Infection is a common and serious complication of ventriculoperitoneal (VP) shunt in children. The usual manifestations of infection include fever, shunt malfunction, signs of meningitis and abdominal pain. However, ascites is rare, especially when it becomes the first presentation for infection. Our patient shows the importance of considering shunt infection when unexplained ascites is the first and only manifestation in neonates with ventriculoperitoneal shunts.
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Discussion. Infection of a VP shunt is estimated to occur in 2-21% of cases. It has been reported to occur within 6 months following implantation of the shunt in 86% of all patients. The most common and important clinical manifestations associated with shunt infection in children are headache, nausea and vomiting due to shunt insufficiency and increased intra-cranial pressure. Abdominal manifestations such as abdominal discomfort, progressive distension, and feeding intolerance are also noted. In neonates, however, temperature instability, increased head circumference, lethargy and vomiting are usually the presenting signs. On the other hand, ascites is a rare complication. It is either due to increased CSF production as in choroid plexus papilloma or inability of the peritoneum to absorb CSF secondary to low grade peritoneal inflammation. Peritoneal inflammation interferes with lymphatic drainage, and the resultant protein accumulation increases peritoneal colloid osmotic pressure leading to further fluid collection. Cerebrospinal fluid ascites without a predisposing infection was postulated to be due to the high protein content, but many children with elevated CSF protein have had shunts placed without any untoward effect. In the absence of infection, no definite explanation has been offered for the inability of the peritoneum to absorb the CSF. Goodman and Gourley reported an 11-year-old girl with VP shunt, Escherichia coli urinary tract infection and ascites. She presented also with progressive abdominal enlargement only. Her shunt infection however, was secondary to the peritonitis. In our patient, who was a neonate with shunt infection, none of the common manifestations were noted. The patient rather had progressive abdominal distension due to ascites. Although the analysis of CSF and peritoneal fluid was consistent with infection in our patient, only the CSF showed positive culture of coagulase negative staphylococci, which is the common pathogen of VP shunt infection. This would favor that the development of ascites was secondary to shunt infection instead of a primary peritoneal infection. These findings differentiate our case from the previous report of Gaskill and Marlin who described 7 patients with VP shunts and spontaneous bacterial peritonitis caused by enteric pathogens.

In conclusion, although it is rare, ascites could be the earliest manifestation of VP shunt infection in neonates. We suggest to consider shunt infection if unexplained ascites develops in a neonate with a VP shunt. Early abdominal ultrasound and diagnostic paracentesis should be performed to confirm the diagnosis. Establishment of an alternative route for CSF diversion is also warranted.

References

Figure 1 - Abdominal ultrasound showing the ventriculoperitoneal shunt located anteriorly in the peritoneal cavity.

Figure 2 - Abdominal ultrasound showing minimal ascites in the lower abdomen.