

# Spontaneous anal Extrusion of a Distal Ventriculoperitoneal Catheter in an Adult: Case Report

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## 1. Introduction

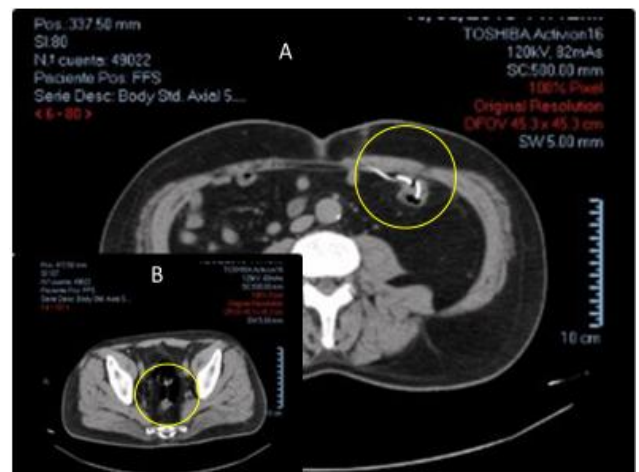
The use of peritoneal cavity for cerebrospinal fluid absorption was introduced in 1908 by Kausch.[3]The ventriculoperitoneal shunt has become the most used surgical procedure in the treatment of hydrocephalus. Although complications by the shunt are common, bowel perforation, and eventually, exteriorization through the anus is a rare condition. [4] Authors present the case of spontaneous externalization of a distal ventriculoperitoneal catheter shunt through anus in amale adult patient.[6]

## 2. Case Report

A 56-year-old male patient with a previous ventriculoperitoneal shunt insertion to treat hydrocephalus due to 8<sup>th</sup> cranial nerve neurinoma since 2011, consulted to the emergency department with diaphoresis, vomiting and crystalline and odorless diarrhea of one week, without abdominal pain or peritoneal symptoms. Physical examination reveals an adequate neurological status, hemodynamically stable, without fever and no evidence of meningism; as a positive finding on inspection of the anal region, we could observe the protrusion of a foreign body through the anus, which seems to correspond the distal end of a peritoneal catheter with minimal flow of clear and colorless fluid (**Figure 1**). Laboratory findings were within normal limits; aCT scan was realized revealing no displacement of the proximal catheter and an unusual position of the distal catheter, entering sigmoid colon's wall, running inside and coming out through the anus; CT scan discarded pneumoperitoneum or free fluid in the abdominal cavity (**Fig. 2a and 2b**). Immediate surgery was decided by sectioning ventriculoperitoneal shunt distal catheter, externalizing the upper segment which is connected to a reservoir, and removing the lower segment via transanal. Cerebrospinal fluid cultures were taken and broad spectrum antibiotic therapy was initiated for about a week until negative results were obtained. In this period the patient complained of no abdominal pain or neurological symptoms. Two weeks later, upper segment of the distal catheter was removed and replaced by a ventriculoatrial catheter. The patient was discharged 3 days after the new procedure, without complications and a control CT scan that shows ventriculoatrial shunt well positioned, without increase in ventricular size. The patient is on regular follow-up, well controlled and without over-added complications.



**Figure 1:** Photo showing extrusion of the ventriculoperitoneal shunt through anus.



**Figure 2**

a: abdominal TC showing ventriculoperitoneal shunt catheter perforating sigmoid colon's wall. b: pelvic TC showing ventriculoperitoneal shunt at the level of sigmoid colon guide towards anus.

## 3. Discussion

Distal migration is a recognized complication of ventriculoperitoneal-shunt placement and was reported in the literature up to 8,6%.[4,5]Mohammed and cols. described three types of migrations, according the extension of the distal catheter and anatomical structures involves: Internal-Type I, External-Type II, Compound-Type III.[6]In our case, it was a Type III because the catheter penetrated colon and extruded through an anatomical orifice (anus). Perforation into gastrointestinal tract has been reported in colon (corresponding to 70% of total cases), stomach and small

bowel (only 10%) [6], and the time of occurrence was between one and 10 years after shunt placement.[6] Colon was involved as a common site of perforation but the extrusion through rectum was less than 0,1-2,5%.[8] Incidence in men is increased due to shorter colon length and stronger colon peristalsis, which could further facilitate extrusion of distal catheter.[6], [10]

The mechanism of distal catheter penetration is not exactly understood and many times is multifactorial. However, hypothesized causes include effects such as pressure, erosion, adhesion, water hammer pressure, direct penetration by the sharp, memory of the distal catheter, silicon allergy, foreign body reaction, chronic irritation and neurologic deficits.[6], [7],[9]

Perforation of the colon can be lethal because of intracranial infections, peritonitis, abscess or fistulae.[8]The most serious complication associated with internal abdominal migration is the development of intracranial infections including meningitis, encephalitis and ventriculitis.[7] Reports revealed that risk of intracranial infection was greater when the distal catheter penetrated the colon; this could be attributed to the retrograde ascent of pathogenic bacteria.[6]Symptoms are variable in at least half of patients and have been recognized since asymptomatic patients, to clinical conditions that generates sepsis and death.[7]In the present case, no symptoms were reported except for diarrhea. Some patients with trans-anal shunt extrusion do not necessarily present with significant abdominal symptoms or develop infection, this could be due to fibrous tract formation at the perforation site, which can seal the hole and prevent spillage of feces into the abdominal cavity.[6]

Treatment of bowel perforation depends on the site of perforation and patient's status. Some colon perforations may require surgical intervention with high morbidity and mortality, but in other cases the perforation may be locally contained without producing peritonitis.[7]When the complication is recognized the removal of the shunt must be considered.[9]At the same time, cerebrospinal fluid and the distal catheter must be sent to culture because most of them showed growth of Escherichia Coli.[6]After the removal of the catheter, broad spectrum antibiotic therapy should be used until cultures and biochemistry results have been obtained; at this point, antibiotics should be adjusted according to the isolated microorganism and its sensitivity profile. Therapy with vancomycin and ceftriaxone should be empirical used for two weeks.[7] Finally, the definitive treatment should be considered once the infectious connotations are resolved and the patient's condition allows it, through a new re-shunting.[7]

#### 4. Conclusions

Spontaneous anal extrusion of a distal ventriculoperitoneal catheter is uncommon; surgical removal should be considered in all cases to avoid morbidity and mortality associated with the high incidence of retrograde infections. A high percentage of patients develop fibrous tract at the perforation site, which facilitates catheter removal and prevent peritonitis and sepsis.

#### 5. Consent

Written informed consent was obtained from the patient for the publication of this case report.

#### 6. Competing Interest

The authors declare no competing interests.

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