

## **Cervical spinal tuberculosis, its management and outcome - A Case Report**

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### **Abstract**

Tuberculosis is a major public health problem which is commonly caused by mycobacterium tuberculosis. Potts spine or Spinal tuberculosis (TB) is one of the rare form of TB in young patient. This can result in serious complications if left untreated or treated inadequately.

Our patient, 20 years old women, presented with complaints of quadriparesis for 1-month and occasional fever for 6-months in a known case of pulmonary tuberculosis diagnosed 4 months back and was started on anti-TB pharmacological drugs.

She was diagnosed as tubercular spondylodiscitis with quadriparesis with C7 vertebral body collapse with significant mass effect on spinal cord at C6-C7 level from histopathology, MRI and biochemical evidences. She was treated with anti-TB chemotherapy for 4 months with inadequate response and continued long for

18 months after further evaluation. Posterior surgical decompression with abscess drainage was done.

Early diagnosis, proper drug treatment, surgical intervention and customized rehabilitation can give nearly full remedy.

**Keywords:** TB, C6-C7, CT or MRI

### **Introduction**

Tuberculosis is a major public health problem in the developing countries, which is commonly caused by Mycobacterium tuberculosis.<sup>(1)</sup> Extrapulmonary TB can involve any structure, most common being the lymph nodes followed by spine, particularly the dorsal spine.<sup>(1)</sup> Tuberculosis is dated back to 3400 BC found in the Egyptian mummies, being one of the oldest diseases known to mankind.<sup>(2)</sup> Spinal tuberculosis is popularly known as Potts spine, pertaining to the first modern

description by Sir Percival Pott in his monograph in 1779.<sup>(3)</sup>

At present, the term potts spine/disease refers to spinal tuberculosis and potts paraplegia refers to paraplegia as a complication of destruction of spinal elements due to the infection.<sup>(4)</sup> Pott disease or Spinal TB is a very dangerous type of skeletal TB. It can be associated with neurologic deficit due to compression of adjacent neural structures and significant spinal deformity. It is a rare disease. The incidence of spinal TB with neurological involvement is between 12.5-100% and it commonly leads to neurological sequelae if not treated sufficiently.<sup>(5)</sup> Therefore, early diagnosis, management and complication prevention should be done meticulously.<sup>(6)</sup>

Pott disease usually presents with chronic back pain which usually involves the lower thoracic and lumbar spine. The infection starts as a discitis and then spreads along the spinal ligaments to involve the adjacent anterior vertebral bodies, causing angulation of the vertebrae may result in kyphosis. Paravertebral and psoas abscess formation is common. CT or MRI is valuable in determining the extent of disease and the amount of cord compression.<sup>(7)</sup>

Tuberculosis of the cervical spine is distinguished from other vertebral localizations by its extreme rarity, representing approximately 2- 3% of spinal TB cases.<sup>(8)</sup> Therefore, its clinical and radiological semiology is quite distinctive, as the cervical spine can be affected by lesions that lead to instability and neurological deficits, and its prognosis is conditioned by the risk of bulbomedullary compression. The conduct of the cervical spine TB can involve a variety of interventions, ranging from TB treatment to

surgery, although chemotherapy is the mainstay of the treatment.<sup>(8)</sup>

### **Case History**

Our patient, 20 years old female, Muslim, married, housewife, normotensive, nondiabetic, nonsmoker, right-handed, hailing from Maharashtra, India, presented with complaints of neck pain for 2-months with weakness of all four limbs since 1 month, occasional fever for 6-months, anorexia for 4-months with significant weight loss for 6 months. Patient had weakness of all four limbs associated with inability to stand, bear weight over both lower limbs and inability to do daily activities from both upper limbs like combing hair, dress herself, eat or hold a glass of water. The “dull aching” neck pain was mild to moderate in nature, aggravated on both rest and movements; specially with neck movements of turning neck side to side, front and back, twisting and relieved partially with analgesics. Fever was occasional, low grade, associated with evening rise of temperature and night sweat. Patient also complained about anorexia. She gave history of weight loss of more than 10%. Her bowel bladder habit was normal. She had occasional lightheadedness, palpitation and easy fatigability.

For these she visited to several physicians, took drug management leading to partial response. She was diagnosed as sputum positive pulmonary tuberculosis 4 months back and was started on anti-tubercular pharmacological therapy (Isoniazid, Ethambutol, Pyrazinamide, Rifampicin) since then. Patient developed weakness of all four lower limbs since 1 month and was admitted at tertiary care hospital for further management.

She was nullipara, with normal menstrual history. She was immunized as per schedule, with Bacillus Calmette-Guerin (BCG) vaccine mark presence over left arm. She

had no relevant past medical, hospitalization or transfusion history. She was living in a joint family, with husbands and in laws; all were enjoying good health and so did her parents & siblings. She was free from tobacco or alcohol habits. She had no known drug reaction.

### Clinical Findings

On general physical examination, she had pallor, pulse 88/min, BP 110/70, BMI (body mass index) 24.2, temperature 98°F.

Musculoskeletal system examination revealed straightening and stiffness of neck, with tenderness over C7 vertebral region, palpable gibbus over C7 vertebral region, pain VAS (visual analogue scale) -6/10, active forward bending and rotation at neck were painful and restricted. No other joint or musculoskeletal problem were found.

Nervous system examination revealed Intact higher psychic function; wasting of muscle bulk, hypotonia of all four limbs, grade 3/5 power of all limbs, deep tendon reflexes were hyperactive on upper and lower extremities, bilaterally flexor planter response; intact all modalities of sensation (pain, touch, temperature, vibration, position) on both side of body.

Respiratory system, cardiovascular system, gastrointestinal system examination revealed no abnormality.



Figure 1: Clinical photos of the patient with Halter's traction in situ and Active straight leg raising tests of 30 degrees bilateral lower limbs.

### Investigation

Patient came with some previous lab findings of Jan 9, 2022. We repeated some, and added some more investigations on basis of previous findings. Table 1 expressed higher ESR, CRP with. Figure 1 was her Xray chest.

Table 1: Investigation findings.

	09-01-2022	14-01-2022
Hemoglobin (g/dl)	8.7	9.2
ESR (at 1 hour)	57	120
Rbc count (million/mm <sup>3</sup> )	3.27	3.3
Wbc count (/mm <sup>3</sup> )	6900	8500
Mcv (fl)	59	56
Mch (pg)	18	18.6
Peripheral blood film-		Microcytic hypochromic anemia
Serum iron (micro gm/l)		20
Ferritin		41.8
TIBC (micro gm/l)		418
SGPT (u/l)		27
CRP (mg/l)		22
S.Creatinine (mg/dl)		0.8
RBS (mmol/l)		5.6
USG of whole abdomen		Normal
TSH		2.12

CRP = C reactive protein, ESR = erythrocyte sedimentation rate, MCH = mean corpuscular hemoglobin, MCV = mean corpuscular volume, RBC = red blood cell, RBS = random blood sugar, TIBC = total iron binding capacity, TSH = thyroid stimulating hormone, USG = ultrasonogram, WBC = white blood cell.



Figure 2: X-ray chest P/A view.

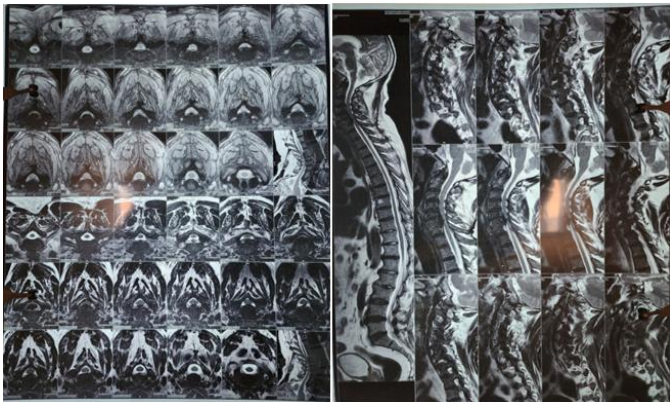


Figure 2: MRI of spine- sagittal and transverse view

MRI of cervical spine with screening of whole spine without contrast report summary was—“significant mass effect on the cervical spinal at C6-C7 level with marrow edema with myelomalacia changes within with severe retropulsion of C6 vertebral body with destruction of C7 vertebral body with significant prevertebral, epidural and paravertebral collection from C3- C4 vertebral body levels and paravertebral collections of about 9.6x3.3 cm on right side and 7x3 cm on left side.”

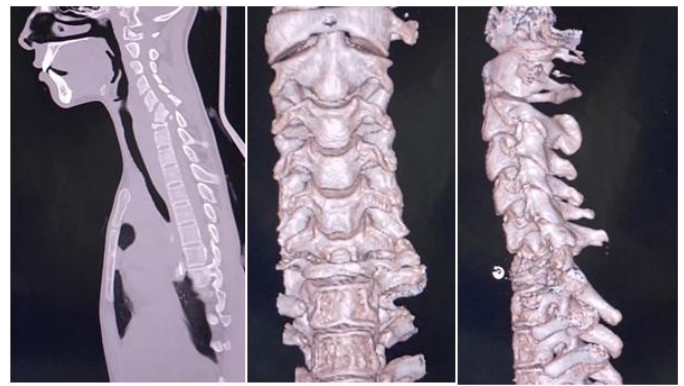


Figure 3: 2D and 3D CT showing collapse of C7 vertebral body with retropulsion of C6 vertebral body.

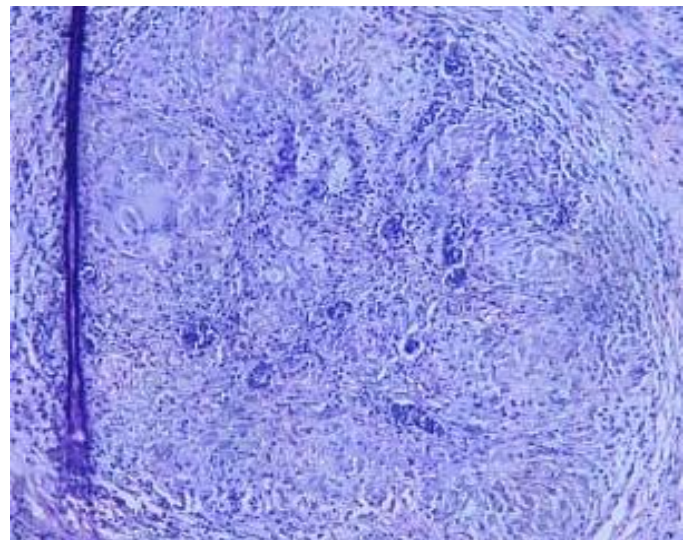


Figure 4: Histopathological image of specimen obtained from CT guided biopsy showing tubercular granuloma

### Clinical Diagnosis

Tubercular spondylodiscitis (Pott disease) at C6-C7 vertebra with quadriplegia with mass effect on the cervical spinal at C6-C7 level with severe retropulsion of C6 vertebral body with destruction of C7 vertebral body in a known case of pulmonary tuberculosis. The diagnosis was made on biochemical, radiological and pathological evidence.

### Management

#### 1. Drug management.

Anti TB category-1 regimen was given initially, she received Isoniazid (5 mg/kg/day), Rifampicin

(10 mg/kg/day), Ethambutol (15 mg/kg/day), and Pyrazinamide (20 mg/kg/day) for at least 2 months (initial phase). This was followed by a 2-drug anti TB treatment (Rifampicin and Isoniazid) for 4 months (continuation phase). As symptoms and alteration of biochemical parameters were persistent so additional 12-month 2 two-drug antiTB treatment was continued (total 18 months).

Also pyridoxin, iron supplement, calcium, cholecalciferol, and NSAID were given. No drug-related adverse outcome was found.

### 2. Surgical decompression

The persistence of bone destruction with spinal instability is an indicator of surgical intervention. Transpedicular stabilization was performed with 2 screws introduced into 2 vertebrae above and below the fracture and connected with rods. Then, laminectomy was performed. The pathological tissue was evacuated from the spinal canal and the meningeal sac was exposed. Material was sampled for a histopathological examination, and to perform cultures for aerobic and anaerobic bacteria, and fungi. The histopathological examination revealed epithelioid cell granulomas with multinucleated Langhans giant cells and caseous necrosis among bone trabecula and the fragments of the articular cartilage. The microscopic picture was consistent with specific granulomatous spondylodiscitis.

### 3. Rehabilitation

Clinically, after the surgery the patient's general condition and mood improved and she regained her appetite. Bedside rehabilitation was conducted. It included passive and active exercises with assistance, and rotor exercises in bed. A week later the patient started using a wheelchair. Ambulation started several

days later and the patient walked with assistance and using handrails.

### Discussion

Among extra pulmonary TB, spinal tuberculosis is a condition which may lead a person with paraparesis or paraplegia and their consequences. Usually, it is more predominant among male. Also, older age, immunosuppressed person have probability to suffer more. Majority time it affect the lower thoracic and upper lumbar region. In contrast, our patient was a young healthy female with Cervical Spine tubercular spondylodiscitis with C7 vertebral body collapse with Quadriparesis, without any known co morbidity. Nevertheless she received BCG vaccine, had no history of direct contact with known TB patient.

Patients with a milder form of the disease with minimal symptoms and without any neurological deficits recover well with conventional medical treatment. The patients with more severe disease of spinal TB in the form of severe disability, gross neurological deficits, spinal deformities, and autonomic involvement needs surgical debridement and fusion procedures in addition to conventional anti TB treatment. From radiological imaging cord compression and C7 vertebral body collapse was were visualized for which surgical decompression was done.

Current surgical techniques are still controversial and include anterior decompression and fusion, with or without fixation; anterior decompression and fusion, with posterior fusion and instrumentation; posterior fusion with instrumentation and anterior decompression with fusion; posterior decompression and fusion with or without posterior instrumentation. These surgical approaches have been reported in the literature with

several advantages and disadvantages as well as different outcomes and success rates<sup>(9, 10)</sup>.

Despite its high frequency of long-term morbidity, there are no straightforward guidelines for the diagnosis and treatment of spinal tuberculosis.<sup>(11)</sup> The duration (6, 9, 12, or 18 months) and frequency (daily vs alternate-day regimen) of administration of drugs have been controversial. WHO recommends 6 months of multidrug antitubercular therapy, including 2 months of 4- or 5-drug treatment (isoniazid, rifampicin, pyrazinamide, ethambutol, and/ or streptomycin) constituting the initiation“ phase, followed by 4 months of “continuation” phase therapy with a 2-drug regimen including isoniazid and rifampicin.<sup>(12)</sup>

### Conclusion

Tuberculosis is a major public health problem which is commonly caused by mycobacterium tuberculosis. Potts spine or Spinal tuberculosis (TB) is one of the rare form of TB in young patient.

Among extra pulmonary tuberculosis, spine tb is a condition which may lead a person with paraparesis or paraplegia and their consequences. The patients with more severe disease of spinal TB in the form of severe disability, gross neurological deficits, spinal deformities, and autonomic involvement needs surgical decompression and fusion procedures in addition to conventional antiTB treatment.

### References

1. Sivalingam J, Kumar A. Spinal tuberculosis resembling neoplastic lesions on MRI. J Clin Diagn Res. 2015; 9(11): 1-3. doi: 10.7860/JCDR/2015/14030.6719
2. Taylor GM, Murphy E, Hopkins R. First report of Mycobacterium bovis DNA in human remains from the Iron Age. Microbiology. 2007;153(4):1243-9.

3. Alam S, Phan K, Karim R, et al. Surgery for spinal tuberculosis: A multi-center experience of 582 cases. J Spine Surg. 2015;1(1): 65-71. doi: 10.3978/j.issn.2414-469X.2015.07.03
4. Moon MS, Sung-Soo K, Hanlim M (2013) Tuberculosis of the spine: current views in diagnosis, management, and setting a global standard. Orthop Trauma 27: 185-194.
5. Wang H, Yang X, Shi Y, et al. Early predictive factors for lower-extremity motor or sensory deficits and surgical results of patients with spinal tuberculosis. Medicine. 2016; 95: 34. doi: 10.1097/MD.00000000000004523
6. A. Osmanagic, A. Emamifar, J. Christian Bang, I.M. Jensen Hansen, A rare case of Pott's disease (Spinal Tuberculosis), Am. J. Case Rep. 17 (2016) 384–388.
7. Backer AID, Mortelé KJ, Vanschoubroeck IJ, Deeren D, Vanhoenacker FM, Keulenaer BLD et al. Tuberculosis of the spine: CT and MRI features. JBR-BTR. 2005; 88(2): 92-77.
8. Xin Hua Yin, Bao Rong He, Zhong Kai Liu, Ding Jun Hao. The clinical outcomes and surgical strategy for cervical spine tuberculosis: a retrospective study in 78 cases. Medecine (Baltimore).2018 Jul; 97(27): e11401.
9. X. Cui, Y. Ma, X. Chen, X. Cai, H. Li, Y. Bai, Outcomes of different surgical procedures in the treatment of spinal tuberculosis in adults, Med. Princ. Pract.22 (4) (2013) 346–350.[12
10. Y. Okada, H. Miyamoto, K. Uno, M. Sumi, Clinical and radiological outcome of surgery for pyogenic and tuberculous spondylitis: comparisons of surgical techniques and disease types: clinical article, J. Neurosurg. Spine 11 (5) (2009)620–627.

11. Garg RK, Somvanshi DS. Spinal tuberculosis: a review. *The Journal of Spinal Cord Medicine*. 2011 Sep;34(5): 440-54.
12. Treatment of Tuberculosis: guidelines. 4th ed. Geneva: World Health Organisation 2010. WHO/HTM/TB/2009. 420.