CASE REPORT

Transanal Protrusion of a Ventriculoperitoneal Shunt Catheter

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ABSTRACT

A two years old boy presented with a transanal protrusion of the ventriculoperitoneal (VP) shunt catheter. A VP shunt was inserted when the boy was six-month-old for congenital hydrocephalus. He was active and neurologically normal, with no signs of meningitis and peritoneal irritation. During laparotomy, the tube was seen entering the sigmoid colon, so the tube was cut at the point where it entered the sigmoid colon. The distal end of the protruding tube was pulled out from the anus. The sigmoid colon was repaired, and a delayed shunt revision was completed. The patient was discharged without abdominal and neurological deterioration.

Key words: *Ventriculoperitoneal shunt. Sigmoid colon perforation. Transanal protrusion.*

INTRODUCTION

Ventriculoperitoneal shunt (VP) placement is the typical management for the treatment hydrocephalus.[1,2] Abdominal complications, including peritoneal pseudocyst, intestinal volvulus, inguinal hernia, and the migration of the catheter through the vagina, scrotum, umbilicus, and intestinal tract, are associated with VP shunt surgery.[3] Perforation of the colon is a very rare complication that can occur after VP shunt surgery. The bowel perforation with the protrusion of a VP shunt catheter from the anus is reported in 0.1 – 0.7% of cases.[1,4] Because fibrous tracts that formed around the shunt catheter block the spillage of the bowel contents into the peritoneum, patients suffering from bowel perforation do not always present with significant abdominal symptoms.[5] However, early recognition of the condition in such patients is essential because of the high mortality rate (15%) due to fatal ventriculitis or sepsis.[2]

The objective of this report is to present a case with bowel perforation and VP shunt protrusion from the anus with therapeutic options.

CASE REPORT

A 2-year-old boy presented with transanal protrusion of the VP catheter. As per patient's history, a VP catheter was inserted for treatment of congenital hydrocephalus when he was 6-month-old. Three months after VP shunting, the patient underwent a revision of the abdominal catheter. On admission, he was aware, active, and neurologically normal with no signs of meningitis. His abdomen was soft without increasing peristalsis. There were no signs of peritoneal irritation. The shunting tube was seen protruding from the anus (Figure1). In abdominal computed tomography, the peritoneal catheter was shown in the lumen of the descending colon (Figure 2). The patient's temperature was 36.8°C. Laboratory examinations revealed a haemoglobin level of 13.2 g/100 ml and white blood cell count of 10,600/mm^3.

To prevent tube retraction, a suture was placed through the distal catheter tubing. Surgical treatment with broad antibiotic administration was immediately performed. In laparotomy, the tube was seen entering the sigmoid colon and was encapsulated by the greater omentum (Figure 3). There were adhesions between the peritoneal tube and the sigmoid colon near the perforation site. The tube was cut where it entered the sigmoid colon, and the protruding distal end was pulled out of the anus. The sigmoid colon was repaired. The cerebrospinal fluid (CSF) was clear; examination of the CSF revealed a normal cell count with a glucose level of 52 mg/dl and a protein level of 41 mg/dl. The culture of the CSF was negative. The entire shunt system was removed, and delayed shunt revision was completed. The patient was discharged without abdominal or neurological deterioration.

DISCUSSION

VP is among the most frequently performed operations for hydrocephalus management. The rate of abdominal complication is 25% with the implementation of a VP shunt.[4] Agha *et al*. reviewed patients undergoing 350 VP derivations, and demonstrated that after a VP shunt, surgery can cause abdominal complications, such as occlusive/mechanical (15%), infections (5%), cyst formation (1 – 2%), catheter migrations (0.2 – 0.5%), visceral perforation (0.2 – 0.3%), and ascites/ metastases (0.3%).[6]

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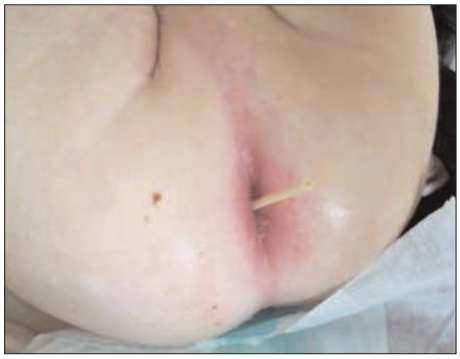

Figure 1: Transanal protrusion of ventriculo-peritoneal catheter.

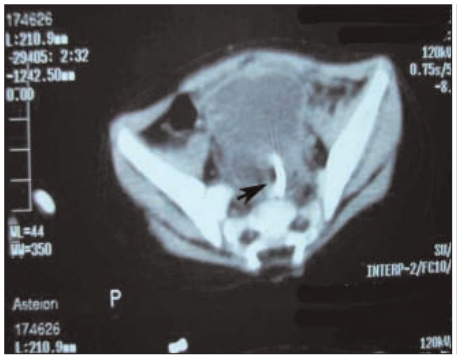

Figure 2: Abdominal computed tomography scan demonstrating a migration ventriculoperitoneal catheter in the lumen of the sigmoid colon (arrow).

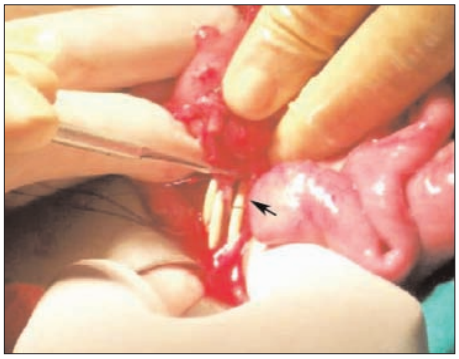

Figure 3: Ventriculoperitoneal catheter perforated in the sigmoid colon (arrow).

The pathogenesis of bowel perforation after VP shunting is difficult to recognize. However, most authors have described the formation of fibrosis surrounding the tube.[2,7] This fibrosis is thought to have a stabilizing effect on the tube, resulting in chronic irritation and the erosion of an area of the bowel that subsequently leads to perforation.[7] Additionally, silicone allergy or a weakness in the bowel wall resulting from deficient innervations and the length of the abdominal end of the tubing may also have a role in the formation of bowel perforation.[2,8]

Most patients with abdominal complications are asymptomatic, and diagnosis is not always straightforward. On the other hand, in patients with the transanal protrusion of a VP shunt catheter, the diagnosis is obvious. The period between shunt placing and the protrusion of the catheter from the anus ranges from 2 to 20 months.[4] Rajendra *et al.* suggested that none of the patients in their study had features of peritoneal infection/peritonitis or intestinal perforation either upon presentation or after shunt revision or removal,[4] as in this case. Adhesions were found between the peritoneal tube and the colon near the perforation site during surgery. Moreover, there was a fibrous tract, and there was no leakage of the bowel contents through the sigmoid colon. The fistula of the sigmoid colon was repaired after the removal of the VP shunt catheter.

Sharma *et al*. reported a child managed by the endoscopic removal of the catheter with a previous disconnection of the cranial end.[9] Snow *et al*. suggested that if the patient has a benign abdominal examination and no prior history of abdominal complications from a VP shunt, then the abdominal catheter can be removed percutaneously.[10] However, in the presence of a severe peritonitis, or a previous history of serious abdominal problems from the shunt catheter, such as an infected pseudocyst or other intra-abdominal pathology, the authors recommended laparotomy with primary closure of the bowel perforation for removing the catheter.

As a result, when bowel perforation is found as asymptomatic, the patient's outcome is better. Otherwise, the mortality of sepsis or ventriculitis, secondary to bowel perforation, caused by a VP shunt is high. Therefore, early diagnosis is critical. This case underwent laparotomy with primary closure of the bowel perforation for removing the catheter, but many authors have had good results from removing the catheter using percutaneous techniques or endoscopy instead of laparotomy. In the latest treatment method, the patients should be closely observed.

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