

Case Report (BRAIN)

## Extrusion of the Peritoneal Catheter of Ventriculoperitoneal Shunt Through the Rectum

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### ABSTRACT

A ventriculoperitoneal shunt is a common procedure for hydrocephalus. It is a life-saving procedure but is not risk-free. Some of the most common complications are shunt blockage and infection but they can also present with uncommon presentations. We report A child who presented with extrusion of a shunt catheter through the rectum. It was treated as an infected shunt. Externalization of the shunt was done through the abdominal site and the exposed shunt was removed through the rectum by gentle traction. Once CSF was clear a new shunt was placed on the opposite side.

**Keywords:** VP shunt, shunt infection, anal extrusion.

**Key Message:** Exposure to a shunt catheter through the rectum is an uncommon presentation. It should be treated as an infected shunt. Most of these cases do not cause peritonitis or meningitis. The exposed shunt catheter should be removed through the rectum by gentle traction.

**Abbreviations:** VP-Ventriculoperitoneal, CSF: Cerebrospinal fluid. ETV -Endoscopic Third Ventriculostomy.

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### CASE HISTORY

We report a case of a Four-year-old child who presented to the Neurosurgery OPD of the Prime

Teaching Hospital with extrusion of the peritoneal part of ventriculoperitoneal (VP) shunt catheter through the anus. The child was brought by parents with a complaint of a shunt tube protruding through the anus and clear fluid draining from the shunt tube (Figure 1). On examination, the child was playful her pulse was 86 per minute, the temperature was 98 F and her GCS was 15/15. On Palpation of the abdomen, it was soft and non-tender. There was no neck stiffness and kerning and Brudzinski was negative. The shunt reservoir was normally compressible showing the shunt is functional. Approximately 20 cm of the catheter was protruded out with clear cerebrospinal fluid (CSF) coming out. A diagnosis

of infected VP shunt was made. The patient was admitted. The patient was put on empiric antibiotics therapy. Blood investigations and abdominal x-ray was performed (Figure 2) and the child was prepared for surgery.

After informed consent, the child was taken to the operation theatre on OT day. After cleansing

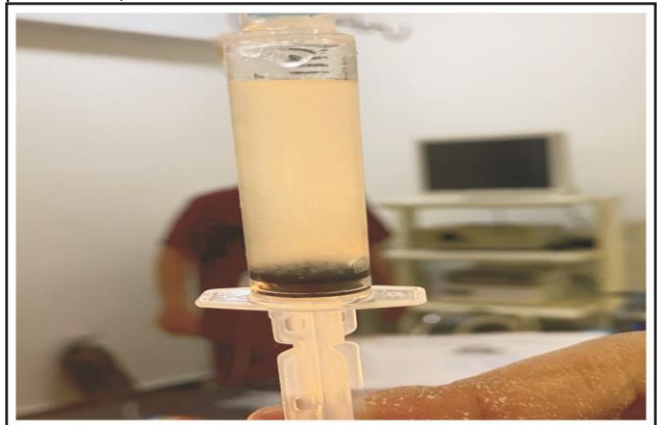


**Figure 1:** Baby with the lower end of shunt protrusion through the anus (consent taken from family for picture).



**Figure 2:** The abdomen and pelvis X-rays show the migration of the lower end of the ventriculoperitoneal shunt

through the rectum to the exterior. (Image used with permission)



**Figure 3:** It shows turbid CSF taken from the distal end of the ventriculoperitoneal shunt exteriorized through the anus.



**Figure 4:** Following washing and draping, the distal end of the shunt catheter was separated and exteriorized via the abdominal incision, where it was linked to a drainage bag. (Picture was taken after taking consent from the attendants)

and draping, the distal part of the shunt catheter was divided and exteriorized through the abdominal wound and connected to a drainage bag (Figure 4).

The lower extraintestinal part was gently pulled out through the rectum, it came out easily. CSF was taken from the exteriorized end which was turbid (Figure 3) and was sent for culture and sensitivity.

Postoperatively the CSF culture came out to be having gram-positive streptococcus

pneumonia, which was sensitive to ceftriaxone, and ceftazidime. Culture-guided antibiotics therapy was given for two weeks. When the CSF R/E report was sterile and the patient was symptoms-free, we put a VP shunt on the opposite side.

The picture of the baby's abdomen has exteriorization of the abdominal part of the ventriculoperitoneal shunt at the old incision and connected to a collection bag.

## DISCUSSION

VP shunt is a cornerstone treatment for CSF diversion in the management of hydrocephalus.<sup>1</sup> Congenital aqueductal stenosis is the most common cause of pediatric hydrocephalus. The incidence of congenital hydrocephalus is 0.36–0.75 per 1000 live births worldwide<sup>2</sup> ventriculoperitoneal shunt is a well-regulated pressure-controlled valve and tube system that control cerebrospinal fluid flow over a wide range of cerebrospinal fluid pressure.<sup>1,3</sup> Most common complication of the ventriculoperitoneal shunt is blockage of the upper end and infection.<sup>4</sup> Abdominal complications of VP shunt vary from 10 to 30% and the most common abdominal complication is pseudocyst formation.<sup>5</sup> Perforation of the gut wall by VP shunts is a rare complication and the incidence is 0.1–0.7% of VP shunt procedures.<sup>6</sup> The factors that can lead to such complications can be the thin gut wall, the hard distal tip of the VP shunt<sup>6,8</sup> trocar can also injure gut wall which can lead to perforation of the gut<sup>9</sup> the tip of the shunt can cause chronic irritation and later on perforation of the gut wall.<sup>7,9</sup> The diagnosis of exteriorization of the lower end of the ventriculoperitoneal shunt spontaneously through the anus is widely reported from all around the world.<sup>7,9</sup> In a patient with ventriculoperitoneal shunt perforation of the bowel without any signs and symptoms of peritonitis and meningitis and any other complications, similar to our patient reported in

this study, no exploratory laparotomy is required. The patient should be prepared for surgery under general anesthesia and an incision should be made in the abdominal wall and the shunt should be disconnected and exteriorization should be done, the intraintestinal part of the shunt should be removed by performing colonoscopy<sup>6</sup> or by per rectal examination and applying traction on the protruding distal end of the shunt through the anus.<sup>10</sup> After 3 samples of CSF R/E and CSF culture results were normal i.e., no microorganisms were found, and a new ventriculoperitoneal shunt should be placed on the opposite side.<sup>11</sup> Another option may be Endoscopic third ventriculostomy for which exteriorized shunt should be blocked 12 hours before surgery.<sup>12</sup>

## CONCLUSION

We report this very rare case of extrusion of the distal end of the ventriculoperitoneal shunt through the anus with the patient having no other presenting symptoms and no positive findings on examination. It was managed initially by exteriorization of the abdominal end of the shunt, after division through the abdominal wound and then removing the extraintestinal part of the shunt through the rectum by gentle traction. After 3 consecutive CSF samples were received sterile, the involved shunt was completely removed, and a new VP shunt was passed on the opposite side. The patient was discharged home in satisfactory condition.

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### Additional Information

**Disclosures:** Authors report no conflict of interest.

**Ethical Review Board Approval:** The study was conformed to the ethical review board requirements.

**Human Subjects:** Consent was obtained by the patient's attendant in this report.

#### Conflicts of Interest:

In compliance with the ICMJE uniform disclosure form, all authors declare the following:

**Financial Relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work.

**Other Relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

## AUTHOR CONTRIBUTIONS

Sr. No.	Author's Full Name	Intellectual Contribution to Paper in Terms of
1.	Aafaq Ahmad Qarnain Khalil, Sajid Khan	Study design, methodology, and paper writing.
2.	Sajid Khan, Tariq Jamal	Data calculation and data analysis.
5.	Mumtaz Ali	Literature review.
6.	Iqra Muhammad Ali	Literature review and quality insurer.