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## Managing Concurrent Discitis and Epidural Abscess Following TFESI Arising from Unlikely Bacterial Species: The Importance of Post-Procedure Education

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## Abstract

### Introduction:

Transforaminal epidural steroid injection (TFESI) can provide pain relief when patients' radicular pain is refractory to medication and physical therapy. However, it is important that clinicians understand potential signs and symptoms of TFESI complications to prevent long-term sequelae. Literature has not documented both discitis and an epidural abscess concurrently following a lumbar TFESI.

### Case:

We present a patient with stage 3c melanoma on the right lower extremity (RLE) with worsening lower extremity and foot pain. The pain was refractory to his current medication regimen of Gabapentin, and he wanted an alternative to opioids. A right L2-L5 TFESI was performed and his pain improved, however, at nine days post-operation, the patient presented with left paraspinal back pain that migrated to the right. He was found to have a leukocytosis and blood cultures revealed Group G streptococcus. MRI of the lumbar spine showed L1-L2 discitis with a left-sided epidural abscess. After an 8-week course of ceftriaxone his follow-up MRI showed resolution of his acute disease.

### Discussion:

This is a rare case showing concurrent discitis and epidural abscess after right L2-L5 TFESI likely secondary to cellulitis in the setting of melanoma. Additionally, the Group G streptococci bacterial etiology is unique compared to other reports of discitis given that *Staphylococcus aureus* is the most common species. Understanding the signs, symptoms, and presentations of these infections is vital for all specialties of physicians. Educating patients regarding the appropriate return precautions after back procedures can help patients present in a timely manner to prevent long-term sequelae.

## Keywords

Discitis, epidural abscess, transforaminal epidural steroid injection, Group G streptococcus

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## Conflict of Interest Statement

I, Robert Louis, on behalf of all co-authors declare that authors have no conflict of interest with this manuscript.

## CASE REPORT

# Managing Concurrent Discitis and Epidural Abscess Following TFESI Arising from Unlikely Bacterial Species: The Importance of Post-procedure Education

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## Abstract

**Introduction:** Transforaminal epidural steroid injection (TFESI) can provide pain relief when patients' radicular pain is refractory to medication and physical therapy. However, it is important that clinicians understand potential signs and symptoms of TFESI complications to prevent long-term sequelae. Literature has not documented both discitis and an epidural abscess concurrently following a lumbar TFESI.

**Case:** We present a patient with stage 3c melanoma on the right lower extremity (RLE) with worsening lower extremity and foot pain. The pain was refractory to his current medication regimen of Gabapentin, and he wanted an alternative to opioids. A right L2-L5 TFESI was performed and his pain improved, however, at nine days post-operation, the patient presented with left paraspinal back pain that migrated to the right. He was found to have a leukocytosis and blood cultures revealed Group G streptococcus. MRI of the lumbar spine showed L1-L2 discitis with a left-sided epidural abscess. After an 8-week course of ceftriaxone his follow-up MRI showed resolution of his acute disease.

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## 1. Introduction

The incidence and prevalence of chronic pain continues to be an issue that negatively impacts the functionality of adults throughout the world. Researchers estimate 20% of adults globally suffer from chronic pain and 10% are newly diagnosed each year.<sup>1</sup> The prevalence and treatment difficulties contribute to America's ongoing massive opioid epidemic with over 42,000 deaths secondary to opioid overdose annually.<sup>2</sup> The creation of this epidemic was multimodal and adequately addressing chronic pain syndrome has led to an increase in

the use of interventional techniques to treat pain. A transforaminal epidural steroid injection (TFESI) can provide short and long term relief for chronic radicular pain.<sup>3</sup> In some cases with neuropathic pain where spinal cord stimulator is being considered, an epidural steroid injection can be used as a predictor of success for the stimulator.<sup>4</sup> However, it is important that clinicians understand the potential risks of introducing a needle that provides the analgesic to the epidural space. Appropriate patient education of the signs and symptoms of infection is vital to prevent permanent neurologic damage from taking place.

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We present a case of a patient with multiple comorbidities who developed discitis and an epidural abscess concurrently following a lumbar TFESI secondary to Group G streptococcus. This retrospective case study aims to present the risk factors, diagnostic (clinical and radiographical) features and management of discitis and epidural abscesses.

## 2. Case

A 60-year-old male with a past medical history of stage 3c metastatic melanoma to the right lower extremity (RLE) presented with progressively worsening stabbing right groin, hip, lower extremity, and foot pain. The pain was worse while standing, walking, and bending forward and was relieved by lying prone or laterally. Review of systems was negative for fever, chills, and dysuria. Upon examination, his RLE had dermal melanoma lesions painful to palpation encompassing the L2 to S1 dermatomes. Lymphedema and mild erythema were present on the lower extremity but without any signs of infection. Strength was 5/5 in lower extremities. A Positive Emission Tomography-Computed Tomography showed progression of the disease, and the patient's pain was refractory to his current medication regimen of Gabapentin 600 mg TID. He was reluctant to escalate his pain regiment to include opioids. After discussing the risks and benefits, a right L2-L5 lumbar TFESI using 5 mg dexamethasone with 1.5 ml 0.25% bupivacaine at each level was performed to address his painful dermatomes. His post procedure pain was 0/10. Subsequently, our plan was to consider a spinal cord stimulator if received benefit from the epidural waned.

At nine days post-op, the patient reported 80% pain relief for three days before the pain returned to baseline. Additionally, on exam, there was crusting and weeping of the melanoma lesions across the lower extremity without signs of active infection, however, the patient denied any fever or chills over this period. He was also seen by his oncologist who noticed worsening lymphedema and new neck and axillary lesions prompting a change in immunotherapy from pembrolizumab to ipilimumab. He received this immunotherapy infusion on the tenth day. On the eleventh day, he presented to the emergency department with a chief complaint of feeling tired and persistent back pain. He reported taking a nap due to his fatigue, and when he awoke, he could not move his legs for 4 h. Initially his back pain was left sided but over time it migrated to the right midback with radiation to the right upper quadrant of his abdomen. Upon exam, he was found

to have severe bilateral paraspinal muscle tenderness. His neurologic and motor strength exam remained intact.

The patient was admitted, and a complete blood count and comprehensive metabolic panel showed a leukocytosis with white blood cell count (WBC)  $8.2 \times 10^3/\text{mcL}$ , prior to his immunotherapy infusion, to  $17.6 \times 10^3/\text{mcL}$ . Blood cultures were sent, and gram stain revealed gram positive cocci and later the culture grew Group G streptococcus. Computed Tomography Abdomen and Pelvis was unrevealing, however, an Magnetic Resonance Imaging (MRI) of lumbar spine with and without contrast showed epidural enhancement surrounding the L1-L2 disc space and a fluid signal collection that measured  $6.0 \times 7.0 \times 18 \text{ mm}$  (anteroposterior vs transverse vs craniocaudal) on the left ventral surface of the thecal sac (Fig. 1). These findings were concerning for discitis and an epidural abscess. Neurosurgery did not recommend intervention given the small size of abscess. The infectious disease team was consulted and recommended an 8-week course of ceftriaxone, and he was discharged with the appropriate pain management for his symptoms. Subsequently, 45 days later, he underwent another MRI that showed resolution of the epidural enhancement and the small fluid collection (Fig. 2).

## 3. Discussion

While discitis and epidural abscesses are a rare adverse outcome of a TFESI, it is important that clinicians understand the anatomy and comorbidities that can lead to these. Anatomically, discitis and epidural abscesses most often occur because of hematogenous spread via the Batson vertebral

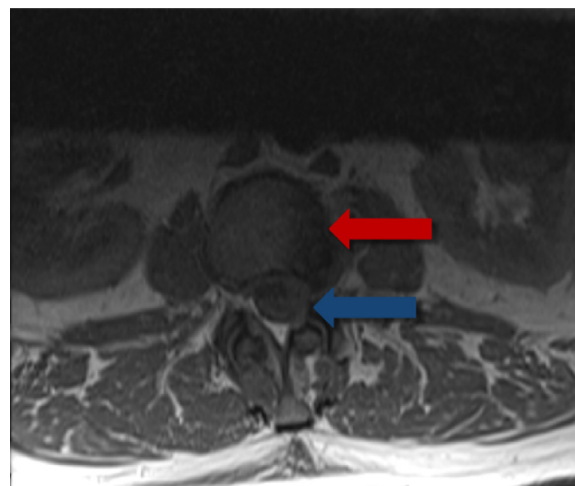


Fig. 1. Initial lumbar spine MRI with contrast in the axial plane depicting both the discitis (red) and the epidural abscess (blue).

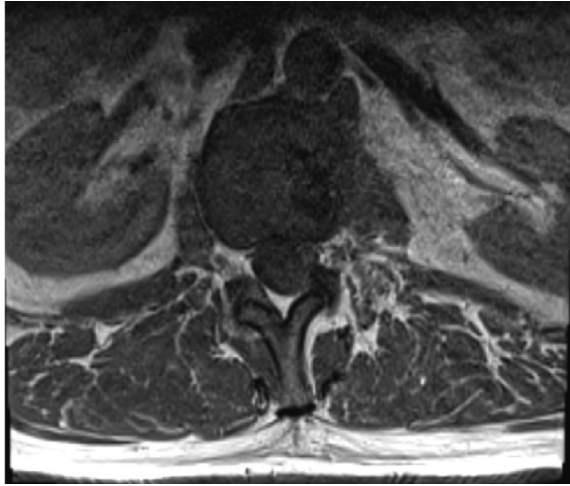


Fig. 2. Lumbar spine MRI with contrast in the axial plane 45 days later depicting improved epidural enhancement and resolution of the epidural abscess.

plexus as well as arterial spread via the anterior and posterior spinal arteries. The most common comorbidity for both diagnoses is diabetes.<sup>5,6</sup> Both also have many of the same predisposing factors such as immunocompromised status, intravenous drug abuse, kidney failure, spinal surgery, and foreign bodies.<sup>5,6</sup> As in our case, the classic presentation of many of these patients is localized tenderness and restricted mobility. A percentage of patients will also experience motor, sensory, and reflex neurologic deficits. These are typically emergent cases that cannot be missed.<sup>5</sup> It is also important to note that only 50% of patients with epidural abscesses will have fever, only 45% will have an elevated WBC count, and biopsies only yield positive cultures in 50% of cases.<sup>5</sup>

Additionally, the most common cause of discitis is *Staphylococcus aureus*.<sup>6</sup> However, our case is unique compared to other reports of discitis in that Group G streptococcus is the bacterial etiology rather than a staphylococcal species.<sup>6</sup> Group G streptococcus is typically found in skin flora and supports this patient's infectious etiology being epidermis breakdown secondary to melanoma disease in the setting of TFESI. An underlying systemic infection is the most common etiology for discitis.<sup>7</sup> Our patient's crusting melanoma wound may have seeded this infection. Even though our patient did not have his skin lesion close to the site of injection, it is important to take note of any potential source of infection in patients undergoing these elective procedures and explain that it may cause them to be at a higher risk of an adverse event.

Of note, steroids are associated with increased rates of infectious complications.<sup>8</sup> Considering that epidural steroid injections can reach systemic circulation, this is an important risk factor to explain to patients.<sup>9–11</sup> One trial using triamcinolone acetate 80 mg epidural steroid injections demonstrated a maximum serum concentration of  $5.5 \pm 2.2$  ng/mL with a time to maximum concentration of  $37.5 \pm 37.7$  hours and an elimination half-life of  $506 \pm 255$  hours.<sup>9</sup> On the other hand, a trial using methylprednisolone acetate 80 mg epidural steroids injections had no systemic absorption.<sup>10</sup> Current evidence suggests that less water-soluble forms of glucocorticoids, such as methylprednisolone, are more likely to be stored in epidural fat.<sup>11</sup> Given that steroids can remain in the epidural space and decrease immune responses, TFESI may have facilitated the infection in this case. Unfortunately, no studies have been done on the pharmacokinetics of epidural steroid injections for dexamethasone.

When infection is suspected and an abnormal neurologic exam is present, a stat MRI and broad-spectrum antibiotics should be ordered along with an appropriate work-up. This coverage can be narrowed once sensitivities are obtained. However, if the patient is stable, blood cultures and biopsies should be drawn before beginning antibiotic therapy. Patients with cervical or thoracic pathology should receive more aggressive treatment. A worsening neurologic exam is an indication for Spine Surgery consultation.<sup>12</sup>

#### 4. Conclusion

This is the first case to show concurrent discitis and epidural abscess after TFESI secondary to cellulitis in the setting of stage 3c melanoma. Additionally, this case is unique compared to other reports of discitis in that Group G streptococci is the bacterial etiology of this infection rather than staphylococcus. The identified risk factors can aid practitioners when an infection is suspected, particularly in the setting of skin breakdown. Moreover, less water-soluble steroids can remain in the epidural space and facilitate infectious processes. Providers should note any potential source of infection, even if remote from the injection site, and advise patients accordingly.

#### Conflicts of interest

I, Robert Louis, on behalf of all co-authors declare that authors have no conflict of interest with this manuscript.

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## Ethics approval

Our institution does not require ethical approval for reporting individual cases or case series.

## Informed consent

Informed consent for patient information to be published in this article was not obtained because the patient has now passed away, and we were unable to reach next of kin for consent.

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