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LETTER TO THE EDITOR

Pseudo-spontaneous third ventriculostomy

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Dear Editor:

A 13-year-old healthy girl was admitted with daily episodes of hand tremor for the last 2 years. During the recent year, the tremor worsened, and the patient developed periodical headaches. Magnetic resonance imaging (MRI) showed hydrocephalus with distal aqueductal obstruction. Sagittal T2 SPACE sequence revealed flow void thorough floor of the third ventricle, highly suspicious for spontaneous third ventriculostomy (Fig. 1a, white arrow). On T1 MRI, the floor of the third ventricle was not clearly visualized, but it had some tendency to sag (Fig. 1c, white arrowhead). In spite of MRI findings, we decided to pursue endoscopic ventriculostomy. During surgery, no perforation was seen, but the floor of the third ventricle appeared very loose and dilated (Fig. 1e). An uneventful endoscopic third ventriculostomy (ETV) was performed, and the patient recovered fast after surgery. Control MRI 1 month after surgery showed resolution of hydrocephalus and prominent flow void similar to preoperative imaging and no sagging of the third ventricle's floor (Fig. 1b, d).

Spontaneous third ventriculostomy (STV) is a rare finding but has been described in several cases of chronic obstructive hydrocephalus [1, 2]. STV typically develops when there is an obstruction, often at the region of aqueduct, causing long-standing hydrocephalus. In acute hydrocephalus, ventricular compliance is low, usually preventing spontaneous wall rupture.

Different methods of neuroimaging are used to demonstrate cerebrospinal fluid (CSF) flow or an obstruction: sagittal T2-FSE/TSE, 3D-SPACE/CISS, phase-contrast MRI, and MR/CT cisternography.

In our case, 3D-SPACE was strongly suggestive for STV, but moderate hydrocephalus together with a ballooned third ventricle lead us to suspect that the flow artifact was not secondary to a true flow through the third ventricular floor, but rather secondary to the motion of the third ventricular floor. We considered intrathecal contrast injection for cisternography too risky due to the obstruction at the level of aqueduct and decided to take the patient for endoscopic procedure.

Intraoperatively, we confirmed that the floor of the third ventricle was not perforated, but rather thin and loose; thus, we speculate that pulsation of the dilated floor was a reason of the flow void artifact of preoperative MRI images.

In conclusion, a flow artifact at the floor of the third ventricle may not necessarily represent a flow void through a patent stoma, but rather may reflect fast up-down motion of a thin third ventricular floor. Thus, preoperative evaluation of the CSF anatomy, as well as follow up after an ETV, should take into account the clinical condition, as well as other anatomical factors such as ventricular size, effacement of subarachnoid spaces, periventricular edema, and orientation of the third ventricular floor and lamina terminalis.

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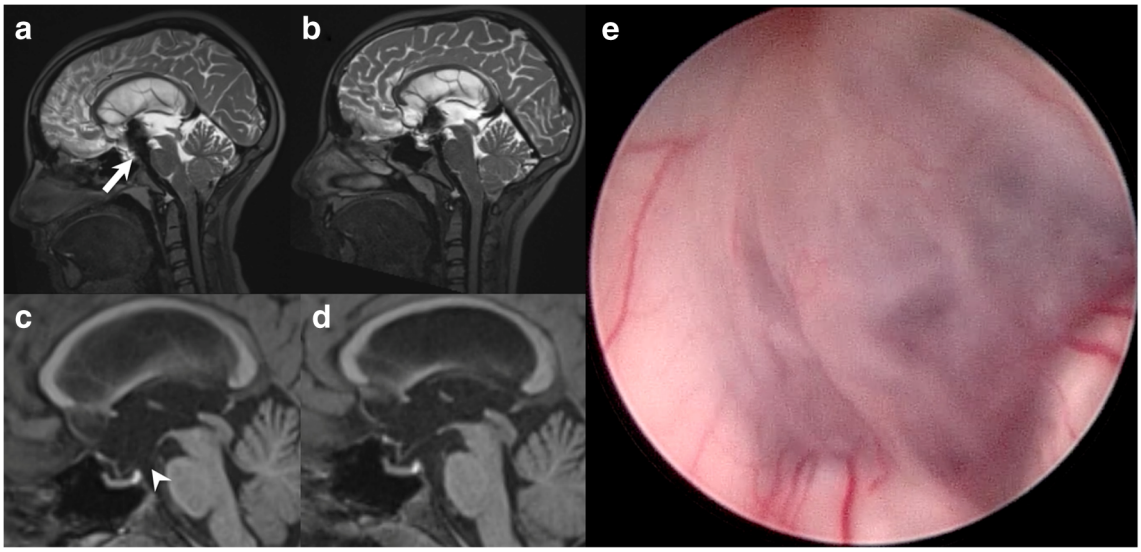

Fig. 1 Mid-sagittal 3D-SPACE T2-weighted MRI before (**a**) and after (**b**) surgery showing prominent flow void through the floor of the third ventricle,; white arrow, pseudo-flow void artifact. Mid-sagittal T1-weighted MRI before (**c**) and after (**d**) surgery showing position of the third ventricle's floor. Before surgery, the floor is not clearly seen but has some tendency to sag (white arrowhead). After surgery, the floor is without any sagging. **e** Intact, but loose, floor of the third ventricle just before ventriculostomy

Compliance with ethical standards

Conflict of interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

Informed consent Informed consent was obtained from all individual participants included in the study.

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