VOLUME - 10, ISSUE - 05, MAY- 2021 • PRINT ISSN No. 2277 - 8160 • DOI : 10.36106/gjra

Original Research Paper

Pathology

# DIVERSIFIED HISTOPATHOLOGICAL INTERPRETATION OF SPINAL CORD LESIONS IN A TERTIARY CARE CENTRE IN LAST TWO YEARS: AN ENIGMATIC OBSERVATION

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**ABSTRACT** Spinal lesions may present in any age group and may be incidental or commonly present as back ache. Metastatic deposits are the commonest encountered entities, but primary lesions may also be found. Often they may be a part of systemic disease. Appropriate history, imaging studies and tissue diagnosis is essential to arrive at definitive diagnosis. This series focus on 7 varied diseases of spinal cord that may pose a diagnostic challenge for the pathologist and clinicians.

**KEYWORDS :** Spinal lesions, Metastasis, Primary lesions, Imaging studies.

## INTRODUCTION

Spinal lesions may have varies presentations and span over a wide age range. While some may be asymptomatic with occult diagnosis, others may present with symptoms of radiculopathy, paraesthesia, etc. that may bring the patient to the clinician. Some spinal lesions may be a spectrum of presentation of a systemic disease, while some may be due to disease process de novo. There may be wide variation in histologic characteristics of the lesion as well, ranging from infective to benign or even aggressive malignant neoplasms. A series of 7 such lesions of wide variability will be discussed here, with special emphasis on a rare variant of neoplasm.

### CASE 1:

A 30 years male presented to the orthopedic OPD with spinal pain with gradually worsening symptoms. He had a past history of Pulmonary Tuberculosis 10 years back that was followed by complete treatment and remission. A MRI spine was advised that showed circumscribed paraspinal collections with irregularities in vertebral bodies. A guided biopsy was scheduled and specimen sent to Department of Pathology.

Fragmented greyish-brown tissue pieces measuring 1 cm in maximum dimension was submitted for processing. Histopathological examinations revealed wide areas of caseous necrosis, Langhans giant cells and granulomas (Figure 1 & 2).

Correlating the history, radiological findings and histopathological study, a diagnosis of **Tuberculous Granuloma of Spine** was made.

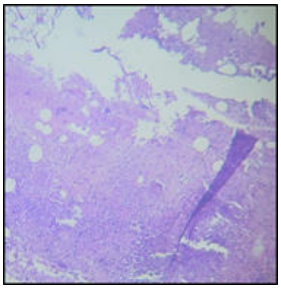

**Figure 1:** Ill-defined granulomas

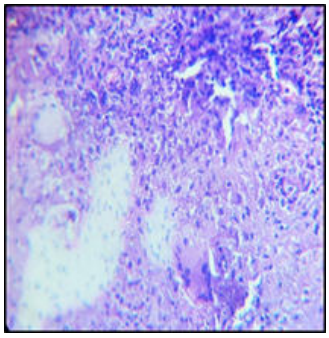

**Figure 2:** Langhans Type Giant Cells.

### CASE 2:

A 55 years old male presented in PMR OPD with back pain. The patient did not give any significant past medical and surgical history or history of any trauma. On palpation, tenderness was elicited at T12 vertebra and MRI was advised. MRI showed punched-out lytic lesions with vertebral erosion. A guided biopsy was done from the bony lesion.

Histopathological examination showed sheets of plasma cells infiltrating into the adjacent bony matrix (Figure 3). Other examinations for CRAB criteria showed negative results. This was followed by bone marrow examination that also turned out to be normal.

Correlating clinical, radiological and histopathological examinations, a diagnosis of **Solitary Plasmacytoma of Bone** was made.

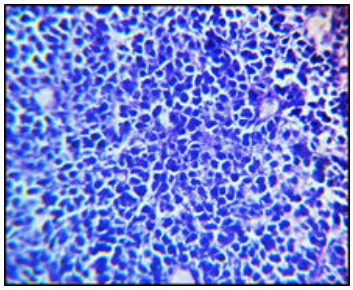

**Figure 3:** Sheets of plasma cells in Solitary Plasmacytoma

**CASE 3:**
An 8 years old male boy was brought to medicine OPD with bilateral lower limb weakness over last 2 days. It was preceded by spinal pain for 15 days. MRI imaging showed a lesion involving D9 vertebral body, pedicle, lamina and transverse process with spinal cord compression. Guided biopsy was done and specimen sent to Department of Pathology.

On histopathological examination of fragmented bits of tissues, there were sheets of small, round cells with scanty pale blue cytoplasm, round hyperchromatic nuclei, high N: C ratio, occasional mitosis (Figure 4). IHC for CD99 came out positive. FISH for t(11;22) were seen in this case.

Corroborating all the above findings, a diagnosis of **spinal Ewing Sarcoma** was made.

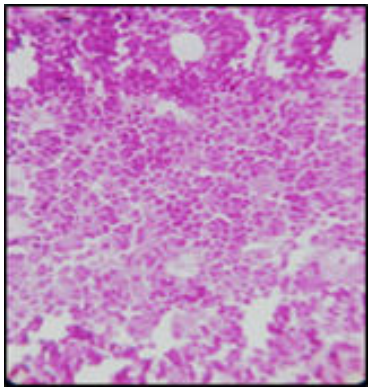

**Figure 4:** Small Blue Round Cells With True Rosettes In Ewing Sarcoma

**CASE 4:**
An 8 years old boy presented to a pediatrician with long standing cervical pain and stiffness of neck with restricted movement, not preceded by any history of trauma. Imaging study was advised. MRI showed an unencapsulated, well-circumscribed lesion with widening of spinal canal, focal tumoral cyst formation and peritumoral oedema. A guided biopsy was advised and patient was referred to the neurosurgeon.

On examining the fragmented tissue pieces, there were papillary architectures with monomorphic populations of bland cuboidal or columnar cells, with pseudorosettes and true rosettes (Fig. 5 & 6). There was intra-tumoral hemorrhage without brisk mitotic activity or prominent necrosis.

The classical histologic picture hinted at the diagnosis of **Papillary Ependymoma of Spinal canal**.

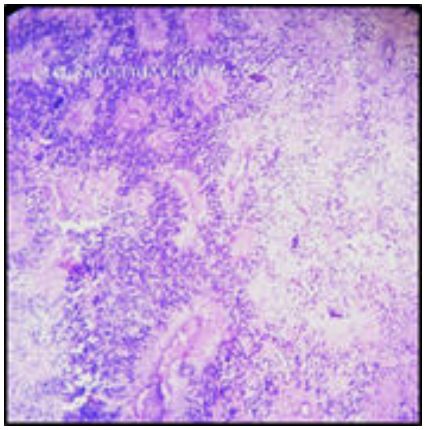

**Figure 5:** Ependymal Pseudorosettes

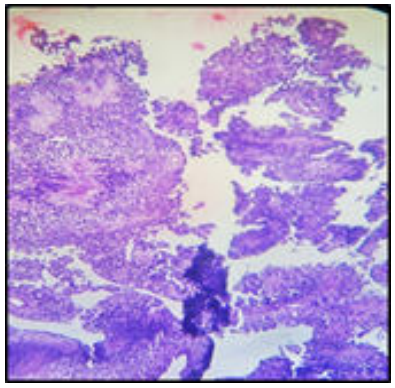

**Figure 6:** Papillary Architecture In Spinal Cord Ependymoma

**CASE 5:**
A 40 years old female presented in Orthopedics OPD with low back pain with tingling and numbness of lower extremities. On examination, tenderness was elicited around lower thoracic spines and history of previous trauma was ruled out. A MRI scan was advised. Imaging revealed an isodense, uniformly contrast-enhancing dural mass at the level of T10-T11 vertebrae.

Examination of guided biopsy specimen from the lesion revealed cords or trabeculae of eosinophilic to vacuolated cells in an abundant chondroid and mucoid matrix (Fig. 7). The meningeal nature of the tumor was revealed by EMA positivity of the tumor (Fig. 8).

So, on clinic-radiological & histopathological correlation, a very rare diagnosis of **Chordoid Meningioma of Spinal cord (WHO Grade II)** was made.

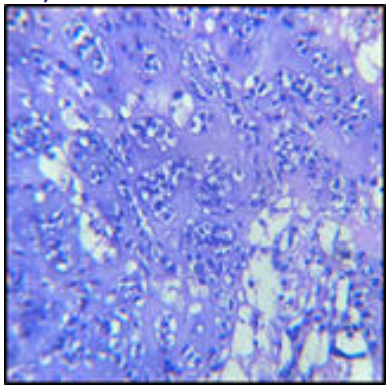

**Figure 7:** Large Vacuolated Cells In Mucoid Matrix (chordoid Meningioma)

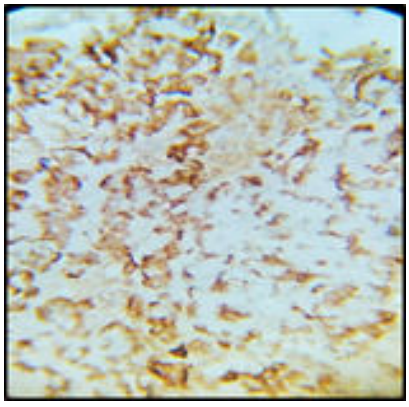

**Figure 8:** EMA positivity in Chordoid Meningioma

**CASE 6:**
A 50 years old male presented in Orthopedics OPD with low

back pain with worsening symptoms over time and not relieved by analgesics. On examination, tenderness was elicited around lumbar spines. A MRI scan revealed a T1 isointense, well-defined rounded lesions with bone remodeling & vertebral body erosion in L1-L2 spinal levels.

Biopsy from the lesion showed an encapsulated neoplasm with spindle cells arranged in alternating hypercellular (Antoni A) and hypocellular (Antoni B) areas, with nuclear palisading around fibrillary areas (Verocay bodies) [Fig.9]. There are also areas with cystic changed (Fig. 10), thick-walled hyalinised blood vessels and foamy macrophages (Fig. 11). S100 IHC stain showed diffuse and strong positivity (Fig. 12). A diagnosis of **Spinal Schwannoma** was given after corroborating all the above findings.

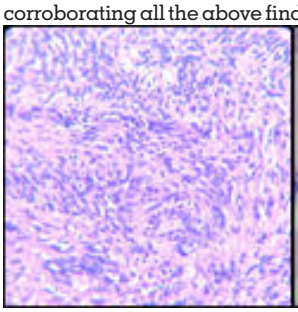

**Figure 9:** Verocay body in Spinal Schwannoma

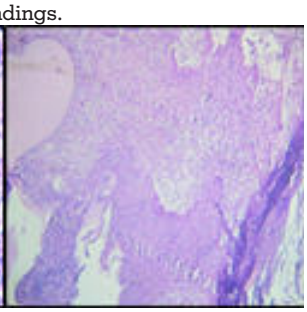

**Figure 10:** Schwannoma with cystic areas

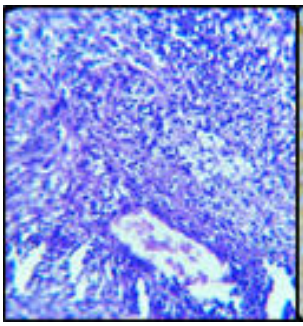

**Figure 11:** Schwannoma with sheets of histiocytes

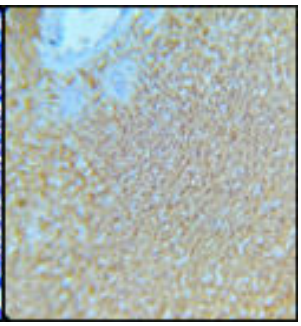

**Figure 12:** Diffuse S100 positivity in Schwannoma

**CASE 7:**

A 40 years old female presented in PMR OPD with back pain, not relieved by analgesics and without any previous history of trauma. On examination, tenderness was elicited. A MRI scan revealed a T1 isointense, well-defined rounded lesion in T10-T12 spinal levels. As a general protocol, a biopsy was advised to determine the nature of the lesion.

On examination of fragmented greyish brown tissue pieces, there were spindle cells forming fascicles with characteristic meningothelial cells in focal areas (Fig. 13). EMA showed diffuse membranous positivity (Fig. 14), thereby confirming the diagnosis of **Fibrous Meningioma of Spinal Cord**.

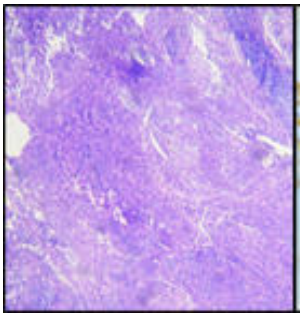

**Figure 13:** H & E fascicles of spindle

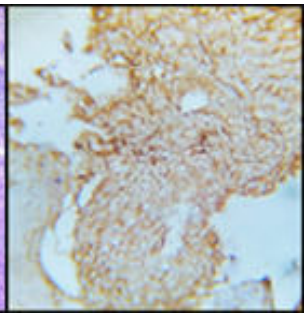

**Figure 14:** EMA positivity in Fibrous Meningioma cells in Fibrous Meningioma

**DISCUSSION:**

Spinal tumors are examined under two headings: primary tumors that originate from the spine itself and its adjacent structures & secondary (metastatic) tumors of distant organs [1]. The spectrum of primary lesions can be benign like osteoid osteoma, osteoblastomas, giant cell tumors, granulomas to rarer incidences of sarcomas like Ewing sarcoma, Chondrosarcomas & Osteosarcomas. Tumors of neural origin as well as hematological neoplasms may also be seen in this location. Primary lesion being the rarer neoplasm has been the main focus in our assimilation of clinical cases and has been extensively studied in this paper.

Majority of the cases are in our study group are of middle age, except for Ewing sarcoma & Ependymoma of spinal cord, as was also seen in a study conducted by Shrivastava et al [2]. All of these cases came to clinical attention due to back ache, few associated with features of radiculopathy, worsening over time. This was not preceded by any history of trauma. Thus, we can see that lower back pain with some features of lower extremity weakness is basically a common presenting symptom in majority of such cases [3]. A substantial proportion of cases is also asymptomatic & may only be diagnosed incidentally.

Differentials of such cases with spinal pain may be varied ranging from benign to malignant conditions [4], as already discussed above. Proper imaging study is very important for these cases that may not only guide in the diagnosis, but also provide biopsy material for tissue diagnosis [5, 6]. As spine is richly supplied with vascular and lymphatic network, metastatic tumors are the most common tumors of this region [7]. Thus, keeping in mind the diverse nature of lesions of this area, a proper diagnosis should be made for proper choice of therapy for these patients.

Sometimes, proper history and histological picture is sufficient to reach at the definitive diagnosis, as was the case with Tuberculous Granuloma of spinal cord. Often we need the help of molecular study to reach at a definitive diagnosis. This was the scenario with Spinal cord Ewing sarcoma, where the typical translocation helped in eliminating other differentials of Small Blue Round Cell Tumors (SBRCTs). Immunohistochemical stains (IHC) also help a great deal when histological diagnosis put us in a lot of dilemma. For example, S100 positivity in Schwannoma was the clinching point in arriving at a definitive diagnosis.

The most challenging case of this series was that of **Chordoid meningioma of Spinal cord.** The occurrence of spinal Chordoid Meningioma is exceedingly rare with first case being discovered in 2000, followed by less than 10 reportable cases in literature till date [8, 9, 10]. The intriguing chondroid cartilaginous background raised the possibilities for many differentials, such as Chondrosarcoma or Chondroblastic osteosarcoma or even Metastasis from unknown primary. However, the clinical presentation, radio-imaging studies and EMA positivity helped in arriving at the definitive diagnosis.

Thus, a combination of detailed history, imaging study and histological study along with other special tests may help to arrive at an appropriate diagnosis.

**CONCLUSION:**

This series of 7 cases mainly highlights on the diverse clinical entities that may present in spinal column. This diverse nature of spinal lesion often poses diagnostic challenge to the clinician. A methodical evaluation and analysis of these cases may help to arrive at appropriate diagnosis that may guide in the development of a proper therapeutic protocol.

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