Case Report

Anal Extrusion of Ventriculoperitoneal Shunt: A Case Report and Review of Literature

Ekstrusi Anal Ventriculoperitoneal Shunt: Laporan Kasus dan Tinjauan Literatur

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ABSTRACT

Ventriculoperitoneal (VP) Shunt is a commonly performed surgical procedure and offers a good result in the treatment of hydrocephalus. In general, 25% of the complication rate of this surgical procedure is abdominal complications. Anal extrusion of a peritoneal catheter is a rare complication ranging from 0.1 to 0.7% of all shunt surgeries. This study presents a rare case of anal extrusion of ventriculoperitoneal shunt in a 1-year-old female child who was asymptomatic. The physical examination revealed swelling and redness along the shunt tract on the retro auricular region, soft abdomen, and no catheter was observed in the anal. This study found several contributing factors affecting the complications in the anal extrusion of a peritoneal catheter, that are thin bowel wall in children and sharp tip and stiff end of VP shunt. The shunt should be disconnected from the abdominal wall, and the lower end should be removed through the rectum by colonoscopy or sigmoidoscopy/proctoscopy or by applying gentle traction on the protruding tube. This study concludes that due to potentially life-threatening consequences and case rarity, thorough anamnesis, physical examination, and objective investigation are needed to determine the appropriate management for anal extrusion of ventriculoperitoneal shunt.

Keywords: Extrusion, hydrocephalus, ventriculoperitoneal shunt

ABSTRAK

Ventriculoperitoneal (VP) Shunt adalah prosedur pembedahan yang umum dilakukan dan menawarkan hasil yang baik dalam tatalaksana hidrosefalus. Secara umum, 25% dari angka komplikasi prosedur pembedahan ini adalah komplikasi abdomen. Ekstrusi anal dari kateter peritoneal adalah komplikasi yang jarang terjadi (0,1 hingga 0,7%) dari semua operasi shunt. Laporan ini menyajikan kasus ekstrusi anal ventrikuloperitoneal yang jarang terjadi pada anak perempuan berusia 1 tahun tanpa adanya gejala. Pemeriksaan fisik menunjukkan pembengkakan dan kemerahan di sepanjang traktus pada regio retro aurikuler, abdomen, dan tidak ada kateter yang diamati di anal. Laporan kasus menemukan beberapa faktor yang mempengaruhi terjadinya komplikasi ekstrusi anal dari kateter peritoneal, yaitu dinding usus yang tipis pada anak-anak dan ujung VP shunt yang tajam dan kaku. Oleh karena itu, pirau harus dilepaskan dari dinding perut, dan ujung bawah harus diangkat melalui rektum dengan kolonoskopi atau sigmoidoskopi/proktoskopi atau dengan menerapkan traksi lembut pada tabung yang menonjol. Studi ini menyimpulkan bahwa karena konsekuensi yang berpotensi mengancam nyawa dan kelangkaan kasus, anamnesis menyeluruh, pemeriksaan fisik, dan investigasi objektif harus dilakukan untuk menetapkan tujuan manajemen yang tepat pada ekstrusi anal dari ventriculoperitoneal shunt.

Kata Kunci: Ekstrusi, hidrocephalus, ventriculoperitoneal shunt

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INTRODUCTION

The placement of Ventriculoperitoneal (VP) Shunt as a diversion of cerebrospinal fluid (CSF) for hydrocephalus has been established as a surgical practice since early 1900. The first ventriculoperitoneal (VP) shunt was done by Kausch in 1908 (1). VP shunt is a commonly performed surgical procedure and offers good results in the treatment of hydrocephalus. However, various complications have been reported, including shunt infection, migration, and cerebrospinal fluid pseudocyst. The rates of complications range from 24% to 47%, and about 25% of these are abdominal complications. Cerebrospinal fluid pseudocysts peritoneal cavity is also being reported as an unusual complication with a reported incidence of less than 1% to 4.5% of ventriculoperitoneal shunting (VPS)(2). In general, caudal migration is more common than cranial migration (3). Caudal migration is usually asymptomatic, whereas cranial migration is typically symptomatic (4). Some abdominal complications are fibrous encasement of the peritoneal tip, blocking or kinking of the distal tube, slipping out through the surgical wound, and migration of the shunt or its components into various abdominal cavities(5) Bowel perforation with protrusion of VP shunt catheter from the anus is reported to occur in less than 0.1% - 0.7% of the cases (6). This study reported a usual complication of shunt procedure through an anal opening.

CASE REPORT

Figure 1. Head CT before VP shunt revealed hydrocephalus

This study presented a case of a 1-year-old female child with anal Extrusion of Ventriculoperitoneal Shunt. The patient was diagnosed with congenital hydrocephalus (Figure 1) with a history of VP shunt undergone in April 2018. The patient came to the ER with a complaint of anal catheter protrusion for three days before admission. She did not feel feverish and denied any gastrointestinal symptoms.

Figure 2.

- A. Swelling and redness along the shunt tract on the retroauricular region
- B. Abdominal X-Ray showing no free air, penetration of peritoneal catheter into the bowel, and its trajectory from the abdomen toward the peritoneal region
- C. Axial view of head contrasted CT scan showing the deformation of the ventricles (post-infection) and multiloculated ventricles

Upon examination, there were no meningeal signs, shunt system was unpatented, swelling and redness were present along the shunt tract on the retro auricular region (Figure 2A) and soft abdomen, and no catheter was noticed in the anus. Rectal examination showed no sign of the tube. The examination was continued using an abdominal x-ray and revealed penetration of peritoneal catheter into the bowel and its trajectory from the abdomen toward the peritoneal region (Figure 2B). The feature pointed towards a cerebral abscess. From a contrast-enhanced computer tomographic (CT) scan of the head, cerebral abscess and brain damage with no hydrocephalus (Figure 2C) were revealed; while, the laboratory investigations of the patient were normal.

Figure 3.

Figure 3.

A & B: VP shunt chamber extraction carried out from the craniocaudal

C : Spontaneous extrusion of the distal VP shunt tube

D : Distal VP shunt tube released spontaneously

Under general anesthesia and intra-operatively, the upper part of the shunt was extracted (Figure 3 A&B). Through rectal toucher durante evaluation, end of the VP shunt tube was not found on the rectum, and the intraabdominal VP shunt tube was marked up. However, during the evaluation on the next day, a spontaneous intra-abdominal VP shunt release was obtained through the anus given local anesthesia, peritoneal catheter tube in the abdomen was released, and the distal end of the peritoneal catheter was pulled out from the anus. Since the patient had an uneventful recovery, empiric antibiotic therapy was given for three days after surgery. The patient was discharged on the ten-post operative day in satisfactory condition.

DISCUSSION

This study presented a case of a 1-year-old female child with anal EVS, which is a rare complication, ranging from 0.1 to 0.7% of shunt surgeries (7). Extrusion potentially causes a fatal ventriculitis and septic condition (8). Awareness and early recognition of this complication are essential (6). Until now, the literature across the world has reported 139 cases of patients with anal extrusion (9). A study by Ghritlaharey *et al.*, showed the sites of perforation in the bowel that were in the caecum (2), ascending colon (1), transverse colon (6), splenic flexure (1), descending colon (5), sigmoid (7), rectum (4), and unknown in the colon (7,10).

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Several contributing factors that affect the complications in anal extrusion of peritoneal catheter are thin bowel wall in children (11), sharp and stiff end of VP shunt (5), distal tip of ventricular-peritoneal catheter placement with trocar (10), long peritoneal catheters chronic irritation caused by shunt (12) previous surgery, infection, and silicone allergy (13). Children of families with low socioeconomic status and suffering from malnutrition also have an increased risk of an anal extrusion VP shunt (10).

Bowel perforation in VP shunt should be considered with gram-negative meningitis or abdominal symptom (14). Abdominal management in the simple bowel perforation and no other complications formal laparotomy is not required. The shunt should be disconnected from the abdominal wall, and the lower end should be removed through the rectum by colonoscopy or sigmoidoscopy/proctoscopy or by applying gentle traction on the protruding tube (6). Patients with bowel perforation peritonitis should undergo exploratory laparotomy with removal of the shunt, thorough lavage, and primary closure of the bowel wall (10). If shunt malfunctions and there is no hydrocephalus, CSF diversion is not required; otherwise, EVD should be established at last for three weeks (10). The patient should be put on broad-spectrum antibiotics (10). After CFS cultures are found to be sterile, VP shunt should be inserted (15). In the case of VP shunt extrusion, it should not be done by intra-abdominal withdrawal extraction (16).

Suspicious complications of bowel perforation in VP Shunt should be considered as malfunctioning shunt with various signs and symptoms, such as cellulitis of the shunt tract or shunt infection, meningitis or cerebral abscess, and abdominal symptoms. Several contributing factors that affect the complications in the anal extrusion of the peritoneal catheter are thin bowel wall in children, sharp and stiff end of VP shunt, distal tip of ventricular-peritoneal catheter placement with trocar, long peritoneal catheters, chronic irritation caused by shunt, previous surgery, infection, and silicone allergy. Children of families with low socioeconomic status and suffering from malnutrition also have an increased risk of an anal extrusion VP shunt.

The treatment of this complication is through removing the extruded shunt, controlling the infection, or conducting alternative CSF diversion if needed. Usually, the extruded end is not complicated by peritonitis or meningitis, and it can be safely taken out from the migrated orifice. As a result, CSF cultures came out to be sterile, and the patient was found to be nontoxic. Revision surgery should be considered as soon as possible.

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