

Sacral Ewing's Sarcoma and Challenges in it's Diagnosis on MRI

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ABSTRACT

A 15-yr old boy presented with low backache for 4 months associated with weakness of left lower limb. MRI of lumbosacral spine showed a sacral lesion with intraspinal and presacral soft tissue extension with neural compression. A diagnosis of tuberculosis was considered in the view of high prevalence in this part of the world, however biopsy revealed Ewing's sarcoma. Ewing's tumor of sacrum is rare, but should be suspected in low backache in children. Differential diagnosis for a sacral lesion includes tuberculosis, pyogenic osteomyelitis, lymphoma, chordoma, osteosarcoma and Ewing's sarcoma. MRI is sensitive in detecting these lesions but is nonspecific requiring histopathological examination for confirmation.

CASE REPORT

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A 15-year-old male presented with complaints of low backache for 4 months and weakness of the left lower limb since the past 3 months. He gave a history of significant weight loss of 8 kg over a period of 2 months. Examination revealed a loss of lumbar lordosis and paravertebral muscle spasm. There was a diffuse fullness noted in the lower back overlying the sacral region. Tenderness was elicited over the left sacroiliac joint and posterior aspect of the sacrum. Spinal flexion and extension movements were restricted by 20%. Neurological examination revealed a weakness of left lower limb involving the flexor hallucis longus and flexor digitorum longus (grade 1 power). There was sensory blunting of the left lower limb in the region of the S 1 dermatome and the ankle jerk on the left side was found to be absent. There was no incontinence, and there was no loss of perianal sensation. The remainder of physical examination was normal. His routine blood investigations were found to be normal and the Mantoux test was negative.

A radiograph of the lumbo-sacral spine in antero-posterior (Fig. 1a) and lateral view (Figure 1b) did not reveal any abnormality. MRI scan delineated a mass involving left sacral ala and posterior part of sacrum with intradural and spinal canal extension, which was hyperintense in T1 WI (Fig. 2a Fig. 3a) and isointense to mildly hyperintense on T2 WI (Figure 2b, 3b, 3c and 4). L5, S1 and S2 exit foramina are involved by soft tissue component, which extends into the presacral area causing neural compression. L5 vertebral body and posterior elements were spared along with ilium. A diagnosis of tuberculosis of the sacrum was considered. For confirmation of diagnosis, CT guided biopsy was done. CT scan done in prone position during biopsy revealed a lytic lesion involving the left sacrum ala and body with irregular destruction of bone. There was no sclerosis noted (Fig. 5a and Fig. 5b). Histopathological examination (HPE) revealed features of malignant round cell tumor consistent with Ewing's sarcoma. Patient was then referred to an oncological centre for further management.

DISCUSSION

In our case, the patient presented with 4-month duration of low backache. His radiographs were not contributory. MRI scan revealed a left sacral ala lesion with intraspinal and presacral soft tissue extension with neural compression, demonstrating T1 hyperintensity and T2 iso- to hyperintensity. Considering the patient's age, clinical presentation, CT and MRI scan findings, tuberculosis, pyogenic osteomyelitis, lymphoma, chordoma, osteogenic sarcoma and Ewing's sarcoma was included in the differential list (1, 2).

Tuberculosis of the sacrum was considered as the first differential diagnosis, keeping in view the high prevalence of the disease in our country. MRI in tuberculosis will reveal a hypo intense signal of the involved bone and tissues in T1 WI and hyper intense signal on T2 WI (3). It can differentiate the abscess of tuberculosis from that of pyogenic spondylitis, where both have abscess and destroyed bone. Edema or purulent material in the marrow will appear as dark signal on T1 WI and bright signal on T2 WI on MRI (4). The abscess wall in tuberculosis will have a thin and smooth enhancement on MRI, whereas a thick and irregular paraspinal enhancement is noted in pyogenic spondylitis (3).

MRI in lymphomas can appear hypo intense on T1 WI and enhance with the administration of contrast, on T2 WI the lesion is homogenous and may be hypointense, iso intense or hyperintense when compared with fat (5).

Chordoma are rare neoplasm's that arise from notochord remnants. They are slow growing and have midline location. On MRI, when compared with skeletal muscle, they are iso-or slightly hypointense on T1WI and typically hyperintense in T2 WI (1).

Ewing's sarcoma is a malignant round cell neoplasm of bone. Spinal column involvement is infrequent; compromising 10% of bone lesions of primary Ewing's sarcoma. Sacral involvement is even rarer (6).

In Ewing's Sarcoma of the sacrum the CT scan and radiographs usually reveal lytic, sclerotic or mixed lesions involving paraspinal soft tissue and extra dural space and is best depicted on MRI scan. However MRI is non-specific (1).

Radiographs and CT scan in osteosarcomas shows purely lytic, mixed or predominantly osteoblastic lesion (1). MRI scan of the non mineralized areas is non specific and the lesions have low to intermediate signal intensity on T1 WI and high signal intensity on T2 WI (1).

When considering the differential of mass lesion in the sacrum, where there is paucity of clinical and radiographic findings, CT and MRI scan becomes the next investigative modality. MRI scan though sensitive in detecting pathology are not specific. As in this case, the MRI findings were suggestive of tuberculosis but HPE confirmed a neoplasm. If CT and MRI findings were relied on without confirmation by a biopsy, an incorrect diagnosis and treatment would have resulted.

In conclusion, in presence of a sacral mass lesion, the above-mentioned differential diagnosis should be considered. MRI scans are necessary routinely for early diagnosis but the key to correct diagnosis and treatment lies in confirmation by histopathological examination.

TEACHING POINT

Ewing's tumor of sacrum is rare, but should be suspected in low backache in children. MRI can identify cases early and enables early treatment though it is not specific.

ABBREVIATIONS

MRI = Magnetic Resonance Imaging.
 CT = Computed Tomography.
 WI = Weighted Imaging.
 HPE = Histopathological Examination.

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FIGURES

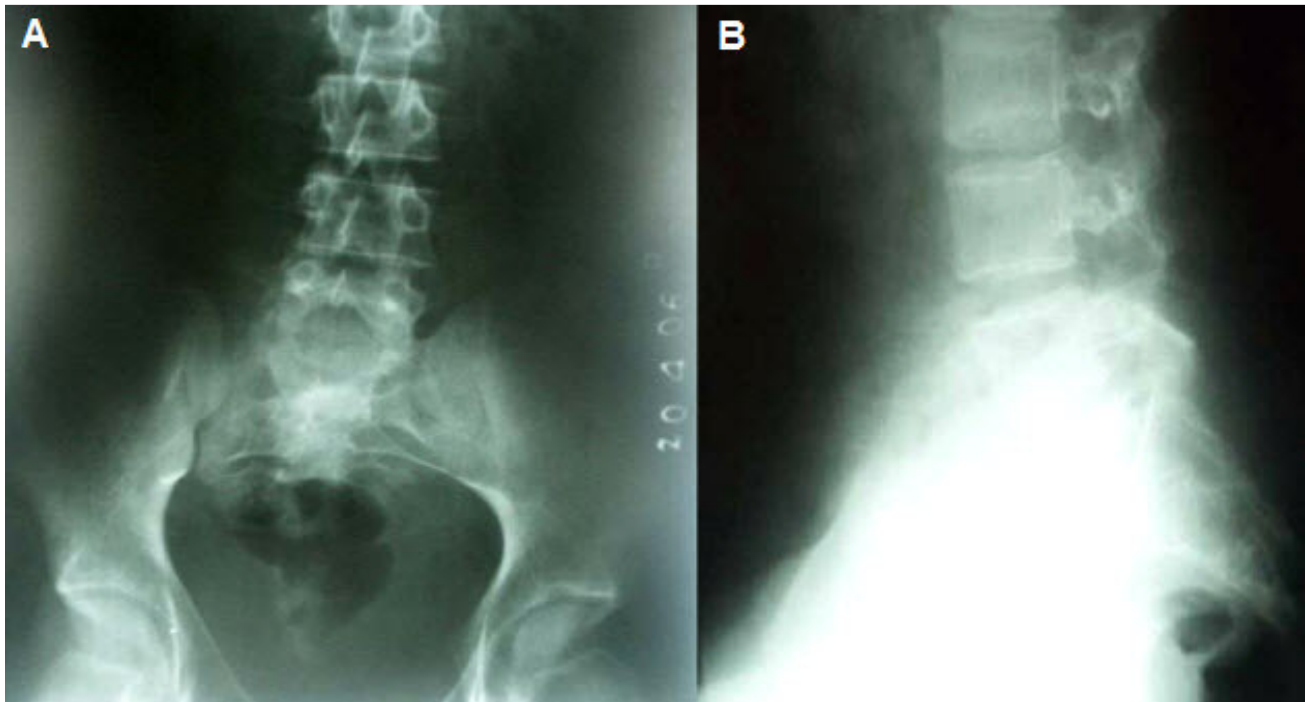


Figure 1: 15 year old boy with sacral Ewing's sarcoma. AP and lateral radiograph of the lumbar spine showing no radiological abnormality.

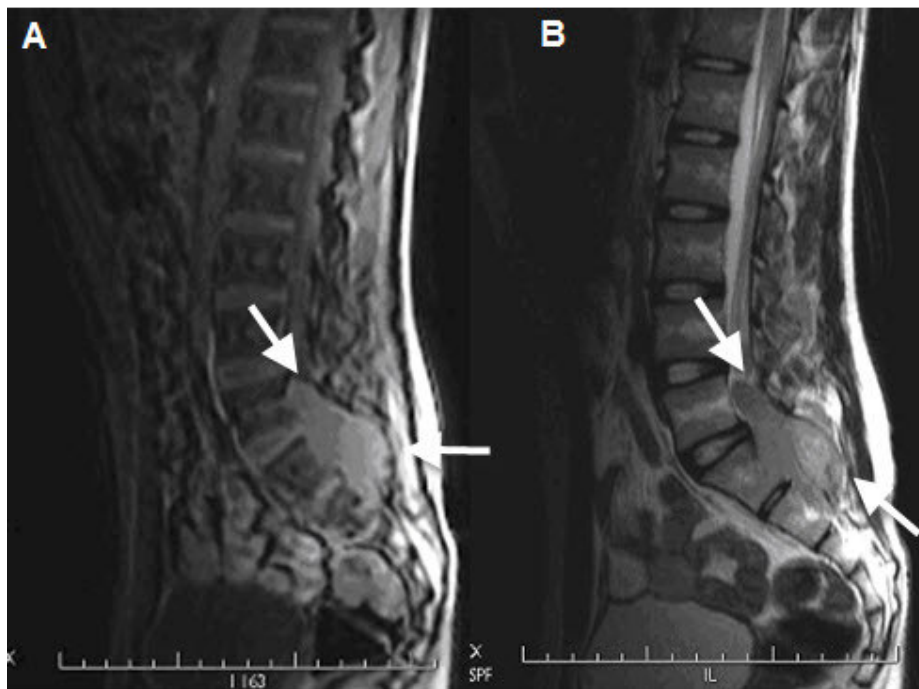


Figure 2: 15 year old boy with sacral Ewing's sarcoma. A) Sagittal T1 weighed MRI of the lumbar spine without contrast demonstrates a homogenous hyperintense mass arising from the left sacral body with intra spinal extension and neural compression. B) T2 weighed MR image sagittal section showing the mass arising from left sacral body to be isointense to mildly hyperintense.

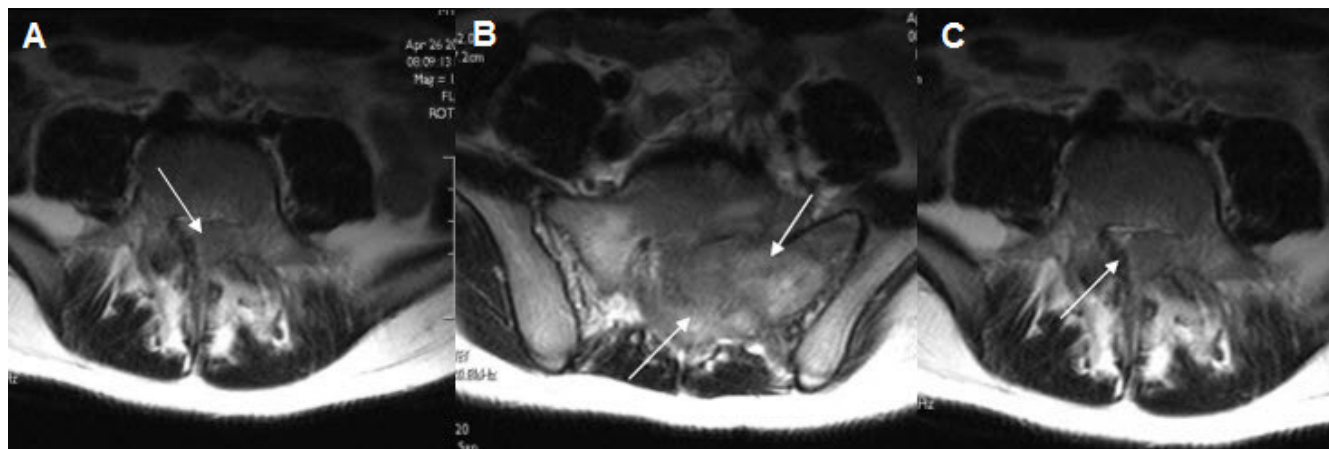


Figure 3: 15 year old boy with sacral Ewing's sarcoma. A) T1 weighed MR Image of sacrum coronal section showing the mass extending into spinal canal and compressing the nerve roots. B) MR image T2 weighed coronal section showing mass arising from left sacral ala extending into canal and soft tissue posteriorly. C) T2 weighed image coronal section showing mass to be isointense to mildly hyperintense.



Figure 4: 15 year old boy with sacral Ewing's sarcoma. Fat suppressed T2 weighed image showing lesion arising from left sacrum.

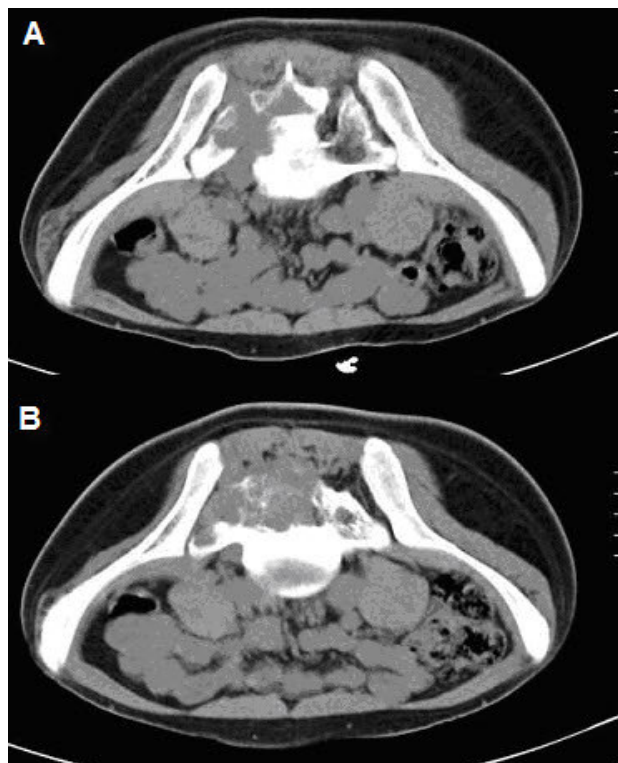


Figure 5: 15 year old boy with sacral Ewing's sarcoma. Axial noncontrast CT scan (prone) of the sacrum showing a lytic lesion involving the left sacral ala and body with bony destruction and spinal extension. There is no associated sclerosis.

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KEYWORDS

Sacral lesion, Ewing's tumor, Sacral Tuberculosis, MRI