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Multiple Shunt Catheter Tips Migration into an Inguinal Hernia in an Adult

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Abstract

Although ventriculoperitoneal shunt tip migration into an inguinal hernia is considered common in children, while in adults it is quite rare. In fact, only a handful of cases have been reported in the literature. We report a rare case whereby two catheter tips (one from a lateral ventricle shunt and a second from a 4th ventricular shunt) migrated into an inguinal hernia. This migration caused distal shunt malfunction, and only distal catheter shortening and suturing to the abdominal wall caused the two shunts to function again.

Keywords

- 4th ventricle shunt
- distal catheter
- distal shunt malfunction
- inguinal hernia
- VP shunt

Case Presentation

We report a case of a 62-year-old man who underwent ventriculoperitoneal (VP) shunt placement in 1988 due to hydrocephalus secondary to meningitis. He was otherwise healthy except for gastroesophageal reflux disease, treated with a proton-pump inhibitor, and a lumbar fixation. The patient was functioning with no neurological deficits up until 7 months prior to his admission, when he started developing a progressive weakness in both his legs and left arm. In the same period, and 2 weeks prior to his admission, he developed severe frontal headaches that worsened while sitting or standing. Furthermore, he developed severe hoarseness and started using a wheelchair for ambulation.

On his admission, the patient had severe hoarseness, a 3 +/5 weakness in both his legs, and a ⅘ right hand weakness. Pupils were equal and responsive, and his left vocal cord was paralyzed.

A head magnetic resonance imaging performed on his admission (►**Fig. 1**) showed marked 4th ventricular dilatation, with no similar dilatation of the lateral ventricles (trapped 4th ventricle). Under general anesthesia, a second VP shunt was inserted, connecting the fourth ventricle to the abdominal cavity (openly). The procedure was unremarkable, and the shunt valve used was a CERTAS adjustable valve (CODMAN, United States) set at level 5 (178 mm H_2O)[1] opening pressure. A few days following surgery, a head computed tomography (CT) scan showed a mild decrease in the diameter of the 4th ventricle but also an increase in the diameter of the lateral and 3rd ventricles. Another head CT scan performed because of increased headaches showed an increase in the 4th and lateral ventricles as well. A thoracolumbar CT scan (►**Fig. 2**) showed both catheter distal ends placed in a right inguinal hernia with the inguinal sac filled with cerebrospinal fluid (CSF).

Optional treatments for this complication include observation and serial monitoring for spontaneous reduction of the shunt, returning to the operating room for laparoscopic shunt revision alone, returning to the operating room for laparoscopic shunt revision and open hernia repair, and

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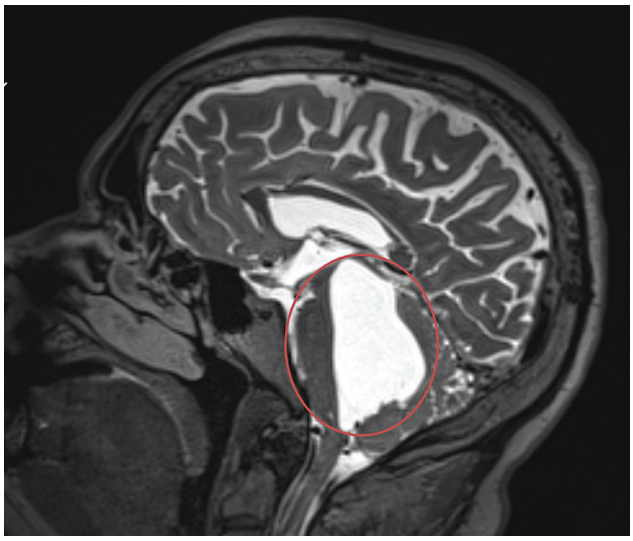

Fig. 1 Sagittal T2 magnetic resonance imaging (MRI) image performed before the second shunt (4th ventricle) was inserted.

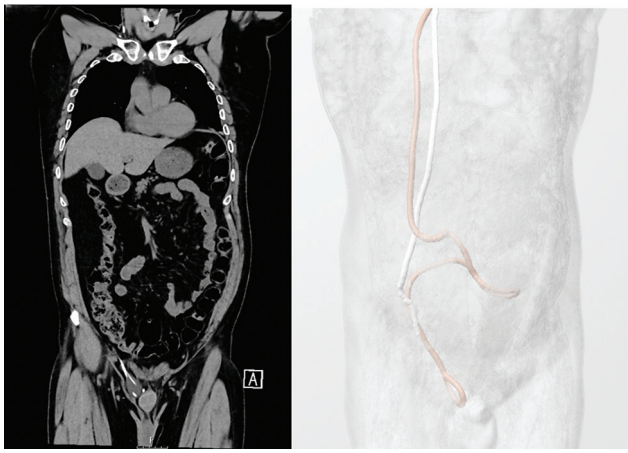

Fig. 2 Left: Coronal computed tomography (CT) scan showing both catheter ends in the inguinal sac hernia on the right side (orange circle) with the hernia cavity filled with cerebrospinal fluid (CSF). Right: Three-dimensional (3D) depiction of the distal catheters, with tips located in an inguinal hernia.

returning to the operating room for laparoscopic extraperitoneal hernia repair (total extraperitoneal repair) (►**Fig. 3**).

Operation

We started with a diagnostic laparoscopy with distal shunt revision. The hernia was small and otherwise asymptomatic and the added risks and complications for hernia repair were not justifiable in our view. The patient was brought to the operating room and placed in a supine position, where general anesthesia was induced. We began with a diagnostic laparoscopy with the intent of reducing the catheter and obtaining abdominal access with the Hasson technique. After insufflation, we noted that the catheter had self-reduced and was situated in the abdomen. Both catheter ends were shortened and sutured to the abdominal wall using a non-absorbable 3.0 V-LOCK sutures, and the two catheter ends were placed in the pelvis. Both distal ends were checked to

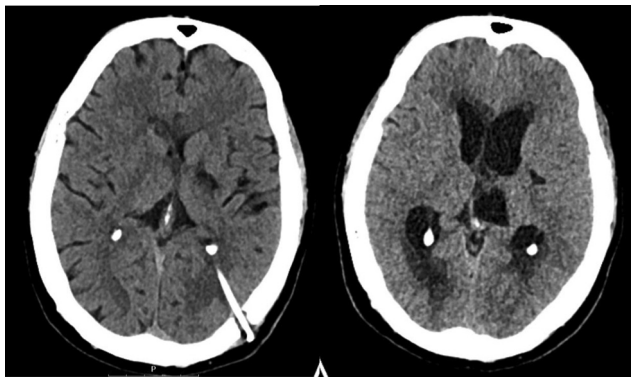

Fig. 3 Pre- (right) and post- (left) operation (OP) computed tomography (CT) scan, showing the resolution of the lateral ventricles hydrocephalus.

see that they drained the CSF and that the suture did not block their flow. It is important to note that following the procedure, the patient improved both clinically and radiologically, whereby a head CT scan showed a decrease in the maximal diameter of the 4th ventricle as well as the lateral ventricles. The patient recovered appropriately and was discharged a few days later.

Discussion

Only three adult occurrences of VP shunt migration into the scrotum have been documented to the best of our knowledge.[2–4] Laparoscopic distal catheter trimming was used in one instance to treat this condition.[3] In another instance, the shunt caused scrotal perforation and had to be completely replaced.[2] In neither case was a hernia repaired concurrently with the shunt revision. Another case report advocated concurrent hernia repair since the patient had symptoms relating to his hernia.[4] We trimmed the catheter ends, but since the inguinal hernia was asymptomatic, we decided it was best to refrain from a hernia repair.

Inguinal hernias with VP shunt incarceration have often been described in children, although adult cases have been documented far less frequently.[5]

The Mechanism of Shunt Migration into a Hernia Sac

The rate of incarceration of shunt catheters among children with newly discovered inguinal hernias has been reported to be as high as 20%.[6] This is thought to be connected to the buildup of volume in the peritoneal cavity, which may increase the risk of hernia development or growth. When compared with adults, who typically develop inguinal hernias because of fibromuscular weakening of the abdominal wall, it may be because congenital hernias from a patent processus vaginalis account for a greater proportion of inguinal hernias in the pediatric population. Various factors, including the up and down movement of the liver during respiration and forceful peristalsis of the pylorus and duodenum, are involved in the displacement. Vigorous peristaltic movement of the small bowel aids migration.[7,8]

Even though VP shunt imprisonment in an inguinal hernia is still a relatively uncommon issue, it is crucial to acknowledge

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it as a potential reason for VP shunt dysfunction and take repair options into account based on the patient profile.

Conflict of Interest
None declared.

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