Pneumocephalus after epidural analgesia: Should loss of resistance with air be blown out?

Sir,

A 52-year-old woman with a history of diabetes and hypertension, controlled on medications, was scheduled for unilateral total hip replacement under combined spinal-epidural analgesia. Her preoperative blood pressure (BP) was 150/80 mmHg and heart rate (HR) 80/min. Routine monitoring was initiated. Epidural space was determined in sitting position by the loss of resistance to air (LORA) using a 16G Tuohy needle via the L2/3 interspace, and an epidural catheter was placed. 5 ml of air was used and injected twice to confirm the space. There was no cerebrospinal fluid (CSF) backflow from the epidural needle. In less than a minute of LORA testing, the patient complained of excruciating bilateral frontoparietal headache with nausea and developed hypertension (BP 240/110 mmHg) and tachycardia (HR 130/min). The epidural procedure was abandoned, and the patient made supine. Oxygen was administered by face mask. Severe frontal headache persisted for 20 min and patient had two episodes of vomiting. Fentanyl 50 mcg was administered intravenous (IV) and the dose was repeated thrice for analgesia. Systolic BP remained more than 200 mmHg in repeat recordings and tachycardia persisted. Twelve lead electrocardiogram showed no changes. Metoprolol 5 mg IV was given, in divided doses, to control BP. Surgery was postponed, and the patient was relieved of the headache after 30 min. Computerized tomography (CT) scan brain showed pneumocephalus along the sulci and cisternal spaces on both the sides [Figure 1]. Patient was shifted to Intensive Care Unit (ICU) for monitoring. Conservative management was advised by Neurologist. Patient did not complain of headache, nausea or vomiting during monitoring in ICU. There was no neurological deficit. Follow-up CT brain, after 72 h, showed significant resolving of pneumocephalus. Patient was scheduled for total hip replacement under general anesthesia, 4 days after the event, with standard monitoring. Intraoperatively anesthesia was maintained with oxygen, air, desflurane, vecuronium, and fentanyl. Perioperative course was uneventful and patient was discharged on the 5th postoperative day.

Dural tear during epidural block is associated with high incidence of post dural puncture headache (PDPH) due to CSF leakage.

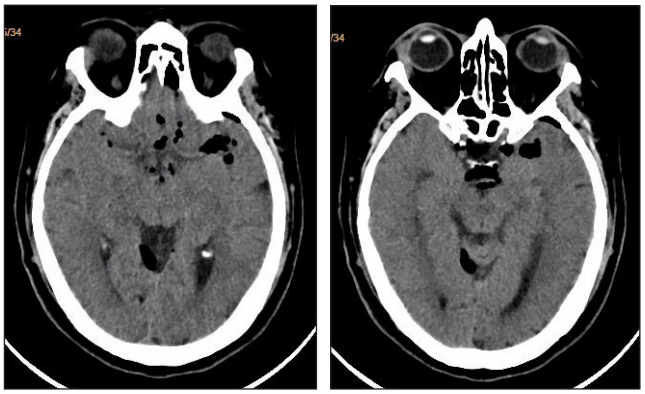

Figure 1: Computerized tomography brain shows air in left frontal, inter-hemisphere, ambient cisterns, and sulci

PDPH mostly occurs in the occipital region, and it normally occurs after 48-72 h. Sudden onset of frontal headache during an epidural procedure is rare. Its occurrence suggests the presence of air in subarachnoid space leading to pneumocephalus. Our patient complained of a severe frontoparietal headache. Cerebrovascular accident was initially suspected as high BP was recorded. CT scan brain, however, ruled it out.

There are case reports of pneumocephalus following epidural with LORA leading to sudden onset headache.[1] Depending on the site of pneumocephalus, headache has been reported to be associated with numbness in upper extremities,[2] visual disturbances,[2] and seizures.[3] However, these symptoms were not seen in our patient. The inadvertent injection of air and local anesthetic into the subdural space can lead to life-threatening complications such as hypotension, bradycardia, and apnea.[4]

Aida *et al.*[5] reported a higher incidence of post meningeal puncture headache with LORA than the loss of resistance with saline. Pneumocephalus can occur with even 2 ml of air.[6] Pneumocephalus normally disappears in 2-5 days with reabsorption of air. It should be treated conservatively with oxygen and head down position. Analgesics are administered in patients with severe headache. Pneumocephalus can be prevented by using saline to determine epidural space. The increase in pneumocephalus can be prevented by avoiding nitrous oxide during general anesthesia as nitrous oxide can increase the intracranial pressure significantly by expanding the pneumocephalus. It is recommended that epidural space should be located with saline only to avoid complications due to the air like pneumocephalus or patchy block.

Manish Jagia, Mukul Chandra Kapoor, Pratibha Panjiar

Department of Anaesthesia, Saket City Hospital, New Delhi, India

Address for correspondence: Dr. Manish Jagia, C1A-12C, Janak Puri, New Delhi - 110 058, India.
E-mail: jagiamanish@yahoo.com

References

1. Gómez-Ríos MÁ, Fernández-Goti MC. Pneumocephalus after inadvertent dural puncture during epidural anesthesia. Anesthesiology 2013;118:444.
2. Nolan RB, Masneri DA, Pesce D. Pneumocephalus after epidural injections. Emerg Med J 2008;25:416.
3. van den Berg AA, Nguyen L, von-Maszewski M, Hoefer H. Unexplained fitting in patients with post-dural puncture headache. Risk of iatrogenic pneumocephalus with air rationalizes use of loss of resistance to saline. Br J Anaesth 2003;90:810-1.
4. 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;25:262-6.
5. 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.
6. Guarino AH, Wright NM. Pneumocephalus after a lumbar epidural steroid injection. Pain Physician 2005;8:239-41.

Access this article online

Quick Response Code:

Website: www.joacp.org

DOI: 10.4103/0970-9185.173399