Colonic Perforation due to Ventriculoperitoneal Shunt Catheter: A Case Report

Ventrikuloperitoneal Şant Kataterine ait Kolonik perforasyon: Bir Olgu Sunumu

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ABSTRACT

Ventriculoperitoneal shunt is the most common and most effective therapeutic modality for the management of hydrocephalus. While most frequent complication is shunt dysfunction, abdominal complications may also occur at a rate of 25%, where 0.01-0.07% consists of colonic perforation. Despite being rare, a delayed diagnosis and treatment has a relatively mortal course. Once the diagnosis is established, prompt treatment should be initiated with accompanying removal of the catheter. In this case report, we presented a patient who had a ventriculoperitoneal shunt catheter protruding from anus with diagnostic and therapeutic approach in the guidance of the literature.

Key Words: Ventriculoperitoneal shunt, colonic perforation, treatment

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ÖZET

Ventriküloperitoneal şant uygulaması hidrosefalinin tedavisinde en sık kullanılan ve en etkin tedavi yöntemidir. En sık görülen komplikasyon şant disfonksiyonu iken abdominal komplikasyonlar %25 oranında görülebilmektedir.Abdominal komplikasyonlar arasında kolon perforasyonu görülme sıklığı % 0,01-0,07 oranındadır. Nadir görülen bir komplikasyon olmasına rağmen tanısının ve tedavisinin gecikmesi durumunda oldukça mortal seyretmektedir. Tanı konulur konulmaz ivedilikle tedavisinin başlanıp kateterin çıkarılması gerekmektedir.Bu sunulan vakamızda, hidrosefali nedeniyle ventriküloperitoneal şant uygulanan hastanın şant kateterinin anüsten çıkması sonucu tanı ve tedavi planının literatür eşliğinde değerlendirilmesi amaçlanmıştır.

Anahtar Sözcükler: Ventriküloperitoneal şant, kolon perforasyonu, tedavi

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INTRODUCTION

Insertion of a ventriculoperitoneal (VP) shunt is an effective treatment for hydrocephalus, where cerebrospinal fluid (CSF) is diverted into the peritoneal cavity (1). Complications of this method consist of catheter obstruction, infection, and various other complications, 25% of which is represented by abdominal complications (2,3). The latter includes peritoneal pseudocyst formation, mesenteric pseudotumors, inguinal hernia, hydrocele, perforations in the small intestine, colon, gall bladder, rectum, bladder, and vagina, and migration of the catheter into the thorax (3,4). Prevalence of colonic perforation ranges between 0.01-0.07% (4). Colon is the most common anatomic site of perforation, and it remains asymptomatic in near half of the cases. However, it may lead to serious infectious complications with a mortality rate of about 15% (4). The time elapsed from insertion of shunt to anal protrusion varies between 2 months and 7 years (5). In this case presentation, we discussed a patient in whom we detected a rare case of anal protrusion of the peritoneal VP shunt catheter that we removed by laparotomy and endoscopy.

CASE REPORT

Ventriculoperitoneal shunt catheter was inserted in a 19-year-old male patient upon diagnosis of hydrocephalus. After one month, distal tip of the catheter was sutured with silk suture due to detection of over drainage. Upon recurrence of hydrocephalus as confirmed by clinical and radiological signs, drum pressure was increased from 70 mm H2O to 100 mm H2O with re-opening of the distal tip. After three months, the patient applied to the neurosurgery departmentafter having seen the tip of the catheter protruding from the anus (Figure 1). On plain abdominal X-ray, the catheter was visualized to extend from colon to the pelvic area (Figure 2). The patient was taken into the operating room, where perioperative colonoscopy showed that shunt catheter was within the colon at the descending colon level (Figure 3). After release of proximal tip of the catheter by the neurosurgery team, catheter was also released from the fascia after insertion of the previous incision. Catheter was removed from its distal aspect via colonoscopy. Insertion site of the shunt at the colonic wall was repaired primarily. The patient was discharged upon being allowed for oral intake on postoperative day 3. On follow-up, the patient was decided not to require VP shunt catheter.

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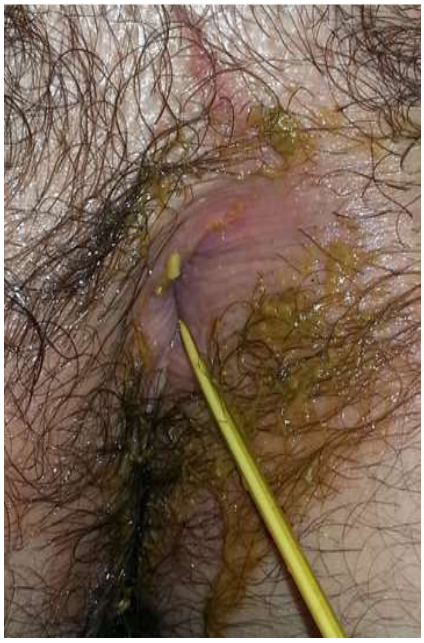

Figure 1. Ventriculoperitoneal shunt catheter extruded fromthe anus is demonstrated.

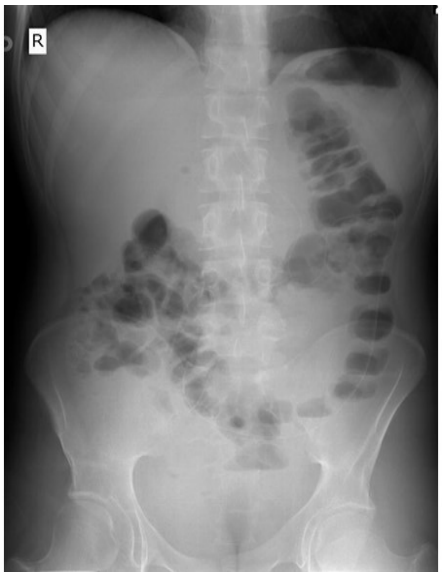

Figure 2. The radiograph of abdomen showing catheter in descending colon.

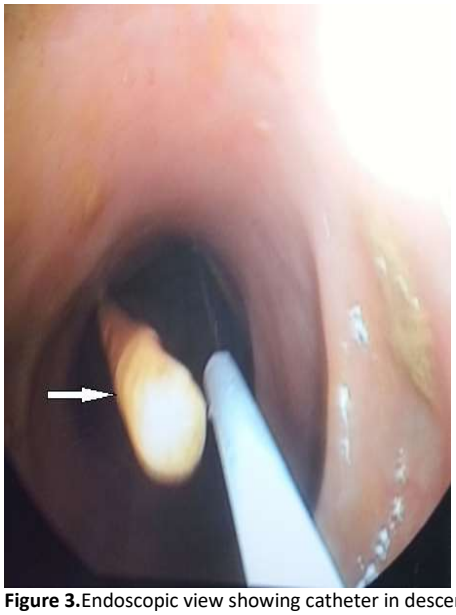

Figure 3. Endoscopic view showing catheter in descending colon.

DISCUSSION

VP shunt was first described by Kouch in 1908 and is still widely used for the management of hydrocephalus (6). Insertion of VP shunt has several complications such as ventriculitis, meningitis, sepsis, and various abdominal complications.

The latter include formation of peritoneal pseudocysts, mesenteric pseudotumors, inguinal hernia, hydrocele, perforations of small intestine, colon, gall bladder, rectum, bladder, and vagina, and migration of the shunt catheter into the thorax (4). VP shunt-induced intestinal perforation occurs at a rate of 0.01 to 0.07%, which was first reported by Wilson and Bertan in 1966 (6). It has a mortality rate of 15% as reported by Snow et al. (7).

Patients may be asymptomatic or present with abdominal pain, vomiting, and diarrhea. If the patient has ventriculitis or meningitis caused by enteric organisms, colonic perforation should be definitely suspected. In such cases, Escherichia coli is the most common microorganism isolated from the cerebrospinal fluid (CSF) cultures (1). Our case was asymptomatic with no abnormal finding on neurological or abdominal physical examination. Detection of no growth in perioperatively obtained CSF culture was attributed to the present antibiotherapy given at that time.

Although the exact mechanism by which the catheter led to colonic perforation was not elucidated, it is thought that catheter-induced local inflammation and irritation may erode the colonic wall and eventually cause perforation. Other possible risk factors include the type and length of the catheter, hardness or sharpness of its tip, developing of allergic reaction to catheter (silicone allergy), localized infection, poor general and nutritional status of the patient due to the primary disease, and abdominal adhesions secondary to previous surgery (8). Our case had a history of antipsychotic treatment for five years and two previous surgical procedures as well as poor self-care and nutritional status.

The diagnosis could be easily established by detection of protruding catheter from the anus, yet plain X-ray and abdominal tomography may also be used for definitive diagnosis. In our case, the diagnosis was confirmed by colonoscopic detecting of the catheter's insertion site at the colon. Management of colonic perforations induced by VP shunt has three main principles; comprising removal of the shunt, initiation of parenteral antibiotic treatment, and provision of the external drainage of the CSF until it is biochemically normalized and no growth is detected in cultures (5). Treatment options include percutaneous removal of the catheter, laparotomy and exploration, laparoscopic removal of the catheter, or even withdrawal of the catheter via colonoscopy (9). The way of removal is based on physical examination, laboratory findings, and consultation with neurosurgical team. In our case, catheter was removed through perioperative colonoscopy, and perforated colon segment was primarily repaired with laparotomy.

Despite being rare to occur and easy to diagnose, intestinal perforations caused by VP shunts are serious complications that may lead to death. Removal of the catheter and initiation of appropriate therapy once the diagnosis is established could be life-saving.

Conflict of interest

No conflict of interest was declared by the authors.

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