Rare Neurosurgical Complications of Epidural Injections: A 14-Year Single-Institution Experience

Gabriel Alexander Smith MD; Jonathan Pace MD; Madeleine Strohl; Anand Kaul MD; Salim Hayek; Jonathan P. Miller MD
[Institution]

Click To Add Logo

Introduction

Epidural injections of steroid or anesthetic can be effective for chronic pain in appropriately selected patients, but severe neurosurgical complications have been rarely reported. The purpose of this study is to define the spectrum of complications that present to an academic neurosurgery service.

Methods

A prospectively maintained database of 27,000 neurosurgical admissions over 14 years were reviewed to identify all patients who had suffered major procedural complications, defined as a new symptom or neurological deficit definitively related to the procedure with evidence of radiological or pathological abnormality. A retrospective analysis of demographic and procedural features was performed.

Results

There were a total of 17 patients who had experienced major neurosurgical complications associated with epidural injections, accounting for 0.64% of all neurosurgical admissions. There were three broad categories of complication: hemorrhagic (n=11), infectious (n=4), and CSF-related (n=2). There was significantly greater association with a history of anticoagulation use among patients with hemorrhagic vs. nonhemorrhagic complications ($p<0.01$, Fisher's exact test). Four patients who developed epidural hematoma had been managed in accordance with the 2014 ASRA guidelines, either after cessation of anticoagulation (n=2) or were taking aspirin only prior to the procedure (n=2). Four infections were identified, and none of the patients were treated with prophylactic antibiotics. The CSF-related cases consisted of diffuse pneumocephalus (n=1) and acutely symptomatic colloid cyst (n=1).

Conclusions

Major neurosurgical complications of epidural injections are distinctly rare but can be quite serious. A majority of these are hemorrhagic and associated with a history of therapeutic anticoagulation; non-hemorrhagic complications tend to

Learning Objectives

By the conclusion of this session, participants should be able to:

1) define rare epidural injection complications

2) identify risk factors for occurrence

3) counsel patients on the inherent rare risk to this routine procedure

References

Administration FaD: FDA requires label changes to warn of rare but serious neurologic problems after epidural corticosteroid injections for pain., in, 2014

2.Anderberg L, Annertz M, Persson L, Brandt L, Saveland H: Transforaminal steroid injections for the treatment of cervical radiculopathy: a prospective and randomised study. Eur Spine J 16:321-328, 2007

3.Andreisek G, Jenni M, Klingler D, Wertli M, Elliott M, Ulbrich EJ, et al: Access routes and reported decision criteria for lumbar epidural drug injections: a systematic literature review. Skeletal Radiol 42:1683-1692, 2013

4.Beissel DE: Complication Rates for Fluoroscopic Guided Interlaminar Lumbar Epidural Steroid Injections Performed by Certified Registered Nurse Anesthetists in Diverse Practice Settings. J Healthc Qual, 2015

5.Benzon HT, Wong HY, Siddiqui T, Ondra S: Caution in performing epidural injections in patients on several antiplatelet drugs. Anesthesiology 91:1558-1559, 1999

6.Bicket MC, Chakravarthy K, Chang D, Cohen SP: Epidural steroid injections: an updated review on recent trends in safety and complications. Pain Manag 5:129-146, 2015

7.Bohme K, Tryba M: [Paraspinal opioids and pump systems]. Z Arztl Fortbild Qualitatssich 92:47-52, 1998

8.Brouwers PJ, Kottink EJ, Simon MA, Prevo RL: A cervical anterior spinal artery syndrome after diagnostic blockade of the right C6-nerve root. Pain 91:397-399, 2001

9.Bui J, Bogduk N: A systematic review of the

Figure 2

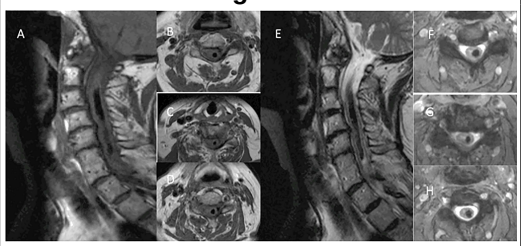

Figure 2. 83 year-old female with history of coronary artery disease on aspirin, chronic axial neck pain and recurrent left upper-extremity radiculopathy following a C6-7 ACDF underwent a cervical ESI and immediately developed bilateral lower extremity plegia. MR-imaging revealed an acute epidural hematoma following cervical ESI. T1-weighted sagittal and thin axial cuts (A-D). Sagittal and Axial T2 weighted imaging (E-H).

Figure 1

Figure 1. 86 year-old female with history of atrial fibrillation on Coumadin with complaints of chronic neck pain for 5 years underwent a cervical ESI and suffered acute onset quadriparesis. MR-imaging revealed an acute intramedullary hematoma following cervical ESI. T1-weighted sagittal and thin axial cuts (A-D). Sagittal and Axial T2 weighted imaging (E-H).