Spontaneous umbilical fistula from ventriculoperitoneal shunt drainage

Report of two cases

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Two cases of spontaneous fluid fistula through the umbilicus connected with the drainage from a ventriculoperitoneal shunt are described. In neither case was it necessary to remove the shunt.

KEY WORDS • ventriculoperitoneal shunt • hydrocephalus • umbilical fistula • cerebrospinal fluid

VENTRICULOPERITONEAL (VP) shunt in the treatment of hydrocephalus has resulted in various complications, especially in relation to the peritoneal catheter. We are presenting two cases in which a spontaneous fistula developed through the umbilicus, related to the drainage system for the shunt. This complication has not previously been reported.

Case Reports

Case 1

This 17-day-old girl entered the Hospital on May 17, 1973. She had a lumbosacral myelomeningocele and deformities of the legs and lumbosacral spine.

Examination. She was an alert baby, who cried strongly when stimulated. She had inferior paraparesis of the legs, muscular hypotonia, free articular movement, equinovarus feet, and anal and vesical incontinence. There was a nodular sac on the lumbosacral region containing a dark brown structure corresponding to the neural plate. The anterior and posterior fontanels were tense and bulging, with widening of the sagittal suture. The head circumference was 40 cm. On admission the cerebrospinal fluid (CSF) was normal. Ventriculography showed dilatation of the lateral and third ventricles, with cerebellar tonsil herniation (Arnold-Chiari malformation) and basal cistern blockage.

Course. After surgery for the lumbosacral meningomyelocele, a VP shunting procedure was performed. A spontaneous CSF fistula developed through the umbilicus 20 days later, followed by abdominal abscess and meningitis. The abscess was drained through the umbilicus, and an antibiotic treatment for the infection was initiated. Two months later, the CSF was clear but there were signs of intracranial hypertension and a ventriculoatrial (VA) shunt was inserted. Infection of the scalp scar and malfunctioning of the system prompted its withdrawal. The child died 8 months postoperatively.
Case 2

This 15-year-old girl entered the Hospital on March 14, 1974, complaining of liquid draining through the umbilicus. When she was 7 years old, hydrocephalus was found with obstruction of the foramina of Luschka and Magendie. A VA shunt was instituted at that time. Nine months before her present admission, a VP procedure had been performed because of obstruction of the VA shunt.

Examination. The girl had an enlarged head and an umbilical fistula with leakage of CSF, which proved to be normal on testing. Despite her mother's report on a previous untreated umbilical hernia, no signs of it were found on examination. A plain film of the abdomen showed the point of the peritoneal catheter at the level of the third sacral vertebra. An injection of contrast material through the umbilicus disclosed a fistulous tract with retrograde filling of the tubing (Fig. 1).

Course. The patient was treated with antibiotics and daily dressings, then discharged without symptoms. An x-ray film with injection of contrast material taken 15 days after admission showed the fistula had resolved.

Discussion

By mechanical compression of the shunt pumps in these two cases we found an increase in the flow of fluid through the umbilicus. The formation of a fistula on the navel is not difficult to diagnose, even though it is uncommon, because its location in the median raphe naturally renders it a place of lesser resistance. It must also be considered that a structural malformation of the abdominal wall may be a contributing factor. In one of our cases there was a history of umbilical hernia. Adeloye, in a somewhat similar case, considered the nonocclusion of the vitelline duct of real importance. Grosfeld and Cooney reported that increased abdominal pressure may be related to this condition, since in some instances CSF production exceeds the peritoneal capacity of absorption.

Peritoneal adhesions must have formed around the catheter in relation to the parietal peritoneum, producing a fibrous tunnel and bridging the distance between the end of the catheter and the umbilicus.

A CSF umbilical fistula may be accompanied by no other complications. Clinical treatment is sufficient, even if there is ascending infection through the shunt, when there seems to be no need to withdraw the catheter. It is evident that when faced with a fistula of this kind and an umbilical hernia, correction of the hernial defect is of utmost importance in the treatment of the fistula.

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References


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