CASE REPORT

Anal Extrusion of a Ventriculoperitoneal Shunt: A New Case

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Abstract
Ventriculoperitoneal shunting is an established surgical treatment of hydrocephalus. However, the procedure may be associated with a variety of complications which can occur in immediate perioperative period or on follow-up. Migration of the peritoneal catheter can occur. We report an unusual case of per anal extrusion of shunt tubing in a 6-month-old infant.

Keywords: Hydrocepalus, Ventriculoperitoneal shunt, Gastrointestinal tract, Cerebrospinal fluid, External ventricular drain.

Introduction

The use of ventriculoperitoneal (VP) shunting is an established surgical treatment of hydrocephalus (1). The procedure may be associated with wide a variety of complications. These may occur in the immediate perioperative period or later on. Neurological and non-neurological complications have been reported. They include shunt infection, migration, and cerebrospinal fluid pseudocyst formation (2). The movement of the peritoneal catheter can occur into various parts of related structures such as the abdominal wall, gastrointestinal tract, urinary bladder, vagina, scrotum, and mediastinum. Infections like peritonitis, ventriculitis, and meningitis are other common complications (3). We report a case of an unusual per-anal extrusion of shunt tubing.

Case report

A 6-month-old male infant was referred to the neurological surgery outpatient clinic in June 2015 as a case of post VP shunt due to congenital hydrocephalus for further monitoring. The mother noticed a tube protruding from her infant's anus (**Figure 1**). On examination; the child was fully awake, head circumference 54 cm, and anterior fontanel was full and firm. The abdomen was soft and lax. The bowel sounds were normal. The tube protruding through the patient's anus was identified as the lower end of the catheter of the VP shunt. A shunt series demonstrated per-anal extrusion of the peritoneal end of the non-functioning shunt. The catheter was extracted per anally after disconnected from the valve proximally. An external ventricular drain was inserted at the same time. The procedure was performed on the following day with no complications. An abdominal-pelvic x-ray done postoperatively showed no signs of bowel perforation or obstruction. A cerebrospinal fluid (CSF) sample analysis showed total protein 58 mg/dl, sugar 27 mg/dl, and no pus cells were present. The child was treated with amikacin and

meronem for four weeks. Following this, insertion of a new VP shunt on the opposite side was performed. The child remained asymptomatic to the time of preparation of this report in April 2017.

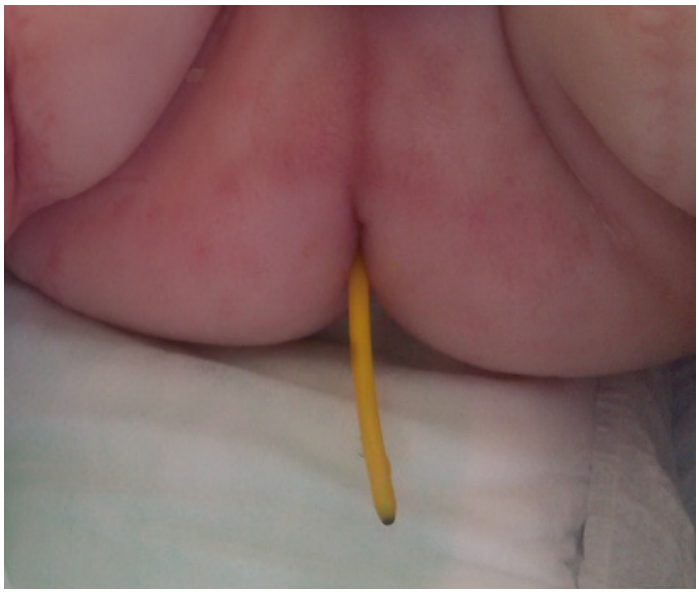

Figure 1. Extrusion of the distal part of the VP shunt through the anus.

Discussion

The reported incidence of intra-abdominal complications of the VP shunt is 10-30% (1)**.** These include mechanical blockage of distal shunt catheter, abdominal pseudocyst, inguinal hernia, intestinal obstruction and spontaneous bowel perforation (2-8).

The anal extrusion of a peritoneal catheter is an unusual complication. Wilson and Bertrand reported this for the first time in 1966. (9). Akyuz et al proposed that the tip of the catheter adheres to the wall of viscera and the constant pressure of the abutting tip together with local inflammatory reaction leads to erosion of the visceral wall and entrance of tip in the lumen of the organ. The peristaltic activity of gut carries it all the way down to the anus (10).

The diagnosis could be obvious if the shunt tube was found extruding through the anus. A shunt series consists of plain radiological views of the skull, cervical spine, chest, and abdomen to demonstrate the course of the radio-opaque ventriculoperitoneal catheter (11). However, the presentation can be in the form of peritonitis or meningitis. The detection of Gram-negative organisms in the CSF should call for consideration of further investigations such as abdominal CT or upper and lower gastrointestinal tract endoscopy promptly (12,13). In the present case, there were no abnormalities on the physical examination of the abdomen, and hence there was no suspicion of intraabdominal complications necessitating further investigations which would have otherwise been mandatory.

The management of these cases primarily includes the prompt removal of the shunt and the institution of broad-spectrum antibiotics (14). The replacement of shunt on opposite side, if indicated should be done after two successive sterile cultures of CSF. In most case, removal of abdominal extruded end may not require a laparotomy. Mobilization of shunt catheter from adhesions of the abdominal wound with gentle pull out followed by careful observation for any signs of peritonitis may obviate the need for major abdominal surgery as in the present case. (15). The distal end of the catheter should not be pulled back into the abdominal cavity to avoid contamination of the tract. Careful and regular follow-up of these patients is crucial as they may develop delayed peritonitis and shunt malfunction at later dates.

In conclusion, most cases of hydrocephalus are routinely adequately managed by CSF diversion procedures like VP shunts. However, these procedures are not totally free of complications. The present case report exemplifies the rare complications of a shunt extrusion from the anus. Early detection of such event by an observant mother and well-informed doctors has instituted prompt management which would hopefully decrease morbidity and mortality in this group of patients.

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Disclosures

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Compliance with ethical principles: No formal IRB approval is normally required at our institution for isolated anonymous case reports. The parents have kindly provided consent for the case report and use of photographs.

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