

Atypical Headache After Cervical Interlaminar Epidural Steroid Injection: A Case of Pneumocephalus

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INTRODUCTION

- Pneumocephalus is a condition where air enters intracranial cavity. Persistent symptoms commonly result from head trauma, neurosurgical intervention, infection, or spinal procedures
- Cervical intralaminar epidural steroid injections (C-ILESI) treats patients with cervical radiculopathy.
- Headache is a common side effect (4.5%), with the most common cause being inadvertent dural puncture, occurring at a rate of 0.25-2%
- Postdural puncture headache (PDPH) results from persistent CSF leakage from dural puncture site.
- We present an unusual case of pneumocephalus after C-ILESI, though clinical presentation was more consistent with PDPH

CASE PRESENTATION

- 36F history of postural orthostatic tachycardia syndrome (POTS) and cervical degenerative disk disease presented with acute head & neck pain post- C7-T1 ILESI at independent clinic
- After 3hr: *Supine* – sharp bifrontal and occipital headache, rated 4/10
  Upright – diffuse sharp, throbbing headache radiating to ears and nasal bridge, rated 10/10
- After 5 days: Worsening nausea and vomiting, otalgia, visual changes, upper extremity paresthesia, and weakness upon standing
- At outside ED, diagnosed with PDPH → treated conservatively with diclofenac, caffeine, ondansetron, hydrocodone, and IV hydration with no relief
- On admission, vitals were stable, physical exam unremarkable
- Neuro exam: no focal deficits, **asymmetric bicep tendon reflexes** (3+ on left, 2+ on right)
- Bern score for intracranial hypotension: **3-4** (intermediate)

Fig. 1

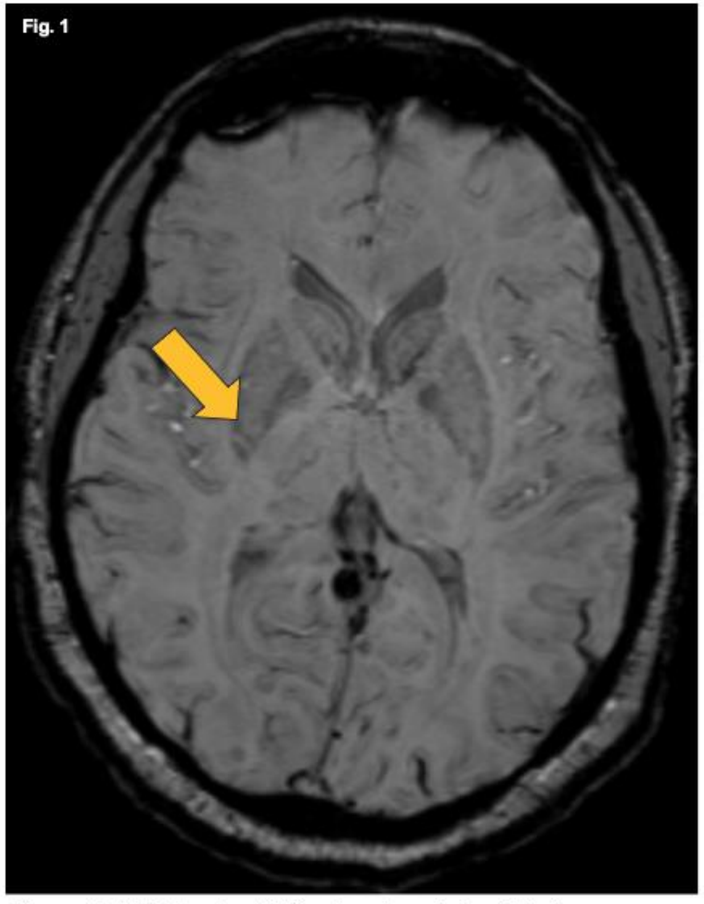


Figure 1. MR Head exhibiting locules of air within the quadrigeminal cistern, diffuse pachymeningeal enhancement extending into the cervical spine, decreased mamillopontine distance, and an epidural fluid collection in the cervical spine

DISCUSSION

Characteristics	PDPH	Pneumocephalus
Cause	CSF leak causing traction on pain-sensitive structures & intracranial hypotension	Air in intracranial cavity
Clinical Presentation	Headache, n/v, neck stiffness, CN VI palsy	Headache, n/v, dizziness, CN palsies, lethargy
Headache Features	Worse when upright, improved when supine	Worse with movement, may be relieved when supine
Onset and Duration	Pressure; mild onset that progressively worsens	Immediate and severe; Thunderclap
Imaging Findings	High Bern score, brain sag, pituitary hyperemia	Hypodensity/hypointensity in subarachnoid space
Treatment	IV fluids, analgesics, caffeine, blood patch	100% Oxygen

- Patient was treated with high-flow oxygen via non-rebreather mask and analgesics.
- Discharged 3 days later with headache mostly resolved, able to sit upright and ambulate without pain
- **100% Oxygen (O_2) Therapy:**
  - Facilitates diffusion of nitrogen (N_2) from intracranial bubble to circulating blood by reducing pulmonary N_2 levels and creating a gradient
  - Limited guidance on most efficacious mode of O_2 delivery
  - Some studies show high-flow nasal cannula accelerates clearance compared to non-rebreather mask due to faster N_2 washout and greater patient comfort

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