

## Spinal Epidural Abscess Following Administration of Epidural Steroid Injection for Low Backache – Need for Urgent Diagnosis and Intervention

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### Abstract

**Background:** Epidural steroid injection is an innocuous and efficient modality of treatment for chronic low back ache due to a multitude of causes, its use being on the rise in recent times. However, a note needs to be made regarding the potentially serious complications following epidural steroid injection including epidural space infection. This condition requires a high index of suspicion for early diagnosis and treatment.

**Case presentation:** A 39-year-old lady presented, following a second episode of epidural steroid injection, with change in nature and increased severity of low back ache. Magnetic Resonance Imaging (MRI) of the lumbosacral spine showed a T1 hypointense, T2 hyperintense peripherally enhancing epidural collection at L3-L5 level for which she underwent laminectomy and evacuation of collection with complete relief of pain. Intraoperatively, there was a non-foul smelling, thick, yellowish pus which turned out to be positive for *Staphylococcus aureus*.

**Conclusion:** Spinal epidural abscess is a rare complication following epidural steroid injection which requires a high degree of suspicion for early detection and treatment, to prevent permanent neurological sequela.

**Keywords:** Epidural steroid injection; Complications; Spinal epidural abscess; Infection; Treatment of low backache

### Introduction

Epidural steroid injection (ESI) is a commonly used treatment modality for patients suffering from chronic low backache due to a multitude of causes [1]. Despite the fact that the procedure lacks evidence for efficacy as a long-term management for chronic back pain (caused by spinal spondylosis and stenosis), the use of ESIs has increased in recent years [2]. While post-ESI complications are usually benign; rare but potentially serious complications, such as spinal epidural/subdural hematomas, spinal epidural/subdural abscesses, and even cerebral/spinal cord infarctions, have been reported in the literature [2]. Spinal epidural abscess (SEA) is one such rare but potentially devastating post-ESI complication, requiring immediate surgical intervention and appropriate antibiotic treatment [3,4]. We present a patient who developed SEA following the administration of two ESIs for chronic back pain. We highlight the importance of meticulous post-ESI follow-up in early detection of such complications, so that swift surgical intervention can be undertaken to prevent permanent neurological damage.

### Case Report

A 39-year-old female presented with long standing history of insidious onset low backache of 9 years' duration. Pain was moderate to severe, intermittent, non-radiating and localized to the lower back. Clinical examination was unremarkable except for minimal local tenderness and a positive straight leg-raising (SLR) test. Patient was initially managed with medications, but as pain persisted, she was investigated with MRI (Magnetic Resonance Imaging) of the lumbosacral spine. MRI showed a small herniated intervertebral disc at L5-S1 level with no significant thecal sac compression, but with mild compression of both the exiting L5 roots. She was advised epidural steroid injection for achieving pain relief. The patient received 2 mL injection of a mixture of budesonide and bupivacaine, in the midline of the lower back, through the inter-laminar route. Following the first ESI, her pain subsided. However, the pain recurred one year later for which she again underwent ESI. She had a set of three injections. First two were done two days apart and following the second injection, patient reported increase in back pain. Along with the increase in severity of the pain, the nature of the pain changed from dull-aching to dragging

nature and there was radiation of pain to both lower limbs. She was managed with analgesics and underwent a third injection four days later.

A week later patient presented to our institution with increasing pain and. On examination, patient was afebrile and vitals were stable. The patient did not have meningeal signs, and there was no focal neurological deficit. She had lower back tenderness, a positive bilateral straight leg raising test and an antalgic gait. Her total leukocyte count was 11,300/mm<sup>3</sup>. All other hematological and biochemical investigations were within normal limits. With the suspicion of epidural or subdural hematoma, she was immediately investigated with MRI of the lumbosacral spine. MRI showed an epidural mass lesion, compressing the thecal sac, and extending from L3 to L5 level. The lesion was T1 hypointense, T2 hyperintense and showed rim-enhancement on contrast administration again raising the suspicion of an epidural hematoma (Figure 1). She was immediately taken up for surgery.

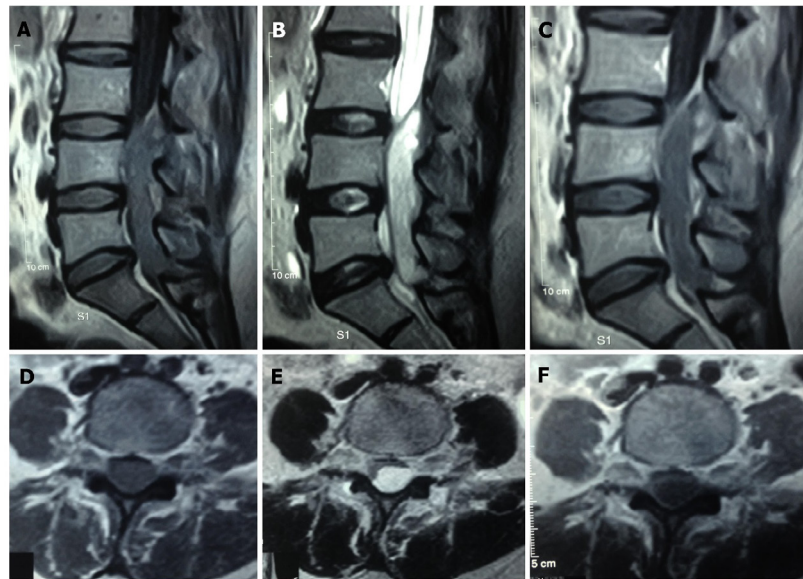
Patient underwent L4-L5 decompressive laminectomy and evacuation of the epidural collection. Intra operatively, thick, yellow, non-foul smelling pus was seen in epidural space with yellowish granulation tissue. Dura was inflamed with adherent yellowish flakes. An epidural drain was placed and the surgical wound was closed primarily. Post-operatively, patient made an uneventful recovery with complete relief of pain and no deficits. Pus culture showed the offending organism to be *Staphylococcus aureus* and she was started on intravenous vancomycin as per culture sensitivity report and continued for 21 days. Histopathology report suggested multiple conglomerates of 'neutrophil-rich' mixed inflammatory cell infiltrate, along with

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**Figure 1:** MRI of the patient after the second ESI showing an epidural lesion extending from L3 to L5 level and severely compressing the thecal sac. (A) T1-weighted sagittal, (B) T2-weighted sagittal, (C) contrast-enhanced T1-weighted sagittal, (D) T1-weighted axial, (E) T2-weighted axial, (F) contrast-enhanced T1-weighted axial, showing T1 hypointense, T2 hyperintense, rim-enhancing lesion.

granulation tissue further confirming the collection being an abscess. The special stains for fungi (PAS and GMS) and AFB were negative.

## Discussion

SEA is a rare condition [3,5]. The exact incidence is not known but one study reports incidence of 0.2-2.8 per 10,000 cases of epidural abscesses after spinal interventions [5]. SEA can be primary or secondary. Primary SEA occurs due to hematogenous spread; while, secondary SEA occurs following spine surgery, local spinal injections, penetrating trauma, etc. [5].

Epidural steroid and anesthetic injection is a common, effective and targeted modality of treatment in the non-operative management of chronic low backache due to various causes including herniated intervertebral disc, lumbar canal stenosis, discogenic pain, post laminectomy syndrome, etc. [3]. Common complications seen following the procedure include infection, dural puncture, nerve damage and problems due to steroid use [5,6]. There are several case reports and case series on occurrence of SEA following spinal instrumentation and spinal epidural anesthesia [6]. But occurrence of SEA following an epidural steroid injection is uncommon and only few case reports have been published [3].

Our patient did not have any other source of infection or prior hospital stay. No signs of infection were seen at the site of injection. She did not have any co-morbidities and had normal biochemical parameters including blood sugar levels. The exact source of infection remains speculative, with likely possibilities being breach of sterility leading to skin flora entering epidural space during procedure or contamination of injecting apparatus or solution.

Epidural steroids suppress the adrenal system for two to six weeks which can mask the inflammatory signs due to infection [4]. Hence, if the patient develops infection, it may be masked, thus delaying the diagnosis. This delay can lead to catastrophic consequences including permanent weakness, sensory loss, and sphincter disturbances [5].

The common symptom, seen in patients with SEA following steroid injection, appears to be worsening of backache (unresponsive

to analgesics) with or without new-onset radicular pain [4]. Our patient had similar presentation without any neurological deficits. Neurological deficits can be seen in case of delayed diagnosis and may be due to direct thecal sac compression, ischemia of the roots or inflammation of the thecal sac and roots [5]. Early diagnosis and treatment is imperative, as delay can lead to irreversible neurological deficits. The treatment of SEA is laminectomy and evacuation of abscess and can lead to good outcome with complete recovery to pre-morbid state [1,5].

## Conclusion

SEA is a rare complication following epidural steroid injection [3]. Though ESI is an innocuous treatment modality as compared to open spinal surgery; it needs proper attention with regards to the technique of administration and the maintenance of sterility while performing the procedure. Post-ESI, maintaining a high degree of suspicion towards the rare but potentially devastating complications is imperative for early investigation, diagnosis, and treatment of those complications. Delay in detecting and treating such complications may result in lifelong morbidity due to neurological deficits [5]. Change in severity or character of the pain, new onset motor or sensory deficits or acute exacerbation of pre-ESI symptoms are harbingers of post-ESI complications and should be dealt with appropriately.

## Disclosures

The authors report no conflict of interest.

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