Surgical Management & Outcome of Spine TB without Instrumentation: Two Case Report & Review of the Literature

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Abstract:

Spine tuberculosis or pott's diseases is not uncommon in our country. Along with tuberculosis epidural abscess also common which present with motor and sensory deficit. Spine tubercular infection usually destroy the vertebra causing instability of spine. Present principle of tuberculosis treatment includes chemotherapy, tubercular abscess drainage, focal debridement, anterior radical surgery (anterior debridment and anterior fusion) and posterior instrumentation with anterior radical surgery. We share our experiences of two cases regarding spine tuberculosis which was managed by only drainage of abscess without instrument with very good outcome.

Key Words: *Tuberculosis; Pott's Spine; medical therapy; spine surgery without instrumentation.*

Bang. J Neurosurgery 2015; 4(2): 56-60

Introduction:

Spinal tuberculosis is one of the oldest disease known to mankind and has been found in Egyptian mummies dating back to 3400 BC[1]. "Pott's disease/Pott's spine" describes tubercular infection of the spine and the term "Pott's paraplegia" describes paraplegia resulting from tuberculosis (TB) of the spine[2]. Globally in 2014, there were an estimated 9.6 million incidence of TB. The South-East Asia and Western Pacific Regions collectively accounted for 58% of the world's TB cases in 2014[3]. Approximately 10% of the patients with extra pulmonary tuberculosis have skeletal involvement. Spinal tuberculosis accounts for almost 50% cases of skeletal tuberculosis[4]. Tubercular infection of the spine usually destroy the vertebra causing instability of spine. Present principle of TB treatment includes chemotherapy, tubercular abscess drainage, focal debridement, anterior radical surgery (anterior debridment and anterior fusion) and posterior instrumentation with anterior radical surgery[5]. Our case highlights a patient with Pott's disease in which a potentially unstable spine was successfully treated with Tong traction, anterior spinal decompression of epidural/paravertebral abscess without instrumentation and anti-tubercular chemotherapy.

Case Report-1:

A16 years old female had history of intermittent neck pain for the last one year, sought medical consultation but anti tubercular drugs was not started even though X-ray of the cervical spine showed evidence of tubercular infection and was prescribed to take analgesics for pain relief. After two months, she visited our hospital with recurrence of pain over nape of the neck which was associated with mild weakness of upper limbs, difficulty in writing and holding objects with hands. She had no other constitutional symptoms of chronic infection. She had positive family history for tubercular infection. X-ray of the cervical spine (taken 2 months back prior to admission in our hospital) demonstrated complete osteolysis of C4 vertebral body and partial osteolysis of C3 vertebral body with kyphotic angulation at these levels with preverteberal soft tissue swelling (Figure 1).

Fig.-1: *Lateral Cervical spine X-ray showed complete lysis of C4 vertebral body and partial lysis of C3 vertebral body with kyphotic angulation at the same level with preverteberal soft tissue swelling (at the time of initial presentation).*

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On examination, she had no anemia and lymphoadenopathy. Motor power was MRC grade 5 in all the groups of muscle of upper and lower limbs except hand grasp bilaterally, which had muscle power of grade 4. She had normal reflexes in all limbs including plantar response. MRI of the cervical showed collapse of C4 vertebra, partial collapse of C3 vertebra, preverterbral abscess and epidural abscess causing compression of spinal cord anteriorly with kyphotic angulation at these levels (Figure 2 and 3).

Fig.-2: *A Sagittal view of MRI Cervical spine with intravenous contrast exhibited complete collapse of C4 and partial collapse of C3 vertebra with kyphotic angulation and enhancing lesion in pre vertebral and epidural region causing spinal cord compression.*

Fig.-3: *A Sagittal view of MRI Cervical spine T2WI revealed hyper intense lesion in pre vertebral and epidural region causing spinal cord compression.*

Her Chest X- ray, ultrasound of the abdomen and pelvis were normal with negative urine exam for infection. ESR was markedly elevated and tuberculin skin test was positive. Anti tubercular medication was started immediately and she was put on Gardner's tong traction. Her motor power significantly improved about 15 days following these measures.

Patient underwent anterior drainage of tubercular abscess followed by chemotherapy (Isoniazide, Rifampicin, Pyrizinamide and Ethambutol) for 18 months. There was significant improvement of symptoms and neurological deficit within 15 days of surgery without any post-operative complication like discharging sinus. She was discharged with ability to walk on her own. There was formation of bony matrix between the adjacent vertebral bodies signifying ongoing bony fusion. There was no increase in kyphotic deformity of spine and no evidence of spinal instability based of dynamic spine X-ray done1and 6 months after surgery (Figure 4 and 5).

Case report 2

A 14 years female presented with mild low back pain radiating to lower abdominal region for last 5 months but had severe pain for last 1 month and mild fever in

Fig.-4: *Lateral Cervical spine X-ray taken a month after starting anti-tubercular therapy and aspiration of the spinal abscess. It exhibits prevertebral shadow and fusion of C3 and C4 vertebral body by bridging bony trabeculation.*

Fig.-5: *Lateral Cervical spine X-ray six months after interventions revealed fusion of C3 and C4 vertebral body with bony bridge, less kyphotic angulation and normal prevertebral soft tissue.*

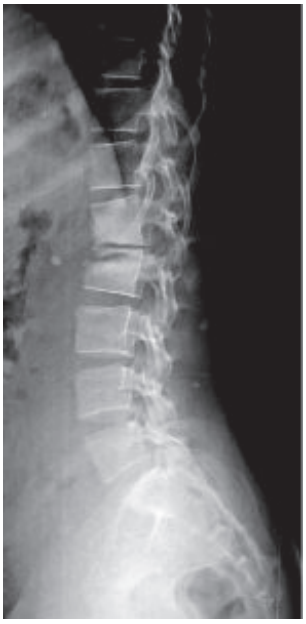

Fig.-6: *Lateral X-ray Dorso Lumber Spine : decreased intervertebral space with partial osteolysis at L1 and L2 with prevertebral Shadow*

Fig.-7: *MRI Dorso lumber spine (post contrast saggital/coronal) – decreased inter vertebral space between L1and L2 with prevertebral abcess and B/L Psoas abcess.*

the night for last 1 month. She had h/o decreased apatite but no h/o significant weight loss. No positive family h/o tuberculosis. On examination; no anemia and lympho adenopathy. Her upper and lower motor power were 5 in all groups of muscle. Restricted and painful lumber spine on flexon and tenderness at L1 and L2 spinous process. On per abdomen examination : intra-abdominal mass in Left lumbar and iliac region measuring with ill-defined margin, soft in consistency, non-tender, fixed with underlying structure, not movable with respiration. X-ray of dorso-lumber spine showed decreased inter vertebral disc space with partial osteolysis of L1 and L2 vertebra (Figure 6). MRI of Lumber showed decreased inter vertebral space bet L1And L2 vertebra, pre vertebral abcess with bilateral psoas abscess (Figure7). Her tuberculin test was positive and ESR was markedly elevated. USG of Abdomen revealed a fairly large cystic lesion with low level echo & with evidence of septation is seen in the right side of paravertebral region measuring about 12.3x5.9x7.6 cm. Another fairly large cystic lesion with low level echo with thick wall & with evidence of septation is seen in the left paravertebral region measuring about 13.9x6.8x8.9 cm which is displacing the individual kidneys laterally, more on the left side which is extending up to left inguinal region suggesting psoas abcess. She had been put on Anti tubercular medication for 18 months, and posterior drainage of pus was done. Her low back pain and lower abdominal pain subsided following surgery.

Discussions:

Surgical intervention of Pott's spine have few advantages like early healing by extirpation of the infected focus, histological confirmation of disease,

shortened use of chemotherapy, reduction in recurrent rates, correction and /or prevention of spinal deformity. It also provides early effective neurological recovery and meets the patient's aesthetic demand[5]. The indica-tions for urgent surgical intervention in spinal TB vary from neurologic deficit due to spinal cord compression (clinical or radiological) to spinal instability[6]. There is controversy about the precise role of surgery in the management of spinal tuberculosis.

This difference of opinion goes back to 1960 when Hodgson and Stock advocated surgical treatment; and Konstam and colleagues advocated conservative treatment[7-9]. Tuli, in 1975, proposed a "middle path regimen" for treatment of spinal tuberculosis. It advocates conservative treatment with multi-drug chemotherapy and surgery reserved for specific indications. The Medical Research Council of the United Kingdom, on the basis of results of some hallmark studies had shown that anti tubercular treatment alone can be effective, with the resolution of neurological sequel and prevention of substantial progression of kyphosis.

A Cochrane Database Review assessing the role of routine surgery in addition to chemotherapy in spinal tuberculosis also concluded that evidence was insufficient for the routine use of surgery. The guidelines published by the Royal College of Physicians noted that there was no additional advantage of routinely carrying out anterior spinal fusion over standard chemotherapy. A randomized trial performed primarily among ambulatory patients by the Medical Research Council Working Party on Tuberculosis of the Spine demonstrated no additional benefit of surgical debridement or radical operation (resection of the spinal focus and bone grafting) combined with chemotherapy compared with chemotherapy alone. Myelopathy with or without functional impairment most often responds to chemotherapy[6,7]. In two Medical Research Council studies conducted in Korea, 24 of 30 patients in one study and 74 of 85 patients in an earlier study had complete resolution of myelopathy or complete functional recovery when treated medically[2].

Patil et al. in 2014 showed 47 out of 50 (94%) patients in their series showed complete resorption and healing of the compress-ing epidural infectious mass with chemotherapy alone. One expert suggested that indications for surgery were pan-vertebral lesions, refractory disease, severe kyphosis, an evolving neurological deficit, and clinical deterioration or lack of clinical improvement[10-12]. An absolute indication for surgical treatment is worsening of existing neurologic deficit or the development of a major neurologic deficit (d"Frankel grade C) or progres-sive paraplegia while on treatment under supervision[10].

We report a case where a patient with Pott's disease with abscess and potentially an unstable spine was treated successfully with minimal intervention. She had standard anti-tubercular therapy for a protracted period of 18 months; however her epidural/ paraveretebral abscess was drained through anterior spinal approach for cervical and posterior spinal approach for lumber without spinal instrumentation. Patient subsequent cervical and lumbar spine X-rays in the post-operative period revealed healing of the involved cervical vertebra with bony bridges suggesting ossification and also decrease in kyphotic angulation. There was also normal pre and para vertebral shadow probably reflecting resolved spinal abscess.

Conclusion::

Although different modalities of treatment exist for Pott's disease like medical treatment alone or combined with early surgical intervention. Different schools of thought differ in favoring one treatment over the other. However in our case, early start of anti-tubercular medication, immobilization of spine and drainage of tubercular abscess without any instrumental stabilization of Pott's spine resulted in recovery of neurosurgical deficit, reduction of kyphotic deformity and decreased hospital stay. Hence it signifies that medical therapy and surgical debridement/drainage without spine instrumentation can result in fusion of the involved vertebra and good functional outcome in selective patients meeting clinical and radiological criteria similar to our case.

References:

1. Dobson J. Percivall Pott. Ann R Coll Surg Eng 1972;50(1):54–65.
2. Garg RK, Somvanshi DS. Spinal Tuberculosis: a review. Journal Spinal Cord Med 2011;34(5), 440-54.
3. WHO Global Tuberculosis Report 2015.
4. Gautam MP, Karki P, Rijal S, Singh R. Pott's spine and Pott's paraplegia. J Nep Med Assoc 2005;44(159):106–15.
5. Moon MS. Tuberculosis of spine: current views in diagnosis and management. Asian Spine J 2014;8(1):97-111.
6. Nussbaum ES, Rockswold GL, Bergman TA, Erickson DL, Seljeskog EL. Spinal tuberculosis: a diagnostic and management challenge. J Neurosurg 1995;83: 243-7.

7. Hodgson AR, Stock FE, Fang HS, Ong GB. Anterior spinal fusion. The operative approach and pathological findings in 412 patients with Pott's disease of the spine. Br J Surg 1960;48:172–8.

8. Konstam PG, Konstam ST. Spinal tuberculosis in Southern Nigeria with special reference to ambulant treatment of thoracolumbar disease. J Bone Joint Surg Br 1958;40-B(1):26–32.

9. Konstam PG, Blesovsky A. The ambulant treatment of spinal tuberculosis. Br J Surg 1962;50:26–38.

10. Patil SS, Mohit S, Varma R, Bhojraj SY, Nene AM. Non-Surgical Management of Cord Compression in Tuberculosis: A Series of Surprises. Asian Spine J 2014;8(3):315-321

11. Jutte PC, Castelein RM. Complications of pedicle screws in lumbar and lumbosacral fusions in 105 consecutive primary operations. Eur Spine J 2002;11(6):594–8.

12. Sell P. Expert's comment concerning grand rounds case entitled "Posterior listhesis of a lumbar vertebra in spinal tuberculosis" (by Matthew A. Kirkman and Krishnamurthy Sridhar). Eur Spine J 2011;20(1):6–8.