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LETTER TO EDITOR

Valsalva maneuver aided adherent ventriculoperitoneal shunt removal

Sir,

Removal of malfunctioning ventriculo peritoneal (VP) shunt is occasionally complicated by difficulty in extricating its ventricular end. Commonly implicated reasons are granulation tissues, choroid plexus adhesion, burying or encasement of the catheter.[1] In such situation, aggressive traction may precipitate catheter shearing or catastrophic intraventricular hemorrhage. We encountered a case where the proximal end of the VP shunt was adhered inside the ventricles and did not extricate with gentle traction. Application of valsalva maneuver (VM) helped us in retrieving the stuck end from the ventricle. After obtaining written and informed consent from the patient, we wish to report this event.

A 20-year-old patient suffering from Tubercular meningitis required a revision surgery for a VP shunt placed 8 months previously due to shunt malfunction (evidenced by noncompressible shunt chamber and computed tomography (CT) scan demonstrating ventriculomegaly with periventricular lucency) [Figure 1]. Following standard protocol anesthesia was induced, and the patient positioned. After initial exploration of the abdominal end of the shunt, which showed the absence of cerebrospinal fluid (CSF) flow (indicating obstruction at the ventricular end), separate shunt was placed successfully on the contralateral side. As extraction of the nonfunctioning ventricular catheter was attempted, it was found that it had stuck inside the ventricle. While the surgeon grasped the catheter with an artery forceps keeping it straight and taut, VM was repeatedly applied increasing the airway pressure to about 10 cm of H_2O above the peak pressure and sustained for about 10 s. During the third attempt of VM, the surgeon could feel the dislodgement at the ventricular end, and catheter could be extracted smoothly. Rest of the surgery completed uneventfully. Postoperatively no neurological deterioration occurred, and CT scan did not show any evidence of intraventicular hemorrhage.

Figure 1: Computed tomography scan showing ventriculo peritoneal shunt inside the ventricle

Various drills like grasping the catheter with a hemostat and rotating, passing a stylet and electrocauterizing through it[2] and intraventricular endoscope cauterization have been recommended to release the adherent end. VM effects the cerebral circulation[3] and increases intracranial pressure (ICP)[4] as the abdominal, and pulmonary pressures changes are propagated to the vascular system of the central nervous system. The resultant variation in the volume of the rigid skull is compensated by movement of CSF, brainstem and spinal cord. VM moves the brainstem cephalad and caudad by 2-3 mm.[5] We postulate that the displacement of intracranial contents and CSF, which occurred during VM resulted in conformational changes around the adherent catheter tip and severed its flimsy adhesions with the granulation tissues or choroid plexus, thus freeing it. Prabhakar *et al*.[6] had reported the utility of the same technique for delivering a cyst from the fourth ventricle using a higher pressure (20 cm of H_2O greater than the peak pressure for 10-15 s). Gentle VM can thus be attempted as an initial measure prior to invasive methods like electrocauterization of the tip in conditions where the catheter is adhered inside the ventricle. However, the universal efficacy and safety of this method can only be ascertained through large scale investigations. In refractory cases with high chances of neovascularization (shunt placement duration more than 12 months)[1] and where intracranial pathology mandates prevention of ICP rise, endoscopic removal should be considered as the procedure of choice.

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Conflicts of interest

There are no conflicts of interest.

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