

Spontaneous Pan-Vertebral Epidural Abscesses Caused by *Streptococcus Intermedius* in an Immunocompetent Patient

Odega Emmanuel^{1,#,*}, Abolaji Atomode^{2,#}, Joseph Ogwuche Onah³, Mustapha Abubakar⁴

¹Department of Emergency Medicine, Royal Bournemouth and Christchurch NHS Foundation Trust, Bournemouth, UK

²Department of Medicine, James Paget University Hospital NHS Foundation Trust, Norfolk, UK

³Royal Gwent Hospital, Cardiff, South Wales, UK

⁴Department of Medicine, Southend University Hospital NHS Trust, UK

[#]These authors contributed equally to this work.

*Corresponding author: Odega5@yahoo.com

Received October 09, 2020; Revised November 10, 2020; Accepted November 17, 2020

Abstract Spinal epidural abscess (SEA) is a rarely reported condition. Here, we present a unique case of a 54-year-old immunocompetent man who developed worsening lower back pain of 2 weeks duration. A full spine magnetic resonance imaging (MRI) was performed with contrast. This showed extensive epidural abscess extending from C2 to S2, more extensive around L5-S2, with left paraspinal, left iliopsoas and right psoas abscess confirming the diagnosis of spinal epidural abscess of the spine. Blood cultures grew *Streptococcus intermedius*, an anaerobic commensal bacterium of the normal flora of the mouth and upper airways. The patient was treated conservatively with intravenous Ceftriaxone 2g and oral Rifampicin 600mg. He was discharged on those medication for 10 weeks. There was remarkable improvement in his symptoms as he retained his baseline strength in his lower extremity and has regained function to the extent that he is independent with his activities of daily living. A high index of clinical suspicion and a low threshold of appropriate imaging, magnetic resonance imaging (MRI) being the gold standard, are important for accurate diagnosis. Though our patient was treated Medically, Prompt medical and surgical treatment may avert complications, and although the patient presented made a complete recovery, patients may be left with neurological deficits.

Keywords: *streptococcus intermedius*, spinal epidural abscess (SEA), immunocompetent

Cite This Article: Odega Emmanuel, Abolaji Atomode, Joseph Ogwuche Onah, and Mustapha Abubakar, "Spontaneous Pan-Vertebral Epidural Abscesses Caused by *Streptococcus Intermedius* in an Immunocompetent Patient." *American Journal of Infectious Diseases and Microbiology*, vol. 8, no. 4 (2020): 127-131. doi: 10.12691/ajidm-8-4-2.

1. Introduction

A spinal epidural abscess is a medical emergency which is rare but a potentially debilitating infection characterized by inflammation with pus collection within the epidural space and potential pressure effect on the spinal cord.

It has an incidence of 0.2-1.2 cases per 10 000 hospital admissions per year and this has been increasing over the years, owing to the rise in numbers of intravenous drug users, elderly population, Alcoholics, immunosuppression (from Diabetes, HIV, malignancy and chemotherapy), spinal surgeries and interventions (epidural injection, intrathecal pump placement, and indwelling spinal catheter) [1,2,3,4].

A decompressive laminectomy and surgical debridement in combination with antibiotic therapy is the treatment of choice. However, in a minority of cases, where there are minimal or no neurological findings, extensive spinal

involvement, paraplegia present for over 48 h and underlying medical conditions precluding surgery, surgery may not be indicated. [2]

Prognosis is most closely related to the patient's neurological status at presentation

We present the case of a 54-year-old gentleman who presented to his primary care physician with a complaint of lower back pain without any sign of infection or any focal neurology. He was initially managed with naproxen, but his symptom worsened, and later he developed sepsis.

The case below highlights one of the rare and catastrophic differential diagnoses of lower back pain. This case is unusual because our patient had an unidentified source of infection with no prior risk factors, the location of pathology as the patient had epidural abscess that extends from the cervical through thoracic, lumbar up to the sacral region which is very rare; the organism isolated was *Streptococcus intermedius* which is uncommon.

2. Case Presentation

2.1. History and Examination

A 54-year old male presented to the emergency department with 2 weeks history of low back pain which has not resolved despite regular NSAID prescribed by his GP. This became associated with progressive lower limb weakness, bilateral leg swelling, inability to ambulate, neck pain and stiffness. Additionally, he reported fever associated with chills and rigor, night sweat, anorexia, lower right sided pleuritic chest pain and right upper quadrant pain. He denies cough, shortness of breath, chest tightness, weight loss, hemoptysis. No history of diarrhea, vomiting, jaundice, abdominal swelling or change in bowel habit.

He is heterosexual, denied a past or recent history intravenous drug abuse, no history of travel or contact with any one with chronic cough and no trauma to the spine or recent spinal procedure. He has no significant past medical condition and usually healthy and independent.

On examination, patient was alert but tachypneic, tachycardic and had pyrexia (NEWS = 6. Respiratory rate 28, Pulse rate 107, Temperature 38.2, Blood pressure 157/100mmHg, SpO₂ 97% on Air).

Respiratory examination revealed normal air entry bilaterally and crepitations in the anterior right lower lung zone. Cardiovascular examination was unremarkable, abdominal examination revealed right upper quadrant tenderness. He had a GCS 15/15, nuchal rigidity, but

normal tone, power, reflexes and sensation across the upper limbs. Lower limb examination revealed a power of 2/5 on the right and 4/5 on the left, tone and sensation were normal. There was also bilateral leg swelling with pitting oedema up to the shin, no loss of sensation and anal tone was intact. Examination of the spine revealed a gibbus at T7-8 vertebral level, no change in skin color or skin ulceration, it was warm to touch, hard in consistency, not tender or fluctuant.

2.2. Investigations

Blood test on admission showed a significant elevation of inflammatory markers with a C-reactive protein (CRP) of 477 mg/L, white cell count of $27.3 \times 10^9/L$ and neutrophils of $24.5 \times 10^9/L$. The Liver function test showed serum alkaline phosphatase of 276 IU/L and alanine transferase of 74IU/L. Chest X-ray showed diffuse airways thickening but no gross consolidation. Thoracic spine X-ray: Degenerative changes in the thoracic spine. No gross bony destruction

A full spine magnetic resonance imaging MRI was performed with contrast due to the high index of suspicion. This showed extensive epidural abscess extending from C2 to S2, more extensive around L5-S2. with left paraspinal, left iliopsoas and right psoas abscess confirming the diagnosis of spinal epidural abscess in the [Figure 1 - Figure 3](#) bellow. Two blood culture samples were collected and sent because the clinical signs and investigation results supported sepsis.



Figure 1. Sagittal section showing epidural abscess from S2 through the lumbar spine, thoracic spine and cervical spine up to C2 and most extensive around L5-S2

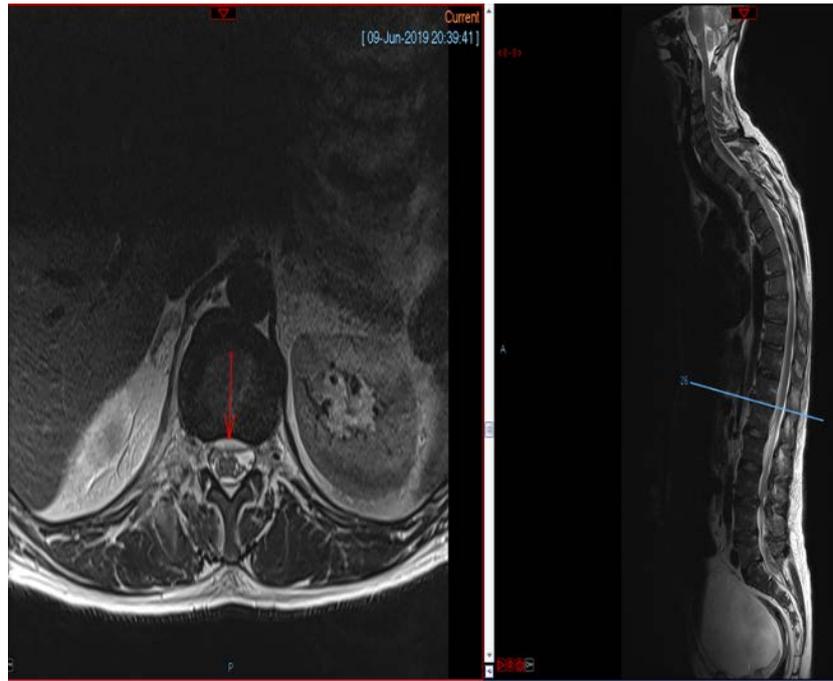


Figure 2. Axial and Sagittal section of MRI showing epidural abscess throughout the posterior and anterior aspects of the thoracic spine, measuring up to 7 mm in maximum depth

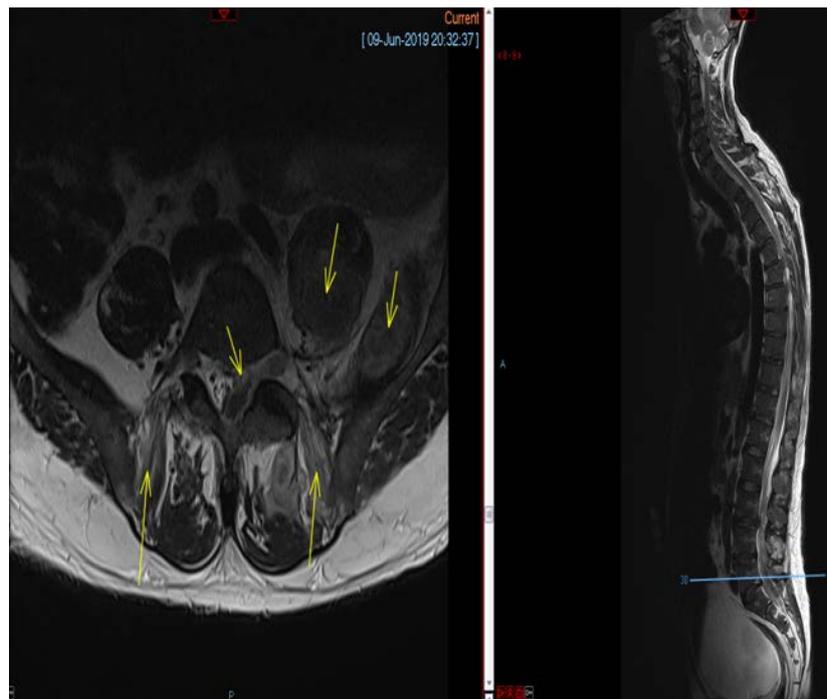


Figure 3. Axial and Sagittal section of MRI showing extensive epidural abscess collection. This is indenting the posterior canal around the level of L5-S2, with multifocal, multilocular abscess collections in the left paraspinal muscles, left iliopsoas and a smaller collection in the right psoas

2.3. Treatment

Patient was started on empirical broad-spectrum antibiotic Intravenously (Flucloxacillin and Gentamicin) in accordance with the local protocol for suspected spinal infection. He was also given opioid analgesia, intravenous fluid (Hartman solution) and paracetamol. He was subsequently referred to the neurosurgeons who elected to manage conservatively. Blood cultures grew *Streptococcus intermedius*, an anaerobic commensal bacterium of the normal flora of the mouth and upper airways. In view of these results, His antibiotic was changed to intravenous

Ceftriaxone 2g and oral Rifampicin 600mg each twice a day as per sensitivity result and microbiologist advice. These antibiotics were continued for a total of twelve weeks. He also benefited from daily physiotherapy while on admission.

2.3.1. Outcome and Follow-up

Eight weeks post discharge and commencement of antibiotics, patient was seen in orthopedic outpatient clinic. He said there was significant improvement in his symptoms as he was able to mobilize without stick indoors and with stick outdoors. He however, noticed left

lower limb swelling which subsides at the end of the day when he elevates his leg. No back and neck pain, loss of bowel or bladder control. On clinical examination, he mobilizes with a mild antalgic gait, had some numbness in the distribution of S1/S2 dermatomes on the left side, had a positive straight leg raising on the left side at around 60° but he had no motor deficit. His blood results were unremarkable with white cell 3.7 ESR 4 and CRP 2. EGFR is 90. A subsequent follow up was arranged with a plan to continue regular exercise, outpatient physiotherapy and another review in four weeks' time with a magnetic resonance imaging (MRI) whole spine, full blood count C- reactive protein, Liver function test, urea, electrolyte and creatinine after he had completed antibiotics.

Six weeks after completing his antibiotics, he reported remarkable improvement in his symptoms, able to mobilize without stick, has returned to work, and no numbness, pins and needle sensation or neurological deficit. Inflammatory markers have normalized, a repeat MRI showed a dramatic improvement with minimal residual abnormality in the left intervertebral foramen at L4/L5 but overall, all the other spinal abnormalities had resolved. There was remarkable improvement in his symptoms as he retained his baseline strength in his lower extremity and had regained function to the extent that he is independent with his activities of daily living. He was advised to continue exercise and regular physiotherapy

3. Discussion

Staphylococcus aureus is the most common identified organism in the blood culture of patient with spinal epidural abscess [2,4,5,6].

However, in this case, *streptococcus intermedius* was isolated from blood culture. It is part of the *milleri* group other members of this group include *streptococcus constellatus* and *streptococcus anginosus*. One of the striking characteristics of these group is their tendency to cause abscess. *Streptococcus intermedius*, is the least isolated and the most virulent member of this group and being a commensal of the mouth and upper respiratory tract it has often been associated with infection of the head and neck and respiratory tract and various pyogenic infections, such as endocarditis, pneumonia, abdominal or cerebral abscess, rarely with osteomyelitis, and exceptionally with muscular abscess. [3,7,8]

Risk factors identification is pivotal, as it raises the index of clinical suspicion in arriving at an early diagnosis, which is of paramount importance in preventing morbidity and mortality. The common risk factor of spinal epidural abscess includes but not limited to Diabetes, HIV, Malignancy, intravenous drug abusers, prior spinal surgeries, or intervention (epidural injection, intrathecal pump placement, and indwelling spinal catheter). In addition, sophisticated diagnostic imaging techniques now can pick up small SEA that has no clinical significance. [1,2,3,6]

However, in this case, the patient did not have any known comorbidities or any of the above risk factors. which make it unique and serves as a learning curve for us and other clinicians. This goes to show that condition such as this can present in any patient and we as clinicians,

should have high index of suspicion and low threshold for appropriate imaging to come to an early diagnosis so as to avert its life changing consequence.

Two case report reviewed showed extensive spinal epidural abscess. One case from the foramen magnum to lower lumbar vertebrae(L4) and the other from C2-L3. The similarity of these cases is that both patients had underlying risk factor and their blood culture grew staphylococcus aureus. [2,4] which bring out another interesting point of our case as being the first pan vertebral spinal epidural abscess caused by *streptococcus intermedius* in a patient with no comorbid conditions or predisposing factors

3.1. Conclusion

A spinal epidural abscess is an uncommon infectious condition. A high index of clinical suspicion is required for early diagnosis and treatment to prevent devastating neurologic consequences and fatality. Our case demonstrated that medical management could achieve a successful outcome in a patient with pan spinal epidural abscess, even in those caused by unusual organism such as of *Streptococcus intermedius* in this case.

3.2. Learning Points

Spinal epidural abscess is a rare condition with devastating neurological consequences if not recognized and treated early.

Spinal epidural abscess can present as a septic patient with non-specific symptoms as such a high index of clinical suspicion and a low threshold of appropriate imaging is required to make an early diagnosis.

The gold Standard imaging modality to detect spinal epidural abscess is MRI spine with contrast which is extremely sensitive and non-invasive.

Medical management could achieve a successful outcome (minimal or no neurological sequelae) in a patient with extensive spinal epidural abscess if initiated early.

References

- [1] Ramhmdani, S. and Bydon, A. (2017). 'Streptococcus intermedius: an unusual cause of spinal epidural abscess' *Journal of Spinal Surgery*, volume 3(2), June 2017, pp. 243-249.
- [2] Van Bergen, J. J. (2009). 'An extensive spinal epidural abscess successfully treated conservatively' *Journal of Neurology, Neurosurgery and Psychiatry* Volume 80, Issue 3 February 2009. pp. 351-353.
- [3] Prakash, A., Raj, R. and Jacob, A. et al (2019), 'Pressure Ulcer Associated with Testicular Prosthesis as a Rare Cause of Spinal Epidural Abscess' *Case Report in Infectious Diseases*, August 2019.
- [4] Thomson, C (2018), 'cord compression secondary to epidural abscess: the importance of prompt diagnosis and management' *BMJ Case Reports*, February, 2018.
- [5] Ju M.-W., Choi S.-W., Kwon H.-J., et al(2015). Treatment of spinal epidural abscess and predisposing factors of motor weakness: experience with 48 patients. *Korean Journal of Spine*. 2015 12(3): 124-129.
- [6] Quast, M.B., Carr, C. M. and Hooten, M.W. (2017). 'Multilevel lumbar spine infection due to poor dentition in an immunocompetent adult: a case report' *Journal of Medical Case Reports* 2017; 11: 328.

- [7] Calza, L et al (2001), 'Iliac osteomyelitis and gluteal muscle abscess caused by *Streptococcus intermedius*', *Journal of Medical Microbiology*, Volume 50, Issue 5, February 2001. pp. 480-483.
- [8] J.E. Clarridge, III, J.E (2001)'*Streptococcus intermedius*, *Streptococcus constellatus*, and *Streptococcus anginosus* ("Streptococcus milleri Group") Are of Different Clinical Importance and Are Not Equally Associated with Abscess' *Clinical Infectious Diseases*, Volume 32, Issue 10, 15 May 2001, pp. 1511-1515.



© The Author(s) 2020. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).