

Case report

Delayed spontaneous pneumocephalus in ventriculoperitoneal shunting: Two case reports and literature review

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ABSTRACT

Spontaneous pneumocephalus following cerebrospinal fluid shunt is a rare complication. In most cases, the air enters in the intracranial cavity via a skull base defect. We report 2 cases of delayed tension pneumocephalus, secondary to ventriculoperitoneal shunt, and review the etiopathogenesis, prevention and treatment of this condition.

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Neumoencéfalo espontáneo tardío posterior a la colocación de válvula ventriculoperitoneal: 2 casos clínicos y revisión de la literatura

RESUMEN

El neumoencéfalo a tensión es una rara complicación después de la colocación de sistemas de derivación de líquido cefalorraquídeo. En la mayoría de casos la etiopatogenia está relacionada con un defecto de la base del cráneo. Presentamos 2 casos de neumoencéfalo tardío a tensión después de la colocación de derivación ventriculoperitoneal y revisamos la literatura, analizando los mecanismos de etiopatogenia, así como las posibles formas de prevención y tratamiento.

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Introduction

Pneumocephalus after shunting may be immediate, occurring in the first few days after shunt placement, or delayed, appearing months or years following ventriculoperitoneal (VP) shunt insertion.^{1,2} This second scenario is more unusual and, because of the lack of a temporal relationship between the VP shunt insertion and the pneumocephalus appearance, the causal diagnosis may be much more elusive.

We are reporting two new cases of delayed spontaneous pneumocephalus, which developed 1 and 5 years after VP shunt placement. We review the literature concerning the physiopathology and management, as well as possible approaches to prevention of this condition.

Case reports

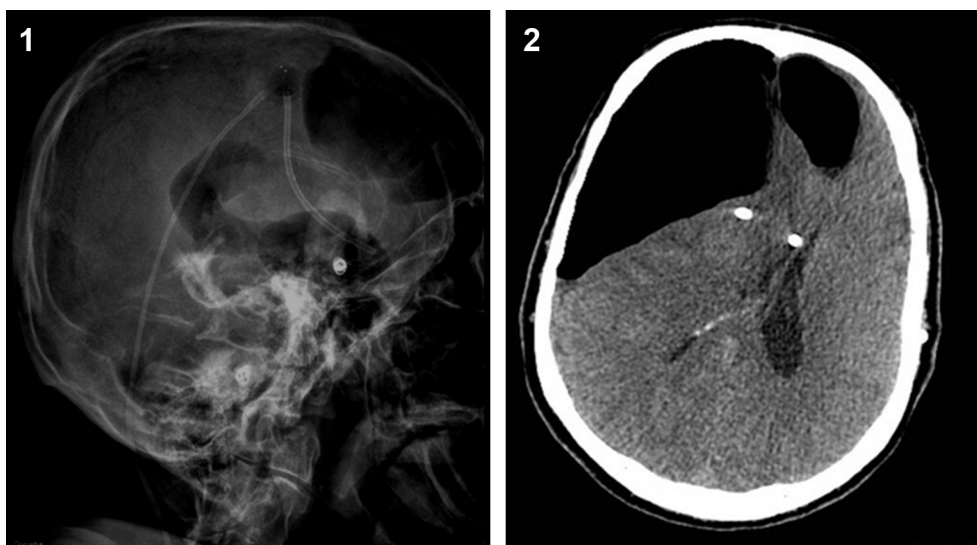
Case 1

A 65-year-old man with a history of subarachnoid hemorrhage secondary to right paraophthalmic aneurysm that was treated endovascularly. The patient's condition was complicated by a communicating hydrocephalus that required a VP shunt. One year later the patient was readmitted complaining of headache, drowsiness, gait disturbance and progressive language impairment.

The cranial CT scan showed pneumocephalus in the frontal and ventricular regions (Figs. 1 and 2). Further assessment with high-resolution bone-window CT did not detect any defects at the skull base.

The shunt was clamped and the pneumocephalus was evacuated. Finally, a programmable anti-siphon valve was implanted, with the opening pressure set at 150 mmH₂O.

Two weeks later the patient was discharged with residual hemiparesis but with complete resolution of the pneumocephalus (Fig. 3). There has been no recurrence during the following 18 months.



Figs. 1 and 2 – Cranial X-ray and CT showing bifrontal tension pneumocephalus causing significant ventricular compression and midline shift.



Fig. 3 – Follow-up CT scan with resolution of the pneumocephalus.

Case 2

A 64-year-old man, with a history of post-meningitis hydrocephalus treated with ventriculoperitoneal shunt 5 years previously (Fig. 4), was admitted to our department presenting with headache, nausea, vomiting and seizures. A right frontal basal pneumocephalus was observed in the CT scan (Fig. 5). The pneumocephalus was evacuated and the ventriculoperitoneal shunt was removed due to infection.

After these procedures, a CT scan reconstruction of the skull and cisternography were carried out. Although no cerebrospinal fluid fistula was detected, a probable skull defect at the level of the frontal sinus was observed in the skull CT reconstruction (Fig. 6). Therefore, the anterior cranial fossa was examined surgically and the skull base defect was confirmed and sealed.

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