PAIN MEDICINE CASE REPORTS

ISSN 2768-5152

Volume 7, Number 8, pp. 345-347

Aortoesophageal Fistula Following a Cervical Epidural Steroid Injection: Case Report

Fangyu Chen, MD and Praba Boominathan, MD

Background: Immunosuppression after cervical epidural steroid injection (CESI) is a potential complication. This report discusses the development of an aortoesophageal fistula following a CESI.

Case Report: Patient is a man in his early 60s with a history of central spinal cord syndrome status post (s/p) anterior cervical discectomy and fusion of C3-C6 and thoracic aortic aneurysm s/p thoracic endovascular aortic repair (TEVAR) who presented with cervical radiculopathy. He underwent a CESI without immediate complications.

Twelve days postop, the patient presented with shortness of breath, fatigue, and change in mental status. He was found to have a pleural abscess and an aortoesophageal fistula from his previous TEVAR stent. He subsequently was admitted to the surgical intensive care unit and received mechanical ventilation, antibiotics, and high-dose vasopressors. Patient was eventually transitioned to comfort care and expired one day after admission.

Conclusions: Systemic steroid absorption from ESIs can lead to complications, such as infection, due to immunosuppression.

Key words: Epidural steroid injection, corticosteroids, spinal stenosis

BACKGROUND

Corticosteroids are frequently used to treat various musculoskeletal diseases due to their anti-inflammatory properties. One use of corticosteroids is in the form of injections, such as epidural steroid injections (ESIs). However, there are potential complications associated with the use of corticosteroids in such injections as well. This report will explore and discuss the potential of systemically absorbed corticosteroids leading to immunosuppression in a patient who received a cervical ESI (CESI) for cervical radiculopathy.

CASE PRESENTATION

Patient is a man in his early 60s with a past medical history of central spinal cord syndrome status post (s/p) anterior cervical discectomy and fusion (ACDF) of C3-C6 1.5 years prior and thoracic aortic aneurysm s/p thoracic endovascular aortic repair (TEVAR). He first presented after a fall with bilateral arm pain without weakness, concerning for potential central cord syndrome. Further workup with cervical spine magnetic resonance imaging (MRI) demonstrated moderate-severe spondylosis with canal stenosis at C3-C4, C4-C5, and C5-C6, with associated T2 cord signal change. There appears to be short pedicles at those cervical levels, likely leading to congenital cervical stenosis. He subsequently underwent ACDF of C3-C6 levels with resolution of bilateral arm pain.

From: Department of Anesthesia and Critical Care Medicine, Hospital of the University of Pennsylvania, Philadelphia, PA

Corresponding Author: Fangyu Chen, MD, E-mail: Fangyu.chen@pennmedicine.upenn.edu
Disclaimer: There was no external funding in the preparation of this manuscript.
Conflict of interest: Each author certifies that he or she, or a member of his or her immediate family, has no commercial association (i.e., consultancies, stock ownership, equity interest, patent/licensing arrangements, etc.) that might pose a conflict of interest in connection with the submitted manuscript.
Patient consent for publication: Institutional policy exempts the need for consent when all patient identifiers have been eliminated.
Authors adhere to the CARE Guidelines for writing case reports and have provided the CARE Checklist to the journal editor.
Accepted: 2023-09-14, Published: 2023-12-31

The patient was then seen in the pain clinic 1.5 years later for right shoulder pain s/p right intraarticular injection with unrelated new symptoms of pain that radiates to the right hand in the median nerve distribution. His exam was consistent with cervical radiculopathy without weakness. A cervical MRI was then obtained and demonstrated chronic myelomalacia and moderate spinal canal stenosis at C3-C6 that is similar to pre-ACDF MRI, as well as expected postop ACDF changes. Patient was subsequently scheduled for a C7-T1 CESI. Five months prior to the CESI, the patient had a TEVAR surveillance computed tomography (CT) image of the chest with contrast that demonstrated T8 vertebral body compression deformity and trace right pleural effusion. The compression deformity was concerning to be pathological with further workup for malignancy found to be negative. Patient received a CESI with home Plavix held for 5 days prior. Patient was in the supine position, prepped and draped in usual sterile fashion. One percent subcutaneous lidocaine was used to numb the skin and an 18-G 3.5-inch Tuohy needle was advanced under fluoroscopic guidance with loss of resistance to saline at 4 cm. One milliliter of contrast solution was injected and demonstrated spread into the epidural space without any intrathecal or intravascular spread. Ten milligrams of dexamethasone was then injected with 1.5 mL of normal saline and all instrumentation was then removed. Patient had uneventful recovery in the postanesthesia care unit and was discharged later that same day to home in stable condition.

Eight days postop patient had a fall from chronic lower extremity weakness and family noticed a new persistent cough. Twelve days postop, with no improvement in symptoms and new development of altered mental status, patient was brought to the emergency department (ED). In the ED, the patient was found to be febrile, tachycardic, and tachypneic. Initial laboratory workup demonstrated a white blood cell count > 40 and a lactate level > 5. A CT angiography of the chest demonstrated large left upper lobe consolidation in the lung with a 4-5 cm abscess in the left mediastinal pleura extending into the mediastinum, adjacent to the patient's stent graft, with concern for aortoesophageal fistula. There were also multiple filling defects in the descending aorta concerning for thrombus and the patient's overall presentation was concerning for mediastinitis. There was no clear nidus for the aortoesophageal fistula and pleural abscess. It was thought, given the patient's recent CESI, one possibility was systemic steroid absorption leading to immunosuppression. The patient was immediately started on broad-spectrum antibiotics and then admitted to the intensive care unit (ICU) where overnight he required intubation due to increased work of breathing. Patient was also started on high-dose vasopressors for septic shock. Given the patient's condition, he was not a surgical candidate and his clinical status continued to deteriorate the next day. During his second day in the ICU, family transitioned patient to comfort care and patient expired later that day.

DISCUSSION

One of the potential adverse effects of CESI is systemically absorbed steroids leading to immunosuppression (1,2), which, in turn, can cause infections. There have been studies demonstrating continued suppression of serum cortisol levels as long as 3 weeks after an ESI, implying systemic absorption (3). Particulate steroids, such as triamcinolone, are found to be more likely associated with systemic absorption than nonparticulate steroids, such as dexamethasone (3).

Infectious complications can also arise in patients after receiving an ESI due to systemic steroid absorption or seeding from instrumentation of the spine. Studies (3,4) demonstrate that infections can occur in patients who undergo spine surgery within 3 months of having had a prior ESI. Other more common infectious complications include spinal abscesses, meningitis, and vertebral osteomyelitis (4,5). There has been a case report (6) regarding fungal infections related to contaminated medications. There aren't any currently reported cases of mediastinal abscess s/p an ESI. However, given the reported patient's previous history of TEVAR, and thus foreign body in the mediastinal space, his risk for infection is increased due to potential seeding on the aortic graft. It is possible that even a very small amount of systemically absorbed steroids may have caused enough immunosuppression to allow the abscess to develop. Another possibility is that the patient may have already had an insidious mediastinal infection or a burgeoning aortoesophageal fistula even prior to the ESI and the systemic absorption of steroids quickened the exacerbation of his condition.

Other common complications from ESI include worsening hyperglycemia in diabetic patients (1,2), which may contribute to the increased risk of postoperative infections as well. Other less common complications include secondary adrenal insufficiency, which can present with weakness, fatigue, and unintended weight loss (2). Vascular embolizations, although rare, have

been reported as well and are typically associated with particulate steroids (2).

CONCLUSIONS

Systemic steroid absorption from ESIs can lead to complications, such as infection due to immunosuppression and instrumentation. The immunosuppression may allow seeding of infections or sometimes the more rapid progression of an already existing infection. The use of particulate steroids can also cause other more rare complications, such as vascular embolizations. Therefore, nonparticulate steroids, such as dexamethasone, are thus preferred in ESIs to minimize such complications while still offering anti-inflammatory relief for patients undergoing ESIs.

REFERENCES

1. Friedly JL, Comstock BA, Heagerty PJ, et al. Systemic effects of epidural steroid injections for spinal stenosis. *Pain* 2018; 159:876-883.
2. Lee MS, Moon HS. Safety of epidural steroids: A review. *Anesth Pain Med (Seoul)* 2021; 16:16-27.
3. Lamer TJ, Dickson RR, Gazelka HM, et al. Serum triamcinolone levels following cervical interlaminar epidural injection. *Pain Res Manag* 2018; 2018:8474127.
4. Epstein N. Major risks and complications of cervical epidural steroid injections: An updated review. *Surg Neurol Int* 2018; 9:86.
5. Lobaton GO, Marrache M, Petrusky O, Cohen DB, Jain A. Devastating vertebral osteomyelitis after epidural steroid injection: A case report. *JBJS Case Connect* 2019; 9:e0028.
6. Kainer MA, Reagan DR, Nguyen DB, et al. Fungal infections associated with contaminated methylprednisolone in Tennessee. *N Engl J Med* 2012; 367:2194-2203.