IMAGING OF A CASE OF SPINAL MENINGIOMA- A CASE REPORT

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ABSTRACT

BACKGROUND

Spinal meningioma is a rare tumour arising from the coverings of the spinal cord. It is usually slow-growing, benign tumour. It is the second most common intradural extramedullary spinal tumour, i.e. inside the dural lining but outside the spinal cord. In rare instances, they may be extradural or even intraosseous or paraspinal. Females are more common than males and peak incidence is fourth and fifth decades. We present a case of a 38-year-old female patient who presented to our hospital with weakness of bilateral lower limbs since 2 months associated with tingling and numbness. Plain radiography, magnetic resonance imaging and computed tomography was performed which showed classical findings of spinal meningioma. We will be discussing about the radiological findings, which help in diagnosis and is confirmed postoperatively.

KEYWORDS

Meningioma, Intramedullary, Extramedullary, Magnetic Resonance Imaging, Computed Tomography, Magnetic Resonance Myelogram.

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BACKGROUND

Neoplasms of the spinal canal comprises a range of tumours, which arise from or involve the spinal cord, theca and nerves [Figure 1]. Depending on their location, the spinal cord tumours can be extradural, i.e. outside the dura mater lining (most common), intradural i.e. within the dura mater lining. Intradural type is further divided into: Intramedullary i.e. inside the spinal cord and extramedullary i.e. inside the dura, but outside the spinal cord. They represent a minority of all meningiomas (approximately 12%), but are the second most common intradural extramedullary spinal tumour representing 25% of all such tumours.[1,2,3] More than 90% of meningiomas arise within the cranial fossa. Magnetic Resonance Imaging is the investigation of choice to evaluate spinal cord and computed tomography to see bony extension/erosion and calcification within the lesion.

CASE REPORT

A 38-year-old female patient presented to our hospital with weakness of bilateral lower limbs since 2 months associated with tingling and numbness. No history of trauma, fever and no significant clinical findings were present. On examination, there was decreased sensation of bilateral lower limbs. Rest of the systemic examination was normal and patient was referred to the Department of Radiodiagnosis for plain radiograph, following which Computed Tomography (CT) and Magnetic Resonance Imaging (MRI) were done.

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Plain radiograph anteroposterior (AP) and lateral views of thoracolumbar spine were normal [Figure 2].

MRI by 1.5 Tesla Siemens Avanto revealed: A well-defined ovoid intradural extramedullary homogeneously enhancing lesion measuring 2.1 x 1.2 cms at the level of T8 vertebral body, which is isointense on Tesla 1 weighted image (T1WI) and iso to mildly hyperintense on Tesla 2 weighted image (T2WI), seen on the left side in the spinal canal pushing the cord on the right side [Figure 3]. The lesion is convex towards the cord and flat on the opposite side towards dura causing widening of the spinal canal. There was compression over the traversing nerve roots with obscuration of the cerebrospinal fluid (CSF) space at the level of T8-T9 intervertebral disc space. Bilateral neural foramina were normal [Figure 3].

On MR Myelogram coronal view showed widening of the CSF space at the level of lesion, whereas on sagittal image the lesion is seen forming crescent of CSF above and below the lesion "meniscus sign" [Figure 4].

Plain CT by 128 slice Siemens Perspective equipment showed a well-defined ovoid hyperdense lesion in the spinal canal at the level of T8 vertebral body suggested areas of calcification. The lesion is seen causing mild scalloping of the posterior border of the T8 vertebral body with normal bilateral pedicles [Figure-5].

With the above findings, diagnosis of intradural extramedullary spinal meningioma was made. Patient was operated and tumour was excised and sent for histopathology, which showed features of psammomatous meningioma.

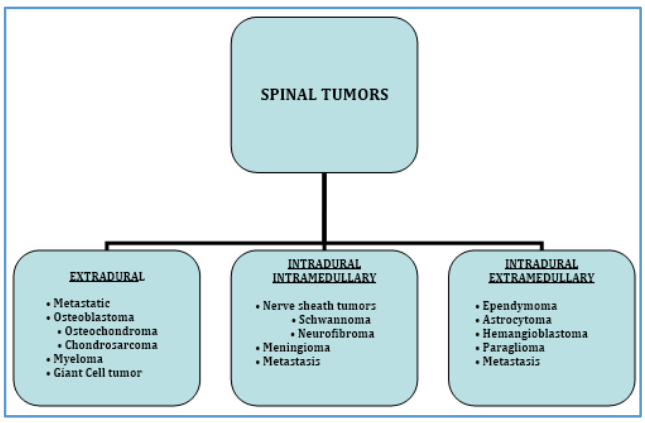

Figure 1. Classification of Spinal Tumours

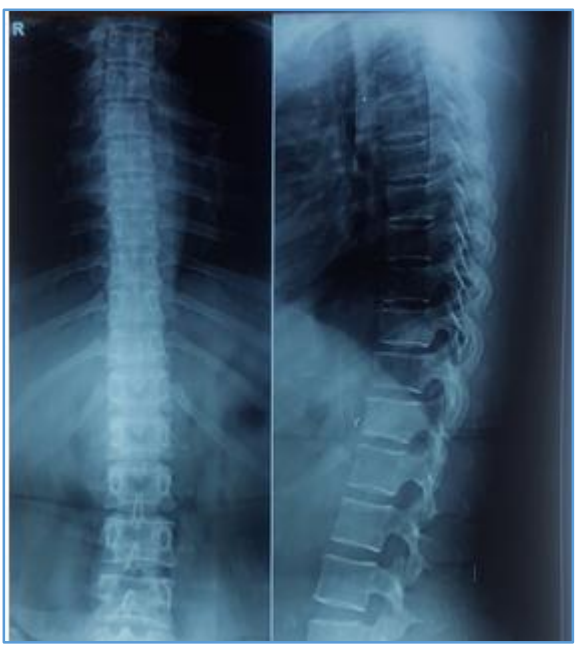

Figure 2. Plain Radiograph AP and Lateral Views is Normal

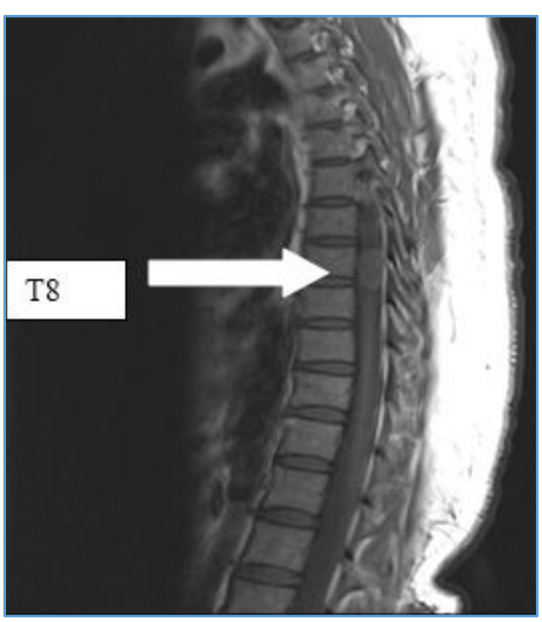

Figure 3a

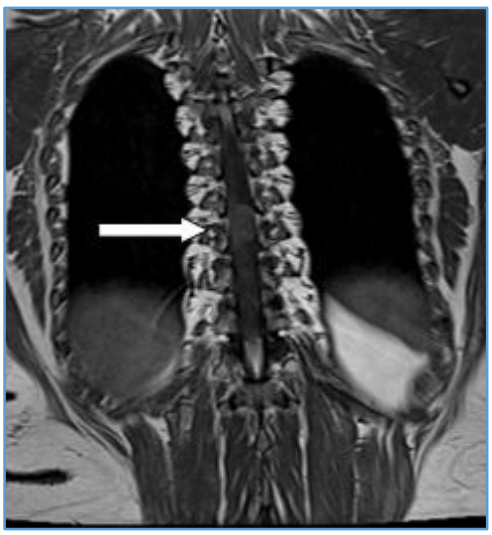

Figure 3b

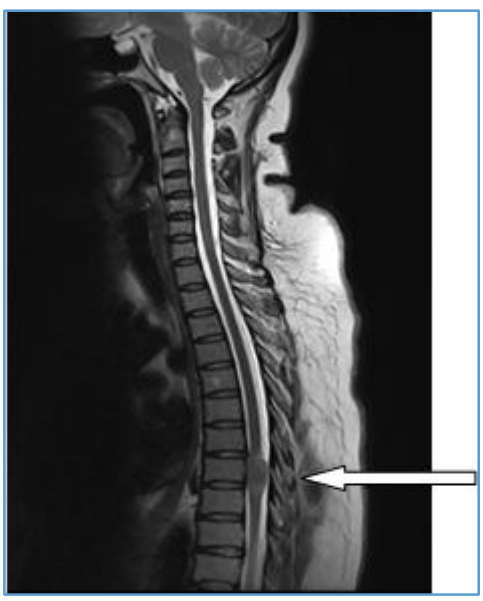

Figure 3c

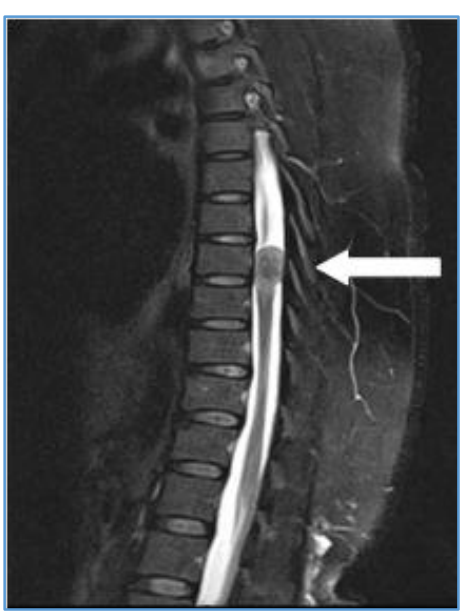

Figure 3d

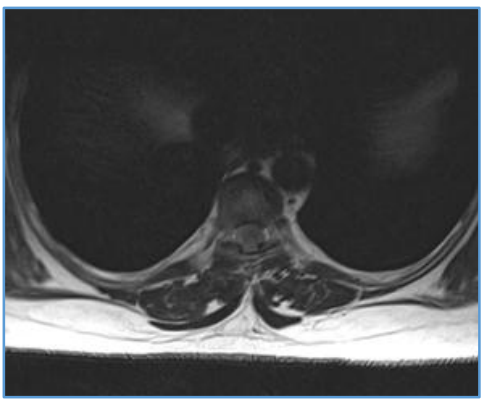

Figure 3e

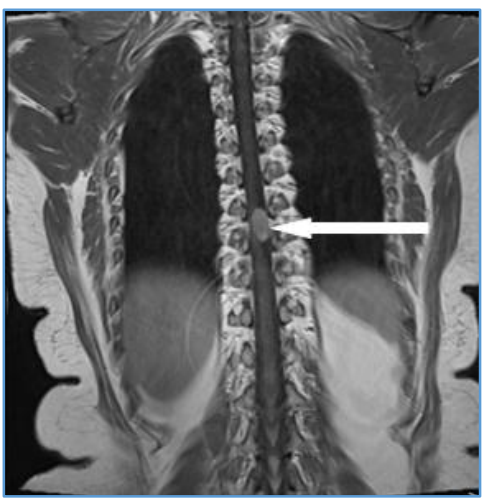

Figure 3f

Figure 3a b, c, d, e, f. MRI Images. (a) Sagittal and (b) Coronal T1WI shows a well-defined Ovoid Intradural Extramedullary Isodense Lesion at the Level of T8 Vertebral Body Level. The Lesion is on the Left Side in the Spinal Canal pushing the Cord on Right Side. (c) Sagittal T2WI; the Lesion is Iso to Mildly Hyperintense. (d) Sagittal T2W suppression Image showing Iso to Mildly Hyperintense Lesion. (e) Axial T2WI showing Lesion in the Spinal Canal obscuring the CSF Space. (f) T1WI Post Contrast Sagittal and Coronal Images showing Moderate Homogenous Enhancement of the Lesion. The Lesion is Convex towards the Cord and Flat on the Opposite Side towards Dura

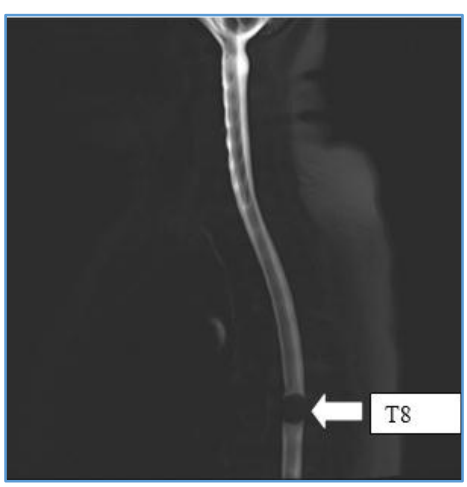

Figure 4(a)

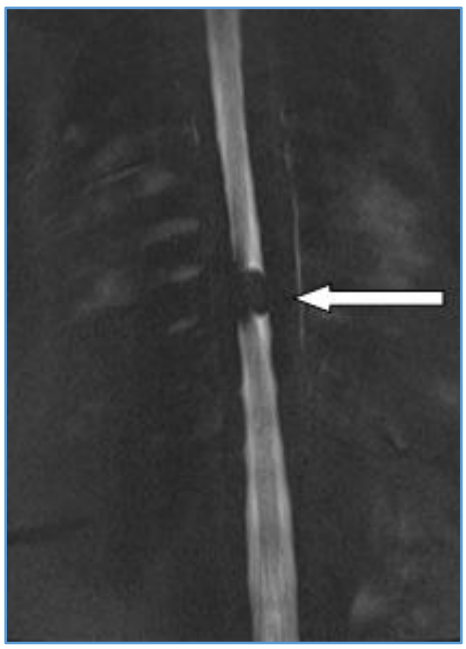

Figure 4(a), (b). MR Myelogram Sagittal and Coronal Images showing Widening of the CSF Space by the Lesion

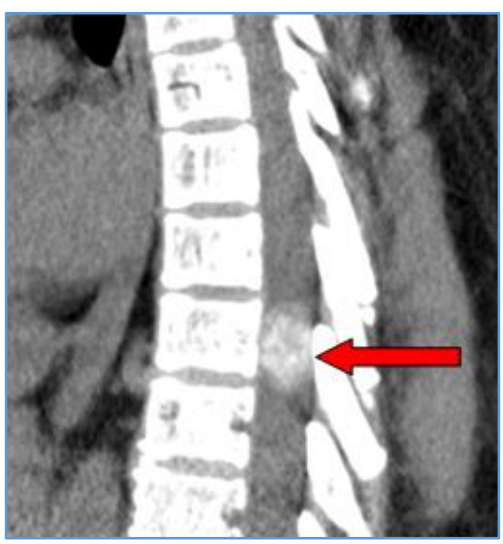

Figure 5a

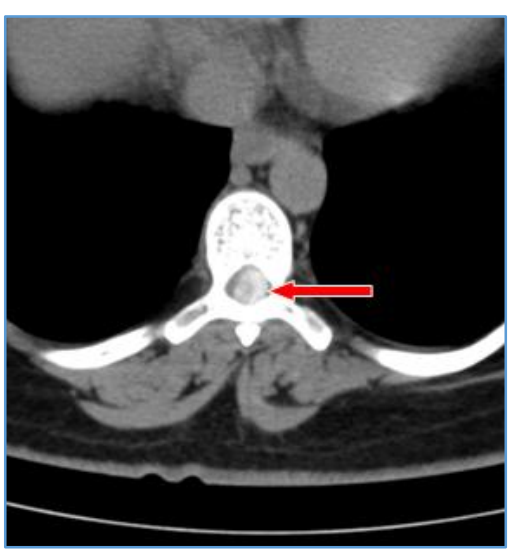

Figure 5b

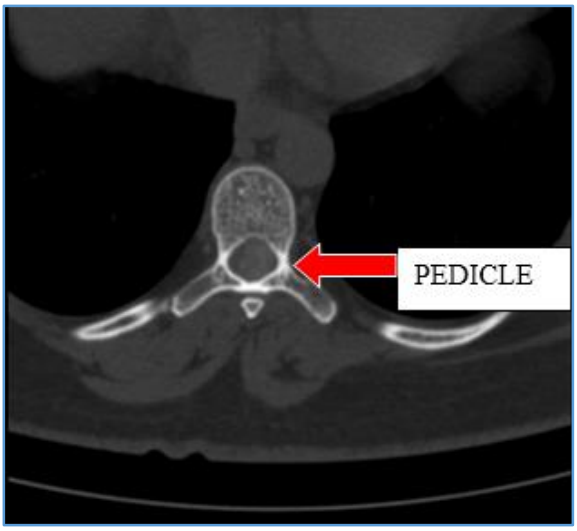

Figure 5c

Figure 5a b, c. CT Images (a), (b) CT Plain Sagittal and Axial Images showing Hyperdense Lesion. (c) CT Plain Axial Bone Window image showing Mild Scalloping of the Posterior Border of the T8 Vertebral Body

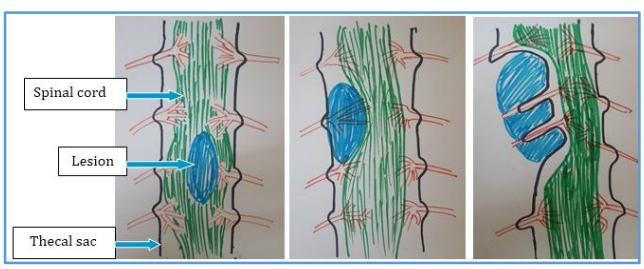

Figure 6a, b, c. Diagramatic representation distinguishing Spinal Tumour according to the Location. (a) Intradural Intramedullary, (b) Intradural Extramedullary, (c) Extradural

DISCUSSION

Neoplasms of the spinal canal comprises a range of tumours which arise from or involve the spinal cord, theca and nerves. Represent approximately 12% of all meningiomas and are the second most common intradural extramedullary spinal tumour representing 25% of all such tumour.[1,2,3] The first step in identifying any intradural lesion is distinguishing it by its location. Depending on their location, the spinal cord tumour can be: Extradural, i.e. outside the dura mater lining (most common) and Intradural i.e. within the dura mater lining. Intradural type is further divided into: Intramedullary i.e. inside the spinal cord and Extramedullary i.e. inside the dura, but outside the spinal cord [Figure 6]. Extradural tumours are far more common than intradural tumours.[4]

Extramedullary tumours are usually easily differentiated from the spinal cord. They compress the spinal cord rather than expand it. MRI is generally the imaging modality of choice; however, CT can be helpful in evaluating the tumour matrix and judging the degree of bony infiltration.

Schwannomas are the most common intradural extramedullary spinal tumour followed by meningioma. Others are drop metastasis, neurofibroma, arachnoid cysts, dermoids, epidermoids and spinal paraganglioma. In this article, we will be discussing about intradural extramedullary spinal meningioma.

Spinal meningioma originates from the dura mater and are usually slow growing, benign tumours. They arise from the arachnoid "cap" cells of the arachnoid villi in the meninges. The term "meningioma" was used first by Harvey Cushing in 1922, to describe a set of tumours that occur in brain and spinal cord. Grading of meningiomas has prognostic and clinical therapeutic implications that based on. According to WHO histological grading system, meningiomas were classified into 3 different grades: well-differentiated (Grade I), atypical (Grade II) and anaplastic (Grade III). The grade I meningioma is a lobular, well-differentiated lesion, generally meningotheliomatous, psammomatous, fibrous or microcystic type.[4] The grade II is atypical meningioma that has intermediate cytological and histological findings. Lastly, grade III is anaplastic type which exhibits atypical feature and consists of both rhabdoid and papillary lesions.[5] Our case is a histological proven case of psammomatous meningioma (Grade I). Psammomatous meningioma is a histological type, which contains psammoma bodies. The World Health Organisation classification system defines both grade II and grade III meningiomas as malignant. Malignant meningioma is a rare, fast growing tumour that forms in one of the inner layers of the meninges (Thin Layers of tissue that cover and protect the brain and spinal cord). Malignant meningioma often spreads to other areas of the body.

Meningioma most commonly occurs in patients in the fifth and sixth decades of life. Women are more commonly affected than men. Spinal meningiomas occurring in younger patients may be more aggressive with a worse prognosis and is usually associated with neurofibromatosis.[2] Usually, patients present with neurological deficits associated with the tumour and the neurogenic pain from compressed nerve tissue. Neurological symptoms, they most commonly involve intradural extramedullary region. In rare instances they may be extradural, both intradural and extradural involvement (5%) or even intraosseous or paraspinal. Most common location is thoracic (80%) and cervical with posterolateral and anterior involvement respectively.[4,6,7]

Plain radiograph is usually normal. On magnetic resonance imaging they are usually well-defined intradural extramedullary lesions; isointense on T1WI; Iso to mildly hyperintense on T2WI with broad base towards dura and on post contrast images shows intense homogeneous enhancement with dural tail sign.[5,7] Dumb bell appearance seen with both intradural and extradural involvement is rare in case of spinal meningioma, (but very rare).[2,8,3] In MR myelogram, the lesion is seen displacing the cord to the contralateral side and causing widening of the CSF space and look blocking of CSF flow with convexity upwards "meniscus sign."[4]

On computed tomography (CT), meningiomas are frequently hyperdense, reflecting their highly cellular nature and associated calcification. However, calcification are more common in intracranial meningiomas.[8,7] They may result in hyperostosis of adjacent bone, but is less common than in intracranial meningiomas, which may be due to the presence of the venous plexus and a greater amount of fat in the epidural space of the spine.[8,7] Meningiomas typically do not demonstrate extension through the neural foramen in the spine and are usually confined to the intradural space, which can help distinguish them from nerve sheath tumours.

Differential diagnosis includes the nerve sheath tumours, most commonly schwannoma which can be hyperintense or heterogeneous on T1 weighted images and on post contrast may show heterogeneous enhancement due to cystic degeneration, presence of haemorrhage or fat degeneration[8] with or without erosion of the pedicle with enlarged neural foramina giving dumb bell appearance.[2,8,7]

Surgery is the treatment of choice and complete tumour removal is achieved in the vast majority of patients. Meningiomas are very rarely malignant, but occasionally tumours may show a tendency to recur showing less than 10% recurrence.[3] Benign meningiomas are associated with a very good survival prognosis with approximately 100% 5-year survival.

CONCLUSION

The first step in identifying a spinal canal tumour is distinguishing it by its location. Meningioma is the second most common intradural extramedullary spinal tumour with female predilection. Imaging findings classical of spinal meningioma are dural tail sign and broadbase towards dura. Our case showed classical intradural extramedullary psammomatous meningioma in thoracic location, which is the most common site with convexity towards dura showing homogeneous enhancement and meniscus sign on MR myelogram.

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