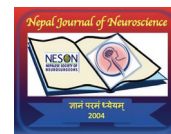


Salmonella Epidural Abscess with Acute Paraplegia: Report of a Rare Vertebral Infection



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Abstract

Salmonella Vertebral osteomyelitis (SVO) is an uncommon entity. In this article, we reported a rare case of a 39-year-old man admitted with low backache for three days which progressed to paraparesis within 24 hours. Urgent CEMRI revealed Spondylodiscitis D7/D8 associated with an epidural abscess causing significant cord compression. He was initially diagnosed as thoracic Potts Spine and underwent emergency decompressive surgery. He was started on Antitubercular drugs, however, tissue and wound culture grew Salmonella Enterica. USG abdomen revealed hepatosplenomegaly. He was started on 6 weeks intravenous antibiotics accordingly; the patient showed postoperative improving neurological deficits with significant symptomatic relief and radiological resolution.

Key words: Diagnosis, salmonella, treatment, vertebral osteomyelitis, Tuberculosis

Introduction

Salmonella is associated with four main clinical spectrums: enteric fever, acute gastroenteritis, bacteremia with or without metastatic infection, and the asymptomatic carrier state⁸. It's uncommon for Salmonella to cause osteomyelitis; incidence is 0.5% - 2% of all cases of osteomyelitis. SVO usually associates with immunocompromised state and with intestinal foci in majority of published literature.

SVO can be associated with SEA (spinal epidural abscess) which most commonly affects patients aged 30 - 60 yrs with M: F of 2:1. SEA usually involves thoracic spine (40-50%), followed by lumbar, then cervical with

highest prevalence in midthoracic spine (T6-T8) (2). Majority are posterior to the cord¹⁰. In our case, SEA was anterolateral to the cord.

In this article, we report a case of a 39-year-old male with Salmonella vertebral osteomyelitis with associated SEA without any evidence of intestinal infection or other predisposing factors.

Case Report

A 39-year-old male, presented with severe low backache for 3 days followed by progressive weakness of both lower limb and sensory loss below umbilicus for 1 day associated with urinary retention. There was no history of fall/trauma. There was no history of constitutional symptoms, high risk behavior or recent travel. General examination was normal. On neurological examination, he had Paraparesis (Frankel grade C) with sensory level below D8 with sphincter involvement. The laboratory tests revealed white blood cells 11.07 X 10⁹/L, with 79.5% neutrophils and 11.4% lymphocyte. C - Reactive protein (CRP) and Erythrocyte Sedimentation Rate (ESR) were increased (CRP: 6 mg/L, ESR: 56 mm/h).

X-ray thoracic spine was normal. Urgent contrast enhanced magnetic resonance imaging (CEMRI) showed Spondylodiscitis D7-8, accompanying with antero lateral epidural abscess causing spinal cord compression and pushing cord to left (Fig.1) (a,b,c). Based on this clinical picture, a working diagnosis of Pott's spine D7/D8 with cord compression was made and pt underwent emergent D7, D8 and D9 laminectomy and drainage of the epidural abscess. Per-op the pus was yellowish green with a well defined thin wall, the cord was severely compressed and

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pushed to the left. The granulation tissue and pus sample were sent for culture and histopathologic examination. Adequate cord decompression was achieved.

Postoperatively, he developed fever, presumptive ATT was started, On Postoperative day 4, his Pus culture report came positive for Salmonella enterica, which was sensitive to Cefoperazone+sulbactam, ATT was stopped and he was started on IV Cefoperazone+sulbactam for 6 weeks. His fever subsided and on further investigation, his USG Abdomen showed hepatosplenomegaly. His Stool, Urine and Blood culture came no growth. His retroviral

status and Australia antigen was negative. The HPE report was suggestive of chronic suppurative inflammation. Postoperatively inflammatory markers resolved. He was gradually mobilized with thoracolumbar brace. Follow up investigations did not reveal any spinal instability. His lower limb weakness gradually improved to MRC 4/5. At last follow up, he is continent and walks with support. He was started on further 6 weeks oral antibiotics in view of minimal residual epidural collection and D7-D8 vertebral and discal enhancement in post operative CEMRI after initial 6 weeks of IV antibiotics (Fig.2) (a,b).

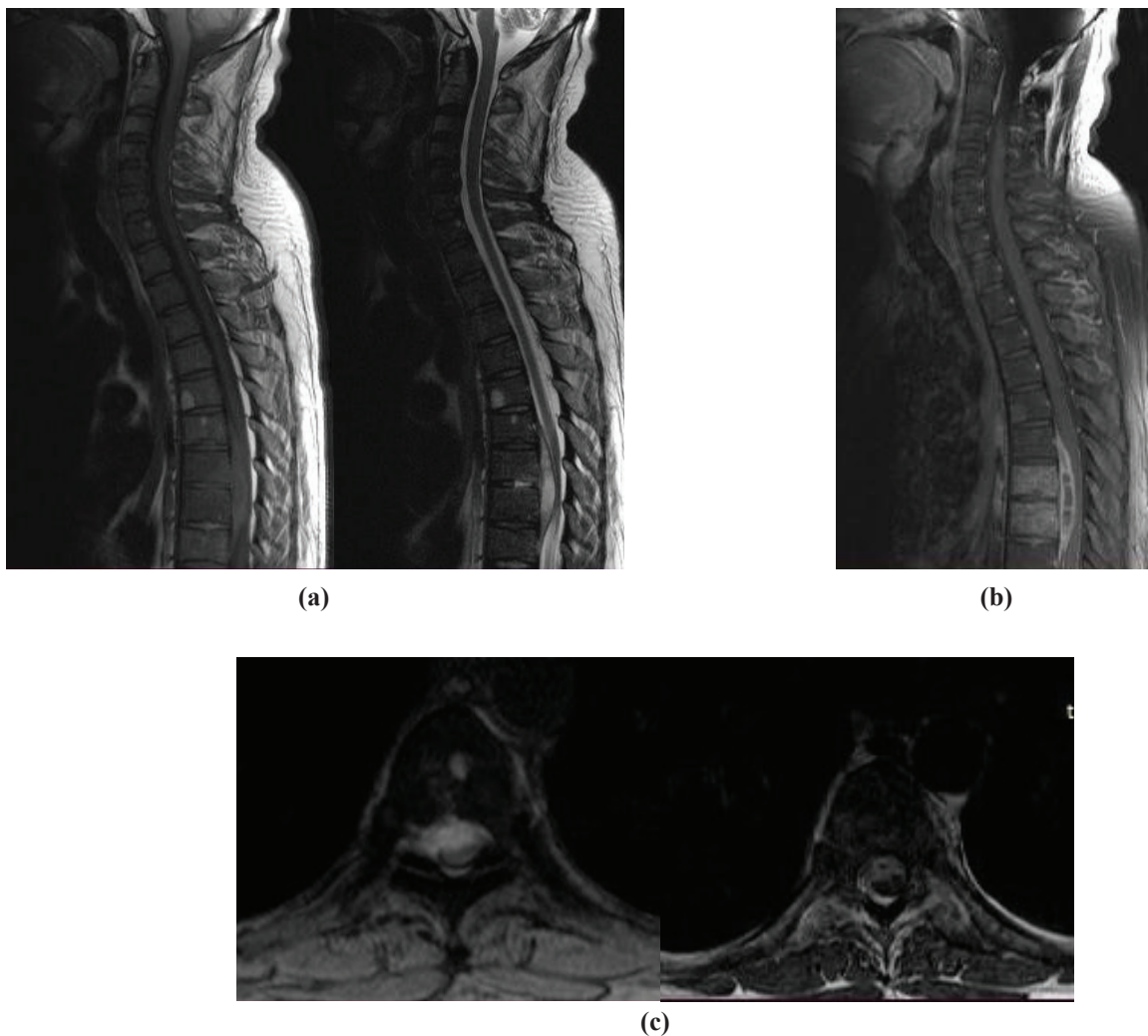
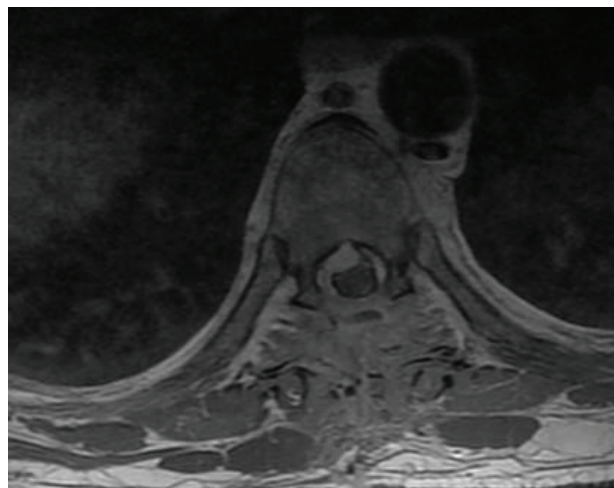


Figure 1: (a) Sagittal MRI T1 and T2: T1 iso to hypointense and T2 hyperintense epidural mass lesion at D6 to D9 anteriorly;
(b) Sagittal MRI contrast: D7-D8 vertebral and discal enhancement with an epidural mass at D6 to D9 anteriorly;
(c) Axial MRI T1 and Contrast: anterior lateral enhancing epidural abscess causing spinal cord compression and pushing cord to left



(a)



(b)

Figure 2: (a,b) Post Op Sagittal and axial contrast MRI: Post laminectomy D7, D8 Status with minimal D7-D8 vertebral and discal enhancement with residual epidural mass at D7 to D8 anteriorly with no evidence of cord compression

Discussion

Fever is the most common presentation of Salmonella infection. However, atypical presentation of typhoid fever is not uncommon. SVO is mainly a disease of immune-compromised state such as diabetes mellitus, IV drug abuse, cancer, liver cirrhosis, HIV, chronic renal failure, repeated urinary tract infections⁵. Our patient did not have these predisposing factors. Santos and Sapico revealed that 54% with Salmonella osteomyelitis had predisposing conditions for infection while the remaining 46% did not have any⁹. Patient did not have any history suggestive of recent salmonella gastroenteritis. In fact, in certain series of Spondylodiscitis with Salmonella, gastrointestinal symptoms were completely absent¹. Published literature revealed Salmonella vertebral osteomyelitis being more common in lumbar followed by cervical regions³. Salmonella Vertebral osteomyelitis is often misdiagnosed as Pott's spine due to similar presentation

The most common presentation is pain, like any pyogenic vertebral osteomyelitis⁹. However, pain has got no diagnostic characteristics. Hence, back pain associated with febrile illness should be further investigated with radiology to rule out spinal infection⁶. However, our patient presented with only back pain with paraparesis with no fever.

Our patient's clinical profile made it difficult to differentiate between tuberculosis and salmonella infection, positive culture report was the one which clinched the diagnosis. Radiological differentiation between typhoid osteomyelitis with tuberculosis is often difficult³. Recent surveys suggest that tuberculous spondylodiscitis tends to present like well-defined paraspinal or intraspinal abscess with thin and smooth wall, and thoracic spine

involvement⁴. Without well defined criteria of salmonella infection, any case of spondylodiscitis is bound to be diagnosed as Potts spine.

Currently, the standard workup for Salmonella vertebral osteomyelitis is tissue culture, blood culture and Widal reaction test. However, the blood culture was negative in our patient which was the case in 40–50 % cases in literature⁷. Our patient Pus culture was positive for Salmonella enterica and USG showed hepatosplenomegaly; however Widal reaction test was negative. Hepatosplenomegaly as a supportive evidence for Salmonella vertebral osteomyelitis has been noticed by Mcanearney S et al⁸.

Vertebral osteomyelitis and epidural abscess frequently present with neurological deterioration and needs combined medical and surgical management. In view of motor deficit and to establishing a tissue diagnosis, our patient underwent emergent surgery. Adequate cord decompression was achieved. Presently, the first line management is surgery for neurological deficits and IV antibiotics according to culture and sensitivity test⁹. The period of time for antibiotic therapy is between 4 - 6 weeks to 3 months and should comprise a period of 4 - 6 weeks of IV antibiotics².

Conclusion

SVO is uncommon but should be considered in differential diagnosis of spondylodiscitis especially in immunocompromised and in non responders to anti tubercular medications. Clinical evaluation with laboratory and radiological examinations does help at times. MRI is the gold standard for any Spondylodiscitis; however there are no specific signs to suggest SVO with

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or without SEA. The standard management protocol is same as any Spondylodiscitis. However more sensitive diagnostic tools are required for early detection of SVO.

Prior publication: Nil

Support: Nil

Conflicts of interest: Nil

Abbreviation list

ATT	- Anti tubercular treatment
CRP	- C - Reactive protein
CEMRI	- Contrast enhanced magnetic resonance imaging
ESR	- Erythrocyte Sedimentation Rate
HPE	- Histopathologic Examination
IV	- Intravenous
MRC	- Medical research council
SVO	- Salmonella Vertebral osteomyelitis
SEA	- Spinal epidural abscess
USG	- Ultrasound

References

1. Chang IC: Salmonella spondylodiscitis in patients without sickle cell disease. *Clin Orthop Relat Res.* 2005; (430): 243-247. doi: 10.1097/01.blo.0000137561.82099.d5. PMID: 15662331.
2. Dietze DD Jr, Fessler RG, Jacob RP: Primary reconstruction for spinal infections. *J Neurosurg.* 1997; 86(6): 981-989. doi: 10.3171/jns.1997.86.6.0981. PMID: 9171177.
3. Feng ZY, Guo F, Chen Z: Literature review and clinical presentation of cervical spondylitis due to salmonella enteritidis in immunocompetent. *Asian Spine J.* 2014; 8(2): 206-210. doi: 10.4184/asj.2014.8.2.206. PMID: 24761205.
4. Harada Y, Tokuda O, Matsunaga N: Magnetic resonance imaging characteristics of tuberculous spondylitis vs. pyogenic spondylitis. *Clin Imaging.* 2008; 32(4): 303-309. doi: 10.1016/j.clinimag.2007.03.015. PMID: 18603186.
5. Jevtic V. Vertebral infection. *Eur Radiol.* 2004 Mar; 14 Suppl 3:E43-52. doi: 10.1007/s00330-003-2046-x. PMID: 14749956.
6. Khan FY, El-Hiday AH, Kamel HA: Typhoid osteomyelitis of the lumbar spine. *Hong Kong Med J.* 2006; 12(5): 391-393. PMID: 17028362.
7. Löhr M, Reithmeier T, Ernestus RI, Ebel H, Klug N: Spinal epidural abscess: prognostic factors and comparison of different surgical treatment strategies. *Acta Neurochir (Wien).* 2005; 147(2): 159-166. doi: 10.1007/s00701-004-0414-1. PMID: 15570436.
8. McAnearney S, McCall D: Salmonella Osteomyelitis. *Ulster Med J.* 2015; 84(3): 171-172. PMID: 26668420
9. Santos EM, Sapico FL: Vertebral osteomyelitis due to salmonellae: report of two cases and review. *Clin Infect Dis.* 1998; 27(2): 287-295. doi: 10.1086/514668. PMID: 9709878.
10. Tali ET, Gültekin S: Spinal infections. *Eur Radiol.* 2005; 15(3): 599-607. doi: 10.1007/s00330-004-2576-x. PMID: 15627186.