

Pyogenic Spondylodiscitis of Lumbar Spine Mimicking Pott's Disease: A Case Report

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1. Abstract

The clinical and radiological presentations of pyogenic spondylodiscitis are similar to spinal Pott's disease. The diagnosis must be done with combination of clinical manifestation, radiological findings, blood, biopsy and histopathological findings. Pyogenic spondylodiscitis of lumbar spine can be treated as conservatively; and or surgically by anterior or posterior single or double stage decompression with fixation if poorly response to medication or severe neurological compromises present. A 72 year-old-female presented with a 20- day history of lower back and both leg pain and weakness along with retention of urine since 1 day, fever on and off before admission. Computed tomography (CT) scan and magnetic resonance imaging (MRI) of spine were done that revealed osteolytic destruction of body L1 intervening disc with upper plate of L2, and paraspinal with epidural collection as well as enhancing collection within psoas muscle and epidural region are suggestive of pott's spondylodiscitis. Antitubercular therapy (ATT) was prescribed but no response and improvement in her symptoms was observed. Single stage posterior decompression with debridement and pedicle screw fixation was done. The patient lower back pain improved after surgery and no recurrence of infection noted during follow up period. Final confirmation of provisional diagnosis was made with tissue biopsy and gene Xpert

Pyogenic spondylodiscitis can mimic as tubercular spondylodiscitis which may misguide for definitive treatment. Therefore, confirmatory diagnosis must be required to reduce the rate of disability and functional impairment. Single stage posterior decompression

with debridement pedicle screw fixation is effective for pyogenic spondylodiscitis.

2. Introduction

Spondylodiscitis is defined as an infection of one or more intervertebral discs and vertebrae by infectious or non infectious diseases. The infectious spondylodiscitis has been broadly divided into three types according to causative agents:(1)Tubercular spondylodiscitis, (2) Pyogenic spondylodiscitis and (3) Brucella spondylodiscitis[1]. Spinal tuberculosis, also named as Pott's disease was first mentioned by Percival Pott in 1799[2]where clinic manifestations like local pain with tenderness; muscle spasm and stiffness; cold abscess with kyphotic bone deformity can be observed. Spine tuberculosis accounts 25% to 60% of all bone and joint tuberculosis[3,4]. So, spinal tuberculosis has become common and increasing in endemic country like India. Destruction in bone with infection in vertebrae or paraspinal structures with similar clinical manifestation has been observed in both pyogenic and tubercular spondylodiscitis. PS is troublesome to distinguish from TS clinico-radiologically[5,6]. Therefore, pyogenic spondylodiscitis has been regarded as a mimicker of tubercular spondylodiscitis. Furthermore, It is very significant to differentiate for fruitful treatment which may diminish the rate of functional and neurological disabilities[4,7].Pyogenic spondylodiscitis can respond to conservative treatment with antibiotics even though it may result fulminant conditions induced by epidural collection leading to neurological deficit, sepsis with multiple organ failure associated with high morbidity and mortality[8,9]. The objective of this study

is to discuss the important of definitive diagnosis method and efficacy of treatment following surgery with posterior decompression with debridement and pedicle screw fixation.

3. Case Presentation

A 72 year-old-female presented at our hospital with 20 days history of fever, generalized body pain with weakness, lower back pain radiating to both leg pain and decreased in oral intake before admission. She had history of diabetes mellitus and hypothyroidism under medication. The patient was admitted and further investigations were done along with CT scan and MRI of spine (Figure 1A, 1B, 1C). It revealed: heterogeneous marrow signal intensity with erosive changes in L1 and L2 vertebrae with partial collapse of L1 vertebrae; mild retropulsion of posterior segment of L1 vertebral body; heterogenous signal in L1-2 intravertebral disc with disc resorption; compression is seen over localized conus at L1-2 with moderate spinal canal stenosis; loculated complex fluid collection in L1 vertebral body and in the L1-2 prevertebral region associated with large bilateral psoas muscle loculated fluid/abscess, and these findings are suggestive of tubercular spondylodiscitis. Then patient was managed with conservatively. Patient responded well and discharged under empirical ATT after 6days of admission. However,

after 21 day of initiation of ATT, patient did not improve rather it was increased with pain intensity with weakness of both leg and urine retention since one day. A physical examination showed severe tenderness over upper lumbar region with swelling and wound discharge. An elevated C-reactive protein (CRP) 179mg/L, ESR-107mm/hr and white blood cell count-15,000/mm³ were noted in blood biochemistry. A whole body FDG PET Scan was done for further evaluation of this condition (Figure 1 D). Intravenous antibiotics were started and single stage posterior decompression with debridement and upper two (T11/T12) and lower two (L3/L4) level pedicle screw fixation (BONETAC) was performed. A biopsy of bone piece and tissue of intervertebral disc from infected part were sent for histopathology, tissue culture and gene Xpert test. All reports with pus AFB for mycobacterium species were negative, but E. coli was detected from pus culture with meropenem sensitivity. The surgical incision site healed without wound discharge. Patient improved in her symptoms with progressive improvement in limbs weakness. She was discharge at the 10th day of surgery. No recurrence of infection with improvement in her power of both legs was observed at the 1st and 3rd month of follow up period (Figure 1 D and E). So we did not suggest for CT and MRI of spine at the follow up time.

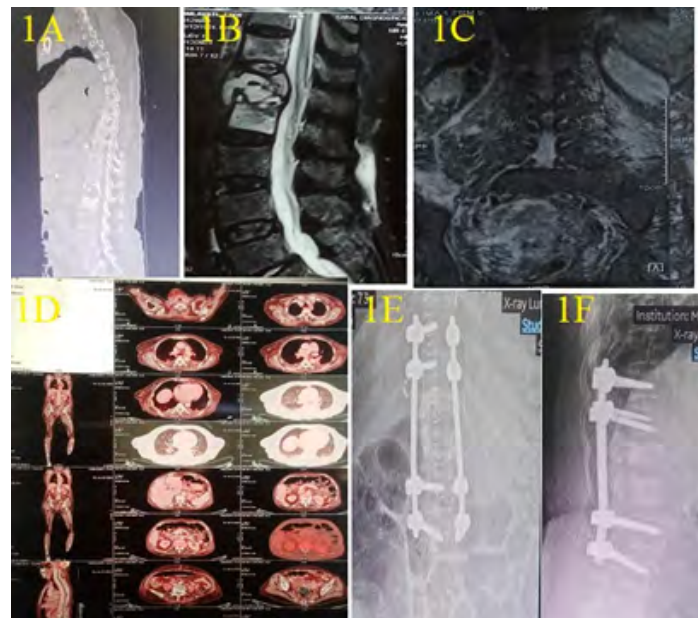


Figure 1: Sagittal view of CT scan of spine showing severe destruction of L1 and partial L2 vertebral body (1A), Magnetic resonance imaging of sagittal view showing osteolytic lesion first and second lumbar vertebra with involvement of disc between L1 and L2 with cord compression, epidural collection and paravertebral tissue involvement(1B), Bilateral psoas muscle abscess(1C), FDG PET scan showing bilateral pleural fluid collection with mild basal collapse of lung and non-tumor osteolytic lesion in L1(1D), Immediate postoperative antero-posterior view of x-ray showing posterior fixation with rod and screws from T11 to L4(1E). Lateral view of x-ray at 3 month follow up (1F).

4. Discussion

Spondylodiscitis points out an infection of one or more vertebrae and intervertebral discs caused by non-infectious and infectious diseases (granulomatous: tuberculosis, brucellosis and fungal), pyogenic or parasitic. Spinal TB (Pott's disease) is one of the most accepted and most critical mode of musculo-skeletal tuberculosis and reports for 50% of all case of skeletal TB [10,11] and most affected region of vertebrae is thoracolumbar followed by lumbar and the cervical vertebrae [12]. Pyogenic spondylodiscitis usually appears by hematogenous route from foci of distant infection in the body, rarely by infection close to oropharynx, abdominal and pleural cavity [13]. The pyogenic spondylodiscitis is predominantly caused by Gram positive bacteria, *Staphylococcus aureus* followed by Enterobacteria and rarely by parasitic [1,14]. Similarly *Escherichia coli*, Gram negative bacteria is most common causative agent followed by *Enterobacter cloacae*, *Hemophilus influenzae*, *Klebsiella pneumoniae* and *salmonella enteric* and Gram negative demonstrates minor propensity to formation of abscess cavity [15]. A positive culture is not so necessary for diagnosis, but immensely meaningful for optimal antimicrobial therapy [16]. In our study, *Escherichia coli* was reported from pus culture and antimicrobial drug-meropenem was sensitive which was prescribed to patient for 4 weeks. The tissue biopsy with bacteriological examination is finest diagnostic tool for conservative treatment optimal antimicrobial therapy. New diagnostic gene Xpert test plays an outstanding role for definitive diagnosis to rule out whether PS or TB [17,18]. Similar to our study, we provisionally diagnosed TS according clinic-radiological characteristics and performed pus AFB, gene Xpert test with tissue biopsy, but all test result were negative.

Pyogenic spondylodiscitis receive similar clinical and radiological characteristics with tubercular spinal disease [5,6,19]. Therefore; it is challenging to separate pyogenic spondylodiscitis from tubercular spondylodiscitis. So, definitive treatment may necessitate for diminishing the rate of functional and neurological impairment by earlier differentiating pyogenic spondylodiscitis from tubercular spondylodiscitis [7,10]. There is rim enhancing abscess in epidural or paraspinal and psoas muscle, bone fragments of vertebrae and disc which compress spinal structure which are evident in MRI of bacterial and tubercular spondylodiscitis with high sensitivity up to 90% and specificity up to 96% [20,21]. Similarly, in our case, osteolytic destruction of body L1 intervening disc with loculated complex fluid collection in L1-L2 vertebral body/prevertebral region associated with large bilateral psoas muscle loculated abscess. Rohit et al described that PS was more common in lumbar spine and TS in thoracic spine along with epidural abscess was 78.6% in TS and 70.8% in PS and similarly psoas abscess in TS and PS was 25.2% and 23.5% respectively which are almost same in proportion [22]. However, Both PS and TS share similar radiological characteristic, MRI gives important key for initiation of pertinent

therapy which may be medical or surgical as per extent of disease involvement and associated complication including epidural and paraspinal abscess. The principal clinical characteristics in PS are presence of severe pain and tenderness, involved muscle contracture (>90% cases) psoas abscess, fever; with high ESR and CRP [23]. In our study, an elevated C-reactive protein (CRP) 179mg/L, ESR-107mm/hr and white blood cell count-15,000/mm³ were noted in blood biochemistry. Furthermore, some study mentioned that sinus complication can be noted according to severity and duration of infection in pott's disease [24] which is similar to our case of pyogenic spondylodiscitis where discharging sinus wound was present.

Pyogenic spondylodiscitis can be managed with antimicrobial therapy, but surgical therapy is specified for instable spine, kyphotic deformities and epidural abscess associated with cord compression resulting neurological deficits or if conservative therapy does help to improve the patient's status [14]. Some study believed that 41 % surgical biopsy to get bacteriological diagnosis should be performed in all suspected PS, where as 23% surgical biopsy with empirical antibiotic therapy shows ineffective, and 28% surgical evacuation of pus should be done regardless of spinal cord compression [8]. The purpose of surgical therapy is improvement in pain and neurological deficit with correction of spinal deformities. A study done by Nagata et al described that favorable outcome (87% in 23 cases) was noted with percutaneous aspiration with drainage from pyogenic spinal infections [25]. This study explains that early pyogenic spondylodiscitis without spinal cord compression induced by epidural abscess can be managed by minimal invasive drainage with antibiotics. Furthermore, percutaneous transpedicular discectomy and drainage (PTDD) procedure for pyogenic spondylodiscitis has described that immediate relief in pain was 75 % cases [1]. PTDD is found suitable, for the spondylodiscitis patient who does not have severe destruction of bone or epidural abscess or infected herniated disc, but for bacteriological and histological testing along with drainage of infected tissue. Furthermore, in these situations, open surgical procedure such as debridement of infected materials with or without bone graft or instrumentations is advised for severe spine instability by kyphosis, increasing neurological deficit and clinical deterioration [22,26]. Surgical management of spinal infections like anterior or posterior approach, single-stage or two-stage surgery with or without graft/instrumentation have been reported. No different in efficacy of two- staged surgery has been described between pyogenic and tubercular spondylodiscitis [27]. Single stage surgery has benefit of lower complication rate, shorter hospital stay and early mobilization as compared to two-staged surgery. Posterior decompression with debridement of infected tissue and pedicle screw fixation is far beneficial for both earlier pain relief with making spinal instability and drainage of infected materials with tissue collection for diagnostic test. A study done Kehrer et al described 1.8% mortal-

ity in hospital stay and 1-year mortality rate of 5.5 % [28]. In our study, patient improved clinically and no mortality and recurrence of infection was noted at the follow up period similar to study done by Ricahrd et al where no recurrence was noted [29].

5. Conclusion

The clinico-radiological features of both pyogenic and tubercular spondylodiscitis can mimic each other. Therefore empirical use of ATT for suspected Pott's disease in tuberculosis endemic country may have adverse consequences which may lead to delay in definitive diagnosis and treatment. Tissue biopsy and gene Xpert test may play important role for definitive diagnosis of spinal infection. Earlier posterior decompression with debridement and pedicle screw fixation is very effective for destructed instability spine with neurological deficit following pre & paravertebral collection.

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