

CLINICAL EVALUATION OF INTRADURAL EXTRAMEDULLARY SPINAL TUMORS IN A TERTIARY CARE HOSPITAL, INDIA

Neurosurgery

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ABSTRACT

INTRODUCTION: The intradural extramedullary tumours of the spine are one of the typical tumours of the spine. They produce nonspecific signs and symptoms which are similar to symptoms of any spinal disorder or nerve root compression. **OBJECTIVES:** The current study was conducted to know the incidence of different types of tumours in intradural extramedullary compartment and analysis of the clinical presentation, to study the radiological features and to study treatment modality. **METHODOLOGY:** A total of 45 patients with intradural extramedullary spinal tumor with all the age group and sex were included in the study. These patients were clinically evaluated for progressive neurological deficit in form of weakness, autonomic abnormalities, sensory abnormality and they were investigated with X-ray, CT scan and MRI scan. The surgical excision was carried out based on the outcome of investigations. **RESULTS:** From the current study it can be concluded that the Intradural extramedullary tumors are majorly benign type largely affecting in 41-60 years of age with male predominance. The contrast-enhanced MRI scans help in the effortless diagnosis. Schwannoma and Meningioma are the typical type of spinal tumors with dorsal location largely.

KEYWORDS

Intradural extramedullary spinal tumors, MRI scan spine, Schwannoma

INTRODUCTION:

The CNS tumors can be primary or secondary due to metastasis. Nearly 15% of CNS tumors are spinal tumors.¹ Based on the site of location, the spinal tumors can be classified in to -A) Extra dural tumors B) Intradural tumors. The Intradural tumours further categorized in to intramedullary and extramedullary.² the extradural tumors arise outside the cord in vertebral bodies or epidural tissues and they contribute 55% of spinal tumors. The intradural extramedullary (IDEM) tumors arise in leptomeninges or roots and constitute 40% of all primary spinal tumors and the intradural intramedullary tumors account for only 5% of spinal tumors. The incidence rate of IDEM tumors is only 3-10 per 100,000 people, as these lesions are exceptionally uncommon.³

The IDEM tumors are common in young middle age group who will present with most common complaint of pain which might be radicular (increases with Valsalva maneuver and spine movement) or local pain like stiff neck or stiff back. Few patients will also present with nocturnal pain. The second most common complaint is motor weakness, followed by sensory changes or paresthesia. The urinary incontinence or fecal incontinence can also be encountered. The most prevalent tumors among intradural extramedullary (IDEM) spinal tumors are Meningiomas, Nerve fibromas, Filum terminale endymomas and Lipomas.⁴

The spine and spinal cord control the many vital functions of the body and the tissues of nervous system are very vulnerable, hence the treatment of spinal cord tumors should be multidisciplinary approach. The first line of investigation for all IDEM tumors is magnetic resonance imaging (MRI) with and without contrast (gadolinium). The MRI will help in assessing the exact position of the tumour and its topographical relationship with the spinal cord. The other investigations like X-ray spine, CT scan spine, MR myelogram and bone scan can be done. The asymptomatic lesions may be followed as there is significant risk of neurologic deficit with surgery. But, the symptomatic lesions require surgery as early as possible.⁵

The current study was conducted to know the incidence of different types of tumours in intradural extramedullary compartment and analysis of the clinical presentation, to study the radiological features and to study treatment modality.

MATERIALS AND METHODS

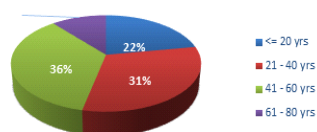
The present study is a prospective observational study which was

conducted in Department of Neurosurgery, Madras Medical College, Madras. The study was conducted over 3 years of time, after obtaining approval from Institutional Ethical Committee. A total of 45 patients presenting with signs and symptoms of spinal tumors were included in the study. Prior informed consent form was taken from all the included patient before initiating the study. Patients who denied to give the informed consent and refused for the investigations or surgery were excluded from the study. The special performa was designed to collect the data of patient. All the patients who met the inclusion criteria underwent the proper clinical evaluation and demographic details, signs and symptoms, duration of illness, complaints of sensory and motor deficit were collected in the performa. The preoperative functional status and severity of the pain were assessed using Frankel grading and the Nurick grading scale and Denis pain scale (DPS) respectively. All the patients were evaluated with radiological investigations like X-ray spine and MRI spine, to mark the variations in spine and its joints and to assess the extension of the tumor with cord. A total of 45 patients were operated for the tumors and total excision of tumor was done via classical laminectomy via postero lateral approach. The postoperatively, all the patients were followed up regularly and treated for complications if any. The collected data were analysed with IBM.SPSS statistics software 23.0 Version. To describe about the data descriptive statistics frequency analysis, percentage analysis were used for categorical variables and the mean & S.D were used for continuous variables.

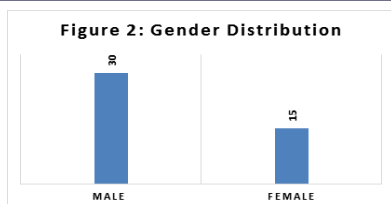
RESULTS:

In the present study it is observed that, out of 45 IDEM tumor patients, 10 cases were less than 20 years of age group. And 14 cases were with age group of 21-40 years, 16 cases were with age group of 41-60 years, and 5 cases were with age group of 61-80 years. (Figure 1)

Figure 1: Age distribution



As shown in the figure 2, male predominance (30 cases) was seen in the present study.



In the present study, among 45 patients, majority of them presented with motor weakness (37.7%) followed by pain along with motor weakness in 33.35% of the patients.

Few patients also presented with sensory deficit and Motor weakness (11.1%). Four patients complained of all the three symptoms and three patients came up with only pain as their primary complaint (6.6%). Radicular symptoms was seen in only one patient. (Table 1)

Table 1: Various Clinical Symptoms

Symptoms	Number (n=45)	Percentage (%)
Radicular Symptoms	1	2.2%
Motor Weakness	17	37.7%
Motor weakness +Pain	15	33.3%
Motor weakness + Pain+ Sensory Deficit	4	8.8%
Motor weakness + Sensory Deficit	5	11.1%
Pain	3	6.6%

Figure 3 shows the various neuroimaging techniques used preoperatively to assess the variations in spine and its joints and to know the extension of the tumor with cord.

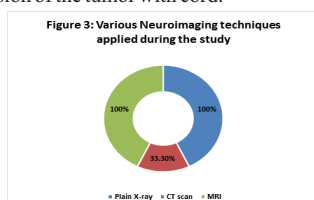
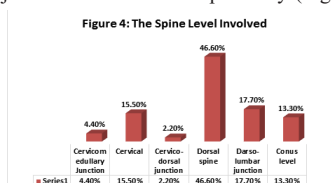


Table 2 shows the distribution of various types of spinal tumors which were diagnosed after MRI scanning. Schwannoma were diagnosed in 31.1% of the total cases. The second most common spinal tumor was found to be Meningioma (15.5%) and further more, 13.3% cases of Ependymoma, 11.1% cases of Lipoma, 6.6% cases of Angiolipoma and Neurofibroma, 4.4% cases of Astrocytoma, Hemopoetic tumors and Gaglioma, only 2.2% cases of Extradural Metastasis were encountered in the present study.

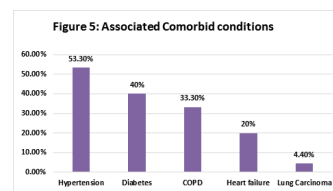
Table 2: Distribution of Various Spinal Tumor

Pathology	Number(n=45)	Percentage
Astrocytoma	2	4.4%
Hemopoetic tumors	2	4.4%
Angiolipoma	3	6.6%
Meningioma	7	15.5%
Schwannoma	14	31.1%
Neurofibroma	3	6.6%
Gaglioma	2	4.4%
Ependymoma	6	13.3%
Lipoma	5	11.1%
Extradural Metastasis	1	2.2%

Among the 45 patients, 25 patients had their spinal tumor located at dorsal spine which can be considered as most common site of spinal tumors. In addition, 17.7% and 15.5 % of patients had their lesion at Darso-lumbar junction and Cervical respectively. (Figure 4)



Hypertension (53.3%) was greatly associated comorbid condition seen in the present study. Followed by Diabetes, COPD, Heart failure and Lung carcinoma were accordingly seen in 40%, 33.3%, 20% and 4.4% of the patients. (Figure 5)



DISCUSSION:

A total 45 cases of IDEM spinal tumor were analyzed in the present study and we could observe the male predominance with majority affecting the age group of 41-60years (36%). Similar type of findings were observed in a study done by Venugopal G et al, where of most of them were in 30-40 years age group (37.5%), with slightly female predominance (59.4%).⁶

We have also observed that maximum number of patients (37.7%) presented with motor weakness and few had pain in addition to motor weakness 33.3%). The maximum patients attending the Department of Neurosurgery, NAMS, Kathmandu, Nepal, also with the complain of local pain (33%), radicular pain (31.4%), motor deficit (29.8%).⁷

Table 3 shows the location of spinal tumor in contrast with other studies. 6, 8 From all the three studies it is observed that thoracic level is greatly involved site for spinal tumors.

Table 3: Comparison of spinal tumor location with other studies

Location	Present study	Singh et al.	Venugopal G et al.
Cervical	15.5%	20.45%	18%
Thoracic	46.6%	63.5%	64%
Lumbar	13.3%	15.9%	18%

In the present study, majority of the patients were suffering with Schwannoma (31.1%), followed by Meningioma (15.5%) and Ependymoma (13.3%). These findings were nearly similar to study done by Cafano et al. However, Extradural metastasis was largely seen in a study carried out by Das S et al. 7, 9 (Table 4)

Table 4: Various pathology compared with other studies

Pathology	Present study	Das S et al.	Cofano et al.
Schwannoma	31.1%	18.6%	43.7%
Meningioma	15.5%	19.7%	37.7%
Ependymoma	13.3%	6.97%	12%
Lipoma	11.1%	2.3%	00
Neurofibroma	6.6%	11.6%	1.6%
angiolipoma	6.6%	1.1%	0.8%
Astrocytoma	4.4%	2.3%	00
Hemopoetic tumors	4.4%	1.1%	1.2%
Extradural Metastasis	2.2%	23.2%	00

CONCLUSION:

From the current study it can be concluded that the Intradural extramedullary tumors are majorly benign type largely affecting in 41-60 years of age with male predominance. The contrast-enhanced MRI scans help in the effortless diagnosis. Shwannoma and Meniongioma are the typical type of spinal tumors with dorsal location largely.

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