E-ISSN:2456-1487
P-ISSN:2456-9887
RNI:MPENG/2017/70771
Research Article
Spinal Cord Tumours

Tropical Journal of Pathology and Microbiology
2022 Volume 8 Number 4 July-August

Publisher
MEDRESEARCH
www.medresearch.in

The spectrum of Spinal Cord Tumours in a Tertiary Care Centre with Emphasis on Rare Tumours: An Observational Study

Sharma M.[1*], Tyagi S.[2], Pandey J.[3], Sharma B.[4], Choudhary A.[5]

DOI: https://doi.org/10.17511/jopm.2022.i04.01

[1*] Mudita Sharma, M.D. Pathology, Junior resident, Department of Pathology, Mahatma Gandhi Medical College, Jaipur, Rajasthan, India.

[2] Surabhi Tyagi, Professor of Pathology, Department of Pathology, Mahatma Gandhi Medical College, Jaipur, Rajasthan, India.

[3] Jyoti Pandey, M.D. Pathology (JR III), Department of Pathology, Mahatma Gandhi Medical College, Jaipur, Rajasthan, India.

[4] B. S. Sharma, Professor & HOD Neurosurgery Director Neurosciences, Mahatma Gandhi Medical College, Jaipur, Rajasthan, India.

[5] Anubha Choudhary, M.D Pathology, Junior resident, Department of Pathology, Mahatma Gandhi Medical College, Jaipur, Rajasthan, India.

Introduction: Spinal cord tumour is an abnormal mass of tissue within/or surrounding spinal cord &/or spinal column. They are referred to according to vertebral levels and area in which they are located within the spine - Extradural & Intradural (Extramedullary & Intramedullary). **Aims and Objectives:** To integrate histopathological spectrum of spinal cord tumours with their relevant immunohistochemistry, their incidence and spectrum about spinal levels, location within spine, age and sex. **Materials and Methods:** Hospital-based observational study in Department of Pathology, Mahatma Gandhi Medical College, Jaipur, for two years & includes 70 cases of spinal cord tumours. **Results:** In our study, 70 cases of spinal cord tumours showed 14 tumour types. Peak incidence was seen in 61-70 years followed by 41-50 years and lowest in children < 10 years. Male preponderance was seen. The major histological type was meningiomas 17 cases (24.3%) followed by schwannomas 12 cases (17.14 %) and metastasis in 8 cases (11.4%). In relation to anatomical site in spinal cord, tumours were most common in the thoracic spine (48.6%) followed by the cervical spine (15.7 %). **Conclusion:** In our study, the spectrum of spinal cord tumours is exhibited in 14 tumour types. Peak incidence was seen in sixth decade with male preponderance and propensity for the thoracic segment of the spine. The most common tumour type was meningiomas followed by schwannomas. IHC plays a vital role in accurate diagnosis that helps in recognizing tumour histogenesis, clinical & radiological correlation, its pathological course, treatment & prognosis. MIB-1 assesses grade & aggressiveness of tumour thus helping in evaluating its chances of recurrence.

Keywords: Spinal cord tumours, extradural, intradural extramedullary, intramedullary, immunohistochemistry

Corresponding Author

Mudita Sharma, M.D. Pathology, Junior resident, Department of Pathology, Mahatma Gandhi Medical College, Jaipur, Rajasthan, India.
Email: sharmamudita1987@gmail.com

How to Cite this Article

Mudita Sharma, Surabhi Tyagi, Jyoti Pandey, B. S. Sharma, Anubha Choudhary, The spectrum of Spinal Cord Tumours in a Tertiary Care Centre with Emphasis on Rare Tumours: An Observational Study. Trop J Pathol Microbiol. 2022;8(4):52-59.
Available From https://pathology.medresearch.in/index.php/jopm/article/view/607

To Browse

Manuscript Received	Review Round 1	Review Round 2	Review Round 3	Accepted
2022-07-27	2022-07-29	2022-08-05	2022-08-12	2022-08-19

Conflict of Interest	Funding	Ethical Approval	Plagiarism X-checker	Note
Nil	Nil	Yes	17%	

Introduction

A spinal cord tumour is an abnormal mass of tissue within/or surrounding the spinal cord &/or spinal column. They are referred to according to vertebral levels and the area in which they are located within the spine - Extradural & Intradural (Extramedullary & Intramedullary) [1]. They occur predominantly in the third and fourth decades & are less common in childhood and elderly [2].

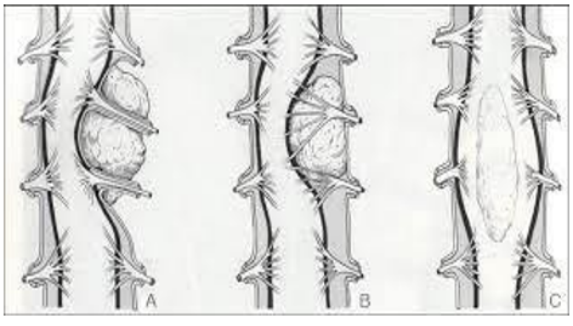
Spinal tumours are < 15 % of all CNS tumours. [3]. They are referred to in two ways (a) **By the vertebral levels or anatomical locations** ·Cervical ·Thoracic ·Lumbar ·Sacral (b) **By the area of location within the spine-**Extradural and Intradural. Intradural can further be divided into- Extramedullary and Intramedullary [4]. Most are extradural approximately 55-60 % and 40-45% are intradural of which, 40% are extramedullary and 5% are intramedullary. [5]. They account for 20% of all intraspinal tumours in adults and 35% of all intraspinal tumours in children. [6]. The objective of this study is to integrate immunohistochemistry in the diagnosis of various spinal cord tumours and to determine their incidence in a tertiary care hospital like ours. The objective is to determine the total number of cases of spinal cord tumours in this observational study throughout two years from January 2020 to June 2021 and to study them in relation to spinal levels and their location within the spine, age and sex. In this study enumeration of a few rare cases encountered is also done

Classification of spinal cord tumours according to the location within the spinal cord

A. Extradural

B. Intradural -Extramedullary

C. Intramedullary



Intramedullary spinal cord tumours grow inside the spinal cord. They are derived from glial or ependymal cells. The frequency of occurrence is approximately 5%. Astrocytomas and ependymomas are the most common. Astrocytomas are commonly seen in children and occupy the thoracic region followed by the cervical spine [7].

Ependymomas occur in the filum terminale and are common in adults. [8]. Although intracranial ependymoma is associated with an aggressive clinical course and poor prognosis, spinal ependymoma is linked with an indolent clinical course and good prognosis [9,10,11].

Intramedullary lipomas are rare congenital tumours, most commonly located in the cervicothoracic spine. Intradural-extramedullary spinal tumours are situated inside the dura, but outside the spinal cord. Spinal intradural extramedullary (IDEM) tumours account for two-thirds of all primary intraspinal neoplasms. These lesions are uncommon [12]. Most common are Meningiomas, which develop in the meninges of the brain and spinal cord. [13].

Meningiomas are often benign, recurrence is common. Schwannomas and neurofibromas arising from the nerve roots extending from the spinal cord or filum terminale and ependymomas occur at the spinal cord base and are usually benign. [14]. Nerve root tumours are also benign but neurofibromas may become malignant over time. Ependymomas, if large, make removal challenging. [15].

Extradural spinal cord tumours are located outside the dura. The incidence is approximately 55%. Occasionally, an extradural tumour extends through the intervertebral foramina, lying partially within and partially outside of the spinal canal. The spinal column is the most common site for bony metastasis. The most common primary-vertebral haemangiomas- are benign and rarely cause symptoms.[16].

Common primary cancers that spread to the spine are lung, breast and prostate. [17]. Lung carcinomas commonly in males and carcinoma breasts in females. Other cancers that can spread to the spine are multiple myeloma, lymphomas, melanomas, sarcomas and cancers of the G.I. tract, kidney and thyroid.

Diagnosis of spinal tumours is done by H & E, supported by ancillary aids- immunohistochemical and ultrastructural tests.

IHC plays an important role in the diagnosis of spinal cord tumours, in identifying the differentiation or origin of the tumour and to determine the proliferative index and expression of growth factor receptors and oncoproteins reflecting the malignant potential of the tumour.

The ultimate prognosis depends upon the histopathological type and grade of the tumour.

Aims and Objectives

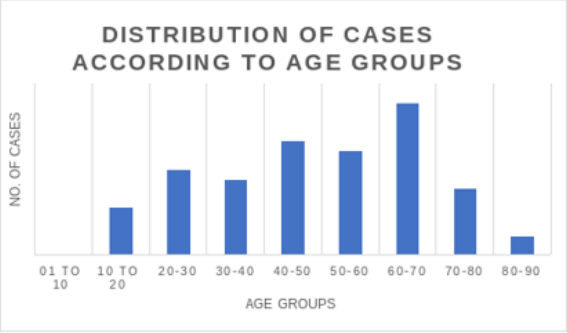
- To integrate the histopathological spectrum of spinal cord tumours with their relevant immunohistochemistry, their incidence and spectrum concerning spinal levels, location within the spine, age and sex.
- Special reference to the rare spinal tumours encountered in our study.

Materials and Methods

- Hospital-based observational study in Department of Pathology, Mahatma Gandhi Medical College, Jaipur, for two years & includes 70 cases of spinal cord tumours.
- All neuropathological specimens of spinal cord tumours recieved were fixed & stained routinely with

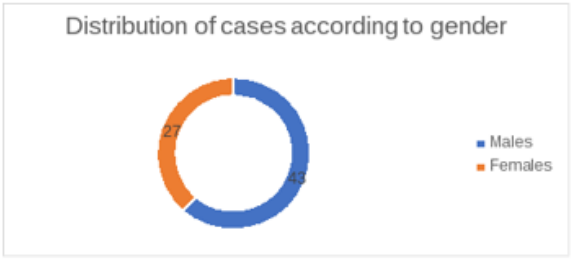
Haematoxylin and Eosin (H & E). IHC was done depending on the diagnostic need of the individual case such as Epithelial Membrane Antigen (EMA), Vimentin, S-100, Cytokeratin(Pan CK), MIB-1, Neurofilament, G-FAP, R132H-IDH1

Table 1: Age-associated distribution of study subjects.



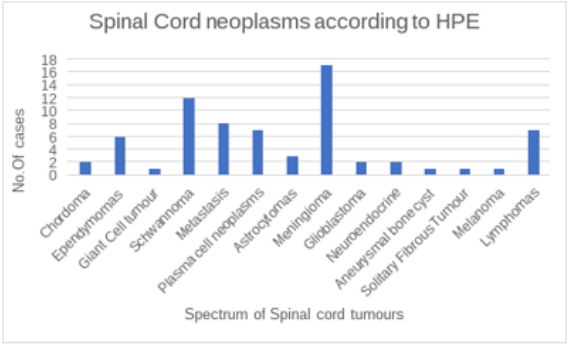
The most common age of presentation for spinal cord tumours was 61-70 years in 24.3% of the cases followed by 41-50 years. The Mean age was found to be 48.71 ± 18.47 years.

Table 2: Gender-based distribution of study subjects.



The occurrence of spinal cord tumours showed male preponderance. There were 43 males (61.4%) and 27 females (38.6%).

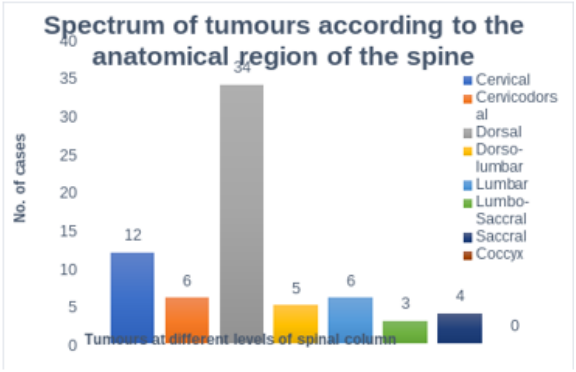
Table 3: Distribution of the study subjects according to the type of spinal cord tumour.



Out of 70 cases of spinal cord tumours, 17 were Meningiomas (24.3%) followed by schwannomas (17.14 %),

8 Rare cases - 2 Neuroendocrine tumours (2.9%), 2 Glioblastomas (2.9%), 1 giant cell tumour (1.4%), 1 melanotic cell neoplasm (1.4%), 1 aneurysmal bone cyst (1.4%) and 1 solitary fibrous tumour.

Table 4: Distribution of the study subjects according to the region of spinal cord tumour.



34 cases occupied the thoracic spine (48.6%), 11 in the cervical spine (15.7 %), 7 in the lumbar (10%), 6 in cervico-dorsal (8.6%), 5 in dorso-lumbar (7.1%), 3 in lumbo- sacral (4.3%) and none in the coccyx.

Table 5: Type of spinal tumours in relation to their location within the spine

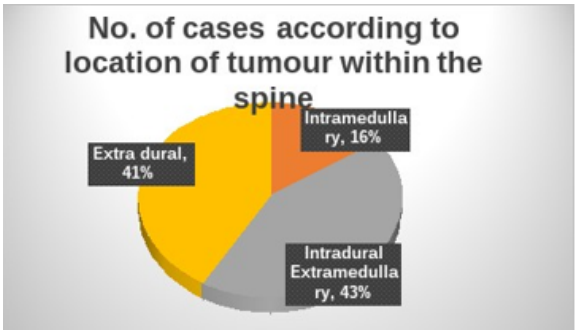


Table 6. Compartmental distribution of spinal cord tumours.

Type of spinal tumour	Extra dur al (No.)	Extra dur al (%)	Intradu ral extram edullar y(N o.)	Intradu ral extram edulla ry (%)	Intradu ral intrame dulla ry (No.)	Intradu ral intrame dulla ry (%)
Aneurysmal bone cyst	1	3.4	0	0	0	0
Meningioma	1	3.4	15	50	1	9.1
Neuroendocri ne tumour	1	3.4	1	3.3	0	0
Chordoma	2	6.9	0	0	0	0
Astrocytoma	0	0	0	0	3	27.3
Ependymoma	0	0	1	3.3	5	45.5
Giant cell tumour	1	3.4	0	0	0	0
Glioblastoma	0	0	1	3.3	1	9.1
Lymphoma	7	24.1	0	0	0	0
Melanotic neoplasm	1	3.4	0	0	0	0
Metastasis	7	24.1	0	0	1	9.1
Plasma cell neoplasm	6	20.7	1	3.3	0	0
Schwannoma	1	3.4	11	36.7	0	0
Solitary fibrous tumour	1	3.4	0	0	0	0
TOTAL	29	100	30	100	11	100

The compartmental distribution of lesions within the spinal cord was 30/70 cases as Intradural-extramedullary (IDEM) 42.90 % followed closely by extradural 29 /70 cases - 41.40% and 11/70 cases as intramedullary (15.70 %).

Results

- In our study, 70 cases of spinal cord tumours showed 14 tumour types diagnosed on routine H & E and IHC and evaluated for their occurrence at different spinal levels and their location within the spinal cord.
- Peak incidence was seen in 61-70 years followed by 41-50 years and lowest in children < 10 years. Male preponderance was seen.
- Major histological type was meningiomas - 17 cases (24.3%) followed by schwannomas - 12 cases (17.14 %) and metastasis - 8 cases (11.4%) lymphomas (10%), 7 plasma cell neoplasms (10%), 6 ependymomas (8.6%), 3 astrocytomas (4.3%) were seen.The rare cases were-

2 Glioblastomas (2.9%),1 Solitary fibrous tumour (1.4%),1 Melanotic cell neoplasm (1.4%),1 Aneurysmal bone

Cyst (1.4%),1 Giant cell tumour (1.4%),2 Neuroendocrine tumours (2.9%)

Rare Spinal Tumors in Our Study

1. Glioblastoma Multiforme(GBM): In our study, 2 cases of glioblastoma multiforme were seen. A 17 year/M was diagnosed with GBM. Tumour was cervical & intradural extramedullary. It was immunopositivity for Olig 2, p53 and 3K27M. MIB1 was 60-70%.

A second case was of a 28-year-old/M diagnosed with GBM in the cervicothoracic region, which showed GFAP and p53 positivity. GBM represent approximately 7.5% of all intramedullary gliomas and has a predilection for the cervical spine or cervicothoracic region.[17]

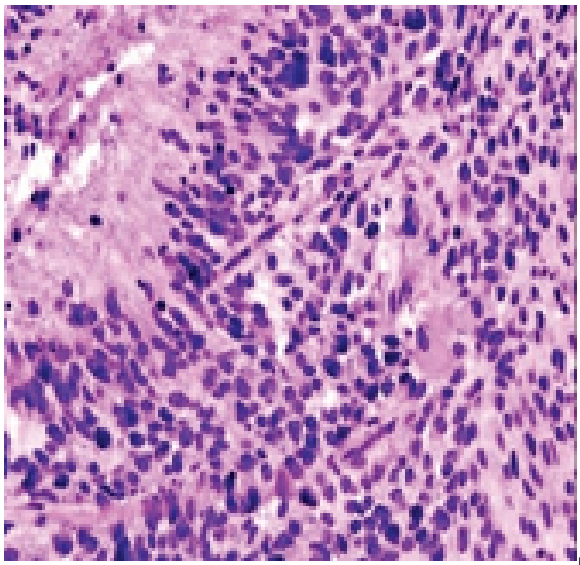


Fig 1: Glioblastoma multiforme H & E 10x

2. Solitary Fibrous tumour: A 48 year/F was diagnosed a case of solitary fibrous tumour in the thoracic spine, extradural in position.