PNEUMOCEPHALUS FOLLOWING COMBINED SPINAL EPIDURAL ANESTHESIA

A CASE REPORT

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BACKGROUND

Regional techniques are common anesthetic modalities used in orthopedics surgery. Despite their advantages, there can be complications, namely pneumocephalus.

Accumulation of air in the interior of any intracranial compartment

- Tumours
- Trauma
- Infection
- ENT surgery
- Neuroaxial anaesthesia
- Neuro surgery

Here we describe a case of pneumocephalus following combined spinal-epidural (CSE) anesthesia with the “loss of resistance to air” (LORA) technique to the identification of the epidural space that held apparently uneventfully.

CASE REPORT

PATIENT: Women 78-year-old ASA III	PROCEDURE	Partial hip replacement (subcapital fracture of the right femur)
<ul style="list-style-type: none">Hypertension,Supraventricular arrhythmia,Overweight (BMI 29,4),Osteoarthritis,Previous ischemic stroke with sequelae,Previous total right knee replacement.	ANAESTHETIC TECHNIQUE (CSE)	<ul style="list-style-type: none">Left lateral decubitus, L3-L4 interspace, median approach, 18G Tuohy needle, loss of resistance to saline (LORS) and LORA technique.Difficult technique, multiple attempts but no CSF or blood leakage perceived.The spinal anesthesia was performed introducing a 27G pencil-point needle through the Tuohy needle, administering levobupivacaine 12,5mg plus morphine 0,1mg. Then the epidural catheter was placed

OR

- Immediately after the procedure the patient was unconscious, without any response to call or any voluntary movements, revealing only a mild response to painful stimuli (as a facial grimace), maintaining spontaneous respiration and hemodynamically stable, despite a mild decrease in peripheral oxygen saturation that was easily reversible with oxygen supply.
- Patient stayed monitored and the situation progressively and spontaneously started to improve, with total recovery in about 30 minutes, without any changes in neurologic examination besides motor and sensitive blockade of the inferior members due to spinal anesthesia

Fig 1

PACU

- The surgery was postponed and the patient remained in the PACU
- Neurology observation found no signs of neurologic dysfunction.
- Cranial CT scan (Figure 1 and 2) showed multiple intracranial air collections in the subarachnoid space, of infra and supratentorial distribution, mostly in the frontal and temporal area involving also the posterior fossa, sella turcica, inter-hemispheric fissure and Sylvian fissure, without causing brain herniations or a mass effect on the adjacent parenchyma.

Fig 2

Follow-up

- In the following days the patient was clinically stable without any neurologic changes or other symptoms related to the pneumocephalus.
- Control CE-CT scan four days after showed a markedly reduction in the quantity of the air collections.
- The patient was later operated under general anesthesia without any complications.

DISCUSSION

Loss of resistance technique → The content of the syringe depends of the preference and experience of the anesthetist.

Air vs saline

- Advantages of saline:** lower incidence of dural puncture, lower incidence of post-dural puncture headache, more effective and less patchy or incomplete blocks.
- Possible advantages of air:** better tactile sensitivity comparing to saline and any fluid that come out of the syringe can be identified has CSF.

PNEUMOCEPHALUS

Direct injection or air in the subarachnoid or subdural space that migrates to the brain.
Air bubbles → occupying space lesions → meningeal irritation

Symptoms: headache, nausea, vomiting, dizziness, focal neurologic signs, seizures, decreased level of consciousness and cardiovascular instability (depending on the distribution and quantity of air).

We conclude there are little advantages in using the LORA technique and there are rare but potentially severe complications of its use. Therefore we discourage its practice. For those practitioners who perceive some advantages in its usage, the volume of air in the syringe should be limited.

REFERENCES: 1. Gómez-Ríos MÁ, et al; Pneumocephalus after inadvertent dural puncture during epidural anesthesia. Anesthesiology 2013; 118(2):444; 2. Bolster F, et al; A preoperative headache. Anesthesiology 2013; 119:121; 3. Grondin LS, et al. Success of Spinal and Epidural Labor Analgesia. Comparison of Loss of Resistance Technique Using Air versus Saline in Combined Spinal-Epidural Labor Analgesia Technique. Anesthesiology 2009; 111:165–1721.