

# FREQUENCY OF DIFFERENT TYPES OF INTRADURAL EXTRAMEDULLARY TUMORS IN NEUROSURGERY UNIT LADY READING HOSPITAL PESHAWAR: STUDY OF 52 CASES

**Khalid Khanzada, Naeemulhaq, Muhammad Usman, Mohammad Ishaq, Bilal Khan, Fakhar Hayat**

## ABSTRACT

**Objective:** The objective of this study is to determine the frequency of various types of Intradural extramedullary tumors.

**Methodology:** This was an observational study conducted in the Neurosurgery Unit, Lady Reading Hospital Peshawar from 1<sup>st</sup> October 2010 to 1<sup>st</sup> October 2011. Patients of all ages with either sex were included. Patients of spinal tumors having diabetes mellitus, hypertension and ischemic heart disease, and previously operated were excluded from the study. All the patients were operated under GA in a prone position and Laminectomy, Duratomy and Gross total resection of the tumor was done. We did follow up for 6 months in the form of 4 weekly visits. Data was stratified regarding age, sex and locality. Results were analyzed and presented in the form of tables and pie charts using SPSS software version 11 for analysis.

**Results:** We studied 52 patients with spinal tumors out of which 30 (57.69%) patients had Intradural extramedullary spinal tumors. Of the total 30 patients with intradural extramedullary spinal tumors, 17 were male and 13 females. Common clinical feature was neck pain and backache in 20 (66.6%) patients, leg weakness in 23 (76.6%) cases, and poor sphincters were observed in 9 (30%) cases. MRI spine was the main diagnostic tool and was done in 30 (100%) cases. Dorsal spine was involved in 16 (53.3%) cases while cervical spine was involved in 9 (30%) and lumbar spine in 5 (16.6%) patients. Neurofibroma was the commonest 14 (46.66%) Intradural extramedullary tumor, while others were meningioma 11 (33.37%), F.T ependymoma 2 (6.6%), dermoid 1 (3.33%), lipoma 1 (3.33%) hydatid cyst 1 (3.33%).

**Conclusion:** Neurofibroma and meningioma were the most common intradural extramedullary tumors.

**Keywords:** Spinal tumors, neurofibroma, meningioma, laminectomy.

## INTRODUCTION

The incidence of spinal cord tumors is 3 to 10 per 100,000 population<sup>1,2</sup>. The sex ratio is equal for most of the tumors except meningiomas, which are commoner in females<sup>1,2</sup>. Primary spinal cord tumors are divided into three categories based upon anatomic location: intramedullary, intradural extramedullary, and extradural<sup>3</sup>. Intradural extramedullary (IDEM) tumors account for two thirds of all primary intraspinal neoplasms. Most studies show neurofibromas as the most common intradural extramedullary tumor (30%) followed by meningiomas (25%). Neurofibroma may occur as a sporadic solitary lesion or be associated with neurofibromatosis (NF1). Astrocytomas and ependymomas are the most common intramedullary tumors<sup>4</sup>. Less common entities include paragangliomas, metastases, lipomas, spinal nerve sheath myx-

Neurosurgery unit lady reading hospital Peshawar.

### Address for correspondence

Dr.Khalid Khanzada  
Assistant Prof , Neurosurgery Unit,  
Lady Reading Hospital Peshawar.  
Email: saif1994@hotmail.com.  
Cellno:03005902918

mas, sarcomas, and vascular tumors<sup>5</sup>. In 1888 Sir William MacEwen first reported the removal of five extramedullary spinal tumors. In 1887 Sir Victor Horsley removed the first intradural, extramedullary spinal cord tumor. Oppenheim and Frazier have divided the symptoms of extramedullary tumors into three phases. The first phase is that of involvement of nerve roots, second that of beginning compression of the spinal cord, and the third, that of extreme compression of the spinal cord, producing the clinical picture of transverse section of the cord<sup>6</sup>. The outstanding symptom of involvement of nerve roots is pain, which is usually characteristic and pathognomonic, accompanied by paraesthesia<sup>7</sup>. It may precede any other symptoms by months or years. The tumor situated anterolaterally will progress and produce the Brown-Séquard syndrome. If the posterior column of spinal cord is compressed, the deep sensibility is decreased and ataxia appears. Paralysis below the level of the tumor comprises the third phase, and is caused by extreme compression of the cord and autonomic dysfunction later on<sup>8</sup>. The use of magnetic resonance imaging (MRI) for the evaluation of spinal tumors has become the standard for localization and multi-planar imaging has broadened the use of MRI with respect to imaging capabilities and pathophysiologic characterization<sup>9</sup>. Total surgical excision is the main treatment.

## MATERIAL AND METHODS

The record of all Royal Hospital patient's with spinal tumors was reviewed and patient's with Intramedullary tumors were analyzed in detail. Out of 52 patients admitted as diagnosed cases of spinal tumors, only 30 patients had Intramedullary/extramedullary tumors and were operated in the Neurosurgery Department, PGMI, Lady Reading Hospital Peshawar between 1<sup>st</sup> Oct 2011 to 1<sup>st</sup> Oct 2012. Patients of both genders irrespective of their age who had spinal tumors were included in the study and those who had recurrence of the tumors or co-morbid conditions like, CHD, HTN, DM or coagulopathy were excluded. The demographic data and clinical, radiological and histological features of the patients were analyzed. All the patient's were operated after establishing a neuroradiological diagnosis. X-rays were done in all the cases. Neuroradiological investigations included CT scan and MRI with MR myelogram of the concerned area. Preoperative work up was done. For proper localization loop and operative microscope were used. All the patients underwent Laminectomy and microscopic decompression was done. Gross total resection was done in all 30 cases. For tissue diagnosis, biopsy was taken and preserved in 10% formaline and sent to laboratory on the same day. All cases were reported by Senior Pathologist. (Fellow of College of Physicians and Surgeons Pakistan).

## RESULTS

We studied 52 patients with spinal tumors, out of which 30(57.69%) had intradural extramedullary tumors. Their ages ranged from three and a half years to 68 years, with mean age of 35.5 years. 17 were male and 13 females. 47(90.38%) patients were admitted from OPD while 5(9.61%) cases were received from Neurology and other units. Common clinical feature was neck pain, nocturnal pain and backache in 20 (66.6%) patients, leg weakness in 23 (76.6%) cases, and poor sphincters were observed in 9 (30%) cases.

**Table 1: Histopathology of lesions**

	No. of patients	%age
Neurofibroma	14	46.66
Meningioma	11	36.66
Ependymoma	2	6.66
Lipoma	1	33.3
Dermoid	1	33.3
Hydatid cyst	1	33.3

**Table 2. Location of tumor**

	No of patients	percentage
Cervical spine	9	30%
Dorsal spine	16	53.33%
Lumbar spine	5	16.66

MRI spine was the main diagnostic tool and was done in 30 (100%) cases. Dorsal spine was involved in 16(53.3%) cases while cervical spine was involved in 9(30%) and lumbar spine in 5(16.6%) patients. Neurofibroma was the common 14(46.66%) Intramedullary tumor, while meningioma found in 11(36.66%) F.T ependymoma 2(6.6%), dermoid 1(3.33%), lipoma 1(3.33%) hydatid cyst 1(3.33%). We had follow up of 6 months with follow up visit after every 4 weeks. Superficial wound infection in 2 (6.66%) patients, CSF leak in 3(10%) cases.

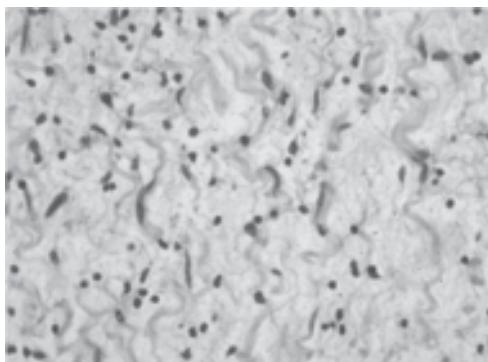
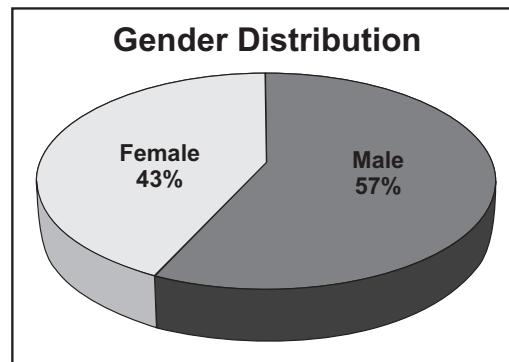


Fig. 1: Neurofibroma



Fig. 2: Meningioma



Fig. 3: Neurofibroma

## DISCUSSION

Intraspinal tumors are 15 % of all the primary CNS tumors and constitute a large group of patients presenting to neurosurgeons in clinical practice. About 25% of all spinal cord tumors<sup>10,11</sup> are spinal anal meningiomas, Infact, the literature shows a prevalence of 80% to 90% of meningiomas in the female<sup>12</sup>. A previous study at the Kenyatta National Hospital which reviewed cases of spinal cord tumours seen over a five year period, reported a frequency of six cases per year<sup>13</sup>. More than 50% of these tumors are found in the thoracic spine, and they occur in the cervical and lumbosacral spine at a similar rate<sup>14</sup>. while in our study, dorsal spine was involved in 16(53.3%) cases while cervical spine was involved in 9(30%) and lumber spine in 5(16.6%) patients. Studies reveal that although no age limit is spared but intradural spinal tumors are more common in people in the 3rd to 6th decade of their life<sup>15</sup>. Fornari reported a mean age of 37 years in his patients with spinal cord tumours and only nine of his patients (11%) were children<sup>16</sup>. In our study the mean age was 35.5 years. In Nittner study, Common clinical symptoms in patients with spinal tumors were pain and paresthesia in the abdomen and the lower limbs, motor abnormality, and dysuria<sup>17</sup>. In our study, neck pain, nocturnal pain and backache was in 20 (66.6%) patients, leg weakness was present in 23 (76.6%) cases, and poor sphincters in 9(30%) patients. A study done in Kampala, Uganda, found urinary incontinence to be the most frequent presenting complaint (seven out of 23 patients) followed by paresis (six patients) and backache, five patients<sup>18</sup>. MRI provides correct information about location, type and nature of the tumor, so MRI was the investigation of choice in all cases.

Surgical indications were neurological deficit, intractable pain, and spinal deformity. Goals of surgery were, decompression of spinal tumors, debulking, tissue diagnosis, correction of spinal deformity, and spinal stabilization.

According to Cheng MK study, histopathological diagnosis include, schwannoma in 23-48%, meningioma in 9.6-35%, neurofibroma in 4-23%, and metastatic tumors in 6.4-25% of the total number of cases<sup>19</sup>. In our study Neurofibroma was the commonest 14(46.66%) Intradural extramedullary tumor, while others were meningioma 11(36.66%)F.T ependymoma 2(6.6%), dermoid 1(3.33%), and lipoma(33.3%). Another local study conducted by Mumtaz Ali et al showed that neurofibroma and meningioma are the most common making 80 to 90 % of intradural extramedullary tumors. Others are lipoma, dermoid and epidermoid. Dermoids are congenital lesions. More common in children<sup>20</sup>. According to Levy and colleagues who studied 66 patients with spinal nerve sheath tumors, 83% neurofibromas were intradural, 10% extradural and 7% both intradural and extradural<sup>21</sup>.

Surgical treatment is favorable in the majority of the cases with a total resection of the tumors. Klekamp et Samii achieved 89% of total resection in 117 cases of spinal meningiomas, while Solero et al in 174 cases of spinal meningiomas attained 97% of total resection. Most authors report good results in 74% to 100% of the cases<sup>22</sup>. We had gross total resection in all cases, so our results are comparable with international studies. Minimally invasive approaches to spinal tumors like Cyber knife radio surgical ablation of such tumors is technically feasible and associated with low morbidity<sup>23</sup>. The outcome of surgery for spinal intradural extramedullary tumors depend upon neurological status of the patient.

## CONCLUSION

Neurofibroma and meningioma are the most frequent intradural extramedullary tumors.

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