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CASE REPORT

A RARE CASE OF BOWEL PERFORATION SECONDARY TO VENTRICULO PERITONEAL SHUNT

Aditya Pratap Singh[1], Vinay Mathur[2], R. B. Goyal[3], Rajlaxmi Jaysing Pardeshi[4], Mahendra Jangid[5]

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ABSTRACT: Bowel perforation is an unusual complication of ventriculo peritoneal shunt. We are presenting a case of 15 month old male child with the shunt tubing protruding through the anus associated with bowel perforation. This complication occurred after the 13 months of insertion of ventriculo peritoneal shunt for congenital hydrocephalus. There were no signs of meningitis but mild signs of peritonitis were present. At laparotomy the tube was seen to enter the sigmoid colon and was encapsulated by the greater omentum. The tube was cut and the distal end removed via the anus. Proximal part of shunt also removed because there was contralateral shunt present. Perforation was repaired. We are here in presenting a rare complication of VP shunt.

KEYWORDS: Anal protrusion, bowel perforation, hydrocephalus, oral extrusion, ventriculo peritoneal shunt, VP shunt.

INTRODUCTION: The ventriculo peritoneal shunt is a popular method of diversion of cerebro spinal fluid. It is relatively simple and safe procedure. It can be safely performed early in infancy and is associated with low revision and low complication rate.[1] The peritoneal end of the VP shunt has been associated with complication such as pseudo cyst formation, perforation of hollow viscus, intestinal volvulus, penetration into solid organs, abdominal wall and protrusion outside body through scrotum, umbilicus, vagina or GI tract.[2]

Bowel perforation is a relatively unusual complication of VP shunt, occurring in only 0.1 - 1.0% of patients.[3] Familiarity with this possible complication and its early diagnosis are important for its prognosis.[2]

CASE REPORT: A 15 months old male child had undergone the right sided VP shunt (chhabra - slit - in - spring silicone shunt) procedure 13 months back for congenital hydrocephalus. After 10 months of the insertion of right sided VP shunt, it becomes blocked so VP shunt put in left side. Right side VP shunt remained in situ. He presented to us with complaint that the child protruded a white tube per anus on defecation for past 15 days. On examination, the child was alert, febrile and had no neck rigidity. There were no other signs of meningitis.

There was mild tenderness present over abdomen. On rectal examination, there was white tube coming from rectum. Total leukocyte count was 11000/cu mm. An ultra sonography abdomen was suggestive of minimal perisplenic collection. The child was operated. The shunt tubing was entering in the bowel through perforation in sigmoid colon. There was adhesion present. During adhesiolysis a small perforation occurred in ileum. Shunt tubing was cut and distal tube removed through anus. Proximal part of shunt tubing also removed because there was left functioning shunt present. Both perforations were repaired. Patient discharged on 7th post-operative day with uneventful post-operative period.

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DISCUSSION: Perforation of the bowel by VP shunts is rare and the incidence is only 0.1 - 0.7% of shunt surgery.[1] Most commonly Raimondi spring coiled peritoneal catheter has been implicated in these cases.[2,3,4] The use of softer, more flexible silastic tubing has led to a reduction in incidence but not elimination of this complication. The duration of time between VP shunt surgery and detection of bowel perforation was found minimum in infant and increasing with age.

The exact pathogenesis of bowel perforation after VP shunt is difficult to explain. Many authors have described the formation of encasing fibrosis around the tube.[2] This fibrosis thought to have an anchoring effect on the tube, resulting in pressure and decubitus ulceration on an area of the bowel that eventually leads to perforation. In our case there were adhesions present between the intestine and tube so during adhesiolysis a small iatrogenic perforation in the ileum had occurred which was repaired.

Whether the length of the abdominal end of tubing has a role in the formation of bowel perforation is unclear.[3] evidence of silicone allergy, which may result in the foreign body like reaction has been implicated in the breakdown and perforation of the bowel.

The absence of peritoneal signs is usual in cases of bowel perforation by a VP shunt. Less than 15-20% of reported cases with demonstrated bowel perforation had an associated clinical peritonitis.[5] But 43-48% of reported cases developed meningitis or ventriculitis.[5] Escherichia coli is the most common organism in CSF cultures.[2] Any patient with a VP shunt who present with ventriculitis or meningitis due to an enteric organism should be assessed for bowel perforation. Prolonged diarrhea of unknown etiology and abdominal symptoms should serve as warning signs of possible bowel perforation.

Children with meningo myelocoele and congenital hydrocephalus may be more susceptible to developing perforation due to weakness in the bowel wall resulting from deficient innervation.

In case of oral extrusion the site of perforation may be stomach followed by jejunum, while in case of anal extrusion the site of perforation may be caecum, ascending colon, transverse colon, splenic flexure, descending colon, sigmoid colon.[1]

The diagnosis is obvious in patients presenting with spontaneous extrusion of a whitish tube while defecating through which clear fluid dripped. Contrast study can be performed through distal shunt (shuntogram) which opacified the bowel.[1] CT scan of abdomen show the shunt in bowel lumen along with peritonitis if present[2] while CT scan of head will show pneumocephalus in patient with VP shunt. In patient with oral extrusion, upper GI endoscopy helps to localize the site of perforation. Patient with VP shunts who developed meningitis by unusual pathogens such as gram negative and anaerobic organism should investigated further.

Management of bowel perforation must be depending on individual circumstances. The initial step is to check ventriculitis or meningitis due to retrograde spread of infection. If there is no peritonitis or abdominal abscess, the tube can be removed by laparotomy or percutaneously. Distal part of VP shunts can be remove by use of colonoscopy or proctoscopy.[2]

The distal end of VP shunt should not be pulled back into the peritoneal cavity to prevent contamination of the tract. External ventriculostomy should be established at least for 3 weeks and patient should be put on broad spectrum antibiotics to prevent infection of CSF.[2] After repeated CSF culture are sterile, patient should undergo repeat VP shunt on the opposite site.

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If there is significant abdominal infectious pathology such as peritonitis or abscess, the fistulous opening may not closed spontaneously then laparotomy should be performed and primary closure of bowel with lavage should be done.

CONCLUSION: If VP shunt patient develop abdominal symptoms, gram negative or anaerobic meningitis suspicion of bowel perforation should be kept high. When bowel perforation is detected at an asymptomatic stage the prognosis for recovery is excellent. The high mortality rate is associated with patient who present with predominantly abdominal complications.

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1. Photo showing shunt perforated into the sigmoid colon.

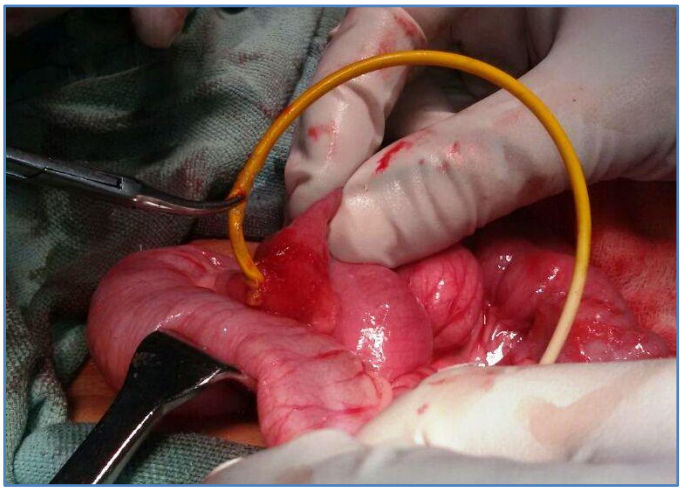

Photo 1

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2. Photo showing shunt tube inside the intestine

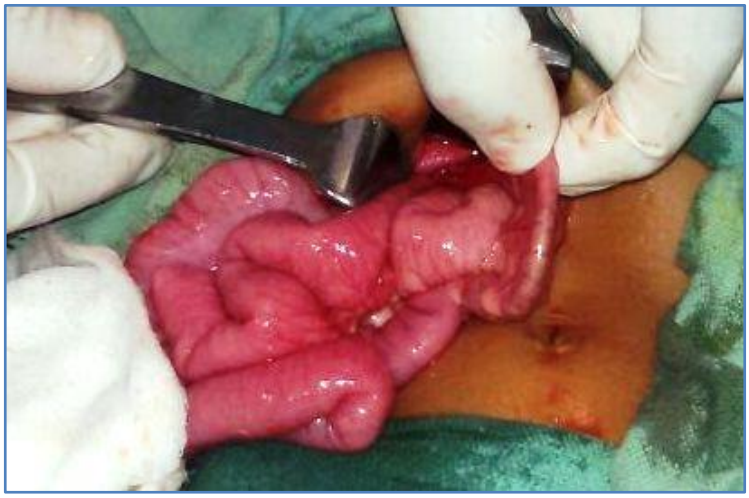

Photo 2

AUTHORS:

1. Aditya Pratap Singh
2. Vinay Mathur
3. R. B. Goyal
4. Rajlaxmi Jaysing Pardeshi
5. Mahendra Jangid

PARTICULARS OF CONTRIBUTORS:

1. MBBS, M.S., M. ch., (Resident), Department of Pediatric Surgery, SMS Medical College, Jaipur.
2. MBBS, M.S., M. ch., Department of Pediatric Surgery, SMS Medical College, Jaipur.
3. Professor and HOD, Department of Pediatric Surgery, SMS Medical College, Jaipur.
4. MBBS, M.S., Department of Obstetrics and Gynaecology, SMS Medical College, Jaipur.
5. MBBS, M.S., M. ch., (Resident), Department of Pediatric Surgery, SMS Medical College, Jaipur.

NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Aditya Pratap Singh,
Near The Mali Hostel,
Main Bali Road,
Falna District, Pali,
Rajasthan.
Email: dr.adisms@gmail.com

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