



KYPHOTIC DEFORMITY : LUMBAR SPINE TRAUMA WITH TUBERCULOSIS

Orthopaedics

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ABSTRACT

Introduction- Tuberculosis (TB) has almost been extinct in many developed countries, the incidence of TB is still very high in India and TB cases have seemed to increase over the last decade. Tubercular infection after compression fracture of a vertebra is rare. Patient's age, immune status, infection location, and pathogen virulence determine the particular characteristics of clinical presentation. Kyphotic deformity is a serious problem for sagittal spinal balance and resulting in back pain, neurologic impairment, and cosmetic problem. Post traumatic kyphotic deformity most commonly occur following unstable spine. **Case report-** here, we present a case of 26 year old male, with a history of trauma 1.5 years back following a fall from height with Obvious kyphosis of the lumbar spine and constraint of the lumbar motion, which was managed by posterior decompression, posterior instrumentation and kyphotic deformity correction by total posterior spondylectomy of L2 vertebrae and autologous bone graft was used for interbody fixation along with the cage. **Conclusion-** A severe kyphotic deformity often requires surgical treatment to eradicate infection, restore alignment and reduce pain. When lesions result in progression of kyphosis to more than 50 degrees, the deformity should be surgically corrected to restore sagittal balance Tuberculosis along with fracture makes the spine highly unstable and causes deformity. Posterior vertebral column resection with instrumentation and inter body fusion was effective and efficient for achieving adequate correction of kyphotic deformity.

KEYWORDS

kyphotic deformity, lumbar spine, tb spine, tuberculosis, trauma and TB

INTRODUCTION

Tuberculosis (TB) has almost been extinct in many developed countries, the incidence of TB is still very high in India and TB cases have seemed to increase over the last decade. Skeleton is the most common site of extrapulmonary involvement, with 50% of these cases being spinal. Tubercular infection after compression fracture of a vertebra is rare. Patient's age, immune status, infection location, and pathogen virulence determine the particular characteristics of clinical presentation. Kyphotic deformity is a serious problem for sagittal spinal balance and resulting in back pain, neurologic impairment, and cosmetic problem. Post traumatic kyphotic deformity most commonly occur following unstable spine. It has been proved that intervertebral disc-space infections and vertebral osteomyelitis are the same disease at different stages, so the outlines of treatment are the same.

Case report

20 yr old male presented to us with a history of trauma 1.5 years back following a fall from height, As neurological function was normal at that time and no obvious spinal canal stenosis was found, no special treatment was performed at that time and he was just prescribed lying in bed. During the conservative treatment, he was in good physical condition with his back pain totally subsiding. Whereas about 7 months after the original trauma, he gradually developed aggravated recurrent back pain and lower extremity weakness and anaesthesia, along with febris and night sweats. For further diagnosis and treatment, he presented to our institution in January 2022. On admission, the temperature was 37.7°C. There was no lymphadenopathy. Obvious kyphosis of the lumbar spine and constraint of the lumbar motion were found.

Physical examination revealed tenderness of the L2-L3 L3-L4 L4-L5 spinous process and the associated bilateral paravertebral space. The neurologic assessment demonstrated lower extremity weakness with

grade 4 strength for the left leg and grade 5 for the right leg, respectively. His walking distance was limited to 50 steps and was unable to stand for more than 2 minutes. There was no sensory deficit. Deep tendon reflexes were normal and Babinski's reflex was absent. Bladder and bowel function were normal. In addition, erythrocyte sedimentation rate significantly increased (ESR, 47 mm/h) and C-reactive protein slightly raised (CRP, 8.2 mg/L). Further diagnostic procedures like chest X-ray and abdominal ultrasound evidenced normal findings. A lumbosacral spine radiograph revealed a destruction of L2 and L3. CT scan for the lumbar spine showed destruction of the L2 and L3 vertebral body, which is usually seen in tuberculous spondylitis. MRI scan of his lumbar spine revealed the subligamentous, intraspinal and bilateral destruction of the L2 and L3 vertebral body and the adjacent intervertebral discs. Further diagnostic procedures like chest X-ray and abdominal ultrasound evidenced normal findings.

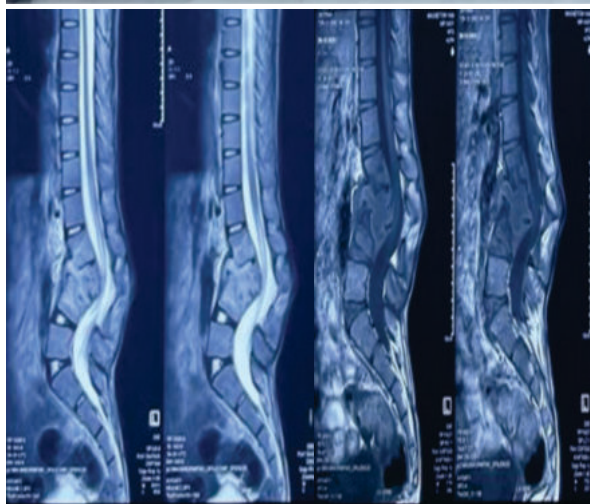
A lumbosacral spine radiograph revealed a destruction of L2 and L3. CT scan for the lumbar spine showed destruction of the L2 and L3 vertebral body, which is usually seen in tuberculous spondylitis along with bilateral fractures of pars interarticularis of L5. MRI scan of his lumbar spine revealed the subligamentous, intraspinal and bilateral destruction of the L2 and L3 vertebral body and the adjacent intervertebral discs. No systemic disease in the patient's past medical history was noted. TB was also denied for him and his family. Surgery was performed based on the decompression and stabilization of the spine. Posterior approach was chosen.

Intraoperatively, purulent yellowish material was seen originating from the L2 L3 body, which had almost completely destroyed the vertebral body. In addition, the intervertebral discs of the adjacent segments were also eroded. Intraoperatively, Subsequent radical

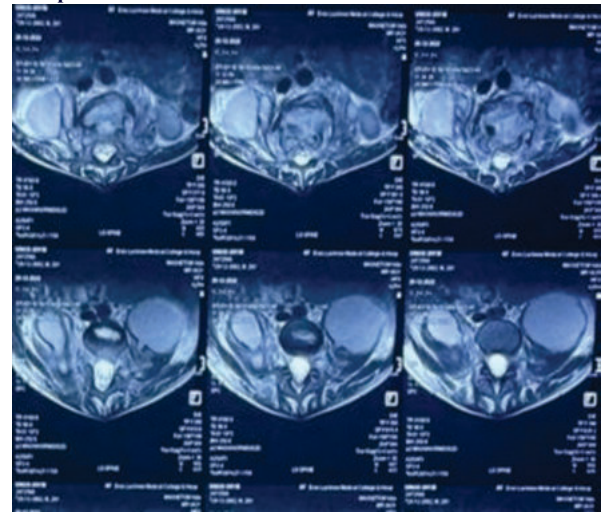
debridement L2 L3 body as well as the adjacent necrotic discs was performed. We performed posterior decompression, posterior instrumentation and kyphotic deformity correction by total posterior spondylectomy of L2 vertebra and Autologous bone graft was used for Interbody fixation along with cage. There was no laceration nor transection of spinal cord.



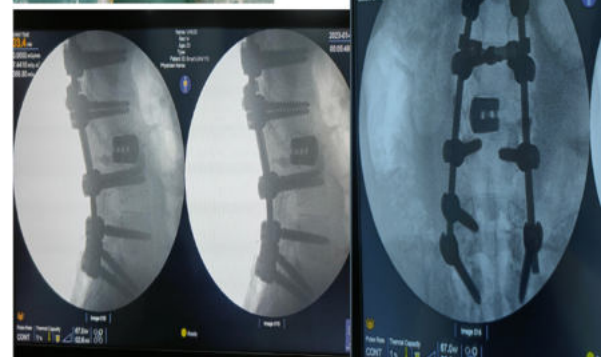
From the initial lumbar x-ray, regional Cobb's angle 60 degrees which was corrected to a normal lordotic lumbar spine. Postoperatively, The physical status presented to be gradually stable with the muscle strength of both lower limbs recovered to grade 5. Culture results were subsequently positive for Mycobacterium tuberculosis. All investigations for other pathogens were negative. The patient was placed in a spinal brace for stabilization of the vertebral column and started on Anti-TB regimen.

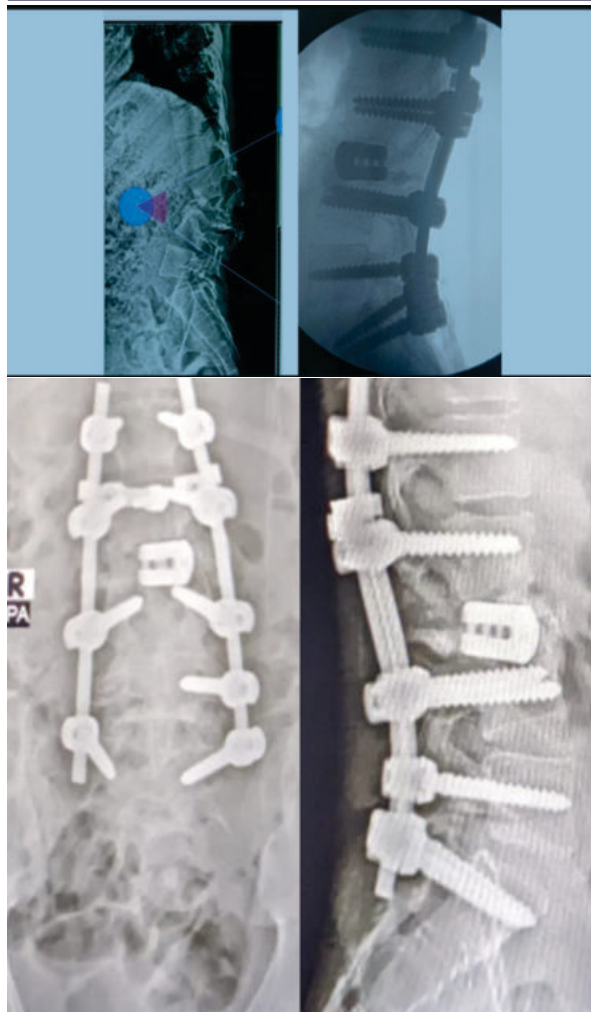


Pre op-MRI



Intra OP





DISCUSSION

Fracture dislocation of spine is the most unstable type of spinal injury with failure of all 3 columns. In our case, the pre-existing hematoma from the fracture of vertebrae probably created a local media for hematogenous seeding of *Mycobacterium tuberculosis* and subsequent formation of abscess. Failure to reduce and stabilize the spine, kyphosis progression will be consequence. In this case there was a lumbar kyphosis of 60 degree of Cobb's angle. Although the prevalence of TB has reduced since the advent of anti-TB drugs, recent studies indicated the increased incidence of extrapulmonary TB in industrialized countries. Only 22 cases of musculoskeletal TB that occurred at the site of recent blunt trauma have been previously described. All those cases had no breach of the overlying skins. A circumferential approach with anterior release via discectomies and corpectomies, followed by posterior instrumentation and fusion has been the standard of care.

CONCLUSION

A severe kyphotic deformity often requires surgical treatment to eradicate infection, restore alignment and reduce pain. In conclusion, this is a fairly interesting and exceptional case. The term 'locus minoris resistentiae' is defined as a place of less resistance, any part or organ which is more susceptible than others to the attack of a morbid agent. The paravertebral venous plexus may be one possible route for the deposition of organism and Macrophages that contained dormant *Mycobacterium tuberculosis* at the potential site of infection entered the circulation and took root in the hematoma by chemotaxis. When lesions result in progression of kyphosis to more than 50 degrees, the deformity should be surgically corrected to restore sagittal balance. Tuberculosis along with fracture makes the spine highly unstable and causes deformity. Posterior vertebral column resection with instrumentation and inter body fusion was effective and efficient for achieving adequate correction of kyphotic deformity.

REFERENCES

1. Huang B, Li CQ, Zhuang Y, Xu JP, Zhou Y. Spinal tuberculosis occurring after a closed

bursting fracture of the vertebrae. *Eur Spine J*. 2012 Jun;21 Suppl 4(Suppl 4):S525-30. doi: 10.1007/s00586-012-2149-7. Epub 2012 Jan 26. PMID: 22278402; PMCID: PMC3369057.

2. Jain AK (2010) Tuberculosis of the spine: a fresh look at an old disease. *J Bone Joint Surg Br* 92(7):905–913
3. Jain AK, Dhammi IK, Jain S et al (2010) Kyphosis in spinal tuberculosis—Prevention and correction. *Indian J Orthop* 44 (2):127–136
4. Yudistira, A., Asmiragani, S., & Satriawan, E. (2019). Correction of kyphotic deformity due to neglected fracture dislocation thoracolumbar spine with posterior vertebral column resection. *International Journal of Research in Medical Sciences*, 7(2), 610–612. <https://doi.org/10.18203/2320-6012.ijrms20190366>
5. Rajasekaran S, Soundarapandian S (1989) Progression of kyphosis in tuberculosis of the spine treated by anterior arthrodesis. *J Bone Joint Surg Am* 71(9):1314–1323