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Role of anterolateral decompression in deformity correction in Pott's spine: A case report

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Abstract
Tuberculosis spondylitis or Pott's disease is the most common destructive form of skeletal *Tuberculosis*. The most commonly affected site is the thoracolumbar vertebra. Once invading the adjacent structures of the vertebrae and intervertebral discs ultimately form an abscess causing spinal cord compression, vertebral collapse, and severe kyphotic deformity. Here we operated a case of 40 years old female with pott's spine with impending paraparesis and after the intervention patient was treated and the impending paraparesis was controlled. "Early intervention is gold standard to prevent the dreaded complications".

Keywords: Pott's spine, *Tuberculosis* spondylitis, skeletal *Tuberculosis*, thoracolumbar vertebra

Introduction
Tuberculosis bacilli have lived in symbiosis with mankind since time memorial. *Tuberculosis* is still a challenging health problem in developing countries, affecting almost all organs. Percival Pott first described TB of spinal column, stating a classical destruction of disc space and the adjacent vertebral bodies, collapse of spinal element and progressive kyphotic deformity.
Neurologic complications is the most dreaded complication of spinal *Tuberculosis*, in association with active *Tuberculosis* of the spine it can be prevented by early diagnosis and prompt treatment which can reverse paralysis and minimize the potential disability resulting from Pott's paraplegia. When needed, a combination of conservative therapy and surgical decompression yields successful results in most patients with Pott's spine who have neurologic complications. The vertebral body is primarily affected in *Tuberculosis* of the spine; therefore, decompression has to be anterior. Late onset paraplegia is best avoided by prevention of the development of severe kyphosis.
As spinal TB is a paucibacillary disease, diagnosis is established through a combination of clinical evaluation, imaging studies, AFB smear, mycobacterial culture, histologic/cytologic and molecular methods of diagnosis. Spinal TB is a disease to be treated by combination of surgical and antitubercular therapy (ATT) until healing is attained.
Herein we present the case of a Pott's spine of D2-D5 level with complaints of back ache, angulation of spine and neurological complaints, treated with anterolateral Decompression to prevent further collapse and paraparesis followed by Anti-tubercular treatment showed good result.

Materials and Method
Patient presented to orthopedic OPD with fever and backpain and was evaluated clinically, radiologically followed by microbiological and histopathological examinations to ascertain the diagnosis for appropriate management

Case report
A 40 years old female presented with complaints of upper back ache and girdle pain since 3 months. Pain was insidious in Onset, Gradually progressive, mild to moderate intensity, dull aching type of pain, aggravated by movements. Patient gave history of evening rise of temperature, loss of weight and night cries. On further examination she was febrile and there was no lymphadenopathy. Rales were noted in right upper lung field, and the heart rate was regular, with a soft precordial systolic murmur. The abdomen was soft, with no organomegaly or tenderness noted, and pedal oedema was absent.

Neurological examination revealed focal motor weakness and UMN type of paraparesis. The reflexes were declined bilaterally, and Babinski's reflexes was absent. She had mild kyphosis.

Complete blood counts showed mild leucocytosis, electrolytes, BUN, creatinine, albumin were normal. The alkaline phosphatase was 36 U/L. The alanine aminotransferase was 140 U/L, Erythrocyte sedimentation rate (ESR) was 98 mm/h. Urinalysis was normal. Serum electrophoresis showed mild increase in IgG, normal IgA. PPD skin test was negative. Two blood cultures had no growth. Sputum was negative for malignant cells and acid-fast bacilli (AFB).c reactive protein was raised

Initial spinal x-ray was performed and revealed osteolytic changes in the vertebral body of T2, T3, T4 & T5 vertebrae with reduction of disc space and destruction of vertebral body. Magnetic resonance imaging (MRI) of the spine illustrated spondylitis of T2 to T5 vertebrae with multiple pre and paravertebral and and anterior epidural abscesses from D3-D5 level causing cord compression and myelomalacia which was suggestive of Potts disease. Polymerase chain reaction (PCR) of the patient's gastric fluid was positive for *Mycobacterium Tuberculosis* (MT). Based on MRI and PCR findings, standard treatment for TB was initiated. Results of the spine biopsy and culture showed colonies of MT and confirmed the diagnosis afterwards.

Patient was planned for anterior decompression and fusion to prevent further kyphosis and paraparesis. Anterior transthoracic, intrapleural approach used for dorsal lesions. Decompression was done & around 200 ml pus was removed. Necrotic bone, granulation tissues and debris was removed with the help of curette from destroyed vertebral bodies .Part of 3rd and 4th ribs were removed and used as a graft at T2-T3 &T4 level to achieve biological union. Patient recovered totally and bone density increased day by day with improvement in her paraparesis as examined in follow ups.

Fig 1: Kyphosis

Fig 2: MRI

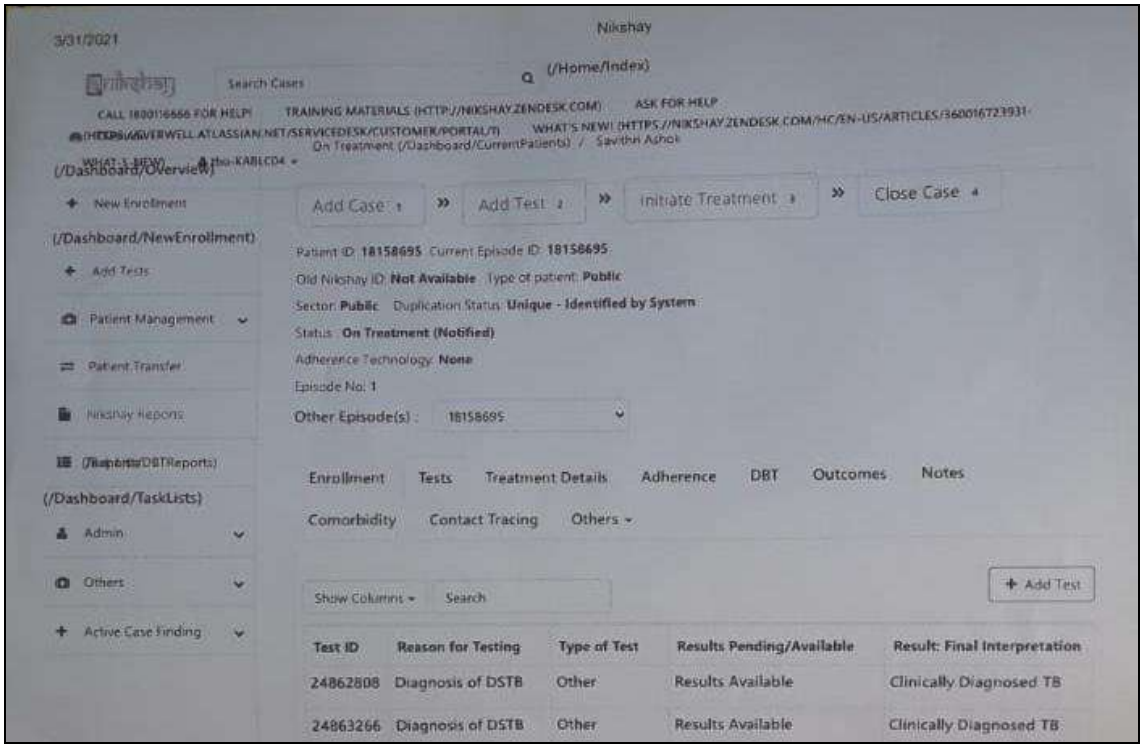

Fig 3: Biopsey Report

Fig 4: MRI Report

ON Follow-up on 12th week and 24th weeks Blood values showed normal results with no further kyphotic deformity and no worsening of neurological symptoms. ESR was repeated on monthly basis and patient recovered totally from the impending paraparesis.

Follow-up X-rays

6th[TH] Week. 12[TH] Week. 24[th] week

Discussion

Spinal *Tuberculosis* is a destructive form of *Tuberculosis*. It accounts for approximately half of all cases of musculoskeletal *Tuberculosis*. It is more common in children and young adults. The incidence is increasing in developed nations. Genetic susceptibility to spinal *Tuberculosis* has recently been demonstrated. Characteristically, there is destruction of the intervertebral disk space and the adjacent vertebral bodies, collapse of the spinal elements, and anterior wedging leading to kyphosis and gibbus formation. The thoracic region of vertebral column is most frequently affected. Formation of a 'cold' abscess around the lesion is another characteristic feature. The incidence of multi-level non-contiguous vertebral *Tuberculosis* occurs more frequently than previously recognized. Common clinical manifestations include constitutional symptoms, back pain, spinal tenderness, paraplegia, and deformities. Spinal involvement is usually a result of hematogenous spread of *M. Tuberculosis* into the dense vasculature of cancellous bone of the vertebral bodies. The primary infection site is either a pulmonary lesion or an infection of the genitourinary system. Spread occurs either via the arterial or the venous route. An arterial arcade, in the subchondral region of each vertebra, is derived from anterior and posterior spinal arteries; this arcade form a rich vascular plexus. This vascular plexus facilitates hematogenous spread of the infection in the paradisical regions. Batson's paravertebral venous plexus in the vertebra is a valve-less system that allows free flow of blood in both directions depending upon the pressure generated by the intra-abdominal and intrathoracic cavities following strenuous activities like coughing. Spread of the infection via the intraosseous venous system may be responsible for central vertebral body lesions. In patients with non-contiguous vertebral *Tuberculosis*, again it is the vertebral venous system that spreads the infection to multiple vertebrae.

Spinal *Tuberculosis* is initially apparent in the anterior inferior portion of the vertebral body. Later on it spreads into the central part of the body or disk. Paradisical, anterior, and central lesions are the common types of vertebral involvement. In the central lesion, the disk is not involved, and collapse of the vertebral body produces vertebra plana. Vertebra plana indicates complete compression of the vertebral body. In younger patients, the disk is primarily involved because it is more vascularized. In old age, the disk is not primarily involved because of its age-related avascularity. In spinal *Tuberculosis*, there is involvement of more than one vertebra because its segmental arteries bifurcate to supply two adjacent vertebrae. Spread of the disease beneath the anterior or posterior longitudinal ligaments involves multiple contiguous vertebrae. A lack of proteolytic enzymes in mycobacterial infections (in comparison with pyogenic infections) has been suggested as the cause of the of the subligamentous spread of infection.

Conclusion

Anterior decompression in spinal *Tuberculosis* is the gold standard procedure with time-tested results. In summary, it provides indirect decompression of the thoracic spinal canal possibly leading to earlier neurological recovery and a decreased need for in-patient treatment.. An adequate specimen can then be sampled under direct vision, and the spinal cord is decompressed indirectly by means of decompressing the abscess cavity and allowing pus to drain from the spinal canal. Anterior decompression for thoracic spinal *Tuberculosis* is an effective treatment option in thoracic spinal *Tuberculosis*, both in establishing diagnosis and appropriate treatment sensitivities, as well as the additional benefit of potentially earlier neurological recovery and to prevent further deformity and paraparesis.

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