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Spinal Cord Compression: Histologic Spectrum of Lesions

Pages with reference to book, From 266 To 269

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Abstract

Histologic diagnosis ultimately determines the prognosis and treatment of lesions causing spinal cord compression. Modern imaging techniques have revolutionized the procedure of localizing lesions presenting with signs and symptoms of spinal cord compression. As a result, these lesions are more accessible for fine needle aspiration and biopsy. A quick diagnosis is possible if cytologic preparation is made. Similarly, intraoperative frozen section facility not only provides rapid diagnosis, but also offers opportunity of appropriate management decision there and then. Histology in many cases needs help of special stains and immunocytochemistry. This study looks at the histologic spectrum of these lesions, gender distribution and age range in Pakistani population (JPMA 48:266, 1998).

Introduction

Spinal cord is a delicate structure which is protected by extension of meningeal coverings and encasement of vertebral bones. Being continuation of the brain, it is liable to develop all the lesions one encounters in former structure, however, the distribution of these lesions is different. We investigated histologic spectrum of lesions causing signs and symptoms of compressive myelopathy.

Material and Method

This study was a retrospective analysis of biopsy specimen having signs and symptoms of compressive myelopathy. The study period ranged from September, 1992 - June 1997. Biopsy material was received and fixed in 10% formalin except in cases where frozen section or cytologic diagnosis was requested. Processing was routinely done and diagnosis was on hematoxylin eosin stained sections. This was supplemented by appropriate special stains. Immunocytochemistry using Avidin Biotin Complex method was used for classification of lymphomas, using various monoclonal antibodies such as leukocyte common antigen, PanB and PanT markers (L26, UCHL). Other antibodies such as glial fibrillary acid proteins (GFAP), vimentin, cytokeratins, EMA, S100 and neuro-filament were also used to supplement diagnosis where H&E preparation did not show classic histologic picture.

Results

We reviewed 110 biopsy specimens from lesions of spinal cord and adjacent structures. Wherever the clinical history of the patient was given, the commonest presentation was paraplegia or paraparesis. This was followed by quadriplegia or quadri paresis. Backache was next in order. In many cases, clinicians mentioned the site of the lesion determined radiologically rather than signs or symptoms of lesion. Commonest histologic diagnosis was chronic granulomatous inflammation, mostly with other features of tuberculosis such as caseation necrosis and/or multinucleated giant cells. Material was obtained by surgical exploration or by fine needle aspiration. There were 46 cases (M=19, F=27). The age range in both genders was almost similar (M=10-66 with a median age of 32 years, F=10-67 with a median age of 43 years). In three cases, only features of chronic non-specific inflammation were present.

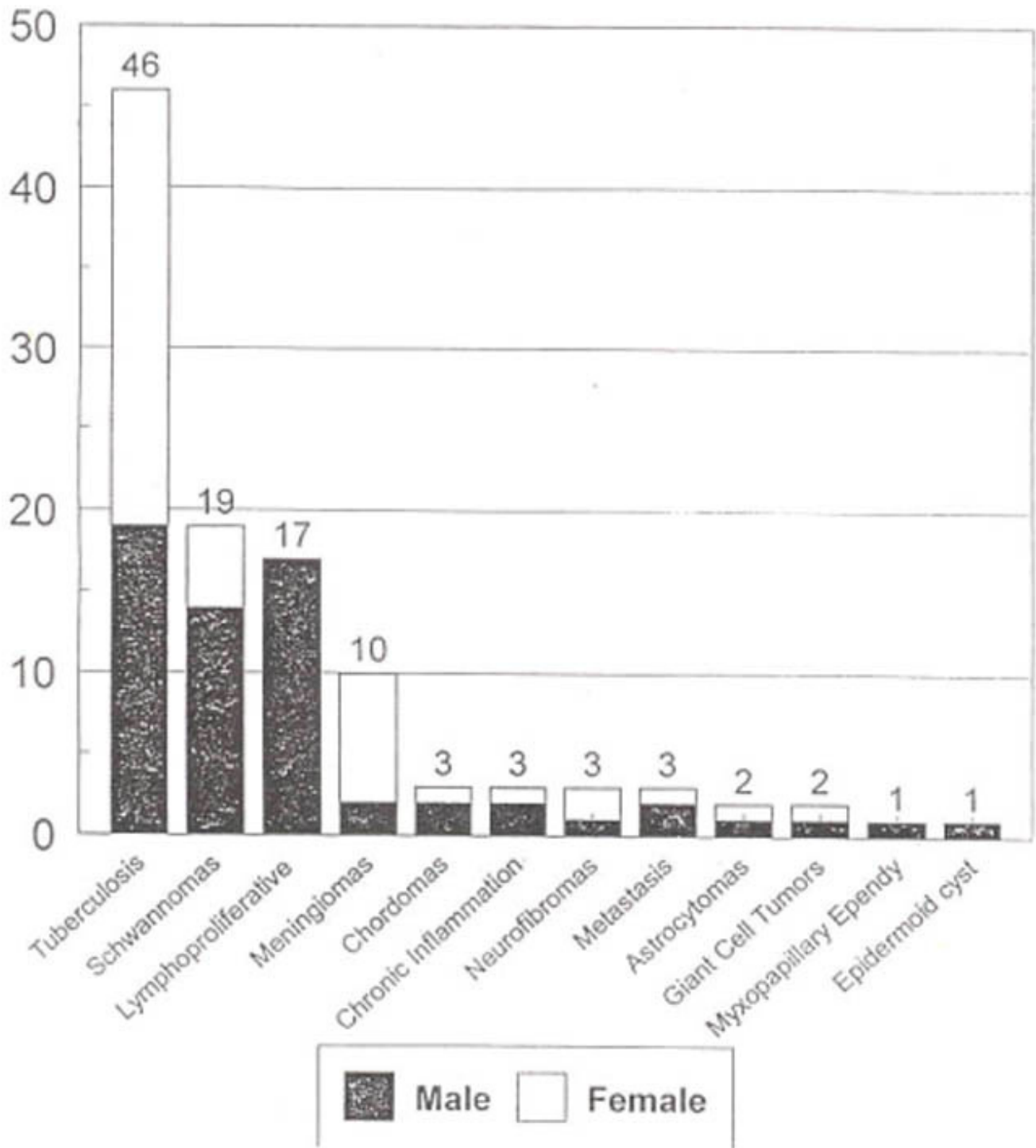


Figure 1. Distribution of various lesions in males and females.

Schwannoma, a benign nerve sheath tumour was seen in 19 cases (M=14 with a median age of 37.5 years, F=05 with a median age of 49 years). The age range was 14-60 in males and 23-67 in females. Seventeen cases belonged to lymphoproliferative disorder category, all being males. Ten of these had plasmacytoma/multiple myeloma, age range being 41 to 74 years, median age was 61 years. Other lymphomas included first ever case of T-cell rich B cell lymphoma presenting as spinal cord lesion in

the world literature. There was also a single case of Hodgkin's disease.

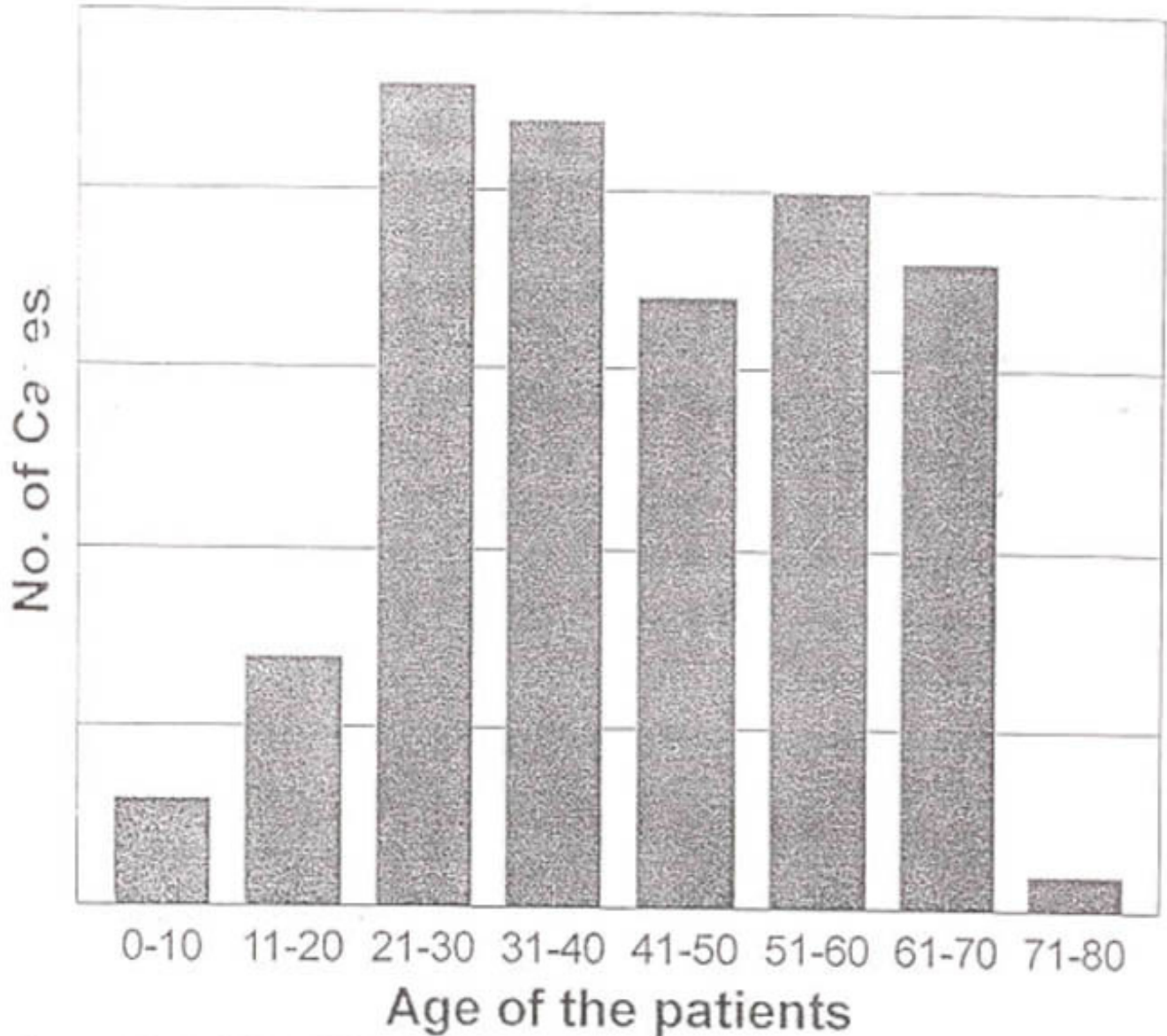


Figure 2. Agewise distribution of these lesions.

Meningiomas, all benign were seen in 10 patients. There was usual female predominance with 8 cases. The age range in females was 30-70 years with a median age of 39 years. The age in two males was 18 and 49 years. All meningiomas had psammoma bodies.

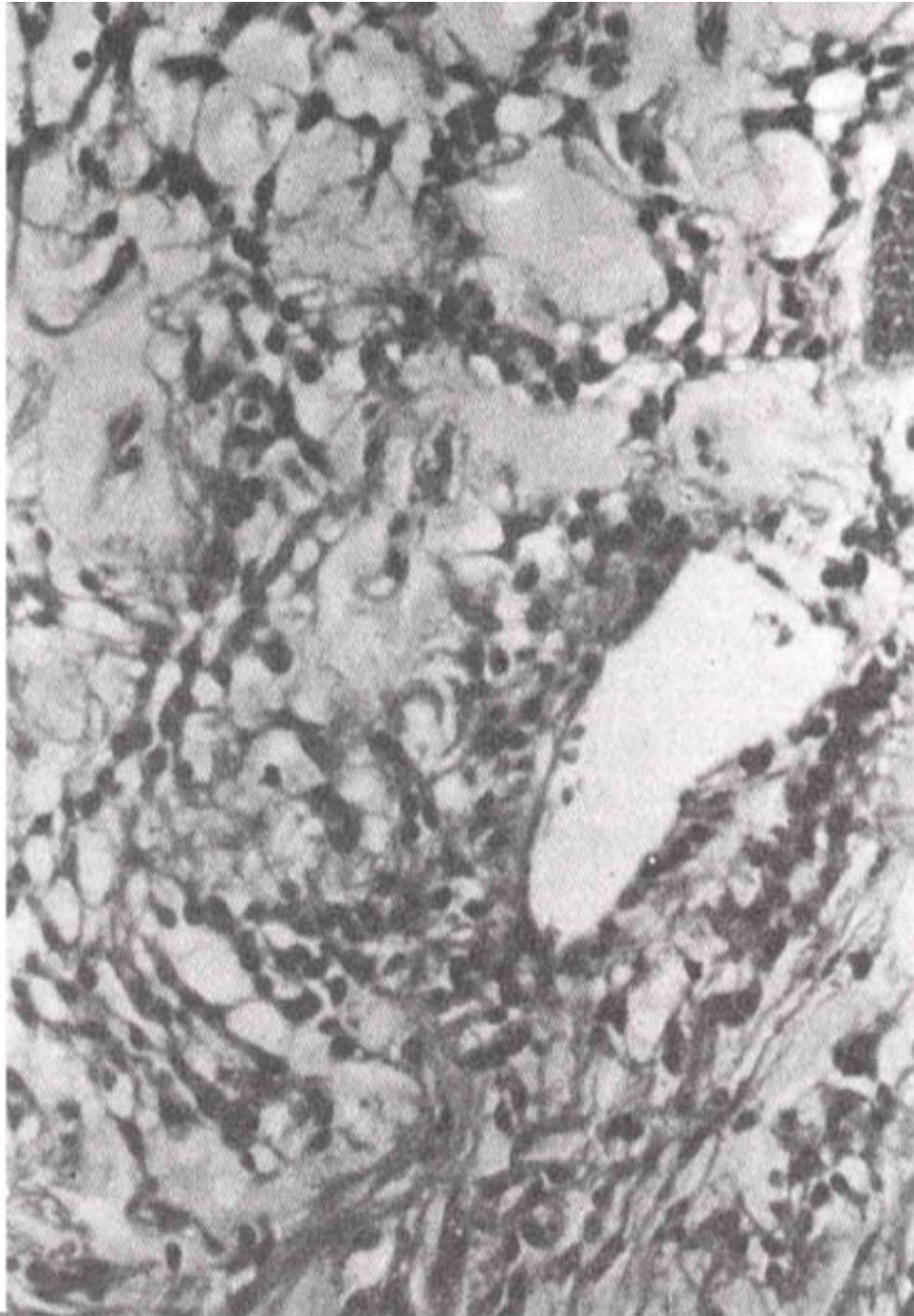


Figure 3. Myxopapillary Ependymoma. Cuboidal cells are seen draping about a basophilic mucinous material. Lesion has pseudopapillary architecture.

Chordoma, a tumour arising from remnants of notochord was seen in 3 cases, 2 males (44 and 65 years) and a female (28 years). Neurofibroma was diagnosed in 3 patients , [(M=01[58 year old)],[F=02 (F35 and 61 years old)]. Metastatic adenocarcinoma was seen in 3 cases [(m=02)(57 and 59 years old)], [F=01(45 years old)]. In one case, Primary site was kidney, in other 2, primary site remained unknown.

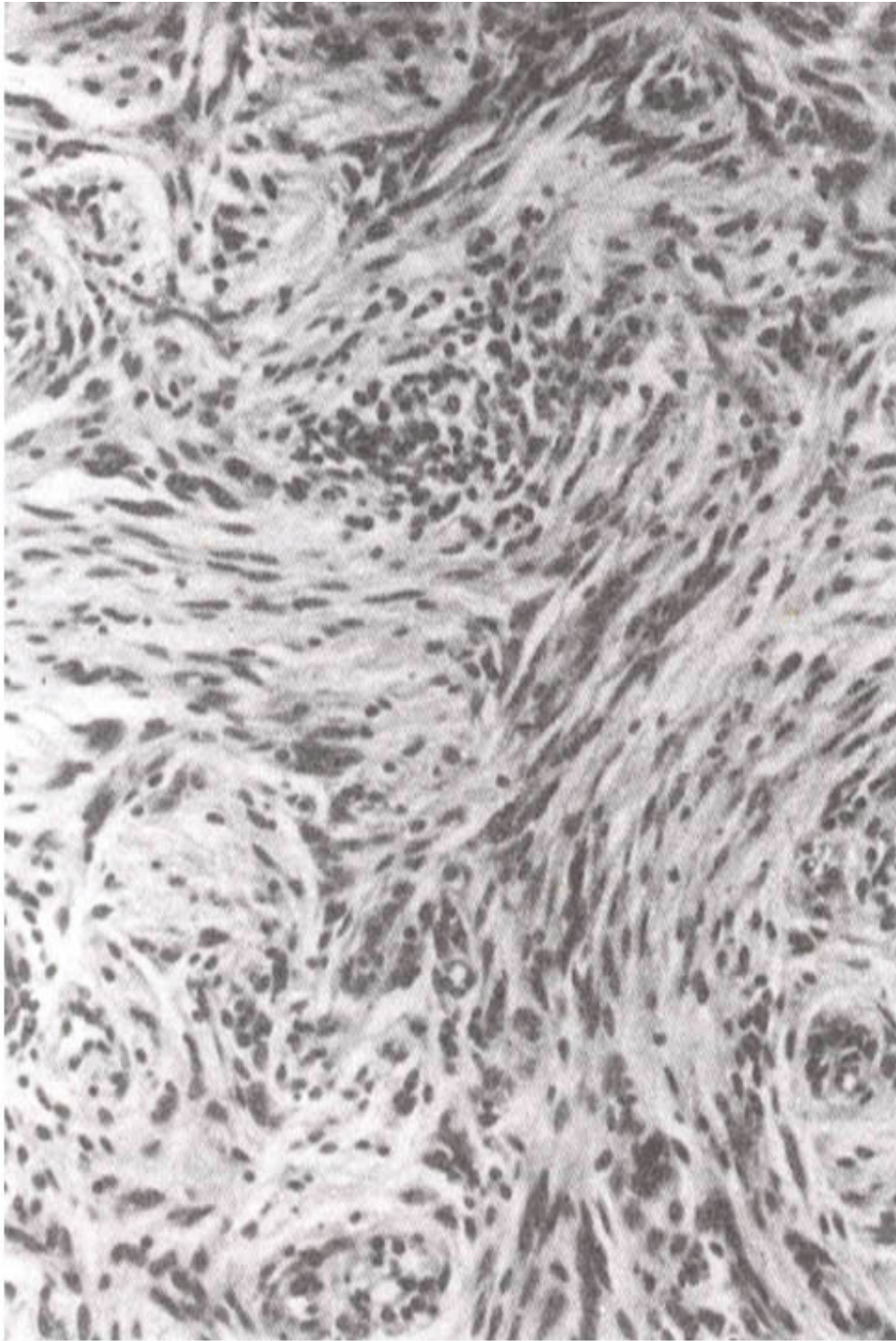


Figure 4. Meningioma: Lesion is formed by elongated cells in a collagen rich matrix. There is attempt at whorl formation.

Two cases of high grade astrocytoma were diagnosed in a male of 22 years and a female of 21 years. Among bone tumours, only 2 cases of giant cell tumour from vertebral bodies were diagnosed, one in a male and one in a female each 38 years old. Myxopapillary ependymoma was seen in a 49 year old male. A rare epidermoid cyst was diagnosed in a 23-year old male.

Discussion

Unfortunately, tuberculosis remains the leading cause of morbidity related to spinal cord. This reflects the overall burden of the disease in the community. Although there is a rise in the incidence of tuberculosis in the developed world, this is due to a growing population of immuno-compromised patients, particularly AIDS related. The situation is alarming in this country, where the health of the nation is the lowest priority in the public sector. The health care delivery system, both the preventive and curative aspects, need major overhauling and attention from authorities. Tuberculous osteomyelitis of vertebral bone is mostly a hematogenous infection commonly seen in young adults, although this may follow tuberculous meningitis. This leads to destruction of cartilage, collapse and cord compression. Fever and other associations of tuberculosis were not presenting features in most cases - There was a female preponderance. One patient was positive for hepatitis B and C virus. Although surgery yields more tissue for histologic diagnosis, fine needle aspiration is equally effective for cytologic diagnosis and culture of organisms¹.

Next common lesion was a benign nerve sheath tumour, Schwannoma. There was a male predominance. Almost all age groups were affected. These lesions are mostly intradural extramedullary. Intramedullary lesions are rare. In practice, distinction between intradural and extramedullary spinal Schwannomas is not always easy, since nerve root tumours invaginating the cord may become partially intramedullary. Conversely, intramedullary lesions may traverse the Pia to become partially extramedullary². Grossly, the lesions are usually well circumscribed and globular. The classic Schwannoma is a biphasic lesion exhibiting alternating areas of compact fascicular tissue (Antoni A pattern) and loose textured spongy tissue (Antoni B pattern) histologically.

Surprisingly, all lymphoproliferative lesions were seen in males. A large fraction of lesions belonged to the plasmacytoma/multiple myeloma group. During this five year period, 44 cases of plasmacytoma/multiple myeloma were diagnosed, only 13 were from biopsies of vertebral region. A definite diagnosis of multiple myeloma apart from biopsy, requires multiple osteolytic lesions and serum immunoelectrophoresis. Clinical information regarding these findings should always be communicated to the histopathologist along with the tissue.

Due to differences in the prognosis and treatment protocol, an effort should be made to classify lymphomas by immunophenotyping and genotyping. We encountered a case of newly described lymphoma entity, T cell rich B-cell lymphoma with the help of Pan T and Pan B immunomarkers. Such a case presenting as an epidural mass has not yet been reported in the world literature. We also reported a case of Hodgkin's disease. It remains unclear whether isolated lymphomas were truly primary in the epidural space or represent spread from occult primary elsewhere³.

There were 10 cases of intraspinal meningiomas, 8 in females, a well known female preponderance. All these lesions had calcified structures called Psammoma bodies. Psammomatous meningiomas have a predilection for spinal dura. Most have indolent biologic behavior. These tumours expand at the expense of the adjacent spinal cord to produce the expected segmental neurologic deficits. Most intraspinal meningiomas are intradural extramedullary lesions⁴. However, we have a rare case of epidural spinal meningioma in our series.

Chordoma, a destructive tumour which originates from remnants of notochord was seen in 3 patients.

Lesion is infiltrative, osseodestructive and often lobulated⁵. The neoplastic cells are phenotypically mixed i.e., mesenchymal-epithelial shown by immunoreactivity for vimentin, cytokeratin and epithelial membrane antigen. Usually, the chordoma with its epithelial cords and distinctive physaliphorous cells lying in a mucoid matrix is diagnosed easily. But sometimes, distinction from chondrosarcoma is difficult and in these cases immunocytochemistry is resorted to. There was also a case of myxopapillary ependymoma in our series. This variant of ependymoma is restricted to filum terminale. Histologically,

lesion is characterized by pseudopapillary architecture, perivascular and intercellular mucin deposition and tendency to cellular elongation.

Neurofibroma was seen in 3 patients. Association with neurofibromatosis was not known in these cases. Histologically, these lesions consist of schwann cells arrayed in short wavy bundles, separated by mucoid matrix. The differential diagnosis includes Schwannomas and meningiomas⁶. Intraspinal astrocytoma are rare lesions in contrast to intracranial tumour where it is the commonest primary malignancy. We reported 2 cases, both being high grade lesions. Grading is done principally on the basis of cellularity, mitotic activity, endothelial proliferation and necrosis⁷. Four grades are assigned, grade III and IV are high grade lesions and pursue an aggressive clinical course.

There were three cases of metastatic adenocarcinoma, primary of one lesion was traced to kidney. Mostly they are solitary lesions which are aspirated or biopsied. Cord lesions are frequent in carcinomatosis, but due to difficult access to this site, other areas are explored to obtain diagnostic material.

Among bone tumours, only 2 cases of giant cell tumour of vertebral bodies were diagnosed. This is amongst 88 giant cell tumours of bone diagnosed in five year period in the department. These tumours are locally osseodestructive lesions which impinge on adjacent structures⁸. These are formed by neoplastic, spindle cells with a uniform intermingled population of osteoclast giant cells. Anaplastic tumour with high mitotic rate can metastasize, but relatively benign looking lesions also possess this potential. Therefore, clinical behaviour of giant cell tumour is difficult to predict histologically.

There was a single case of epidermoid cyst in a 23 year old male. These occur throughout neuraxis, but most are intracranial. Rare intraspinal case report exists in world literature⁹. The uniloculate, thin walled epidermoid cyst has pearly quality due to content of Keratin. This is formed by well differentiated squamous epithelium, generating anucleate squames. Lesion is a benign entity.

On a number of occasions when the clinical and radiologic impression was of a spinal cord tumour, histologic diagnosis revealed granulomatous inflammation and vice versa. Tissue diagnosis is therefore, imperative due to wide variety of lesions in this area with differing prognosis and treatment modalities. Radiologic localization, fine needle aspiration, frozen section and immunocytochemistry have complemented rapid and accurate diagnosis.

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