Pneumocephalus: a radiological presentation of intracranial hypotension secondary to spinal anaesthesia

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DESCRIPTION
A 44-year-old woman underwent a total laparoscopic hysterectomy for adenomyosis under spinal anaesthesia and general anaesthesia. Postoperatively, she recovered uneventfully and was discharged the following day. Three days after the surgery, she developed severe orthostatic headache associated with nausea. Neurological examination showed no focal neurological deficits or signs of meningeal irritation. The diagnosis was intracranial hypotension secondary to spinal anaesthesia. CT of the head revealed pneumocephalus in the subarachnoid space and cisterns of the brainstem and cerebral convexities (figure 1A). She was treated with bed rest, 30-degree Fowler position, oxygen therapy, analgesics and epidural blood patch. Her symptoms gradually improved. The repeated CT of the head 4 days after the epidural blood patch showed resolution of pneumocephalus (figure 1B).

While pneumocephalus is commonly seen following opened head trauma and neurosurgery,\(^1\) it is a rare radiological presentation of intracranial hypotension after spinal anaesthesia. The proposed mechanisms of pneumocephalus secondary to spinal tapping are the ball-valve mechanism\(^2\) and the inverted soda-bottle effect.\(^3\) After a dural–arachnoid tear from spinal tapping, air leaks into the subarachnoid space through the puncture site causing air trapping from the ball-valve effect. The air then travels through the subarachnoid space and cisterns to the uppermost part of the brain due to relatively lower pressure (the inverted soda-bottle effect).

Learning points
- CT scan is the diagnostic tool for identifying pneumocephalus.
- Non-tension pneumocephalus usually resolves spontaneously by conservative management including bed rest, 30 degrees Fowler position, avoiding Valsalva manoeuvre, analgesics and high flow oxygen therapy.
- Physicians should recognise pneumocephalus as a rare radiological presentation in patients with intracranial hypotension after spinal anaesthesia.

Figure 1 (A) CT of the head showed scattered pneumocephalus in the subarachnoid cisterns of the brainstem and cerebral convexities. (B) Repeated CT of the head 4 days after the epidural blood patch showed resolution of pneumocephalus.

REFERENCES

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