



Pneumocephalus After Dural Puncture During Epidural Analgesia: A Case Report

Gholamreza Mohseni¹ , Faranak Behnaz^{1*} , Zahra Tahmasebi¹

¹Department of Anesthesiology, Shohada Tajrish Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Abstract

Lumbar epidural anesthesia commonly used to control post-operation pain. The 'loss-of-resistance' to air technique (LORA) generally engaged in the appreciation of the epidural space. One of the rare but serious side effects of this technique is pneumocephalus. We report a case of sudden frontal and parietal headache after a dural puncture during the performance of epidural analgesia using the LOR to air technique.

Keywords: Epidural analgesia; 'loss-of-resistance' to air technique (LORA); Pneumocephalus; loss of consciousness; headache.

*Correspondence to

Faranak Behnaz, assistant professor department of anesthesiology Shohada Tajrish Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran
Tel: +982122741174;
Email: faranak.behnaz@gmail.com

Citation: Mohseni G, Behnaz F, Tahmasebi Z. Pneumocephalus after dural puncture during epidural analgesia: a case report. Int Clin Neurosci J. 2020;7(1):52-53. doi:10.15171/icnj.2020.08.

Published online December 23 2019

Introduction

Pneumocephalus, rare importance of unintentional dural puncture, results from the injection of air into the subarachnoid or subdural space and cranial passage.¹ Headache, signs of the space-occupying lesion (focal neurologic deficits counting 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.² The occurrence of air density areas within the cranial cavity on the computed tomography scan, which is more sensitive than magnetic resonance imaging, approve the diagnosis.³

Case Report

A healthy, 42-year-old woman (163 cm, 72 kg) scheduled for elective Hepaticojejunostomy because of pain on the right side of the upper abdomen presentation. She was conscious, and her vital findings were normal (BP:125/70 mm Hg PR:98 min RR:18 min). With the consent of the patient, epidural analgesia chosen for controlling the post-operation pain. Back of patient was prepped and draped with an aseptic solution while patient was at the sitting position, and 2% lidocaine infiltrated for skin analgesia at the L4-5 interspace. A 17-gauge Husted needle introduced using the LOR to air technique. During the first attempt, accidentally dural punctured as a result the free flow of cerebrospinal fluid came out from the needle. At the same time, 5 mL of air injected into the subarachnoid space. Approximately after one minute, the patient was complaining of a headache, and then she became unconscious. The arterial pressure decreased to

90/54 mm Hg, PR: 70 min, and RR:22 min. Immediately patient underwent Trendelenburg position, then Normal saline solution 1000 mL and oxygen via a face mask were administered. The patient gained her conscious after medical treatment, and the vital sign came back to normal. Although she was complaining of severe frontal and parietal headache. The surgeon decided to postpone the surgery. The patient directly transferred to the intensive care unit (ICU). A computed tomography brain scan was performed after the patient transferred to ICU and demonstrated pneumoventricle, pneumo-cistern, and pneumolabyrinth (Figure 1). Finally, the patient was discharged from the hospital with an excellent general condition after four days from her admission.

Discussion

Various complications have recognized to the use of air for documentation of the epidural space: compression of

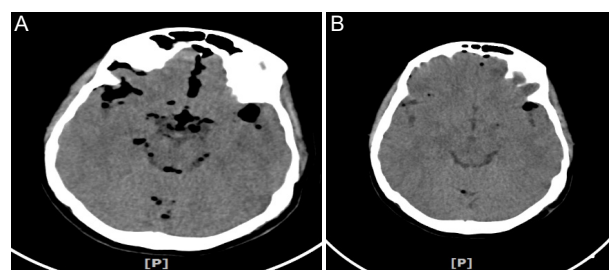


Figure 1. Axial computed tomography (CT) scan of the head demonstrated free air in cistern and ventricles (A) CT brain, after 72 h, showed significant resolving of pneumocephalus (B)

the cauda equina, pneumocephalus air embolism cervical emphysema, and increased incidence of dural puncture.⁴ With slow reabsorption of the air, symptoms vanished progressively.⁵ However, if nitrous oxide had used during general anesthesia, the volume of air could have increased, with harmful effects. It has suggested that nitrous oxide should not use after documentation of the epidural space with LOR to air.^{4,6} The LOR to saline technique offers many benefits compared with the LOR to air technique. Although this case report may not support the total neglect of the LOR to air technique, it does suggest that when this technique has chosen, the quantity of air should minimize. Also, the LOR to air technique should not use after an accidental dural puncture.⁶

Pneumocephalus can happen with even 2 ml of air.⁷ Pneumocephalus disappears typically in 2-5 days with reabsorption of air,⁸ and It should be treated predictably with oxygen and Trendelenburg position. Analgesics administered in patients with severe headache.⁸ Pneumocephalus can prevent by using saline to determine epidural space. The increase in pneumocephalus can prevent by avoiding nitrous oxide during general anesthesia, as nitrous oxide can increase the intracranial pressure significantly by expanding the pneumocephalus.^{7,8} It has suggested that epidural space should be located with saline only to avoid problems due to the air like pneumocephalus or patchy block.⁸ Our patient complained of a severe frontoparietal headache. The cerebrovascular accident initially suspected as a decreased level of consciousness was recorded. CT scan brain, however, ruled it out.

Conclusions

Every headache that occurs in the situation of epidural anesthesia and analgesia should not consider as post-dural puncture headache, but if we doubt it should be better to looking for neurology consult and obtaining an emergent head CT. The main goal of this case report is to demonstrate that rare complications may develop as

pneumocephalus. Therefore, the anesthetist should be aware of this potential complication to respond quickly and effectively as it occurs.

Conflict of Interest Disclosures

The authors declare that they have no conflict of interests.

Ethical Statement

An informed consent form for publication of the study obtained for the patient.

References

1. Lim HY, Choi JW, Lee AR, Park HW, Choi DH. Pneumocephalus during labor analgesia using the combined spinal-epidural technique. *Korean J Anesthesiol*. 2013;65(6 Suppl):S93-4. doi: 10.4097/kjae.2013.65.6S.S93.
2. Wankar A, Maheshwari A, Athale S. Post epidural puncture delirium resulting from pneumocephalus: an uncommon presentation. *J Neuroanaesth Crit Care*. 2016;3(1):43-5. doi: 10.4103/2348-0548.173254.
3. Nistal-Nuño B, Gómez-Ríos MÁ. Case Report: Pneumocephalus after labor epidural anesthesia. *F1000Res*. 2014;3:166. doi: 10.12688/f1000research.4693.1.
4. Nafiu OO, Urquhart JC. Pneumocephalus with headache complicating labour epidural analgesia: should we still be using air? *Int J Obstet Anesth*. 2006;15(3):237-9. doi: 10.1016/j.ijoa.2005.10.011.
5. Kim YD, Lee JH, Cheong YK. Pneumocephalus in a patient with no cerebrospinal fluid leakage after lumbar epidural block - a case report. *Korean J Pain*. 2012;25(4):262-6. doi: 10.3344/kjp.2012.25.4.262.
6. Verdun AV, Cohen SP, Williams BS, Hurley RW. Pneumocephalus after lumbar epidural steroid injection: a case report and review of the literature. *A A Case Rep*. 2014;3(1):9-13. doi: 10.1213/xa.0000000000000055.
7. Guarino AH, Wright NM. Pneumocephalus after a lumbar epidural steroid injection. *Pain Physician*. 2005;8(2):239-41.
8. Beilin Y, Arnold I, Telfeyan C, Bernstein HH, Hossain S. Quality of analgesia when air versus saline is used for identification of the epidural space in the parturient. *Reg Anesth Pain Med*. 2000;25(6):596-9. doi: 10.1053/rpam.2000.9535.