

Spontaneous pneumocephalus caused by the association of pneumosinus dilatans and meningioma

Case illustration

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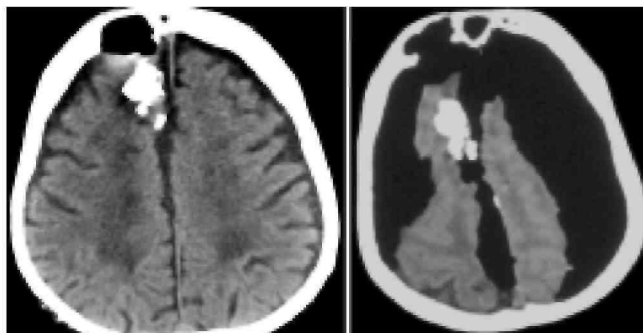
Pneumosinus dilatans (PSD) refers to an abnormally enlarged, air-filled paranasal sinus without radiological evidence of localized bone destruction, hyperostosis, or mucous membrane thickening. This disorder has been associated with meningioma, especially optic nerve sheath meningioma,¹⁻³ but its pathophysiology remains unclear. Spontaneous pneumocephalus is an exceptional presentation of PSD and, to our knowledge, has never been associated with meningioma.

This 74-year-old man in previously excellent general condition was admitted to our hospital for acute headache and progressive obtundation. A computed tomography (CT) scan of his head revealed pneumocephalus and PSD. The posterior wall of the right frontal sinus was completely eroded by a 3-cm intracranial calcified frontal mass (Fig. 1 *right*). Interestingly, a CT that had been obtained 1 month before admission (Fig. 1 *left*) already showed both the PSD and meningioma, which was then located close to the frontal sinus with an incompletely eroded posterior wall. There was no radiological sign of pneumocephalus.

Initially, the pneumocephalus was emergently evacuated via bilateral bur holes. The patient improved dramatically, and a bicoronal craniotomy was performed. Operatively, there was a large osseous defect in the posterior wall of the right frontal sinus, and the dura mater was thickened and adhered to a gray extraaxial mass invading surrounding brain. The tumor and overlying dura were resected, and the frontal sinus was plugged with bone dust and fibrin glue. The durai defect was closed using parietal pericranium, and a frontal flap of pericranial tissue was folded over the frontal sinus and laid along the anterior cranial base. Neuropathological examination of the lesion revealed fibrous meningioma.

The association of PSD and meningioma eroding the posterior wall of the sinus could be the origin of the pneumocephalus. Because of the risk of dramatic neurological deterioration, a neurosurgical procedure including bifrontal craniotomy, cranialization of the PSD, and resection of the meningioma should be considered, even if a patient is asymptomatic.

FIG. 1. *Left: Head CT obtained 1 month before admission, already showing the PSD in contact with a 3-cm intracranial mass. Right: Head CT revealing tension pneumocephalus and PSD involving the right frontal sinus together with a large defect in the posterior wall and a 3-cm right intracranial calcified mass.*



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