Case Report

Medicine Section

Intramedullary Tuberculomas of Cervical Spinal Cord in a Young Immunocompetent Patient: A Case Report

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ABSTRACT

Spinal intramedullary tuberculosis is a rare form of tuberculosis. We report a rare case of intramedullary tuberculomas in cervical spinal cord in young immunocompetent patient with no evidence of tuberculosis elsewhere in the body. Magnetic Resonance Imaging (MRI) showed cervical cord edema and circumscribed lesions at C4-C5 level. The lesions showed conglomerate ring enhancement with central hypointensity on contrast enhanced MRI, suggestive of granulomatous etiology. Patient received anti-tuberculous treatment following which patient was symptom free and MRI showed complete resolution of the lesions. Intramedullary tuberculosis if diagnosed early, usually has good response to medical treatment preventing the need for surgical intervention.

Key Words: Intramedullary tuberculomas, Magnetic Resonance Imaging, Anti-tuberculous treatment

KEY MESSAGE

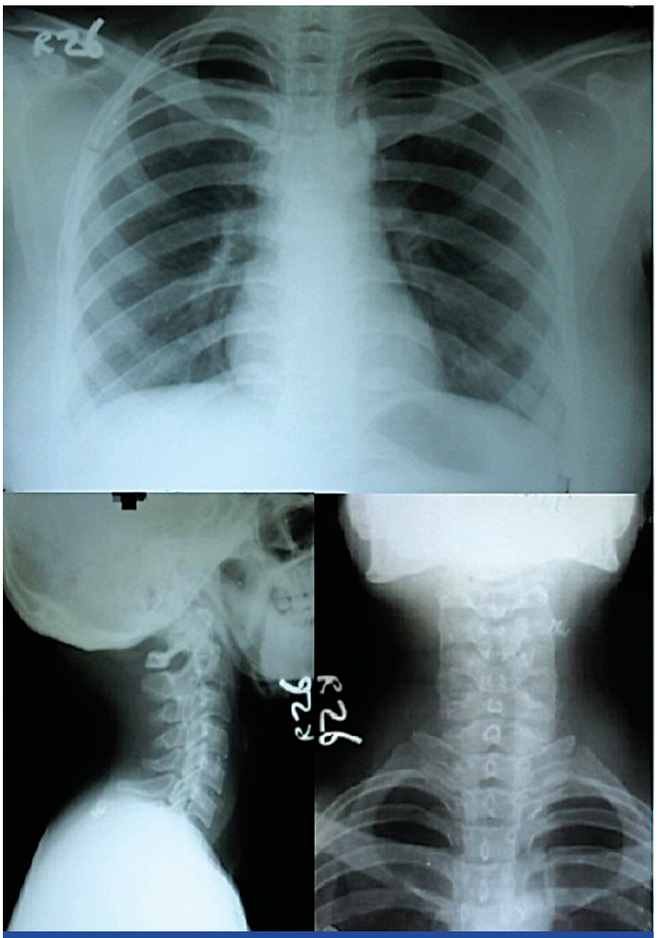
- Early diagnosis and treatment with antitubercular therapy of IMT is sufficient for complete resolution of lesions.

INTRODUCTION

Tuberculosis involving the central nervous system is rare compared with other systems [1]. The brain is far more commonly affected than the spinal cord, the ratio being 42:1[2]. Intramedullary tuberculomas are seen in only 2 out of 100,000 cases of tuberculosis [3,4]. Intramedullary tuberculomas occur usually in young people and most commonly involve the thoracic spinal cord [5]. Patients frequently present with quadriplegia/paraplegia and with other signs of spinal cord compression. We report a rare case of cervical intramedullary tuberculomas (IMT) in a young immunocompetent patient with no evidence of tuberculosis elsewhere in the body.

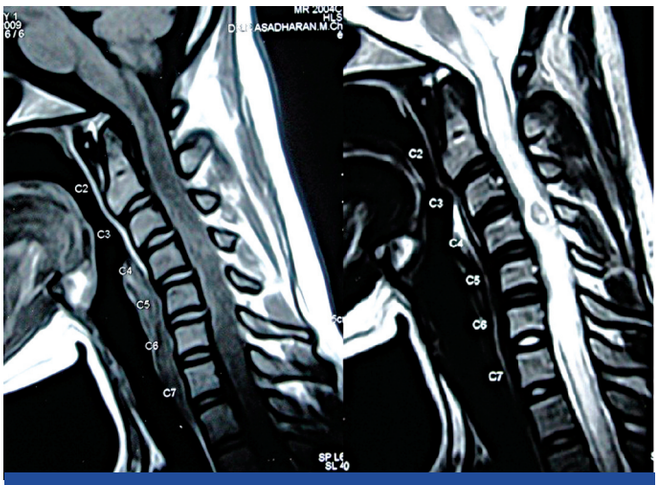
CASE REPORT

A twenty-two year old female patient was admitted in our hospital one and half years back with complaints of sudden onset quadriparesis 15 days prior to admission. Her hemoglobin,TC,DC,ESR were within the normal range. Mantoux test,Hepatitis B surface antigen test and ELISA for HIV were negative. Cerebrospinal fluid analysis revealed lymphocytosis with elevated protein and low sugar levels. Chest and cervical spine radiographs were normal [figure 1]. MRI of cervical spine was performed before and after intravenous injection of Gadobenate Dimeglumine (MRI contrast agent). MRI showed diffuse enlargement of cervical spinal cord with edema, hypo-isointense circumscribed lesion in the cervical cord at C4 vertebral level in T1 weighted images(WI) and iso-hyperintense in T2 WI [Table/Fig-2, 3]. On contrast administration, two conglomerate ring enhancing lesions were seen in the cervical cord at C4-C5 level [Table/Fig-4]. Adjacent vertebral bodies and the paraspinal soft tissues were normal. The lesions due to their size, surrounding oedema along with thick and conglomerate ring enhancement on post contrast scans were highly suggestive of intramedullary

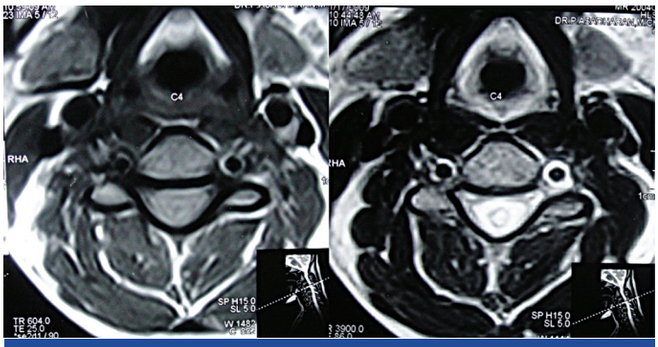


[Table/Fig-1]: Chest and cervical spine radiographs showing no abnormality

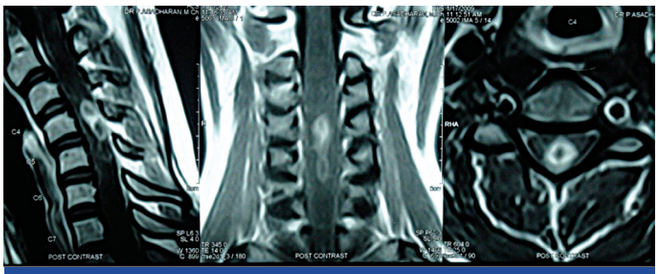
tuberculomas and the diagnosis of intramedullary tuberculosis was made. Patient was kept on complete antituberculous treatment for eighteen months:four drug regimen (isoniazid, rifampicin, pyrazinamide and ethambutol) for three months followed by two drug regimen (rifampicin and isoniazid) for fifteen months. Patient improved clinically and was symptom free by two weeks. On completion of treatment, follow up MRI of cervical spine was done. MRI showed normal signal intensities of cervical spinal cord with no evidence of edema, focal lesions or abnormal enhancement [Table/Fig-5].



[Table/Fig-2]: Sagittal MRI images showing circumscribed hypo-isointense lesion with slightly hyperintense rim in the cervical cord at C4 level in T1WI and iso-hyperintense lesion with hypointense rim in T2WI.



[Table/Fig-3]: Axial MRI images showing circumscribed hypo-isointense lesion with slightly hyperintense rim in the cervical cord at C4 level in T1WI and iso-hyperintense lesion with hypointense rim in T2WI.



[Table/Fig-4]: Post contrast sagittal, coronal and axial T1WI showing conglomerate thick ring enhancing lesions at C4-C5 level.

DISCUSSION

Extra-pulmonary tuberculosis occurs as a result of haematogenous spread from a primary focus, usually the lung.CNS involvement is less common as compared to the involvement of other systems and is seen in up to 10% of patients with systemic tuberculosis. [1].

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[Table/Fig-5]: Follow up MRI after completion of treatment (Sagittal T1, T2 and postcontrast T1WI) showing no abnormality.

The brain is more commonly affected than the spinal cord; This may be due to the relative masses of neural tissue in them [2]. There may be no evidence of extra-neural tuberculosis in up to a third cases of neurotuberculosis. Therefore, even in the absence of tuberculosis elsewhere in the body, as in our case, the possibility of CNS tuberculosis can not be ruled out.

Although spinal tuberculosis is common in geographic areas where tuberculosis is endemic, spinal IMT are rare. Spinal IMT occur usually in young people and commonly involve the thoracic spinal cord. IMT frequently presents with signs of subacute spinal cord compression, variable clinical presentations with Brown-Sequard syndrome and episodes of paraplegia have also been reported [2]. Intramedullary tuberculomas are also seen in patients with HIV, auto-immune disease, especially systemic lupus erythematosus and patients undergoing immunosuppressive treatment due to liver transplantation [6].

The most common parenchymal form of central nervous system tuberculosis is tuberculous granuloma (tuberculoma). Tuberculoma may be secondary to haematogenous spread of systemic disease or may evolve from extension of cerebrospinal fluid infection into the adjacent parenchyma via cortical veins and penetrating arteries. Pathologically, tuberculoma is composed of a central zone of solid caseation necrosis, surrounded by a capsule of collagenous tissue, epitheloid cells, multinucleated giant cells [7]. Outside the capsule, there is surrounding edema. The edema surrounding tuberculoma is relatively more prominent in the early stages of granuloma formation.

MRI has revolutionised the imaging of tuberculomas and the diagnosis can be made with reasonable certainty, avoiding the need for an invasive procedure [8, 9]. On MRI, signal intensities of tuberculomas are compared to signal intensities of the normal spinal cord. Tuberculomas appear hypo-isointense in T1 weighted images and have a slightly hyperintense rim [6, 8]. On T2 weighted images, tuberculomas exhibit variable signal. They are hypointense or isointense, this relative hypointensity is related to T2 shortening by paramagnetic free radicals produced by macrophages that are heterogeneously distributed throughout the caseous granuloma. The diminished signal on T2 Weighted images is due to the mature tuberculoma being of greater cellular density [10]. Tuberculomas may also be hyperintense on T2 weighted images and this is due to a greater degree of central liquefactive necrosis in these lesions [6,11]. In our case, the lesions showed hyperintensity in T2WI, this may be due to central liquefactive necrosis.

Postgadolinium images of tuberculomas demonstrate intense nodular and ring like enhancement. Healed tuberculomas calcify in 23% of cases. Institution of anti-tuberculous treatment is the primary modality of treatment for spinal IMT. If diagnosed early in the course of disease, IMT resolve completely with anti-tuberculous treatment and surgery can be prevented [12,13]. Tuberculous abscess is a rare complication of IMT.

The differential diagnosis of intramedullary tuberculomas includes cysticercal granulomas, and astrocytoma. However, in this case, the clinical picture and the size of the lesion combined with the classical thick and conglomerate ring enhancement with surrounding oedema was highly suggestive of tuberculoma. The complete resolution of the lesions in the follow-up MRI after the institution of anti-tuberculous treatment was confirmative of the diagnosis of IMT.

CONCLUSION

Intramedulary tuberculomas of spinal cord are rare. Gadolinium enhanced MRI helps in the accurate diagnosis of IMT. MRI is also useful in monitoring the response to treatment and in the follow-up of these patients. In cases with early diagnosis of IMT, immediate medical treatment with anti-tuberculous treatment is sufficient and complete resolution of lesions is seen. Surgery may be indicated for large lesions with rapid deterioration of the neurological status or when there is paradoxical increase in the size of the lesion following anti-tuberculous treatment.

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