

SPECTRUM OF INTRAMEDULLARY SPINAL CORD TUMOURS: CASE SERIES OF 30 PATIENTS

Naeem ul Haq¹, Mumtaz Ali², Ramzan Hussain³, Hayat Muhammad Khan⁴

¹⁻⁴ Department of Neurosurgery, Lady Reading Hospital Peshawar - Pakistan.

Address for correspondence:

Dr. Naeem ul Haq

Department of Neurosurgery, Lady Reading Hospital Peshawar - Pakistan.

E-mail: naeem_gmc@yahoo.com

Date Received:

November 07, 2014

Date Revised:

November 30, 2015

Date Accepted:

December 11, 2015

ABSTRACT

Objective: To assess the frequency of intramedullary spinal cord tumours based on clinical and histological features.

Materials and methods: This descriptive study was performed at the Department of Neurosurgery Lady Reading Hospital Peshawar, from 20th Jan 2003 to 19th Jan 2009. Treatment charts of patients with spinal tumours were reviewed and patients operated for spinal tumours were identified. A total of 30 patients out of 480 cases of spinal tumours with different intramedullary spinal tumours were considered in this study. Their frequency, clinical features, and histological reports were analyzed in different aspects.

Results: There were total of 30 patients with mean age of 36 years and a wide range beginning as young as 6years. Seventeen patients (56%) were male and 13(43%) were female. Common presenting complaints were loss of sensation in 24 patients (80%), paresis in 20 patients (66%), altered sensation in 12 patients (40%), back pain 11 patients (36%) and sphincteric disturbances 9 patients (30%). MRI spine was the main diagnostic tool and was done in 30 (100%) cases. Cervical spine was involved in 12 patients (40%), cervicothoracic 6 patients (20%), thoracic 10 patients (32%), conus 2 patients (08%). Ependymoma was the most common intramedullary spinal cord tumour 20 patients (60%), while 07 (21%) patients had astrocytoma and 03(09%) had haemangioblastoma. We had follow up of 1 year with follow up visit after every 3 months. Superficial wound infection in 2 (6.66%) patients, CSF leak in 3(10%) cases. Worsening of neurodeficit in 3(10%) patients.

Conclusion: Ependymoma and astrocytoma constituted majority of cases. Intramedullary spinal cord tumours peak during 3rd to 4th decade of life

Key Words: Intramedullary Spinal cord tumours, spinal ependymoma, astrocytoma, Haemangioblastoma.

This article may be cited as: Haq N, Ali M, Hussain R, Khan HM. Spectrum of intramedullary spinal cord tumours: Case series of 30 patients. J Postgrad Med Inst 2015; 29(4): 252-5.

INTRODUCTION

Spinal cord tumours of the intramedullary types contribute to 4 to 10% of all CNS tumours. They are about 25% of adult intradural tumours. But in children they are 50% of all intradural tumours arising in the spine. Intracranial tumours are more frequent than spinal cord tumours with a ration of 4:1¹. Ependymoma is slightly more common than astrocytoma, but it is more common in adult population, while astrocytoma is more common in pediatric population^{2,3}. In recent years, the diagnosis of spinal cord tumours has improved with the advent of magnetic resonance imaging (MRI).

Gowers and horsely document the first ever successful surgery upon a spinal cord tumour that despite all constraints and lack of imaging modalities of present day required adequate neurological examination to lo-

calize the lesion. Late 19th century witnessed this milestone that paved way for the present day management of such tumours⁴.

Recent improvements in microsurgical techniques have moreover replaced the more conservative approach to such tumours suggesting that the previous concepts of a conservative approach with gaining histological evidence and radiotherapy is to be challenged⁵.

Clinical features mimic like pain of entrapment neuropathy, intercostals neuralgia, referred pain like cholecystitis, renal pain. Back pain including nocturnal pain is important presentation. sphincter dysfunction is late presentation. Patients presents with paraplegia and quadriplegia along with long tract signs.

There are limited local studies on intramedullary spinal cord tumours, this study will help to know about the

local trend about spinal cord tumours.

METHODOLOGY

The record of all patients with spinal tumours was reviewed and patients with Intramedullary spinal cord tumours were analyzed in detail. Out of 480 patients admitted as diagnosed cases of spinal tumours, only 30 patients had Intramedullary spinal cord tumours and were operated in the neurosurgery department, PGMI, lady reading hospital Peshawar between January 2003-2009. Patients of both genders irrespective of their age who had spinal tumours were included in the study and those who had recurrence of the tumours or co-morbid conditions like, CHD, HTN, DM or coagulopathy were excluded. The demographic data and clinical, radiological and histological features pertaining to these patients were studied and documented. All the patients were operated after establishing a diagnosis. X-rays were done in all the cases. Radiological investigations were done like CT scan and MRI with MR myelogram of the involved area. Preoperative preparation was done. For proper localization preoperative marker with X-ray, image intensifier and operative microscope were used. Selective administration of potent steroid was considered in preoperative phase with clinical evidence of neurological deterioration or radiological evidence of edema. All the patients were operated under G.A., after taking informed consent, in prone position followed by Laminectomy, durotomy, myelotomy, microsurgical resection of tumour, and closure of wound.

Gross total resection/partial resection was done. For tissue diagnosis, biopsy was taken and preserved in 10% formalin and sent to laboratory on same day. All

cases were reported by senior pathologist. In case of doubt slide was reviewed.

RESULTS

Of a total 480 patients with spinal tumours underwent surgery at the lady reading hospital between January 2003 and Jan 2009 30 patients were intramedullary spinal cord tumours. Seventeen patients (56%) were male and the rest female. The mean age was 36 years and a wide range beginning in patients as young as 6years.. Common presenting complaints were loss of sensation in 24 patients (80%), paresis in 20 patients (66%), altered sensation in 12 patients (40%), back pain in 11 patients (36%) and sphincteric disturbances in 9 patients (30%). MRI spine was the main diagnostic tool and was done in 30 (100%) cases. cervical spine was involved in 12 patients (40%), cervicothoracic 6 patients (20%), thoracic 10 patients (32%), conus 2 patients (08%). Ependymoma was the most common intramedullary spinal cord tumour 20 patients (60%), while 07 (21%) patients had astrocytoma and 03(09%) had Haemangioblastoma. we had follow up of 1 year with follow up visit after every 3 months . superficial wound infection in 2 (6.66%) patients, CSF leak in3(10%) cases. Worsening of neuro deficit in 3(10%) patients.

Compared to the preoperative neurological condition, the overall postoperative state at last follow-up was improved or unchanged in 65%patients (n=20) and worse in 34 % patients (n=10). The preoperative and postoperative states were evaluated through Frankel grades.

Table 1: Symptoms reported

Symptoms	No. of patients	Frequency
Sensory loss	24	80%
Limb weakness	20	66%
Paraesthesia	12	40%
Back pain	11	36%
Sphincteric disturbance	09	30%

Table 2: Localization of tumour

Level	Number of patients	Frequency
Cervical	12	40%
Cervicothoracic	06	20%
Thoracic	10	32%
Conus	02	08%

Table 3: Histopathology findings

	No. of patients	% age
Ependymoma	20	60%
Astrocytoma	07	21%
Haemangioblastoma	03	9%

DISCUSSION

A wide spectrum of frequencies has been reported for the western society regarding the incidence of such tumours^{6,7}. Literature has reason to support ependymomas and astrocytomas as the most common histological types. In our study ependymoma (60%) is more common than astrocytoma (21%), there is marked difference. Generally ependymoma is slightly more common than astrocytoma. However our study is comparable to another study conducted by G manzano, BA green et al at Miami USA, in which ependymoma (50%) and astrocytoma (12%)⁸. In our study IMSCT regarding location cervical is most common site (40%), followed by cervicothoracic, thoracic and conus area. Another study conducted by Sandalcioglu, Gasser et al in Essen Germany show same result regarding location of IMSCT⁹. Earlier concepts of a conservative approach has changed significantly with support in literature that could be due to better surgical techniques and technology as well as newer imaging modalities. These include cavitron ultrasonic aspirator, and neurophysiological monitoring¹⁰. MRI with contrast is investigation of choice. With earlier reports suggesting lesser total resection rates recent figure suggest most if not all are amenable to total resection¹¹ and now resection is upto 90%. In our study gross total resection of ependymoma is upto 65%, which is lower than international studies; it is due to lack of neurophysiological monitoring which guides towards complete safe removal of tumour. Prolonged pressure of the tumour could be the reason for an even still unconvincing result of decreased function even after the surgery and a compromised blood flow could only compound the situation¹².

Conventionally intra medullary astrocytomas were subjected to radiological evaluation followed by radiotherapy as a primary modality for treatment¹³. It is due to the diffuse nature of the tumour, and difficulty in its removal due to absence of cleavage plan. In our series complete resection of astrocytoma was 35 %. Variable reports to the frequency of total excisions for low grade astrocytomas exist in literature some as low as 5% and others documenting many as amenable to resection¹⁴⁻¹⁶. Haemangioblastoma is non-glial tumour, and its resection is easy as compared to glial tumours. Gross total resection was done in majority cases. Regarding the age, mean age at presentation is 36 years; Fornari et al¹⁷ had reported mean age quite similar with similar array of symptoms and very few were children in the series

reported that study. Natural history of these tumours is benign. Its associated side effects, including neurologic worsening from tissue edema or radiation necrosis and the potential wound healing complications after initial and subsequent microsurgical resections, cannot be ignored. The role of focused radiotherapy such as cyber knife radiosurgery is yet to be determined¹⁸. In the present literature, postoperative radiotherapy is performed only in cases with high-grade IMSCTs.

CONCLUSION

Ependymoma and astrocytoma constituted majority of cases. Intramedullary spinal cord tumours peak during 3rd to 4th decade of life.

REFERENCES

1. Tihan T, Chi JH, McCormick PC, Ames CP, Parsa AT. Pathologic and epidemiologic findings of intramedullary spinal cord tumours. *Neurosurg Clin N Am* 2006; 17:7-11.
2. McCormick PC, Torres R, Post KD, Stein BM. Intramedullary ependymoma of the spinal cord. *J Neurosurg* 1990; 72:523-32.
3. Houten JK, Cooper PR. Spinal cord astrocytomas: presentation, management and outcome. *J Neurooncol* 2000; 47:219-24.
4. Toellner R. *Illustrierte geschichte der medizin*. Weltbild Verlag: Augsburg, 2000.
5. Cooper PR, Epstein F. Radical resection of intramedullary spinal cord tumours in adults. Recent experience in 29 patients. *J Neurosurg* 1985; 63:492-9.
6. Austin, G. *The spinal cord basic aspects and surgical considerations*. 2nd Ed. Illinois: Thomas CC; 1972.
7. Connolly ES. Spinal cord tumour in adults. In: Youmans JR, editor. *Neurological Surgery*. 2nd Ed. Philadelphia: Saunders; 1982.
8. Manzano G, Green BA, Vanni S, Levi AD. Contemporary management of adult intramedullary spinal tumours pathology and neurological outcomes related to surgical resection. *Spinal Cord* 2008; 46:540-6.
9. Sandalcioglu IE, Gasser T, Asgari S, Lazorisak A, Engethorn T, Egethof T, et al. Functional outcome after surgical treatment of intra medullary spinal cord tumours: experience with 78 patients. *Spinal Cord* 2005; 43:34-41.
10. Hejazi N, Hassler W. Microsurgical treatment of intramed-

- ullary spinal cord tumours. *Neurol Med Chir (Tokyo)* 1998; 38:266–73.
11. Cristante L, Herrmann HD. Surgical management of intramedullary spinal cord tumours: functional outcome and sources of morbidity. *Neurosurgery* 1994; 35: 69–74.
 12. Park WW. Applied anatomy of the spine. In: Herkowitz HN, Garfin SR, Balderston RA, Eds. *The Spine*. 4th Ed. Philadelphia: Saunders; 1999:29–73.
 13. Marsa GW, Goffine DR, Rubinstein LJ, Bagshaw MA. Megavoltage irradiation in the treatment of gliomas of the brain and spinal cord. *Cancer* 1975; 36:1681–9.
 14. Samii M, Klekamp J. Surgical results of 100 intramedullary tumours in relation to accompanying syringomyelia. *Neurosurgery* 1994; 35: 865–73.
 15. Brotchi J, Dewitte O, Levivier M, Baleriaux D, Vandesteene A, Raftopoulos C, et al. A survey of 65 tumours within the spinal cord: surgical results and the importance of preoperative magnetic resonance imaging. *Neurosurgery* 1991; 29:651–6.
 16. Cristante L, Herrmann HD. Surgical management of intramedullary spinal cord tumours: functional outcome and sources of morbidity. *Neurosurgery* 1994; 35:69–76.
 17. Fornari M, Pluchino F, Solero CL, Giombini S, Luccarelli G, Oliveri G et al. Microsurgical treatment of spinal cord tumours. *Acta Neurochir Suppl (Wien)* 1988; 43:3–8.
 18. Abdel-Wahab M, Corn B, Wolfson A, Raub W, Gaspar LE, Curran W Jr, et al. Prognostic factors and survival in patients with spinal cord gliomas after radiation therapy. *Am J Clin Oncol* 1999; 22:344–51.

CONTRIBUTORS

NH conceived the idea, planned the study, and drafted the manuscript. RH helped acquisition of data and did statistical analysis. HMH drafted and critically revised the manuscript. MA supervised the study. All authors contributed significantly to the submitted manuscript.