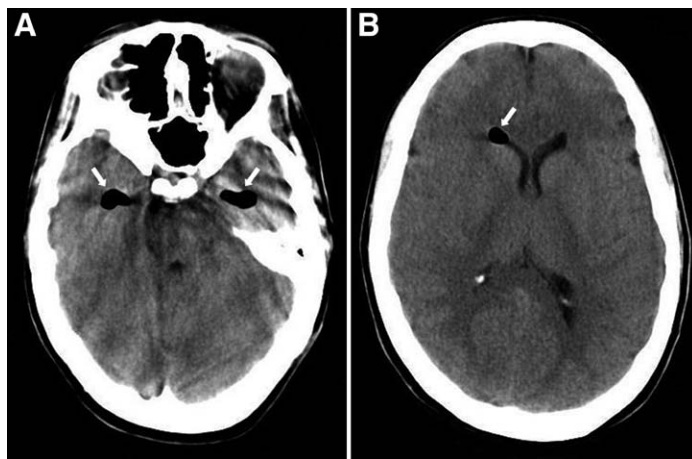


Hugh C. Hemmings, Jr., M.D., Ph.D., Editor
Alan Jay Schwartz, M.D., M.S. Ed., Associate Editor

Pneumocephalus after Inadvertent Dural Puncture during Epidural Anesthesia

Manuel Á. Gómez-Ríos, M.D.,* María Concepción Fernández-Goti, M.D.

* Department of Anaesthesiology and Perioperative Medicine, Complejo Hospitalario Universitario de A Coruña, Spain.
 magoris@hotmail.com



A 34-YR-OLD healthy parturient developed sudden severe frontal headache coinciding with locating the epidural space at the L4–L5 interspace using loss of resistance to air (LORA) (injection of 3 ml). The needle was withdrawn without cerebrospinal fluid flashback. An epidural catheter was placed at the L3–L4 interspace using loss of resistance to saline (LORS). Computed tomography of the brain performed immediately postpartum revealed air in the temporal horns and right frontal horn of the lateral ventricle. The images correspond to axial computed tomography scans and represent different levels of the brain, showing the extension of the intraventricular pneumocephalus.

Pneumocephalus, a rare consequence of unintentional dural puncture, results from the injection of air

into the subarachnoid or subdural space and cranial migration.¹ Headache, signs of space-occupying lesion (focal neurologic deficits including cranial nerve palsies, hemiparesis, or hemiplegia) or increased intracranial pressure (vomiting, seizures, lethargy) and cardiovascular instability may arise depending on the distribution and amount of intracranial air. The presence of air density areas within the cranial cavity on computed tomography scan (arrows), which is more sensitive than magnetic resonance imaging, confirm the diagnosis.

Treatment of pneumocephalus is symptomatic. In addition, oxygen therapy facilitates denitrogenation and reabsorption of the air collection, increasing the nitrogen concentration gradient.² Surgery is recommended in tension pneumocephalus. Nitrous oxide should be avoided to prevent its expansion.² There are two mechanisms of postdural puncture headache: cerebrospinal fluid leakage (late onset, long lasting) and intrathecal air (immediate onset, short duration).³ Epidural infusion or blood patch, treatments of the first mechanism, are ineffective in pneumocephalus-induced headache.^{1,3} It usually disappears in 3–5 days with reabsorption of the air. Our patient was discharged home after clinical-radiologic resolution on the fifth day. The amount of air in LORA should be minimized. LORA should not be used after dural puncture. The LORS technique avoids this complication.

References

1. Nafiu OO, Urquhart JC: Pneumocephalus with headache complicating labour epidural analgesia: Should we still be using air? *Int J Obstet Anesth* 2006; 15:237–9
2. McMurtrie R Jr., Jan R: Subarachnoid pneumocephalus: A rare complication of epidural catheter placement. *J Clin Anesth* 2002; 14:539–42
3. Aida S, Taga K, Yamakura T, Endoh H, Shimoji K: Headache after attempted epidural block: The role of intrathecal air. *ANESTHESIOLOGY* 1998; 88:76–81