

Ball-Valve Mechanism of Colloid Cysts

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An 18-year-old woman, with a 5-month history of intermittent acute headaches, was admitted to her local hospital owing to drowsiness and confusion. Her mother described a feeling of heaviness in the head when leaning forward, and dizziness, followed by short and intense headaches, sometimes accompanied by vomiting and blurred vision. The symptoms were typically transient and disappeared suddenly after a few minutes. No focal neurological deficits were noted. The brain computed tomography (CT) scan showed an acute obstructive biventricular hydrocephalus and a spherical isodense lesion in the anterior third ventricle (Fig. A, white arrow). During the transfer of the patient to our clinic, her level of consciousness declined acutely. She was intubated and sedated.

Upon arrival, magnetic resonance imaging (MRI) T2-weighted axial images (Fig. B) confirmed the obstruction of both interventricular foramina by an approximately 1cm hyperintense colloid cyst (black arrow) of the roof of the third ventricle. The lesion appeared hypointense on the T1-weighted images and did not contrast enhance. The very thin third ventricle (white arrowheads) highlighted the strictly biventricular nature of the hydrocephalus. Periventricular hypodensity on CT and hyperintensity on T2 MRI demonstrated cerebrospinal fluid (CSF) resorption from the increased hydrostatic pressure. The patient underwent an urgent, minimally invasive endoscopic surgery. There was complete and immediate postoperative recovery, with a normal neurological examination. The operative endoscopic view from the right lateral ventricle (Fig. D) shows the colloid cyst (*) obstructing the right interventricular foramen. The

septum pellucidum (SP), the right fornix (Fx), the choroid plexus (CP) and the right thalamus (Th) are also visible. Only a narrow window remains for the CSF flow (black curved arrow).

The wall of the cyst was fenestrated, and the viscous and heterogeneous contents were aspirated, allowing the cyst to collapse and the restoration of CSF circulation. T2-weighted axial MRI at 2 months follow-up (Fig. C) shows the collapsed cyst and resolution of hydrocephalus, with permeable Monro foramina.

Colloid cysts are benign tumors, most often asymptomatic, representing around 1% of all intracranial neoplasms. They are usually discovered between 35 and 60 years of age. Although benign, their localization is ominous because they can potentially cause obstruction of both foramina of Monro¹ and acute biventricular hydrocephalus. Their shape and relative rigidity can cause positional “ball-valve” gravity- and pressure-dependent foraminal closure leading to flow obstruction, causing headache. An increase in the intensity or frequency of symptoms is believed to be a signal of impending acute foraminal closure. Coma, by complete obstruction of CSF pathways, is rare but leaves little time for life-saving surgery. Sudden death is exceptional and can occur spontaneously² or after a lumbar puncture by immediate and fatal tonsillar herniation.³ Although colloid cysts are usually hyperdense on brain CT, they can sometimes be isodense to the brain, as in this case. If the isodense cyst is also small, it can be missed on CT scanning, but usually appears on MRI. Understanding the pathophysiology of colloid cysts is essential to identify and treat them in a

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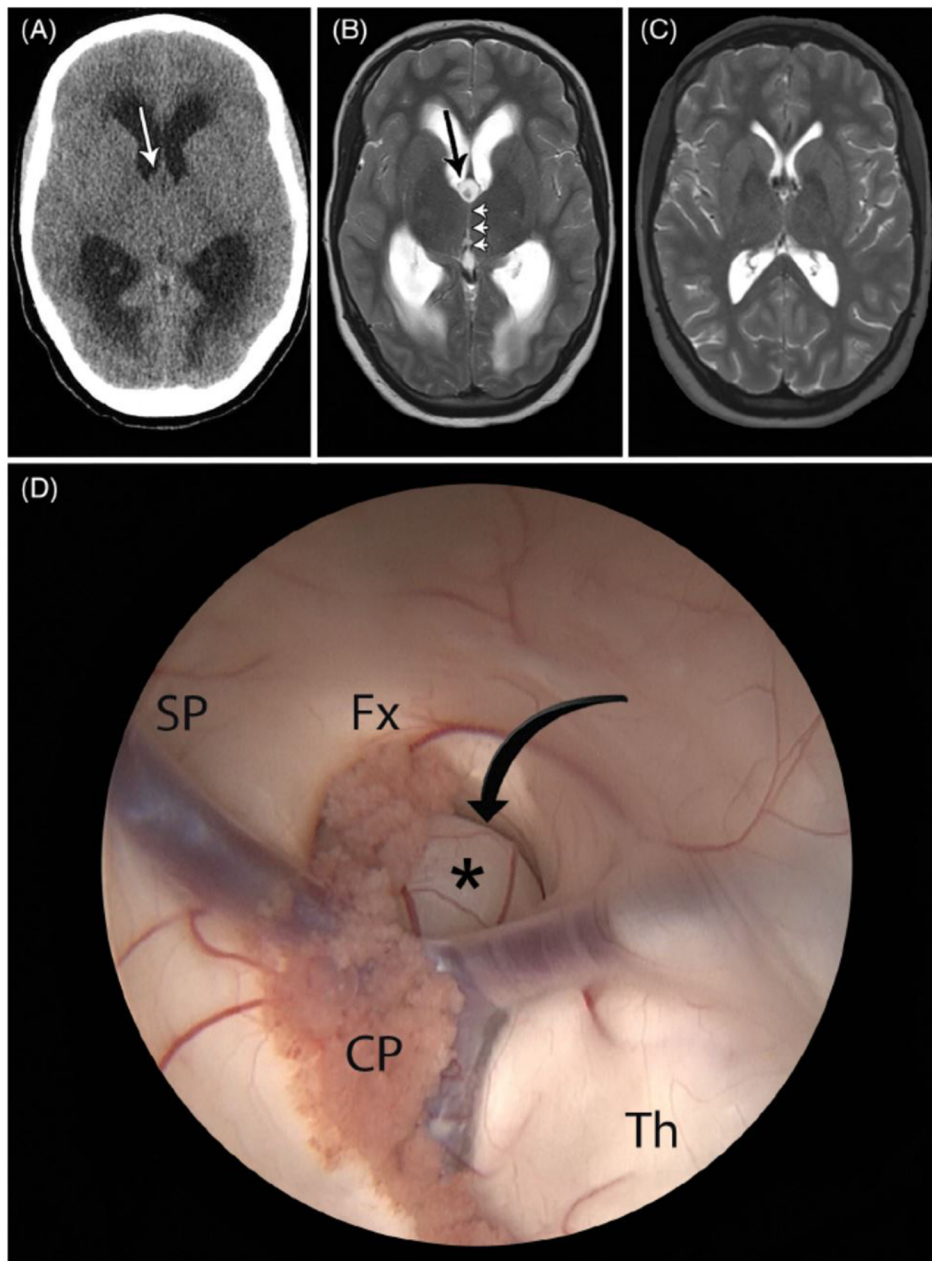


FIGURE: Radiological and surgical images [Color figure can be viewed at www.annalsofneurology.org]

timely way and to avoid hazardous diagnostic examinations, such as lumbar taps.

Author Contributions

All authors were involved in patient management. F.L., A.L. and E.S. contributed to the conception and design of the study; F.L. and A.L. contributed to the acquisition and analysis of data; F.L., A.L., J.F.Z.-J. and E.S. contributed to drafting the text and preparing the figure.

Potential Conflicts of Interest

Nothing to report.

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