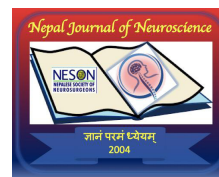


Asymptomatic anal extrusion of a migrated ventriculoperitoneal shunt: Case report and literature review

Sabin Jung Shah¹, Gaurav Kshetri², Prakash Kafle³

¹⁻³Department of Neurosurgery, Nobel Medical College Teaching Hospital, Biratnagar, Nepal



Date of Submission: 25th May 2026

Date of Acceptance: 12th June 2026

Date of Publication: 15th June 2026

Abstract

Background: Ventriculoperitoneal (VP) shunting remains the standard treatment for hydrocephalus; however, it is associated with several complications. Bowel perforation with trans anal extrusion of the distal catheter is an exceptionally rare but potentially life-threatening complication that may remain clinically silent and lead to severe infections if not recognized promptly.

Case Presentation: A 2-year-old girl with congenital hydrocephalus presented with asymptomatic protrusion of the distal VP shunt catheter through the anus six months after shunt revision. She had no signs of meningitis, peritonitis, or abdominal symptoms. Imaging confirmed migration of the distal catheter into the colon. Surgical exploration revealed transverse colon perforation. The migrated catheter was removed, the perforation was repaired, and the shunt was revised. Cerebrospinal fluid cultures were sterile, and the patient recovered uneventfully with antibiotic therapy.

Conclusion: Trans anal VP shunt extrusion may occur without abdominal or neurological symptoms. Early recognition and prompt surgical management are essential to prevent potentially life-threatening complications such as meningitis and sepsis.

Keywords: Hydrocephalus, ventriculoperitoneal shunt, bowel perforation, trans anal extrusion, catheter migration.

Introduction

Ventriculoperitoneal (VP) shunt placement is the most commonly performed surgical procedure for the management of hydrocephalus; however, it is associated with a range of potentially serious complications¹. Bowel perforation is a rare but well-documented complication, with an incidence reported between 0.1% and 0.7%, although Rajendra et al. described a higher incidence of 2.51%. Among these complications, migration of the distal peritoneal catheter into hollow viscera is particularly uncommon and may involve the rectum, vagina, scrotum, abdominal wall, or mediastinum. Distal catheter migration into the bowel with extrusion through the anus is especially rare but clinically significant, as it may remain silent initially and later lead to severe infections, including meningitis, sepsis, and even death. In this report, we describe a

malnourished child who presented with asymptomatic extrusion of the VP shunt through the anus, highlighting the importance of early recognition. Possible risk factors and mechanisms for such migration include malnutrition, bowel wall fragility, chronic irritation, and foreign body erosion. This case, along with a brief review of the literature, underscores the need for vigilance in patients with VP shunts, even in the absence of overt abdominal or neurological symptoms.

CASE REPORT

A 2-year female child with congenital hydrocephalus secondary to aqueductal stenosis underwent a right-sided VP shunt insertion (Chhabra-slit-in-spring silicone medium pressure shunt) 10 months ago. Two months later, she developed shunt malfunction due to disconnection of the proximal catheter and underwent VP shunt revision. Six months after the revision surgery, her parents noticed a tube protruding through her anus presented in the neurosurgery from emergency department. The child had no fever, vomiting, abdominal pain, or other signs of illness.

On examination, the child was afebrile, alert and had no neck rigidity, and the abdomen was soft. On rectal examination, there was a white tube coming from beyond the reach of finger. In physical examination did not reveal signs of meningitis and peritonitis. Her vital signs and laboratory investigations were within normal limits. The child was investigated with a plain X-ray abdomen which revealed the peritoneal end within the colonic lumen and traversing the sigmoid colon and rectum going beyond the pubic symphysis. Brain computed tomography was performed to confirm the intraventricular position of the shunt.

Access this article online

Website: <https://www.nepjol.info/index.php/NJN>

DOI: <https://doi.org/10.3126/njn.v23i2.92057>



HOW TO CITE

Shah, S. J., Kshetri, G., & Kafle, P. Asymptomatic anal extrusion of a migrated ventriculoperitoneal shunt: case report and literature review. *NJNS*. 2026;23(2):63-65

Address for correspondence:

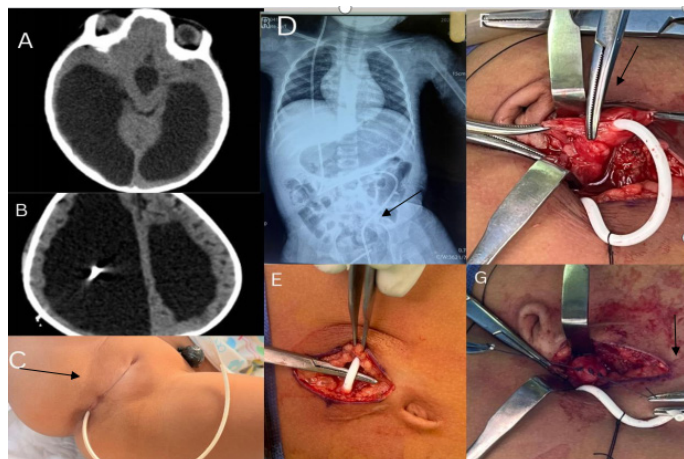
Sabin Jung Shah
MBBS, MS, MCh Neurosurgery Resident, Nobel Medical College Teaching Hospital
E-mail: drsabinjungshah27@gmail.com

Copyright © 2023 Nepalese Society of Neurosurgeons (NESON)
ISSN: 1813-1948 (Print), 1813-1956 (Online)



This work is licensed under a Creative Commons Attribution-Non Commercial 4.0 International License.

The child was operated through a small incision with the distal end perforating the transverse colon, the shunt was cut at abdominal surface and repair of perforation done. The rest of the distal tube was extracted per rectum. The proximal tube was reconnected with a new distal end of VP shunt. The cerebrospinal fluid (CSF) analysis sends which reveals sterile and Broad-spectrum intravenous antibiotics are started.



(A): Axial reconstruction of cranial computed tomography (CT) shows the Hydrocephalus (B) Intraventricular location of the ventriculoperitoneal shunt tip in right lateral ventricle. (C): Shunt tube coming out per anus (arrow head) (D): X-ray abdomen erect showing distal end of ventriculoperitoneal shunt tube going well beyond pubic symphysis (arrow head) (E): Showing the subcutaneous and intraperitoneal positioning of the shunt before perforation. (F): Showing the perforation site on transverse colon (arrow head) (G): Showing the catheter removal and surgical repair of the perforation site (arrow head)

Discussion

Hydrocephalus is a condition characterized by excessive accumulation of cerebrospinal fluid (CSF), leading to enlargement of the brain ventricles and increased head size, and it usually requires surgical treatment. It may be congenital or acquired and results from impaired CSF production, absorption, or obstruction to its normal flow². Ventriculoperitoneal (VP) shunting is a common neurosurgical procedure used to treat obstructive and normal-pressure hydrocephalus, but it may be associated with serious complications. These include infections such as ventriculitis, meningitis, and sepsis, as well as rare abdominal complications and distal catheter extrusion through different sites. Abdominal complications account for 10%–30% of VP shunt complications. Bowel perforation is rare (0.1%–0.7%) but serious, and in some cases the distal catheter protrudes through the anus, carrying a mortality rate of up to 15%³. Other delayed abdominal complications include perforation of the bladder, stomach, or fallopian tubes, intestinal obstruction, and pseudocyst formation⁴. The colon is the most commonly perforated organ (70%), followed by the stomach (16%) and small intestine (14%)⁵.

Although uncommon, bowel perforation can lead to fatal complications such as meningitis, encephalitis, and brain abscess, making early recognition crucial. Despite its effectiveness, VP shunt-related complications remain common.

Shunt malfunction is the most frequent problem, with 70%–80% of patients requiring revision, often due to infection⁶. Infection rates range from 5%–10%, with most occurring within the first two months after surgery².

The exact cause of bowel perforation and catheter migration remains unclear. Proposed risk factors include excessive catheter length, poor fixation, foreign body reaction, pressure injury, weak bowel walls in children, bacterial contamination, malnutrition, previous abdominal surgery, and adhesions³. Young age, male sex, prior abdominal surgery, and infection have also been identified as predisposing factors. In children, weak intestinal muscles combined with strong bowel movements may explain the higher risk, and once the catheter enters the bowel, peristalsis can push it toward the anus⁵. This complication is thought to occur gradually due to fibrous tissue formation and continuous CSF pressure, which weakens the bowel wall and allows catheter perforation. Fibrosis around the perforation may prevent bowel contents from leaking, explaining the absence of abdominal symptoms⁷.

Catheter migration is classified into three types: Type I (internal), Type II (external), and Type III (compound migration with protrusion through natural openings such as the anus). Our case fits Type III migration⁸. Bowel perforation usually occurs long after shunt placement (average 18.7 months), supporting a chronic process rather than an acute injury⁹.

Management is individualized based on the patient's condition, presence of infection, and shunt dependency⁶. Broad-spectrum intravenous antibiotics are started in all cases. Patients with peritonitis or sepsis require laparotomy with removal of the catheter through the anus, while uncomplicated cases may be managed laparoscopically¹⁰. After shunt removal and confirmation of sterile CSF, a new shunt can be placed at an appropriate time. Immediate shunt externalization is essential to prevent retrograde infection⁴. Laparotomy is indicated in the presence of peritonitis or abdominal abscess⁶, while catheter removal alone may be sufficient in asymptomatic patients, allowing spontaneous closure of the bowel perforation, as seen in our case³. When re-shunting is required, an alternative distal site outside the peritoneal cavity should be considered to reduce recurrence risk.

Grosfeld et al. reviewed 185 infants and children with VPS insertion done for the treatment of hydrocephalus during the period 1969–1973 found that VPS catheter had perforated the colon in five of the children and in 2 (1.08%) cases, the distal VPS catheter had passed per-rectally¹¹. Vinchon et al. in a retrospective review of the cases of bowel perforation by the peritoneal catheter of the VPS in a series of 1956 with a mean follow-up period of 10 years found that 3 (0.15%) cases reported with the per-rectal extrusion of the distal VPS catheter¹². Ghritlaharey et al. in a review of 398 cases of VPS insertion done in children for the treatment of hydrocephalus and documented that 10 (2.51%) of them presented with the trans anal extrusion of the distal VPS catheter and the mean interval was 6.1 months and ranged from 2 to 20 months². Ezzat et al., in a review of the management of 15 cases of the VPS complications, including 06 cases of per-rectal extrusion of the distal VPS catheter, found that the interval was 6 months or less for 6 of their cases.

Sharma et al.¹³ described a similar case in a 2-year-old child with asymptomatic anal protrusion of a VP shunt. Colonoscopy showed rectal perforation 10 cm from the anal verge, and the shunt was safely removed endoscopically after

disconnecting the cranial end, without complications.

Teegala and Kota¹⁴ reported two cases of anal extrusion of VP shunts and suggested that poor nutrition and infection were likely contributing factors.

This case shows the importance of early recognition and proper treatment of rare VP shunt complications. Prompt diagnosis and timely surgery help prevent serious complications such as sepsis and improve patient outcomes.

Funding: No funding was received for this study

Patient consent for publication: Not-applicable

Competing interests: Not declared

Conflict of interest: All authors certify that they have no affiliations with or involvement in any organizations or entity with any financial interest, or non-financial interest.

References

1. Sathyanarayana S, Wylen EL, Baskaya MK, Nanda A. Spontaneous bowel perforation after ventriculoperitoneal shunt surgery: case report and a review of 45 cases. *Surg Neurol.* 2000;54(5):388-396. doi:10.1016/S0090-3019(00)00334-7
2. Ghritlaharey RK, Budhwani KS, Shrivastava DK, et al. Trans-anal protrusion of ventriculo-peritoneal shunt catheter with silent bowel perforation: report of ten cases in children. *Pediatr Surg Int.* 2007;23(6):575. doi:10.1007/s00383-007-1916-8
3. Guthe S, Pravin S, Darade P, Velho V. Silent migration of ventriculoperitoneal shunt per anus in a child: Management and review of literature. *Asian J Neurosurg.* 2018;13(02):446-448. doi:10.4103/1793-5482.228559
4. Plummer NR, Tokala A, Date RS. Transanal protrusion of ventriculoperitoneal shunt reflecting asymptomatic perforation of the large bowel. *BMJ Case Rep.* 2014;2014:bcr2014204842. doi:10.1136/bcr-2014-204842
5. Low SW, Sein L, Yeo TT, Chou N. Migration of the abdominal catheter of a ventriculoperitoneal shunt into the mouth: a rare presentation. *Malays J Med Sci.* 2010;17(3):64-67. http://www.ncbi.nlm.nih.gov/pubmed/22135552
6. Chugh A, Gotecha S, Amle G, Patil A, Punia P, Kotecha M. Abnormal Migration and Extrusion of Abdominal End of Ventriculoperitoneal Shunt: An Experience of Eight Cases. *J Pediatr Neurosci.* 2018;13(3):317-321. doi:10.4103/JPN.JPN_18_18
7. Paff M, Alexandru-Abrams D, Muhonen M, Loudon W. Ventriculoperitoneal shunt complications: A review. *Interdiscip Neurosurg.* 2018;13:66-70. doi:10.1016/j.inat.2018.04.004
8. Allouh MZ, Al Barbarawi MM, Asfour HA, Said RS. Migration of the distal catheter of the ventriculoperitoneal shunt in hydrocephalus. *Clin Anat.* 2017;30(6):821-830. doi:10.1002/ca.22928
9. Park CK, Wang KC, Seo JK, Cho BK. Transoral protrusion of a peritoneal catheter: a case report and literature review. *Child's Nerv Syst.* 2000;16(3):184-189. doi:10.1007/s003810050491
10. Chiang LL, Kuo MF, Fan BJ, Hsu WM. Transanal Repair of Colonic Perforation due to Ventriculoperitoneal Shunt—Case Report and Review of the Literature. *J Formos Med Assoc.* 2010;109(6):472-475. doi:10.1016/S0929-6646(10)60079-4
11. Grosfeld JL, Cooney DR, Smith J, Campbell RL. Intra-abdominal complications following ventriculoperitoneal shunt procedures. *Pediatrics.* 1974;54(6):791-796. http://www.ncbi.nlm.nih.gov/pubmed/4431676
12. Vinchon M, Baroncini M, Laurent T, Patrick D. Bowel Perforation Caused by Peritoneal Shunt Catheters: Diagnosis and Treatment. *Oper Neurosurg.* 2006;58(suppl_1):ONS-76-ONS-82. doi:10.1227/01.NEU.0000192683.26584.34
13. Sharma A, Pandey AK, Diyora B, Shah S, Sayal P. Management of ventriculo-peritoneal shunt protruding through anus. *Indian J Surg.* 2006;68(3):184-186.
14. Teegala R, Kota LP. Unusual complications of ventriculo peritoneal shunt surgery. *J Neurosci Rural Pract.* 2012;03(03):361-364. doi:10.4103/0976-3147.102628