



# Case Series: Intramedullary Air and Epidural Hematoma following Cervical Injection: Rare Causes of Spinal Cord Injury

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## Introduction

- Chronic neck and back pain are the leading cause of missed work.
- May be treated conservatively with physical therapy, oral and topical medications.
- May also be treated invasively, such as with epidural steroid or facet injections.

### CASE 1

- 86 year old with history neck pain for 5 years undergoes epidural steroid injection.
  - Immediately develops diminished sensation and weakness in all 4 extremities.
  - MRI demonstrates epidural collection.
- ### CASE 2
- 83 year old with intractable neck pain and radiculopathy presents for epidural steroid injection.
  - Immediately following procedure developed acute plegia of left upper extremity and bilateral lower extremities.
  - MRI demonstrates intramedullary air.

## Figure 1

### Fluoroscopic Localization of Epidural Space

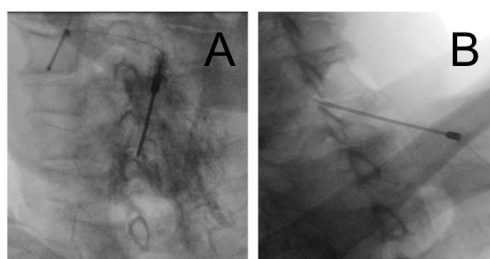


Figure 1. AP (A) and Lateral (B) projections of localization of the epidural space under fluoroscopic guidance.

- Aside from fluoroscopic localization of the epidural space, the “loss of resistance technique” is used.
- In this maneuver, zero resistance syringe is attached to the needle.
- As the needle is advanced through the ligamentum flavum, resistance is lost and the syringe injects the air or saline.
- Theoretically, this localizes the epidural space, a safe region for injection of medication.
- Demonstrated below are two cases of inappropriate localization of the epidural space and its sequelae.

## Figure 2

### Case 1: Epidural Hematoma

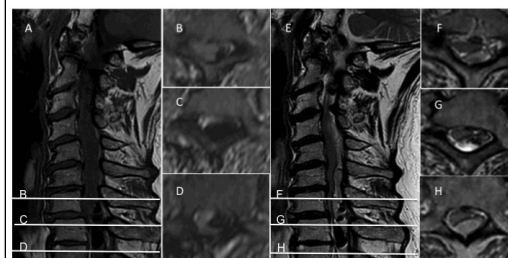


Figure 2. A-D Sagittal and Axial T1 imaging of the cervical spine. Thin axial cuts of (B) C7, (C) T1, and (D) T2. E-H, Sagittal and Axial T2 imaging (F) C7, (G) T1, (H) T2.

## Figure 3

### Case 2: Intramedullary Air

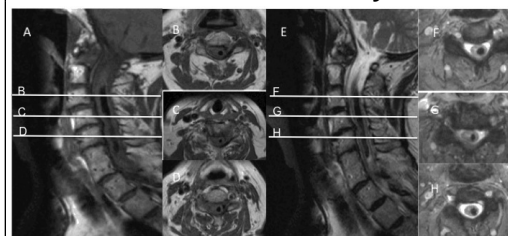


Figure 3. A-D Sagittal and Axial T1 weighted imaging of the cervical spine. Thin axial cuts of (B) C3, (C) C4, and (D) C5. E-H, Sagittal and Axial T2 weighted imaging (F) C3, (G) C4, (H) C5.

## Discussion

- Medicaid patients undergoing epidural injections have increased by 130% from 2000 – 2011, and the number is expected to continue to climb.
- While these are exceedingly rare complications, diligence is required to avoid iatrogenic injuries to patients.
- A wide variety of complications may occur aside from those described here, including infection, abscess, paraplegia, stroke, and cardiac arrest.

## Conclusion

- Care in patient positioning and avoidance of undue sedation helps to minimize risk.
- These cases stress the importance of proper localization and intimate knowledge of anatomy.
- These cases also illustrate that all procedures carry risk and there should be a low threshold for urgently investigating new deficits following epidural steroid injections.