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Spinal meningioma at the level of D6-D7 vertebra with Paraparesis in a young adult female managed with excision and decompeession - A case report

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Abstract

Introduction: Spinal meningiomas are the most common primary spinal tumour in adults.The most common symptom is local pain in the back but usually diagnosed in the later stages where compression causes weakness in the limbs.Magnetic Resonance Imaging is the most important modality for earlydiagnosis. Surgery is the best modality of treatment,and the goal is decompression via simple laminectomy or hemi laminectomy and radical tumour resection and then reconstruction.

Case Report: A 30 year old female, farmer by profession presented with weakness of both lower limbs and inability to bear weight over both lower limbs for one month. Contrast Enhanced MRI of the Dorsal Spine showed a well defined round to oval solid extramedullary intradural lesion in dorsal spinal canal posterior to D6-D7 disc and superior half of D7 vertebral body with significant compression leading to myelopathy. Decompression with transverse process resection and laminectomy followed by excision of mass at D6-D8 level was done through posterior approach. Histopathological (HPE) was suggestive of meningioma. Tumor resection was done.Post operative neurological evaluation showed improvement in neurological status and other symptoms of the patient

Conclusion: Spinal meningiomasare benign tumour of the spinal cord which needs early diagnosis for better functional outcome. MRI of the involved spinal segment helps in early diagnosis and it can be confirmed on histopathological examination of the biopsy sample. Surgical resection of the tumour is associated with good prognosis and outcome.

Keywords: Spinal Meningeoma, Compressive myelopathy , Laminectomy, Spinal tumour, Benign tumour

Introduction

Spinal Meningeoma is a common tumourthat accounts for 25-46 % of the spinal neoplasms[1-4].These originates from the arachnoid cap cells in the leptomeninges surrounding the spinal cord[5]. Itis generally benign,well circumscribed and slow growing. The most common site where it becomes clinically evident in thoracic region[1-9]. It mostly occurs in 4th 5th 6th decades of life and the women to men ratio is 3:1.

Pain (radicular,funicular,or localized) is the most common symptom[1,3,5,6].Significant weakness (paraparesis or paraplegia) and sensory loss (hypoesthesia, paresthesia,or anaesthesia) is the next common symptoms. Magnetic Resonance Imaging is the best non-invasive neuro imaging technique for diagnosis of meningioma[10].

Surgical Resectionis the preferred treatment. Most commonly used approach is the posterior approach. The acceptable treatment modality for spinal meningeoma is the total resection of the tumour. Partial resection may lead to recurrence.Thus if spinal meningioma is diagnosed and treated early, rapid recovery of neurological deficit can be achieved. As the radiological and the surgical techniques has advanced, the operative and long-term mortality rates of spinal meningiomas have decreased recently.

Case Report

A 30 year old female , farmer by profession,was brought to our orthopaedicout patient department with complaints of weakness of lower limb and inability to bear weight and inability to walk since last 15 days.

Fig.1: showing initial condition of patient, not able to walk or stand

Patient was apparently normal one month back.Then patient developed pain in both heels. The pain was dull aching in type and was insidious in onset.It was non progressive in nature. It relieved on taking medication. There was no aggravating factor.Patient then started developingweakness in both lower limbs.The weakness was gradual in onset and was progressive in nature. Patient was initially able to walk with support, but, overtime patient was not able to walk.

On Examination,patient was cachexic,afebrile with pulse rate of 92 beats/minute,blood pressure of 130/80, temperature of 37.8 degree Celsius and spO2 99%(in room air).

On physical examination,patient was not able to stand or walk

(Fig1).Tenderness was present over lower lumbar region on deep thrust. Flexion and extension of the lumbar segment was painful. On neurological examination, power in both lower limb was 0/5.Hypotonia was noted in both lower limbs. All the superficial sensations were absent whereas all deep sensations were intact. All deep tendon reflexes were absent except the plantar reflexes. Bladder and bladder sensation and bulbo-cavernous reflex was intact.

Laboratory investigation showed Hemoglobin level 9.8 gm %,Total Leukocyte Count of 6800, Erythrocyte Sedimentation Rate of 64mm/hr , C-Reactive protein of 34 mg/dl, Alkaline Phosphatase of 56 IU/L.

X Ray of Dorso-Lumbar spine and Lumbo-Sacral spine show no boney involvement. Contrast Enhanced Magnetic Resonance Imaging was suggestive of a well-defined round to oval solid homogeneously enhancing extra medullary intradural lesion in dorsal spinal canal posterior to D6-D7 disc and superior half of D7 vertebral body occupying predominantly left half of the dural sac with significant compression and displacement of dorsal cord on right side, favouring benign neoplastic etiology suggestive of meningioma(fig.2). Diffuse short segment hyperintense signal was noted in compressed dorsal spinal cord, suggestive of myelopathy.

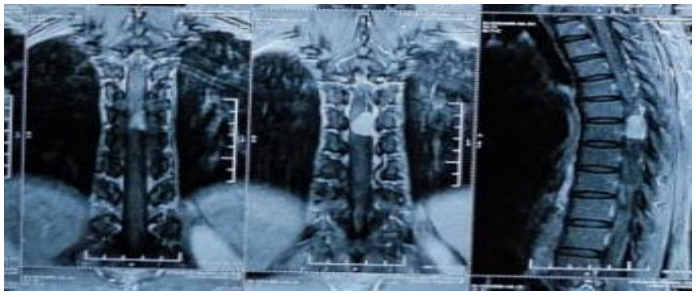

Fig 2: MRI showing a well-defined round to oval solid homogeneously enhancing extra medullar intra Dural esionindorsal spinal canal posterior to D6-D7 disc and superior half of D7 vertebral body

After confirmation, we discussed about the treatment modality with patient and relatives and proceeded for surgery after written informed consent was taken. Surgery was done in prone position under general anesthesia. Posterior midline incision taken from spinous process of D5 - D9. After soft tissue dissection, par spinal muscles were reflected with subperiosteal dissection till transverse process. Spinectomy and laminectomy from D6 to D8 vertebra was performed. Spinal cord was separated over posterior aspect of duramater. Midline incision was taken over the dura. Fleshy mass was observed just below the duramater (2x0.1x0.5 cm) which was greyish in color.

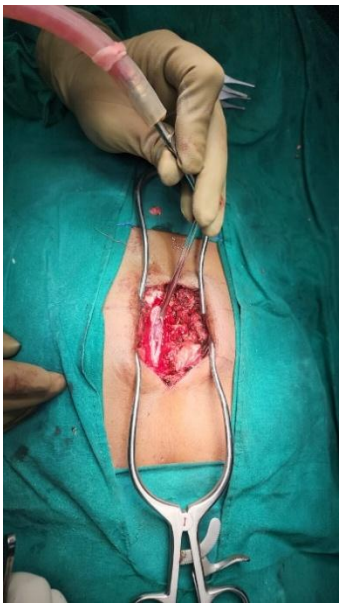

Figure 3

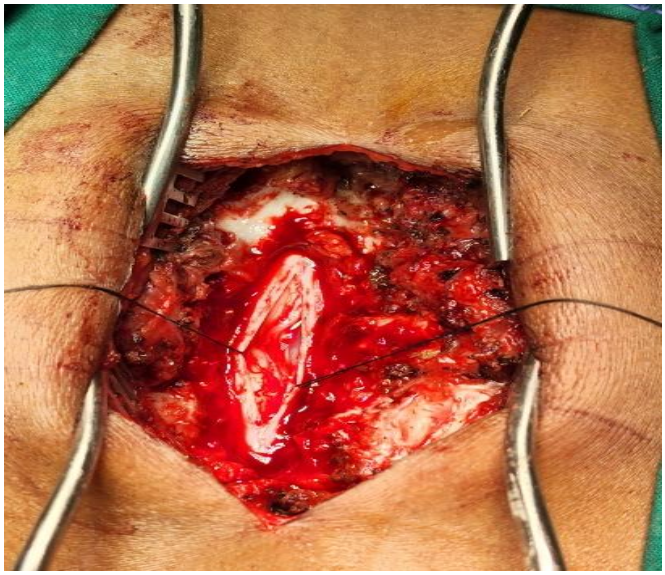

Figure 4

Intra operative pictures showing tumour resected with blunt dissection The tumour was resected with blunt dissection and sample was sent for histopathological examination(Fig 3 and 4). Histopathological Examination results were suggestive of Meningeoma.

Follow-up:

On post operative day 15, suture removal and clinical evaluation were done. Patient had improvement in neurological status and general condition. Power in the both lower limb was 2/5, reflexes and sensations were intact. At 3 months follow up, patient had dramatic improvement of neurological status and general condition. Patient came to us walking without support, all sensations and reflexes were normal Fig.5.

Fig .5

Post operative 3 months follow up of patient showing dramatic improvement in patient as patient came walking to opd

Discussion

Meningioma is a common tumour that accounts for 25-46% of spinal neoplasm. Spinal Meningeoma is a benign lesion that commonly occurs in women of middle age[1-4,9].Many investigators have reported a higher prevalence of women in their series[1-4,8]It has been suggested that spinal meningioma occurs more frequently in fertile women ,because of the possible dependency of these tumours on sex steroid hormones[4,9].Hormonal studies has shown the existence of various receptor types (steroid, peptidergic, growth factor, aminergic) in meningioma[4].Genetic studies have showed a loss of one homologue of chromosome22localisedon the long arm in patients with spinal meningioma. The site may be a putative tumour suppressor gene. The loss of the Y chromosome in approximately40% meningeomas in men suggest it is associated with tumour progression. Spinal

meningioma arises from cap cells of the arachanoid membrane and originate in proximity to nerve roots. Mostly it would be located extradural and and almost always associated with intradural component[5-7,9].

Pain is the most common symptom[1,3,5,6]. Significant weakness (paresis or plegia)and sensory loss (hypoesthesia,paraesthesia or anaesthesia) were the next common symptoms. Hydrosyringomyelia can occur in rae case of intramedullary meningioma[6].

Magnetic Resonance Imaging is the best non invasive neuroimaging technique in preventing misdiagnosis. The parameters used in MRI is tumour outline,invasive behaviour and edematous reactions.Spinal Meningioma shows intense enhancement on MRI studies after intravenous injection of gadolinium-DTPA[8,10].The most frequent location of spinal meningioma is thoracic region in intradural-extramedullary space[1-9]. The incidence of thoracic location was reported by levy et al [1]as 75%, by nameretal as 66%[3] and by Roux etal as 79.5% [3,8].In most cases the meningioma growth is slow and well distinguished from spinal cord enabling easy removal of the tumour[1-6,8,9].The rate of tumour resection was reported by Levy et al as 82 %, by Roux et al [8] as 92.6 %and by soleroet al [9] as 97%. In our case, we did total resection of the tumour after laminectomy.

The postoperative result varies according to preoperative neurologic status, the nature and location of tumour and type of surgical resection. Although the extend of resection is thought to be the main prognostic factor in treatment of spinal meningioma, there is no clear correlation between outcome and resectionof dural attachment[1,2,8,9]

Recurrence of the tumour has been reported in many cases. The late reccurence rate was reported by Levy et al as 4% [1] and by solero et al as 1.3 % [9].Mirimanoff et al [2] reported that after a total resection ,therecuurence free rates in 5,10,15 years,were 93%, 80%and 68 %,respectievely, whereas after a subtotal resection the progression free rate was only 63%,45%,and 9% during the same periods.

Meningiomas are mostly benign. Atypical and Malignant types have also been reported. Atypical Meningeoma displays hypercellularity, frequent mitosis,and focal necrosis,but the brain parenchyma is not invaded. Approximately 50% recur approximately 1-2 years after operationand the rate of metastasis is 5%. Anaplastic (malignant) meningioma is charectrised by an aggressive clinical course, a recurrence rate of approximately 70 % and a metastasis rate of approximately 30 %.

Although the acceptable treatment method for spinal meningioma is total removal of the tumour, Mirimanoff et al suggested that radiotherapy should be considered as an adjunct treatment after subtotal resection[6].

Conclusion

Spinal meningioma areslow growing, benign tumours of spinal neoplasmwhich get noticed mostly when patient develops neurological symptoms. Magnetic Resonance Imaging is considered the best neuroimaging techniques for early diagnosis, planning of surgery and follow-up. The goal of surgical treatment must be total resection of the tumour, as partial resection may lead to recurrence.Total excision of tumour through posterior approach gives good results and outcome is comparable with other modalities of treatment.If spinal Meningioma is diagnosed and treated early by surgical resection,rapid recovery of neurological deficit can be achieved. Long term follow up is needed as these tumours have high recurrence rate.

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