

## Special Article – Tuberculosis

# A Case Report of Disseminated Pott's Disease (Spinal Tuberculosis) Complicated by Abscess and Near Complete Destruction of Cervical Spine (C5, C6)

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Potts disease (PD) or spinal tuberculosis is a rare infectious disease, which is commonly spread from extra-spinal infection. It commonly involves the anterior aspect of multiple vertebrae. The most common affected site is the lower thoracic vertebrae, with the cervical vertebrae the least common site but has the most serious complication. Back pain is the earliest and most common symptom, along with other constitutional symptoms like fever, night sweating and weight loss. Other presentations depend on the stage of disease and the occurrence of complication. The most sensitive diagnostic modality is Magnetic resonance imaging (MRI) which demonstrates features of spondylodiscitis, disc collapse and disc destruction, cold abscess, vertebral wedging, vertebral collapse and spinal deformities. Histopathological analysis can be done by Ultrasound and computed tomographic (CT) guided needle aspiration or biopsy. Treatment is by combination Anti-Tuberculosis and surgery (debridement, decompression, fusion and bone auto-graft) in case of complication. A 55 years old man presented complain of dull back pain that started three weeks prior to admission along with fever and night sweating, one week later he started to develop neurological complication in form of lower limb weakness, his condition deteriorated gradually to the level of complete paraplegia and he also had urine retention. Diagnosis of pott's disease was confirm based on MRI imaging and microscopically analysis of a needle aspiration sample. Patient was treated with a combination Anti-Tuberculosis and underwent surgery (decompression and fixation).

**Keywords:** Pott's disease; Tuberculosis; Abscess; Neurological deficit; MRI**Introduction**

Tuberculosis (TB) is considered a disease most prevalent among people with low socioeconomic status and so found mostly in underdeveloped countries. TB may involve any part of the body like; skin, lungs, brain, bones and intestines. Spinal TB is commonest type of tuberculosis involving the bony element, and it is called pott's disease (PD). It may spread to the spine from the lungs and abdomen or it may manifest as primary disease [1]. The clinical presentation of PD depends on the Stage of disease, the affected site and the Presence of complications such as neurologic deficits, abscesses, or sinus tracts [2]. Diagnosis depends on the presence of characteristic clinical manifestations and neuroimaging findings. Etiological confirmation requires the demonstration of acid-fast bacilli on microscopy or culture of material obtained from the lesion.

**Case Presentation**

55 years old male farmer from El Gezira (middle Sudan) known to have diabetes mellitus type two for 10 years on insulin, presented complain of low grade fever that started 25 days prior to admission, fever was mainly at night and associated with sweating. Two days later he started to have dull back pain, mainly at cervical and lumbar region. Then after seven days, he started to develop lower limb weakness that deteriorated gradually to the level of complete paraplegia. In

addition, the patient began to have urine retention in the last two days prior to admission. Patient had no history of cough or shortness of breath; also, he had no history of close contact with a patient with tuberculosis or chronic cough. Regarding other systemic review he has no complaints. Patient is not smoker or alcohol consumer.

Examination at the date of admission showed the followings; patient was very ill, pale, not jaundice, not dyspneic, oriented in time place and person, blood pressure 117/55. Pulse rate 110/min (regular, large volume, synchronize, no radio-femoral delay), respiratory rate 18/min, spo<sub>2</sub>: 100%, temperature: 38C, jugular venous pressure (JVP) not raised. Pulmonary examination: normal air entry bilaterally, normal vesicular breathing, no crepitation or wheezing. Cardiac examination: normal S1 and S2 no added sound. Abdominal examination: no abnormalities detected. Back examination: tenderness in lumbar and cervical regions, no deformities. Neurological examination: Glasgow coma scale (GCS) was 15/15, cranial nerves examination were intact, upper limbs examination (power grade five, normal tone and reflexes, sensation was intact), Bilateral lower limbs examination (power grade zero, hypo-tonia and hypo-reflexes, sensation was diminished) (Table 1).

Chest x-ray: normal findings. Abdominal ultrasound: bilateral hydro ureter and hydronephrosis. Cystogram -x ray: thick wall urinary bladder. Echocardiography: ischemic heart disease, mild diastolic

**Table 1:** Laboratory results at admission.

Investigation	Result	Investigation	Result
C. Reactive protein	158mg/l	Serum urea	46mg/dl
ESR	130mm/hrs	Serum creatinine	0.4mg/dl
TWBCS	16.69x10 <sup>3</sup>	Serum.potassium	3.7mg/dl
Hemoglobin	8.7 g/dl	Serum. sodium	137mg/dl
MCV	76.7 f	Urine general	Pus cell: uncountable
MCHC	25 g/dl	HbA1c	10.40%
platelets	519x10 <sup>3</sup>	Thyroid stimulating hormones (TSH)	2.8 (normal 0.27 to 4.2)
ALT	10 u/l (normal 7 to 55)	FT4	18.3 (normal 12 to 22)
AST	11.1 (normal 8 to 43)	Prostate specific antigen (PSA)	2.2 (normal <4)
ALP	89 (normal 45 to 115)	F.PSA	0.39 (normal <0.4)
GGT	40 (normal 11 to 50)	S. Alfa fetoprotein (AFP)	0.7 (normal <5.8)
Serum protein	6.5 (normal 6.6 to 8.7)	CA 19.9	2.81 (normal 0 to 37)
Serum albumin	2.3 (normal 3.4 to 4.8)	CEA	0.76 (normal <3.4)
Total bilirubin	0.3mg/dl (normal <1.1)	HIV	Negative
Direct bilirubin	0.1mg/dl (normal <0.3)	HBV	Negative
S.Vitamin B <sub>12</sub>	307.6 (normal 211 to 946)	HCV	Negative

dysfunction, depressed systolic function with EF: 35%. Oesophago-gastro-duodenoscopy (OGD): in the esophagus there is extensive candidiasis. MRI whole spine with contrast: opinion features of disseminated pott's disease (disseminated multilevel spondylodiscitis associated with multilevel cord myelopathy, left psoas abscess, near complete destruction of C5 and C6 (Figures 1-3).

### Therapeutic intervention

After stabilization, patient was admitted to the hospital and the following were done. Intravenous (IV) fluid (for one day then we encourage oral uptake), urinary catheter was inserted, input and output fluid chart, IV board spectrum antibiotics (after taking blood and urine sample for culture and sensitivity), insulin (long acting once at 7:00pm and three doses of short acting with meals), proton pump inhibitor (40mg iv once/day), enoxaparin subcutaneous prophylaxis dose (40mg once/day). Anti-tuberculosis tabs (FDC 4 tabs) once/day, pyridoxine (vitamin B6) 50mg tabs once/day. Blood transfusion (packed red blood cell 3 units), fluconazole 150mg IV once per day. After cardiologist consultation (Aspirin 100mg tabs once/day, Clopidogrel 75mg tabs once/day, Bisoprolol 2,5mg tabs once/day, Spironolactone 25mg tabs once/day, furosemide 20mg once/day) were added to his plan of management.

Steroid was started initially at presentation then stopped after diagnosis of PD was confirm and due to esophageal candidiasis. Neurosurgery and orthopedic consultation was done and they recommended spine fixation surgery. Do surgical intervention four days after admission (decompression and fixation). Surgery went without complication, post-surgery follow up patient did well, and his condition improved gradually. His follow up including examination and lab investigation is showed in (Table 2).

### Discussion

Tuberculosis (TB) is one of the ancient infectious disease, it still posing a major health, social and economic burden at a global level



Figure 1: MRI spine.



Figure 2: MRI spine.

and especially in low and middle income countries [3]. Sudan has low health expenditure (6.2% of GDP) and has an estimated TB incident rate of 117 per 100,000 individuals [4].

### Pathogenesis

TB is caused by members of the specie *Mycobacterium tuberculosis* complex (MTBC), among which *Mycobacterium*

**Table 2:** Follow up (examination and laboratory investigation).

	Day 0	Day one	Day two	Day five	Day ten	Third week
Vital signs	Stable	Stable	Stable	Stable	Stable	Stable
Lower limb power	Grade zero	Grade zero	Grade zero	Grade zero	Grade one	Grade two
TWBCS	16.69x10 <sup>3</sup>		15.09x10 <sup>3</sup>	9.9x10 <sup>3</sup>	5.3x10 <sup>3</sup>	4.2x10 <sup>3</sup>
CRP	158	152	138	51	40	20
Hemoglobin	8.7 g/dl		9.1 g/dl	10 g/dl	10.4 g/dl	11 g/dl
Urine general	Pus cell: uncountable			Clear		Clear

**Figure 3:** MRI spine.

tuberculosis (MTB) is the most important etiologic agent of TB in humans [5]. MTB infection acquire by breathing contaminated air droplets with tubercilli bacilli that were coughed or sneezed by a nearby person who has active Tuberculosis. Then it reach alveoli where it is likely to be kill by professional alveolar macrophage [6]. If the bacilli can survive this first line of defense, it starts actively replicating and diffuses to nearby cells, reaching in few weeks of exponential growth a high bacterial burden [7]. Spread to other organs through lymphatics or haematogenous dissemination occurs during these early steps of infection [8].

### Diagnosis of TB

Definitive diagnosis requires the detection of MTB by using at least one of the following microbiological techniques: microscopically analysis, isolation in culture or molecular methods [9]. Specimens such as sputum and Broncho-alveolar lavage are used for the diagnosis of pulmonary TB, and it shows high sensitivity and specificity [10]. On the other hand, there is lower sensitivity of the microbiological assays in the non-pulmonary specimens probably due to lower bacterial concentration, and this make the diagnosis of non- pulmonary TB more difficult.

Immunological diagnosis by the Mantoux test or tuberculin skin test (TST) and by the interferon- gamma release assays (IGRAs) only detect MTB infection without distinguishing between Latent and active TB patients [11].

### Presentation

Patients with Potts disease may have history of pulmonary tuberculosis or concomitant disease. Constitutional symptoms of Potts disease are fever, night sweating and weight loss [12]. Back pain is the earliest and most common symptom of Potts disease, with

patients usually experiencing this problem for weeks before seeking treatment. Neurologic abnormalities include spinal cord compression with paraplegia, paresis, impaired sensation and nerve root pain occurs in half of cases. Cervical spine is a less common affected site but it is more serious because severe neurologic complications are more likely. Spinal tuberculosis seems to be more common in persons infected with HIV than HIV negative, but the clinical presentation is similar in both [13].

### Treatment

Early diagnosis and proper treatment will prevent further neurologic complications of pott's disease. The principle of treatment is conservative treatment with a combination of anti-TB drugs. The standard medical treatment protocol includes isoniazid, rifampicin, Ethambutol, and Pyrazinamide, with duration of six months, which may be prolonged to 9–12 months in complicated cases [14,15]. Early surgical intervention, if surgery is indicated, is recommended to avoid further instability and neurologic complications. Indications for surgical intervention include neurological deficit, spinal deformity, resistant to medical therapy, large paravertebral abscess, and indefinite diagnosis [16-18].

In our patient although the onset of symptoms was acute and without past medical history of TB, chronic cough or contact with a patient having TB, but still spinal tuberculosis (PD) was on the top of our differential diagnosis, because the patient presented with features highly suggestive of pott's disease and came from a region with a high incidence of tuberculosis. So we targeted the workup to confirm the diagnosis and to exclude other possibilities as early as possible, because early diagnosis and intervention is a corner stone in management of spinal tuberculosis especially if it presents with complications like cord compression and destruction of vertebrae. Involving multiple departments and teamwork help us reaching provisional diagnosis more easily and rapidly, this lead to good outcome and prevention of permanent complications.

### Conclusion

The case described in this report is of a man with no history of TB, close contact with TB patient or chronic cough. Who presented with back pain, paraplegia and urine retention. The patient was diagnosed as having disseminated pott's disease complicated by epidural abscess, psoas abscess and near completed destruction of cervical spine (C5, C6). Treated by combination Anti-Tuberculosis and underwent surgery (decompression and fixation). Patient condition was improved gradually and discharge after three weeks from admission date on good condition.

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