Reversible Child Cognitive Impairment and Suprasellar Arachnoid Cyst

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Arachnoid cysts are fluid-filled suprasellar arachnoid cyst (SACs) surrounded by a transparent arachnoid membrane. Prevalence in children is estimated at 1 to 3%.[1] Most arachnoid cysts are asymptomatic and do not need specific treatment. SACs represent 1 to 20% of all arachnoid cysts. Our case is classified as an SAC-1 subtype[2] (43% of all SACs). It is originated from an expansion of the diencephalic leaf of the Liliequist membrane, explaining its upward growth until the appearance of obstructive hydrocephalus.

Minimally invasive treatment of arachnoid cysts by surgical endoscopic fenestrations took over invasive craniotomies, especially when hydrocephalus is associated, as it provides natural fluid spaces to navigate deep into the brain, allowing to restore cerebrospinal fluid (CSF) dynamics between all compartments.

Early recognition of developmental delays and cognitive impairment is of paramount importance in pediatric neurology as many causes can be amenable to treatment with reversible neurological deficits. Our case illustrates an uncommon symptomatic presentation of a benign entity (Fig). The positive outcome is related to the recognition of the clinical decline and the successful restoration of CSF dynamics.

Author Contributions

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., J.Z., and E.S. contributed to drafting the text and preparing the figure.

Potential Conflicts of Interest

The authors declared no conflict of interest.

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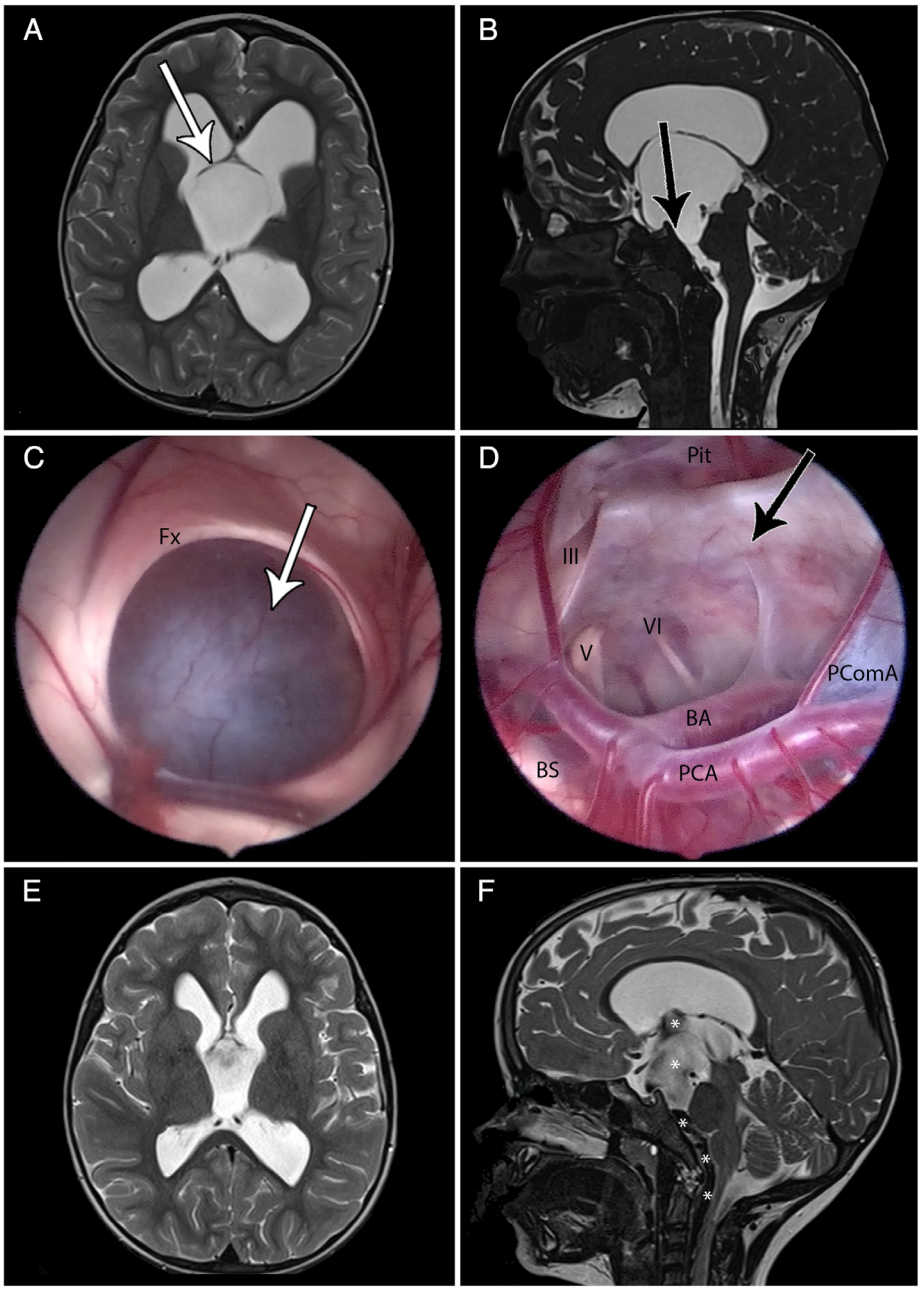

FIGURE: A 4-year-old girl was addressed to our department with a 1-year clinical history of clumsiness, gradual cognitive decline, language disorders, and chronic headaches. Her parents reported a dramatic drop in school performance. Clinical evaluation showed no macrocrania and no abnormalities in long tracts, cranial nerves, or cerebellar function. Neuropsychological evaluation revealed alterations of executive functions (nonverbal solving tasks, visuospatial planning, and organization), attention and concentration, short and long-term memory (visuospatial, story, and word-list recalls), motor apraxia (skilled movements, imitation, and pantomime of gestures), lower phonemic verbal fluency and speech apraxia (initiation, articulation, and prosody). Magnetic resonance imaging (MRI) shows in T2-weighted axial images an obstructive biventricular hydrocephalus due to a large suprasellar arachnoid cyst (SAC) bulging into the third ventricle (A). The cyst lines the skull base, distorts the floor of the third ventricle, compressing the optic chiasm, pituitary stalk, both fornixes, the pons, and obstructing both foramina of Monro, as seen in sagittal Fast Imaging Employing Steady-state Acquisition (FIESTA) sequence (B). Endocrinological investigations showed preserved pituitary function and ophthalmological examination was normal, without papillary edema. We performed a minimally invasive neuroendoscopic procedure to fenestrate the cyst with the ventricles and basal cisterns. The intraoperative neuroendoscopic view entering from the right lateral ventricle (*white arrow*) shows the obstruction of the right foramen of Monro by the cyst (C), distorting the fornix (Fx). A deeper intra-cystic view (*black arrow*) shows in detail the anatomy of the skull base (D). Postoperative T2-weighted axial (E) and sagittal (F) MRI shows marked hydrocephalus amelioration, cyst collapse and cerebrospinal fluid (CSF) flow artifacts (*asterisks*) into the ventricles and basal cisterns, characterized by "smoke-like" T2 hyposignals through fenestrations. The patient recovered fully after a few weeks and went back to school with complete resolution of symptoms. Neuropsychological evaluation was normal at 5-year follow-up. BA = basilar artery; BS = brainstem; PCA = right posterior cerebral artery with brainstem perforators; PComA = right posterior communicating artery; Pit = pituitary gland and stalk; III, V, and VI = left cranial nerves. [Color figure can be viewed at www.annalsofneurology.org]