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Research Article

Tuberculous Spondylodiscitis – Characteristic Features with MR Imaging

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Abstract
Aim: *To determine the main MRI characteristic features of tuberculous lesions of the spine in clinically confirmed cases of tuberculous spondylodiscitis*
Materials and Methods: *MRI images of patients with clinically proven Tuberculous spondylodiscits was assessed and the findings assessed to determine the characteristic features.*
Result: *The most commonly involved part was the thoracic spine. Para vertebral abscesses with destruction of the vertebrae and discs were seen in seven out of eight patients.*
Conclusion: *The study matches with the features described in literature.*

Introduction

Tuberculosis of the spine is a potentially life-threatening infection because it can produce neurological complications. It is one of the most common world-wide causes of a kyphotic spinal deformity.

Aim of the study

To determine the main MRI characteristic features of tuberculous lesions of the spine in clinically confirmed cases of tuberculous spondylodiscitis.

Materials and Methods

It is a retrospective study on 8 patients diagnosed as having tuberculous spondylodiscitis either clinically, histopathology and/or imaging and treated with anti tuberculous treatment for 12 months. MR scan taken at the time of diagnosis and at the end of 12 months of antituberculous treatment formed the main basis of the study. The various characteristics that define the lesion and its complications were studied using MRI scan. These patients had attended the neurology clinic of Government Medical College, Trivandrum with complaints of back pain/neck pain with or without significant neurological deficit.

MRI scan was performed on 1.5 Tesla MR scanner, Siemens, Germany installed in the Department of Radiodiagnosis, Medical college, Trivandrum from July 2019 to December 2019. Basic sequences T1w, T2w, and post contrast images formed part of the study taken for diagnostic purpose. This study is done as part of a larger study on CNS Tuberculosis.

The characteristics that were analysed were – 1.level of involvement 2. Number of vertebrae involved 3. Loss of vertebral height 4. Paravertebral abscess 5. Signal intensities on T1w

and T2w images 6. Wall of lesion 7. Contrast enhancement of the lesion 8. Cord compression involvement of cord compression.

Findings

The findings of the study are tabulated in Tables 1 and 2

Table 1 Morphological characteristics of the lesion

	Patient 1	2	3	4	5	6	7	8
Level of involve ment	Thoracic T6-T12	Thoracic T2-T4	Thoraci T9-T10	Lumbar L1-L3	Thoracic T9-T12	Thoracic T3-T4	C5,T7, L5	L5-S1
Number of vertebrae	6	3	2	3	4	2	3	2
Loss of vertebral height	Nil	More than 75%	50%	10%	More than 75%	nil	10%	nil
Para vertebral abscess present	Yes	No	Yes	yes	Yes	yes	nil	yes

Figure 1 - T2w image showing extensive involvement of lower thoracic vertebrae. There is destruction of the anterior and posterior cortices of vertebral bodies and compression of the cord .

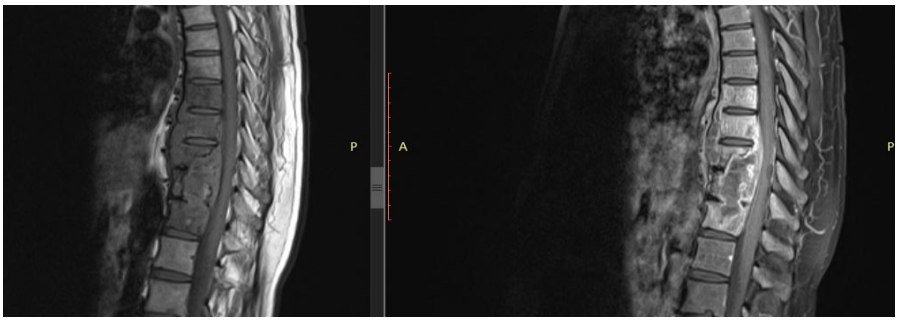

Figure 2 – T1w and post contrast sagittal images. The lesion on T1w is hypointense, post contrast images shows extensive intraosseous abscess – non enhancing area with enhancing wall at the site of thoracic vertebral bodies

Table 2: MR imaging characteristics of the lesion

At time of diagnosis	Patient 1	2	3	4	5	6	7	8
Signal intensity on T1w (compared to normal bone marrow)	hypo	hypo	hypo	hypo	hypo	hypo	hypo	hypo
Signal intensity on T2w (compared to normal bone marrow)	Heterogeneou sly hyper	hyper	hyper	hyper	hyper	hyper	hyper	hyper
Wall of lesion	Well defined	Well defined	Ill defined partially	Well defined	Well defined	Ill defined	Well defined	Well defined
Contrast enhancement-predominant	Hetero genous Hypo enhan cing	Homo genous Hypo enhan cing	Hetero genous Hyper enhan cing	Heteroge nous Hyper enhan cing	Homo genous Hypo enhan cing	Homo genous Hyper enhan cing	Homoge nous Hyper enhan cing	Hetero genous Hypo enhan cing
Cord compression	Present	present	present	nil	present	nil	nil	Nil

Discussion

MR imaging is considered superior for accurately defining the epidural extension of the disease and neural structure involvement.[1] Loss of vertebral body cortical definition and the presence of a paraspinal mass with thick irregular rim enhancement favour tubercular over bacterial spondylodiscitis Because of its superior ability to detect marrow changes before any bony destruction, MR imaging plays an important role in early diagnosis even in patients with normal radiographs. In majority of cases, tubercular spondylitis appears hyperintense on T2-weighted images and hypointense on T1-weighted images with contrast enhancement indicating marrow edema in the infected area. An important imaging feature that characterizes tuberculous infection compared to bacterial infection is sparing of the intervertebral disc in the early stage of infection. Conversely, early spread to discs with loss of disc height and disc herniation favor bacterial infection .Other characteristic involvement of the anterior vertebral body corner, subligamentous spread, multiple vertebral bodies, extensive paraspinal abscess formation, abscess calcification, and vertebral destruction differentiates tubercular from bacterial spondylodiscitis.

The patients in the study presented to the neurology department either with severe back pain and neurological deficit, and are clinically proved cases of spondylodiscitis. The most commonly involved part is lower thoracic spine. One patient had involvement of cervical spine and another had lesion at L5-S1. One patient had lesions at multiple levels with no intervertebral disc involvement. 5 out of 8 patients had loss of vertebral height and cord compression accounting for the neurological deficits. Paravertebral abscesses were seen in all except one where there was no intervertebral disc involvement. The paravertebral abscess were largest in the L5-S1 patient with extensive involvement of the pelvic wall and subcutaneous compartment.

The lesions were homogenously hypointense on T1w images, heterogeneously hyperintense on T2w. The lesion showed peripheral enhancement with intraosseous and soft tissue paravertebral abscesses.

None of the patients underwent therapeutic intervention. The abscesses resolved completely. The main clinical problem was the neurological deficit caused due to cord compression due to loss of vertebral height and gibbus deformity which was seen as sequelae to established cases of spondylodiscits.

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