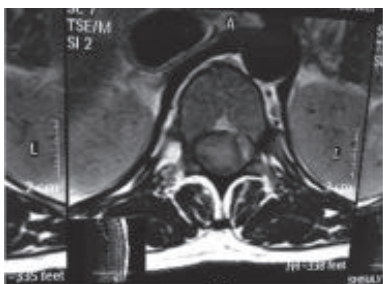


Satisfactory postoperative outcome corresponds with the degree of decompression- total removal of meningiomas or neurofibromas leads to full recovery, but decompression in cases of primary intramedullary tumors and metastases is palliative and accompanied with complications.

#### Extent of tumor resection

Complete	10 (29.41%)
Partial removal	18 (52.94%)
Biopsy only	6 (17.65%)
Patient onset of improvement	
Immediate	8 (23.53%)
With improvement at discharge	13 (44.12%)
Improvement in 6 month follow-up	8 (23.53%)
Worsened	3 (8.82%)
Death	2(5.88%)

The most frequent difficulties encountered during surgery were the profuse bleeding, anesthetic hazard in previously pulmonary compromised patient difficulties when undergoing spinal instrumentation due to tumor infiltration of neighbouring levels or osteoporosis. Postoperative complications include: CSF leakage- 2 cases, wound infection 2 cases .



## Discussion:

The extent of tumor resection and decompression correlates directly with a good outcome. The period from the onset of first neurological symptoms till the diagnosis in 90% of our cases was more than 6 weeks. This period is long enough for the development of undesired factors influencing the outcome after surgery. The same was reported in the literature by Bauer, Brotchi, Dunn, Klekamp. That's why, from 27 cases of total tumor removal, only in 8 cases we registered full recovery. The extent of excision either incomplete or biopsy was found to positively correlate with postoperative improvement; 24 cases in our study. In few cases the improvement was temporary but we didn't realize to record the period free of complains and the development of the disease. This is because in our country we don't have yet a developed multidisciplinary approach and follow-up tools for patients suffering of this pathology.

32.35% of patients discharged without improvement were with spinal metastases. These data are approximately the same with the statistics reported from most of the authors. Postoperative complications vary 10-52% (9, 12, 15, 17, 21, 23-27, 33-39). Different causes were reported such as: bronchopneumonia, embolism, heart failure, surgical site haematoma, failure of stabilization, infections, CSF leakage etc. 23.53% of our cases experienced postoperative complications. Wide range of mortality rate was reported from different authors- Cohen & Allen report a mortality rate 0-3%, Bilsky 13% and in our study 7,3 %. Most of factors influencing surgical treatment and the outcome are well known. That's why through early diagnosis and proper treatment (surgery, radiation and chemotherapy), the complications can be avoided or at least minimized.

## References:

1. Angevine PD, McCormack PC: Spinal cord ependymomas. *Operative Techniques Neurosurg* 2003, 6:9-14
2. Bauer HCF, Wedin R: Survival after surgery for spinal and extremity metastases: prognostication of 241 patients. *Acta Orthoped Scand* 1995, 66:143-146 (Medline)
3. Bilsky MH, Lis E, Raizer J, Lee h, Boland P: The diagnosis and treatment of metastatic spinal tumors. *The Oncologist*, 1999, 4(6):459-469
4. Bridwell K, Jenny A, Saul T et al: Posterior segmental spinal instrumentation with posterolateral decompression and debulking for metastatic thoracic and lumbar spine disease. *Spine* 1998, 13:1383-1394
5. Brotchi J : Intrinsic spinal cord tumor resection . *Neurosurgery* 2002, 50:1059-1063
6. Brotchi J, Lefranc F : Current management of spinal cord tumors. *Contemp Neurosurg* 1999, 21:1-8
7. Brown L Middleton G, Macvicar Ad et al: Vertebral metastases: changes on treatment and correlation with response to therapy. *Clin Radiol* 1999; 53: 493-501.
8. Byrne TN: Spinal cord compression from epidural metastases. *N Engl J Med* 1992, 327: 614-619 (Medline)
9. Cahill DW, Kumar R: Palliative subtotal vertebrectomy with anterior and posterior reconstruction via a single posterior approach. *J Neurosurg* 1999, 90: 42-47
10. Cohen AR, Wisoff JH, Allen JC, Epstein F: Malignant astrocytomas of the spinal cord. *J Neurosurg* 1989, 70: 50-54
11. Constantini S, Miller DC, Allen JC, Rorke LB, Freed D, Epstein JF: Radical excision of intramedullary spinal cord tumors: Surgical morbidity and long term follow-up evaluation in 164 children and young adults. *J Neurosurg, Spine*: 2000, 93:183-193
12. Cooper P, Errico T, Martin R et al: A systematic approach to spinal reconstruction after anterior decompression for neoplastic disease of the thoracic and lumbar spine. *Neurosurgery* 1993, 32: 18 (Medline)
13. Dunn Jr RC, Kelly WA, Wohns RNW et al: Spinal epidural neoplasia. A 15-year review of the results of surgical therapy. *J Neurosurg* 1980, 52; 4751 (Medline)
14. Epstein FJ, Farmer JP, Freed D: Adult intramedullary astrocytomas of the spinal cord. *J Neurosurg* 1992, 77: 355-359
15. Gilbert RW, Kim JH, Posner JB: Epidural spinal cord compression from metastatic tumor : diagnosis and treatment. *Ann Neurol* 1978, 3: 40-51 (Medline)
16. Gokaslan ZL, York JE et al: Transthoracic vertebrectomy for metastatic spinal tumors. *J Neurosurg* 1998;89:599-609
17. Han IH, Kuh SU, Chin DK, Jin BH, Cho YE: Surgical treatment of primary spinal tumors in the medullaris. *J Kor Neurosurg Ass*, 2008, 44(2): 72-77
18. Holman PJ, Suki D, McCutcheon I, Wolinsky J-P, Rhines LD et al: Surgical management of metastatic disease of the lumbar spine: experience with 139 patients. *J Neurosurg: Spine*, 2005, 2(5): 550-563
19. Houten JK, Cooper PR: Spinal cord astrocytomas, presentation, management and outcome, *J Neurooncol* 2000, 47:219-224
20. Hoshimaru M, Koyama T, Hashimoto N et al: Results of microsurgical treatment for intramedullary spinal cord ependymomas. Analysis of 36 cases. *Neurosurgery* 1999, 44:264-269
21. Hufana V, Tan JSH, Tan KK: Microsurgical treatment for spinal tumors. *Surg Med J*, 2005, 46(2):74-77



22. Isaacson SR: Radiation therapy and the management of intramedullary spinal cord tumors. *J Neurooncol* 2000, 47:231-238
23. Klekamp J, Samii H: Surgical results for spinal metastases. *Acta Neurochir (Wien)* 1998, 140: 957967(Medline)
24. Klimo P Jr, Kestle JR, Schmidt MH: Treatment of metastatic spinal epidural disease: a review of the literature. *Neurosurg Focus*, 2003, 15(5): 1-9
25. Ėėāðēō ĀĀ : Ōēōōōāēý ñēīīīāī īīçāā. īīñēāā, 1990, ñōō.258-280
26. Maranzano E, Latini P: Effectiveness of radiation therapy without surgery in metastatic spinal cord compression: final results from a prospective trial. *Int J Radiat Oncol Biol Phys* 1995, 32: 959-967(Medline)
27. McCormick PC, Stein BM: Spinalcord tumors in adults. In Youmans JR ,ed *Neurological Surgery*. Philadelphia. WB Saunders, 1998, 3102-3122
28. Miller DJ, McCutcheon IE: Hemangioblastomas and other uncommon intramedullary tumors. *J Neurooncol* 2000, 47:253-270
29. North RB, LaRocca VR, Schwartz J, North CA et al : Surgical management of spinal metastases; Analysis of prognostic factors during a 10-year experience. *J Neurosurg: Spine*, 2005, 2(5): 564-573
30. Perrin RG,McBroom RJ: Spinal fixation after anterior decompression for symptomatic spinal metastases. *Neurosurgery* 1998, 22:324-327
31. Sama AA, Girardi FP, Cammisa FP: Spinal Tumors.eMedicine Orthopedic Text Book, 2008, 3-12
32. Sanderson SP, Cooper PR: Intramedullary spinal cord astrocytomas. *Operative Techniques Neurosurgery* 2003, 6:1-23
33. Schwartz TH, McCormick PC : Intramedullary spinal cord tumors.Special issue. *J Neurooncol* 2000, 47: 187-317
34. Schwartz TH, McCormick PC : Intramedullary ependymomas: Clinical presentation, surgical treatment, strategies and prognosis. *J Neurooncol* 2000, 47:211218
35. Sciubba DM, Petteys RJ, GarcesAmbrossi GL, Noggle JC, McGirt MJ et al: Diagnosis and management of sacral tumors. *J Neurosurg: Spine* ,2009, 10(3) : 244-256
36. Solero CL, Formari M, Giombini S, Lasio G, Oliveri G, Cimino C et al: Spinal meningeomas: review of 174 operated cases. *Neurosurgery* 1989, 25: 153-160
37. Sundaresan N, Digiacinto GV, Hughes JE et al: Treatment of neoplastic spinal cord compression: results of prospective study. *Neurosurgery* 1991, 29: 645-650
38. Sundaresan N, Steinberger AA, Moore F et al : Indications and results of combined anterior-posterior approaches for spine tumor surgery. *J Neurosurg* 1996, 85:438-446
39. Taricco MA, Guirado VMP, Fontes RBV, Piese JPP: Surgical treatment of primary intramedullary spinal cord tumors in adult patients. *Arq. Neuro Psiquiatr.* 2008, vol 66, N1: 1-