

Introduction

- Lumbar epidural steroid injections are abundantly common in pain management for treatment of radicular low back pain.
- Current LCD guidelines for epidural steroid injections require use of contrast dye to confirm safe and accurate needle tip location prior to medication administration.
- The patient presented in this case experienced altered mental status due to pneumocephalus one day after epidural injection using gadobutrol.

Methods and Materials

All patient information has been de-identified for this case report. Per University of Cincinnati Medical Center policy, single patient case reports are exempt from IRB review.

Case Report

- 41 year old female PMH gastric sleeve, COPD on 4L O2, hepatitis C, diabetes type 2, opioid use disorder presented to the hospital 8 hours after lumbar epidural steroid injection with altered mental status.
- Upon arrival in the emergency department, she was febrile, agitated, hypertensive, and tachycardic. She was started on prophylactic levetiracetam, intubated for airway protection and sent for imaging.
- CT scans revealed a large subarachnoid hemorrhage and small volume pneumocephalus.
- Neurosurgery was consulted stat, hypertonic saline was started and external ventricular drain was placed with not output overnight.
- Repeat CT showed resolve of pneumocephalus, and clinical exam returned to baseline.
- Therefore, initial hyperintensity on CT was less likely subarachnoid hemorrhage. Instead, hyperintensity was likely from gadobutrol contrast used for the patient's lumbar epidural one day prior.
- The patient continued to improve clinically, and ultimately discharged after five-day hospitalization.



Initial Head CT
Arrow: small volume Pneumocephalus
Diffuse hyperintensity resembling subarachnoid hemorrhage



Repeat Head CT (24h)
Resolution of small volume Pneumocephalus
Resolution of diffuse hyperintensity

Discussion

Pneumocephalus after epidural injection is a rare but known complication. It can at times mimic symptoms of post- dural puncture headache, however develops more rapidly and does not improve with recumbent position [1]. Other symptoms can include confusion, dizziness, or nausea and vomiting. It is important to identify the diagnosis promptly, as excellent prognosis is achieved when treated timely [1]. The typical treatment is supplemental oxygen, which has been seen to result in rapid improvement in some case reports [2]. In this case, the patient was intubated, had external ventricular device placed, and saw rapid improvement overnight in clinical status as well as radiographically. The case was further complicated due to gadobutrol uptake in the intrathecal space. This lead the initial evaluators to believe the patient has suffered large subarachnoid hemorrhage, given what was seen on initial CT and her clinical presentation. Therefore, neurosurgical escalation with external ventricular device placement was done although clinical status improvement might have been achieved with supplemental oxygen alone. Of note, based on ASRA 2022 guidelines gadolinium-based contrast in setting of allergy or absence of iodinated contrast materials as was done in the case [2]. This case can further the argument to avoid use of gadolinium-based contrast when performing spine injections.

References

- 1.Reddi, S., Honchar, V., & Robbins, M. S. (2015). Pneumocephalus associated with epidural and spinal anesthesia for labor. *Neurology: Clinical Practice*, 5(5), 376. <https://doi.org/10.1212/CPJ.0000000000000178>
2. Kohan, L., Pellis, Z., Provenzano, D. A., Pearson, A. C. S., Narouze, S., & Benzon, H. T. (2022). American Society of Regional Anesthesia and Pain Medicine contrast shortage position statement. *Regional Anesthesia & Pain Medicine*, 47(9), 511–518. <https://doi.org/10.1136/RAPM-2022-103830>