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CSF Hydrocele — unusual complication of V-P shunt

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Abstract

CSF hydrocele as a complication of migration or extrusion of the peritoneal end of the V-P shunt has rarely been reported. Here the case of a 6 month old infant, born at 28 weeks gestational age, is reported. The baby was noted to have scrotal swelling, exacerbated by crying, two months after insertion of ventriculoperitoneal shunt. The hydrocele resolved following revision of the shunt. Possible pathophysiological causes are discussed.

Keywords: CSF hydrocele, extrusion, hydrocephalus, premature baby, V-P shunt complications.

1 Introduction

Ventriculoperitoneal shunt is one of the commonly practiced neurosurgical procedures for the treatment of hydrocephalus. Common complications of the procedure include shunt obstruction and infection [2, 5, 14, 18]. Other less usual complications are intestinal obstruction, transrectal, intragastric extrusion, transdiaphragmatic and intrahepatic migration, bladder perforation, ascitis, and extrusion through the umbilicus, vagina, and scrotum [1–5, 7, 9–12, 14–18]. Slit ventricles and intracerebral haemorrhage have also been reported [6, 18].

Extrusion into the scrotum is extremely rare, and occurs only in newborn babies or infants in the first year of life. Premature babies are the most likely to develop this complication due to a patent residual processus vaginalis.

2 Case report

On February 2, 1988, a 1,500 gram male infant was born at 28 weeks gestational age with Apgar scores of 2, 7, and 10. The child's progress was poor, with multiple problems including cerebral asphyxia, sepsis, intracerebral haemorrhage, renal glycosuria, thrombocytopenia, congenital obstructive hydrocephalus, cerebellar vermis aplasia, and periodic spells of apnoea with cyanosis.

These problems were carefully managed, and, at the age of three months, the patient was referred to the Neurosurgical Unit in King Fahd Hospital of the University. CT scan showed marked hydrocephalus. The patient's weight was 2.20 kg with a head circumference of 46 cm. He was maintained on nasogastric feeding. The baby suffered frequent apnoea attacks with cyanosis and hyponatremia. Due to the poor condition of the patient, a Rickham's reservoir was inserted into the lateral ventricle, under local anaesthesia, for repeated aspiration of CSF. The patient was then transferred back to the referring hospital. Two months later he was readmitted to our hospital. The general condition of the patient allowed the insertion of a medium pressure V-P shunt (closing pressure 50–90 mm H_2O) under general anaesthesia. The postoperative course was uneventful. Oral feeding was established a few days after surgery, and the apnoea attacks and cyanosis remained infrequent. On the eighth postpoperative day, the baby was discharged to home. Two months later, the parents noticed enlargement of the scrotal sac, exacerbated by crying, and fever. He was readmitted and found to be fully conscious. The anterior fontanelle was sunken. No attacks of apnoea or cyanosis were observed. An area of redness on the neck, over the shunt tube, was noticed. Scrotal examination showed marked enlargement of the sac, which reached 10 cm diameter during crying. The transillumination test was positive. The tip of the distal end of the peritoneal catheter was palpable in the dorsal part of the scrotum. Abdominal and pelvic

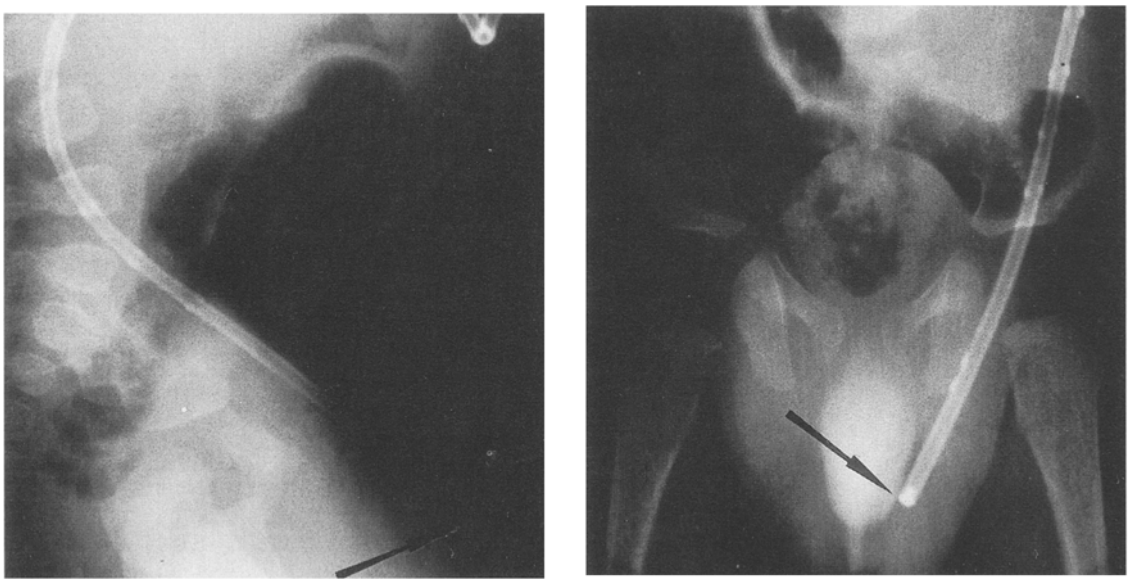

Figure 1. Shows the tip of the peritoneal catheter passing through the vaginal canal, ending in the scrotum in **A)** A-P view; and **B)** lateral view. Black arrow indicates the tip of the catheter.

X-rays revealed the distal end of the peritoneal shunt to be passing through the inguinal canal, terminating in the scrotum (Figure 1, a and b). CT scan demonstrated the shunt to be functioning; the ventricles were markedly reduced with subdural CSF collections. CSF culture revealed a growth of staphylococcus aureus, which was sensitive to gentamycin and septrin.

The V-P shunt was removed and appropriate antibiotic therapy instigated. A few days later, the scrotal swelling had completely absorbed, even during crying. A few weeks later, a high pressure V-P shunt was inserted. On follow-up a year later, the patient was doing well with no evidence of recurrence of the scrotal swelling.

3 Discussion

Hydrocele as a result of scrotal extrusion of the peritoneal catheter is a rare complication of V-P shunt. To the best of our knowledge, it has never occurred in adults, although it is theoretically possible. All of the reported cases have been newborns or infants in the first year of life [2–5, 7, 10, 11, 14, 17].

We believe that three concomitant factors contributed to the occurrence of hydrocele: 1) Complete descent of the testes occurs between the 7th and 8th month of intrauterine life [7, 8, 13, 17]. Soon after birth, the processus vaginalis is obliterated. Congenital hydrocele may result from failure of this obliteration process; 2) Peristaltic intestinal and omental activity pushes any foreign body present in the peritoneal cavity toward the umbilicus or inguinal canal [1, 13, 14]; 3) Increased intraperitoneal pressure, as a result of increased intraperitoneal fluid, is known to predispose to development of inguinal hernia [5, 11].

In hydrocephalic newborn babies treated with a shunt, particularly premature babies, where the processus vaginalis is patent, peristaltic movements may drive the catheter, particularly if it is long, into the inguinal canal and subsequently to the scrotum. This is especially true if the intraperitoneal pressure is raised due to large volume of CSF, being dispersed into a relatively small cavity.

In our case, the patient was of 28 weeks gestational age at birth, and, although he was operated on at six months of age, his body weight was onyl 2.2 kg. We believe the processus vaginalis was patent. As a result of the presence of all three contributary factors, hydrocele occurred. The revision of the shunt using a high pressure valve setting and a shorter catheter cured the hydrocele.

Since premature babies are at higher risk of developing hydrocele, great care should be taken to avoid it by choosing a suitable valve pressure and length of the peritoneal catheter. Possibly, a ventriculo-atrial shunt could be more advantageous in this group of patients.

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