Case Series of Pott's Disease

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ABSTRACT

Tuberculosis (TB) is one of the leading infectious disease in developing countries. Pott's disease, also known as tuberculous spondylitis, is a classic presentation of extra-pulmonary tuberculosis. It is associated with significant morbidity and can lead to severe functional impairment. About 5% cases of Pott's disease develops psoas abscess. At the beginning of the twentieth century, psoas abscess was mainly caused by Pott's disease. Here, we report four cases of recently diagnosed Pott's diseases including one case of pott's disease with psoas abscess with their variable presentations. Low back pain and intermittent evening fever were common presentation. Significant weight loss was reported by three cases of them. Diagnosis was done based on history, physical examination, plain radiology, CT scan of abdomen and MRI of dorsal spine. All the patients were managed in consultation with physician, general surgeon and orthopaedician. They were treated with category I anti-tubercular drugs The patient of pott's disease with psoas abscess (Case-I) was treated with ultrasound guided aspiration of pus followed by open surgical drainage of psoas abscess with biopsy from abscess wall to confirm the diagnosis. No surgical intervention was done for the remaining three cases. All the four cases were responded well with anti-tubercular drugs found on subsequent follow up.

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INTRODUCTION

Tuberculosis (TB) is caused by infection with *Mycobacterium tuberculosis complex*, comprising of *Mycobacterium tuberculosis hominis, Mycobacterium tuberculosis bovis, Mycobacterium africanum* and *Mycobacterium microti*, of which *Mycobacterium tuberculosis hominis* is responsible in vast majority of cases. The majority of cases occur in the world's poorest nations. Recent figures suggest a decline in the incidence of tuberculosis, but its impact on world health remains significant.[1]

In TB patients, involvement of skeletal system is seen in 1%-10%.[2] Pott's disease represents 15% of extra-pulmonary TB.[3] Spinal TB or Pott's disease was first described by Sir Percival Pott in 1779, thus the term 'Pott's spine' or 'Pott's disease' was invented.[4] Psoas abscess developed from Pott's disease in about 5% cases and was first described

by Mynter in 1881. He referred to it as "Psoitis".[2] Tuberculosis is one of the oldest disease of mankind as evidences of Pott's disease were detected in the ancient mummies in Egypt and Peru.[5]

Pott's disease, although commonly diagnosed in the stage of "Spondylodiscitis", the disease process is thought to result from hematogenous spread via the venous plexus of Batson.[6] Infection usually begins in the anterior part of the vertebral body adjacent to the end plate. Subsequent demineralization of the end plate allow the subligamentous spread of infection to the intervertebral disc and adjacent anterior vertebral bodies, causing angulations of the vertebrae resulting in kyphosis and often gibbus.[6] In children, the initial infection may also start in the intervertebral disc due to their preserved vascularity.[7] Pott's disease has two distinct types. One is the classic form or spondylodiscitis, usually affecting more than one vertebrae. Another atypical, early lesion of spondylitis without disc involvement are now increasingly diagnosed.[8]

Spinal TB can include any of the following: progressive bone destruction leading to vertebral collapse and kyphosis, cold abscess formation, spinal canal narrowing by abscesses, granulation tissue or direct dural invasion resulting in spinal cord compression with neurologic deficits and secondary Psoas abscess.[9] Here we are reporting four cases of Pott's disease in this series.

The Cases

Case-I:

A female of 21 years old was admitted in North Bengal Medical College Hospital with pain in the back, low grade evening fever on and off and weight loss about 15 kg for about seven months. She had no history of Trauma, Tuberculosis (TB), Diabetes Mellitus. There was no family history of TB.

She was anaemic and had low grade pyrexia (101^{o} F). Nervous system examination findings were normal. On inspection, lateral flexion of spine was restricted and painful and there was no gibbus. On palpation, tenderness present at L_3/L_5 spine. Straight Leg Raising test: Restricted to 30^{0}. There was an intra-abdominal lump about 20x10 cm in size occupying from left lumber region to the pelvis, which was non-tender, soft in consistency and fluctuant. Her Haemoglobin-8.9 gm/dl of blood and ESR was 90 mm in 1st hour. X-ray Spine showed loss of lumbar lordosis, mild scoliosis of lumbar spine. There was erosion of L_4 vertebral body with disc space reduction between L_3/L_4. (Figure 1).

Ultrasonography of Abdomen revealed an elongated cystic lesion about 24.3x7.34 cm in size with internal septations and debri, extending from left kidney to pelvis, suggestive of psoas abscess.

CT scan of abdomen revealed evidence of destruction of vertebral body and their opposing end plate of L_3/L_5 with large amount of paraspinal soft tissue swelling and psoas abscess formation (Figure 2A, B).

Figure 1

Figure 2: (A)

Figure 2: (B)

Figure 1: X-ray of lumbo-sacral spine (both view)
Figure 2(A): Axial non-contrast CT image of abdomen showing Psoas abscess (arrow)
Figure 2(B): Longitudinal contrast CT image of abdomen showing Psoas abscess (arrow)

Case-II:

A male of 41 years old presented with low back pain back, intermittent fever and weight loss about 8 kg for about six months. His elder brother had tuberculosis five years back. There was tenderness at lower dorsal spine. Neurological examination findings were normal. His Haemoglobin-10.6 gm/dl of blood and ESR was 66 mm in 1st hour. Tuberculin skin test showed induration 06 mm at 72 hours. X-ray spine showed marginal osteophytes with disc space reduction between T_{12}/L_1 (Figure 3). MRI of dorsal spine revealed infective spondylodiscitis (likely tuberculous) involving T_{12}-L_1 vertebrae, pre and para-vertebral minimal collections, compression of corresponding bilateral exiting T_{12} and L_1 nerve roots and thecal sac indentation (Figure 4 A, B).

Figure 3

Figure 4: (A) T1

Figure 4: (B) T2

Figure 3: X-ray of lumbo-sacral spine (both view)

Figure 4 (A): MRI (T1W image) of spine showing Inhomogeneous hypo-intense lesion (arrow)

Figure 4 (B): MRI (T2W image) of spine showing Inhomogeneous hyper-intense lesion (arrow)

Case-III:

A female of 32 years old presented with low back pain, low grade fever for nine months, weakness of both lower limbs for three months and inability to walk for 21 days. Weight loss was not reported. There was tenderness at lower dorsal spine. In both lower limbs, muscle power was reduced to 3 of 5; all jerks were exaggerated with extensor planter response, and diminished pain sensation from T_{10} to downwards. Her Haemoglobin-10.8 gm/dl of blood and ESR was 33 mm in 1st hour. Tuberculin skin test showed induration 16 mm at 72 hours. X-ray spine showed disc space reduction between T_{11}/T_{12} (Figure 5).

MRI of dorsal spine revealed opposing end plate of T_{11} and T_{12} with their intervening discs T_{11}/T_{12} associated with anterior bilateral paraspinal soft tissue swelling along with collection markedly compressing thecal sac, stenosis of spinal canal and obliterating neural foramen at the site leading to compression of dorsal cord and traversing nerve root (Figure 6 A, B).

Figure 5:

Figure 6: (A) T1W

Figure 6: (B) T2W

Figure 5: X-ray of lumbo-sacral spine (both view)

Figure 6 (A): T1 image of spine showing Inhomogeneous hypo-intense lesion (arrow)

Figure 6 (B): T2 image of spine showing Inhomogeneous hyper-intense lesion (arrow)

Case-IV:
A female of 50 years old presented with low back pain, intermittent low grade evening fever, loss of appetite and weight loss for five months. She had kyphosis but no neurological deficit. Her Haemoglobin-10.9 gm/dl of blood and ESR was 59 mm in 1st hour. Tuberculin skin test showed induration 20 mm at 72 hours. X-ray dorsal spine showed compressed fracture at T_8 (Figure 7).
MRI of dorsal spine revealed infective spondylodiscitis involving T_8/ T_9 vertebra with collapse of T_8 vertebra and abscess formation (Figure 8 A, B).

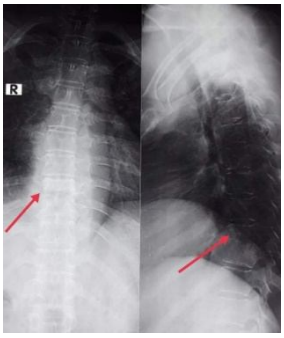
Figure 7:

Figure 8: (A) T1W

Figure 8: (B) T2W

Figure 7: X-ray of Dorsal spine (both view)
Figure 8 (A): T1 image of spine showing Inhomogeneous hypo-intense lesion (arrow)
Figure 8 (B): T2 image of spine showing Inhomogeneous hyper-intense lesion (arrow)

In all the patients, total blood count, X-rays Chest P/A view and Ultrasonography of Abdomen revealed normal except Ultrasonography of Abdomen in case-I, revealed psoas abscess. All the patients were advised to take anti-tubercular drugs for one year. All the patients were treated with anti-tubercular chemotherapy (Category I) with combination of rifampicin, isoniazid, pyrazinamide and ethambutol for initial two months and then rifampicin and isoniazid for subsequent months.
The patient of pott's disease with psoas abscess (Case-I) was treated with ultrasound guided aspiration of pus about 300 ml initially. On follow up after one month, the size of psoas abscess was not reduced, so open surgical drainage of psoas abscess with biopsy from abscess wall was done. Histopathological report showed granulomatous lesion consistent with tuberculosis. Her post-operative recovery was good, with no sinus or fistula formation. No surgical intervention was needed for other three cases. On subsequent follow up, all the four cases were well responded to anti-tubercular drugs in the form of reduction of back pain, fever subsided, weight gained and able to walk with support.

DISCUSSION

The spine is the most common site for tuberculosis (TB) of bone (Pott's disease)[1] and accounts for 50% cases of skeletal TB[4] and mainly involves the dorsal and dorso-lumbar regions[1,10] as these found in our cases.
Pott's disease is most frequently seen in first three decades of life. Commonly, in tuberculous spondylitis, the symptoms develop insidiously due to the slow progression of the disease, contributing to a significant delay between symptoms onset and diagnosis. Back pain is the most common symptom (83-100% of the patients), and constitutional symptoms, including fever, are relatively rare (33%).[11] Psoas abscess is more common in males than females.[12]
There are two types of psoas abscess, primary and secondary, depending on the underlying cause. Primary psoas abscess usually results from an occult source via lymphatic or hematogenous spread[13] in especially immunocompromised patients. Secondary psoas abscess results from local extension from infective focus in close proximity of the psoas muscle. Several studies[5,14] revealed, the most common cause of secondary psoas abscess is considered to be Crohn's disease.

In case-I, the psoas abscess is secondary type. The presentation of psoas abscess was usually non-specific. This leads to delay in diagnosis. The classical triad of presentation is fever, flank pain and limitation of hip movements found only in 35% cases.[14] Chronic progressive back pain with or without associated muscle spasms may prompt the diagnosis. In this study, low back pain, low grade evening fever, weight loss were the common presentations. In general, laboratory testing is non-specific. ESR and C-reactive protein are generally elevated and may be useful.[15] Diagnostic suspicion of tuberculous spondylitis is based on clinical and radiological features.

Spinal radiography may showed a destructive process of vertebras and adjacent discs if osteomyelitis is present. In these cases, X-ray Chest was normal indicating no pulmonary TB. X-ray Spine showed loss of lumbar lordosis, mild scoliosis of lumbar spine with reduced disc spaces between L3/L4 (Case-I), there were reduced disc space only (Case-II, III) and compressed fracture at T_8 vertebra (Case-IV). Ultrasonography of abdomen revealed psoas abscess (Case-I). Ultrasonographically this type of finding found in about 60% cases.[16] Computed tomography (CT)should be done for definitive diagnosis and is considered the gold standard.[17] CT scan of abdomen revealed paraspinal soft tissue swelling and psoas abscess formation (Case-I). Some authors believe that MRI is superior to CT scan[18] in few conditions like MRI gives better delineation of soft tissues and abscess, evaluation of spinal pathology and can also differentiate between tuberculous and pyogenic abscess. MRI was done in all the cases. Ziehl–Neelsen staining of aspirated pus from abscess, Acid Fast Bacilli usually not found.[19] Diagnosis can be based on culture which gives positive results in 50-75% cases. Fine needle aspiration cytology (FNAC)is simple and safe outpatient procedure for diagnosing pott's disease. Histopathological report showed granulomatous lesion consistent with tuberculosis (Case-I).

Treatment of pott's spine is the combined care of physician, surgeon, orthopedician and neurosurgeon. Anti-tubercular drugs are the foundation of treatment. Dass et al.[20] showed improvement of pott's disease with anti-tubercular drug. The standard is a combination of isoniazid, rifampicin, and pyrazinamide, with or without ethambutol. Anti-tubercular drugs should be given at least for one year with or without rest of spine with plaster jacket.

Surgery is reserved for unacceptable complications such as paraplegia, kyphosis or psoas abscess. Surgical options are drainage (percutaneous or open surgical) of psoas abscess or costotransversectomy with removal of all caseating material with bone grafting or posterior spinal fusion etc.[21,22] Goni et al.[4] showed significant improvement by percutaneous drainage of psoas abscess with anti-tubercular drugs but we experienced improvement in open surgical drainage with anti-tubercular drugs. Other three cases were well responded to only anti-tubercular drugs.

CONCLUSION

Extra pulmonary tuberculosis is one of the common disease in our country. The diagnosis of Pott's disease with or without psoas abscess may be considered in patient who had chronic back pain, low grade fever with weight loss. MRI is the most valuable method for detecting the early pott's disease. Early diagnosis and treatment of such disease can prevent the significant morbidity and mortality.

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