Management of ventriculo-peritoneal shunt protruding through anus

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ABSTRACT

Ventriculoperitoneal shunt is among the most frequently performed operations in the management of hydrocephalus. But it may be associated with certain complications. We have here, a case report of a child of 2 years, who presented with the lower end of the ventriculo-peritoneal shunt tube coming out through the anus. The child was asymptomatic on presentation. Colonoscopy revealed the site of perforation to be in the rectum, 10 cm from the anal verge. After disconnecting the cranial end of the shunt, it was removed endoscopically without any further complications. Though this complication has been previously reported, it remains a rare event. Both pathogenesis and treatment, still represent a problem.

Key words: Ventriculoperitoneal shunt, complications

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Colonic perforation from a ventriculo-peritoneal shunt catheter, is an infrequently described complication. Usually these patients present with either peritonitis or meningitis, but rarely they may be asymptomatic. The management also differs according to the presenting symptoms.

CASE REPORT

A 3-year-old male presented with a thin white tube coming out through the anal verge. His mother first noticed this, while he was squatting. He was a known case of tuberculosis, and had undergone a right-sided ventriculoperitoneal shunt catheter insertion one year back for obstructive hydrocephalus, which he had developed due to tuberculous meningitis. The catheter inserted was a standard Chabra's medium sized Ventriculoperitoneal (VP) shunt. The peritoneal end was positioned through a midline incision, towards the right iliac fossa. His postoperative course was uneventful, and

the shunt was functioning normally. The patient was discharged, and was advised regular follow up.

Presently he has no complaints of fever, headache, vomiting, altered consciousness, diarrhea, or pain in abdomen. On examination, he was afebrile. Vital parameters were normal. He was alert and conscious, with no neurological deficits. There were no signs of raised intra- cranial tension or meningitis. His abdomen was soft and non-tender. A 15 cm long segment of the shunt catheter was found protruding through the anal verge, with a continuous trickle of CSF.

Ultrasonography of the abdomen was normal, and the catheter tip could not be visualized. CT scan of the brain showed the shunt tip to be in the right lateral ventricle, with no signs suggestive of air in the ventricles. There were no signs of meningitis. His Hb was 11 gm%, and WBC count was 5800/cmm. A lumbar spinal tap was done. The aspirated CSF was clear, and the pressure was normal. Proteins were 40 mg/dl, and sugar was 30 mg/dl. There were no cells, and culture of the CSF vielded no growth.

The patient was started on intravenous cefotaxim and Metronidazole. He was prepared for surgery with

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endoscopic shunt removal. A flexible colonoscopy was done to determine the site of perforation, which revealed a single perforation in the rectum, 10 cm from the anal verge [Figure 1]. Then via a scalp incision, the cranial end of the shunt catheter was disconnected, and the shunt chamber was removed. The distal end was removed under endoscopic guidance by using a snare. The ventricular end was connected to a ventricular reservoir for intermittent drainage of CSF.

There was no evidence of post-operative peritonitis, either clinically or radiologically. After 2 weeks, the patient remained asymptomatic neurologically, and underwent a repeat CT scan of the brain, which showed no evidence of hydrocephalus. His CSF study was normal. He was discharged without re-insertion of the shunt.

DISCUSSION

Abdominal complications of VP shunts are reported to be from 10-30 per cent, [1] thus remaining clinically important for early recognition and treatment in patient management. These complications include perforation of viscera, pseudocyst formation, CSF ascites, and peritonitis. Extra-abdominal complications include malfunctioning of the shunt, leading to progressive hydrocephalus, gram-negative ventriculitis, or meningitis (usually by *E. Coli*).

The reported incidence of bowel perforation by VP shunt is 0.7-0.10%, [2] with a mortality as high as 15%. [3] The most common clinical presentation is meningitis, which occurs in about 43% of the cases. [3] But fewer than 25% of the cases present with peritonitis. [4]

Sathyanarayana *et al*^[5] have reported a case of rectal protrusion of the shunt tube after asymptomatic bowel perforation in an adult. The shunt was removed without any complications, and the patient remained

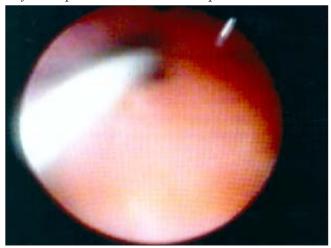


Figure 1: Endoscopic view of ventriculo-peritoneal shunt perforated through the rectal wall

asymptomatic on follow up. Digray *et al*^[6] reported a case of ventriculitis in a hydrocephalic child, following intestinal perforation and anal extrusion of a ventriculoperitoneal shunt. Removal of the shunt, external ventriculostomy, and antibiotics led to complete recovery. In comparison, our patient was absolutely asymptomatic, with a functioning shunt protruding through the anus, and an invasive laporotomy was avoided by the endoscopic removal of the shunt, with excellent results.

Various mechanisms have been suggested with regard to the pathogenesis of the perforation viz. foreign body reaction, pressure necrosis of intestinal wall by the tube, and silicon tube allergy. The catheter most commonly associated with perforations, is the Raimondi spring coiled catheter. The introduction of softer, more flexible silastic tubing has reduced, but not totally eliminated the incidence of bowel perforation.^[7] A high index of clinical suspicion is therefore warranted in a patient with a VP shunt, in an appropriate clinical setting. Imaging modalities play a crucial role in reaching the diagnosis. In the past, a radio-opaque dye was injected into the shunt catheter after occluding its proximal end. The course of the dye was traced by obtaining radiographs of the chest and abdomen. Supine and lateral decubitus abdominal radiographs were obtained for definite evaluation. However, presence of air within the ventricular system on a plain radiograph of the skull, could also be an indirect pointer to this complication. CT scan of the abdomen is however, the investigation of choice. Endoscopic visualization of the perforated bowel may also aid diagnosis.

Many methods have been suggested for prevention of this complication. There have been suggestions to anchor the distal end of the peritoneal tube to the peritoneum in children. This simple method does not add much to the operation time, and has prevented shunt-tube migration in the group studied. Other suggestions include division of the catheter - this cut should be distal to the end of the sharp wire contained in it, which otherwise will protrude. However, larger groups will need to be studied to see if any of these needs to be done on a routine basis.

The management of this complication depends on the complications and clinical presentation. The authors have previously treated a similar case, wherein after disconnection of the cranial end, a simple removal of the catheter was performed with the help of a flexible colonoscope under direct vision, thereby obviating the need for a laparotomy. The patient had no further complications. On the basis of our previous experience with the technique, and in light of the excellent results obtained with endoscopic removal and intravenous antibiotics, a similar procedure was carried out for the present case. Therefore, in patients with asymptomatic

perforation of the colon, endoscopic removal may be a safe option. However, in cases where serious abdominal complications like peritonitis, infected pseudocyst or an abcess develop, exploratory laparotomy is required for removing the shunt catheter and tackling the problem accordingly.

An awareness of these complications is necessary in creating an index of suspicion for the primary physician, whose patients harbor a VP shunt, and present with abdominal symptoms. The present case highlights the rarity of this complication, and the need for its early recognition and management. It also highlights the fact that in well-indicated cases, endoscopic removal of the catheter is a safe option.

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