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A Rare Case of Isolated Involvement of Posterior Elements of T9 and T10 in Spinal Tuberculosis: A Case Report

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Abstract
Involvement of posterior elements in tuberculosis is rare, it is difficult to diagnose and can lead to early-onset neuro-deficit. We present a case of a 10-year-old male with isolated tuberculosis of posterior spinal elements with neuro deficit in whom early surgical intervention resulted in improvement in symptoms and motor involvement.
Keywords: Tuberculosis, Neuro deficit, Infection.

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Introduction

Percival Pott in 1779 described tuberculosis (TB) of the spinal column as destruction of disc space and adjacent vertebral bodies.[1] The infection begins in vertebral body and spreads to the adjacent vertebra by extending beneath the anterior longitudinal ligament.[2] Involvement of posterior elements is a rare occurrence. Although its true incidence is uncertain it is reported to occur in <1% to 6% of patients with spinal tuberculosis.[3-8]The lamina, the spinous process, the transverse process, the articular processes, and rarely the pedicles may be affected by neural arch tuberculosis in isolation or combination, with epidural abscess and/or pyomyositis of the posterior spinal muscles.The diagnosis is often delayed or perhaps missed due to the difficulties in interpreting early-stage radiographs or the disease being obscure radiographically.[4-6,9]

The unusual feature of this form of TBis that itresults in early spinal cord compression and may be associatedwith a delay in diagnosis due to its uncommon location.[10] Because of the rarity of this phenomenon and its devastating consequences, we feel it is justified to add to the literature another case.

Case Report

A ten-year-old male patient, presented to the outpatient department (OPD) for evaluation of sudden onset weakness in bilateral lower limbs. He had a history of backache for past 3 months, which has increased in intensity during last 2 weeks because ofwhich he was unable to lie down in supine position. He also had history of fever for past 1 week.Initially patient has visited a local paediatrician who had prescribed analgesics for backache and antipyretic for fever, however, when weakness developed the paediatrician referred the patient to our centre which is a tertiary care centre. He also had history of loss of weight and appetite during this period. He was HIV-negative and had no significant past medical history.

On examination, the patient had spinal thrust tenderness in lower thoracic region. No local deformity was present. He had spastic paraparesis with sustained ankle clonus with an

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upgoing plantar reflex. Bladder and bowel functions were intact and there was no subjective loss of sensations. On motor examination, the muscle power was 2 of 5 from the hip downward. Destruction of posterior elements of T9 and T10 vertebrae could be seen radiographically. Magnetic resonance imaging (MRI) revealed intensity enhancing soft tissue lesion seen in the posterior elements of T8, T9 and T10 vertebral bodies such that it draped around the posterior arches of these vertebrae and had an intraspinal extradural as well as posterior extrathecal component [Figure 1]. The intraspinal, extradural involvement caused anterior displacement of the dorsal cord causing its compression. Dorsal cord at T9 and T10 vertebral level showed signs of mild compressive myelomalacia. The posterior component involved the erector spinae muscle in midline. Subtle areas of necrosis were also seen within the soft tissue lesion. Posterior arches of T9 and T10 vertebral body showed subtle edema with subtle bony erosive changes seen in the right posterior arch of the T10 vertebral body – which was highly suspicious of tubercular etiology radiologically. Laboratory test showed ESR (erythrocyte sedimentation rate) of 60 mm/hr and a CRP (C-reactive protein) of 18 mg/L (normal 0 to 6 mg/L). The total leucocyte count was 12,000/mm^3.He had normal liver and kidney function test. The patient belonged to high socioeconomic background and had no history of contact with TB patient.

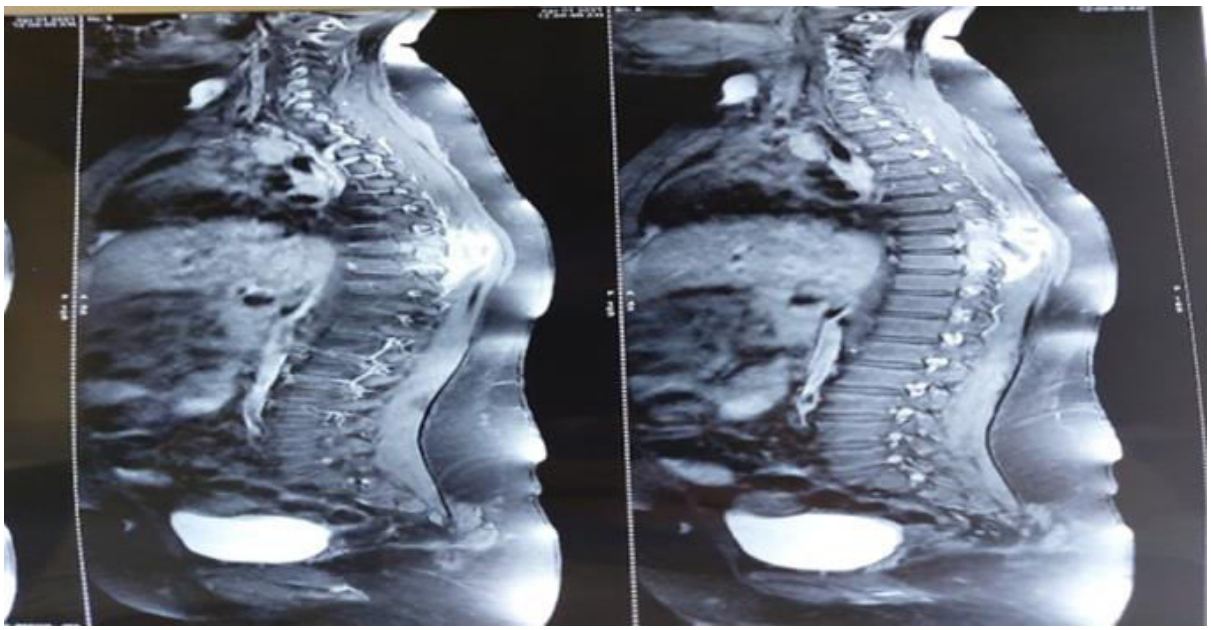

Figure 1: Magnetic resonance imaging (MRI) showing enhancing soft tissue lesion seen in the posterior elements of T8, T9 and T10 vertebral bodies.

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Figure 2: Surgical view showing granulation of abscess bed

Figure 3: Specimen for histopathological examination

Since Tuberculosis was highly suspected both clinically and radiologically, the patient was taken up for surgery after routine blood work and examination the next day. T9 and T10 posterior laminotomy was performed with decompression of spinal cord. The surgery was performed under general anesthesia with the patient in left lateral decubitus position. Upon incision finding included pus with granulation of abscess bed [Figure 2]. Pus and bone were sent for histopathological and microbiological examination [Figure 3]. A washout was performed with 5 litres of normal saline. The patient was discharged 3 days later without any complications. His culture report was positive for TB and no resistance to antitubercular drugs was detected. He was started on antitubercular therapy. The therapy was well tolerated by the patient.

At three months follow up, he had power of 4 of 5 in the right lower limb and 5 of 5 in the left lower limb and is able to walk with support. The patient also reported that he now has reduced backache and improved appetite and weight gain. Laboratory test showed ESR of 40mm/hr and leucocyte count of 10,000/mm3. The patient is routinely followed up monthly as of now.

Discussion

The involvement of posterior elements in spinal tuberculosis termed as neural arch tuberculosis and it is a rare clinical entity[3-8, 11-12.] This is essentially different from the typical

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paradiscal tuberculous spondylitis because of an early and high prevalence of neurological complications.[4,7,11,12] The literature on tuberculous posterior spinal disease remains sparse.[4-7,11,12-15]

Two hypotheses exist regarding involvement of posterior elements: (1) tuberculous bacteria spread from a primary focus via the Batson venous plexus.[4,6,16,17] This plexus of veins contain no valves to control the flow of blood. Because it has no valves retrograde flow of blood occurs from infected viscera to the Batson plexus due to increased pressure in body cavities.

The venous plexus present posteriorly anastomose freely with the other vertebral venous plexi therefore the infection could pass to the posterior veins and hence to the posterior spinal structures via this mechanism. (2) TB in immunodeficient patients. In recent decades, cases of atypical TB have increased in HIV-positivepatients.[18,19]

Tuli et al,[20]proposed the ‘middle-path' approach to treating spinal tuberculosis. Patients should be treated with anti-TB chemotherapy first, with surgery reserved for those who are resistant to it. However, he considered that diseases affecting the posterior components of the spine should be treated right away because of the risk of developing superficial abscesses or sinuses, as well as meningeal infections

We presented a case of neurologically deficient patient with TB of spine. We felt that surgery would be the best modality of care for our patient due to the unique anatomical position of his lesion, as well as his symptomatology of pain and loss of power.

There is usually a delay in the diagnosis of atypical TB. In our case, we diagnosed our patient at 3 months from the beginning of symptoms. The delay in diagnosing TB early can lead to spread of tuberculosis to anterior elements making it pan-vertebral tuberculosis leading to instability of the spine. Vertebral bodies in children are mainly made up of cartilage as compared to adults. Younger child have more cartilage volume in each vertebral body. Due to this severe deformities occur in children due to tuberculosis infection involving vertebral bodies in children as compared to adults.[21] Therefore, timely intervention is of utmost importance in case of children.

Our patient showed significant improvement at 3 months of follow-up with significant improvement in motor power of lower limb i.e. 4 of 5 in the right lower limb and 5 of 5 in left lower limb and the patient is now on ambulant chemotherapy. This can probably be attributed to the drainage of tubercular abscess surrounding the neural arch and intraspinal decompression achieved via laminotomy.

As early surgical management in our case reduced the risk of spinal instability and development of spinal deformity and late complications associated with TB. We, therefore, believe it’s important to determine the management of patients with involvement of posterior elements on a case by case basis rather than providing a universal treatment.

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