Ascites from a ventriculoperitoneal shunt

Case report

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An unusual case of ascites secondary to a ventriculoperitoneal shunt is presented. The ascites did not redevelop following diversion of the distal catheter into the right atrium, and no adequate explanation was found as to why the cerebrospinal fluid was not absorbed by the peritoneum.

KEY WORDS • hydrocephalus • ventriculoperitoneal shunt • ascites

Only five cases of cerebrospinal fluid (CSF) ascites have been reported previously. The present case involves ascites resulting from a ventriculoperitoneal shunt.

Case Report

This baby girl was born on May 13, 1974, after a difficult forceps delivery due to obstructed labor; the pregnancy had been normal. Head circumference at birth was 40.5 cm, and had increased to 43 cm by 1 week. The child had no other abnormalities. Air ventriculograms revealed a severe obstructive hydrocephalus with a cerebral mantle of 5 mm.

Ten days after birth, a Pudenz ventriculoperitoneal shunt was inserted with the use of a Silastic Raimondi spring-reinforced peritoneal catheter. After this, the child did well and was discharged with a head circumference of 42.5 cm. At 3 months of age, however, the patient was referred back to the hospital with a large collection of ascitic fluid that had accumulated over 1 week. Her head circumference was stable at 43 cm and she was mentally bright. The shunt system was working well. Liver and renal function tests were normal and the ascites could not be adequately explained. Paracentesis was performed in order to relieve respiratory problems, and 1 liter of clear xanthochromic fluid obtained. This fluid had a protein content of 700 mg%; 50 red blood cells/mm³; and 10 white blood cells/mm³. The fluid was sterile on culture, with no malignant cells.

The ascites rapidly redeveloped, and 1 week later 700 ml of clear fluid was obtained by paracentesis. Again this showed a raised protein content and was sterile on culture. Air ventriculogram again demonstrated obstructive hydrocephalus (secondary to aqueductal stenosis) with no evidence of any coincidental intracranial tumors.

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After this, the peritoneal catheter was removed and the shunt redirected into the right atrium. During this procedure, a laparotomy was performed by a general pediatric surgeon and no abnormalities could be found macroscopically in the liver, peritoneum, gastrointestinal tract, kidneys, or pelvic organs. The liver and parietal peritoneum were biopsied, and neither showed any histological abnormalities. The ascitic fluid was clear and had the same protein content as the CSF (110 mg%). Again, the fluid was sterile on culture.

Following this procedure, the shunt system worked well. Head circumference remained at 43 cm and the child was still mentally alert. The ascites has not reaccumulated.

Discussion

Apart from the common complications of shunting, such as blockage and infection, several unusual complications have been reported over the last few years. Our patient developed an ascites due to inability of the peritoneal cavity to absorb CSF from a ventriculoperitoneal shunt. This is unusual as the area of the peritoneal cavity is large and normally able to absorb large volumes of fluid. No cause could be found as to why the fluid was not being absorbed, although one must assume that a lymphatic obstruction caused diminished return of the fluid to the vascular compartment. Another possible cause may have been decreased peritoneal absorption secondary to chronic peritoneal inflammation, but no evidence of this was seen histologically or bacteriologically. No reason was found for the high level of protein in the CSF.

Five similar cases have been reported previously. Dean and Keller reported CSF ascites following an injection of diphosphothiamin; this was attributed to an immune reaction to foreign protein. A case reported by Rosenthal, et al. occurred in a 3-year-old girl with a Grade II astrocytoma. A laparotomy revealed signs of chronic inflammation with adhesion formation, but no evidence of tumor seeding by way of the shunt.

No common features in the six cases suggest an etiology; hence, no adequate explanation for the occurrence of this complication can be offered.

References

Ascites from a VP shunt


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