Extrusion of Ventriculoperitoneal Shunt Catheter through Mouth in a Two-year-old Girl: A Case Report

Rajendra K. Ghritlaharey

Department of Pediatric Surgery, Gandhi Medical College and Associated Kamla Nehru and Hamidia Hospitals, Bhopal, India

Email address: drrajendrak1@rediffmail.com

To cite this article:

Abstract: Ventriculoperitoneal (VP) shunting used in the treatment for hydrocephalus is associated with several complications. Gastric perforation and extrusion of peritoneal part of VP shunt catheter through mouth is an extremely rare complication. This is a report of a management of a two-year-old girl who had extrusion of peritoneal part of VP shunt catheter through mouth. Right sided VP shunt was done for communicating hydrocephalus associated with meningitis at the age of one year. She required revision of peritoneal part of shunt for extrusion of peritoneal catheter through the abdominal healed scar, 3 months after the placement of VP shunt. At the age of two-year she was admitted with bouts of vomiting and cough, followed by peroral extrusion of peritoneal part of VP shunt catheter. She was managed with removal of peroral extruded part of the shunt, external ventricular drainage, and delayed shunt revision. Three weeks later, she was admitted again with a history of extrusion of part of VP shunt catheter through abdominal wound, and was managed with re-insertion of peritoneal catheter to the peritoneal cavity through a different abdominal site. At last follow-up done two months later, she was doing well and her abdominal wounds were also healed well. The intention of reporting this case is its rarity.

Keywords: Children, Hydrocephalus, Peroral Extrusion, Shunt Complication, Shunt Revision, Ventriculoperitoneal Shunt

1. Introduction

Hippocrates, 5th century B.C. (460–377 BC), Greek physician and surgeon, the father of medicine, is thought to be the first physician to attempt and document the treatment of hydrocephalus (1).

Kausch in 1905 introduced the use of peritoneal cavity for cerebrospinal fluid (CSF) absorption in VP shunting, since then VP shunting is amongst the most frequently performed operation in the management of hydrocephalus (1-4). VP shunt operation is associated with several complications with reported incidence of 24 - 47% of cases, of which abdominal complications are reported to occur in 25% of the cases (3). Colon is the most commonly involved site for visceral perforation by VP shunt catheter and extrusion through rectum, and reported in less than 0.1% to 2.5% of the cases (3, 4). Extrusion of VP shunt catheter through mouth is an extremely rare complication, and only 20 such cases, including one in adult have been reported in the literature till date (5, 6).

2. Case Report

One-year-old girl was admitted with a diagnosis of moderate communicating hydrocephalus and meningitis. She was semiconscious and on naso-gastric feeding. Right sided VP shunt was placed for hydrocephalus after treating meningitis. Chhabra “slit n spring” valve and a regular reservoir, medium pressure, whole length (peritoneal / distal catheter length 75 cm), hydrocephalus shunt system (G Surgiwear Limited, Shahjahanpur, Uttar Pradesh, India) was used during shunting. She responded well to the above, and her CNS status and general condition improved well. She gained her consciousness and was discharged on oral feeding and medications. Three months later she was admitted with extrusion of peritoneal catheter of VP shunt through healed abdominal scar (fig 1), and was managed with revision of peritoneal part of VP shunt.

Nine months later, at the age of two years, she was admitted with history of peroral extrusion of peritoneal part of VP shunt catheter (fig 2a). She had sudden onset of vomiting and cough of 4 hrs duration, followed by extrusion of VP shunt catheter through mouth. Clinical examination
revealed that her vital were within normal limits except she had tachycardia and some salivation / frothing through mouth. She was irritable and pulling out the extruded part of the shunt catheter. There were no features of meningitis, raised intracranial pressure, or peritonitis. She was irritable due to peroral extruded VP shunt catheter, so that she was directly shifted to the operation theatre. Under local anaesthesia, old abdominal scar site was explored and the shunt catheter was identified and pulled out for few inches, while the end of the extruded shunt was hold with artery forceps (fig 2b). At this point the catheter was cut and peroral extruded peritoneal part of VP shunt catheter was taken out easily by pulling from its end, and the remaining peritoneal catheter was connected to a distal / peritoneal part of a new catheter and used as an external ventricular drainage (fig 2c). The CSF flow and the function of shunt were checked again. Clear CSF was coming through the end of the shunt (fig 2d) during pumping the shunt chamber. Her irritability and other were settled down within minutes of removal of peroral extruded shunt catheter.

X-ray of the abdomen and chest were done after the shunt removal and were normal. X-ray of the abdomen neither showed gas under the diaphragm nor showed fluid collection in the peritoneal cavity. Her abdominal sonography was also normal. CT scan of head showed dilated ventricles suggesting hydrocephalus with a shunt catheter in the right lateral ventricle (fig 3). CSF sample obtained during shunt externalization was sterile. She was clinically observed for peritonitis, meningitis and others, and she was stable. On fifth day after external ventricular drainage, the peritoneal catheter was reinserted in the peritoneal cavity. During the shunt revision the function of the shunt, and CSF flow were checked again, which was functioning well. Her immediate post-operative course was uneventful.

Three weeks later, she was admitted again with a complaint of extrusion of peritoneal catheter of VP shunt through old abdominal wound site (fig 4), and was managed by reinsertion of peritoneal catheter through a different abdominal site through mini laparotomy. Her post-operative course was normal. At last follow-up done two months later, her both the abdominal wounds were healed well, and she was also doing well.

3. Discussion

The risk in performing a VP shunt operation is low, but the complications related to shunts are many. Visceral perforation is an unusual but serious complication following VP shunt operation. Bowel / colon is most common site for visceral perforation, leading to extrusion of peritoneal catheter through anus and reported in less than 0.1% to 2.5% of the cases (3, 4).

Extrusion of peritoneal part of VP shunt catheter through mouth is an extremely rare complication, and only 20 such cases (excluding present case) have been reported in literature, including one case report in adult (5-10). One of the reasons for more of this complication in children than adult population is that more number of VP shunt operations is being performed in infants and children. Peroral extrusion of peritoneal part of VP shunt catheter was first reported by Griffith et al in 1987 in a girl child, 3 months after placement of VP shunt (7). Fermin et al in 1996 also reported peroral extrusion of peritoneal part of VP shunt catheter in 14-month-old girl child, 6 months after the placement of VP shunt for communicating hydrocephalus. In this case the catheter perforated the diaphragm, entered the thoracic cavity and trachea (confirmed during intubation), and extruded through mouth. She was successfully managed by exploratory laparotomy, removal of peroral extruded part of shunt, and revision of peritoneal catheter (8). Sridhar et al (2009) reviewed six cases of peroral extrusion of VP shunt catheter including their own case, and concluded that all the cases occurred in children below 12 years of age and the youngest was 8-month-old girl (9). Yilmaz et al in 2013 reported transoral protrusion of peritoneal catheter due to gastric perforation 10 years after VP shunting in a 47-year-old female, and authors reported as first such case report in adult (6).

On reviewing case reports of peroral extrusion of VP shunt catheter, the interval from VP shunt placement or last shunt revision to the occurrence of peroral extrusion of VP shunt catheter ranged from one month to 10 years, and in half of the cases it occurred within one year of shunt placement (5-10). The main complaints observed were sudden onset of bouts of vomiting, with or without cough and followed by peroral extrusion of the peritoneal part of the VP shunt catheter, and the clinical diagnosis was obvious on clinical observation of peroral extrusion of VP shunt Catheter. In the cases of peroral extrusion of VP shunt catheter, stomach was the site of perforation in majority of the reported cases, but it was also observed that the shunt catheter perforated the tracheobronchial tree and jejunum, followed by peroral extrusion of shunt catheter. Occurrence of peritonitis due to gastric perforation and peroral extrusion of peritoneal part of VP shunt catheter is not a rule (5-10).

The management of peroral extrusion of VP shunt catheter must be individualized and depends upon the presence or absence of features of meningitis, raised intra cranial pressure, peritonitis, shunt or shunt tract infection. The options for managing VP shunt extrusion through mouth are; (1) exploratory laparotomy, removal of peroral extruded part of shunt catheter, and shunt revision, (2) removal of entire shunt system and delayed re-shunt, (3) removal of peroral extruded part of shunt catheter, external ventricular drainage and delayed shunt revision, and (4) endoscopic and laparoscopic procedures. An endoscopic and laparoscopic procedure for managing peroral extruded catheter has also been advocated. This technique not only helps in the visualization of the site of gastric perforation with added advantages of minimal access surgery, and at the time avoids laparotomy and its complication (5-10).

Present case was diagnosed as meningitis and communicating hydrocephalus and she was treated with placement of VP shunt at the age of one year. She needed
revision of peritoneal part of shunt for extrusion of peritoneal part of VP shunt catheter from old healed abdominal scar, 3 months after the placement of VP shunt. At the age of two year (9-months after above shunt revision), she was presented with peroral extrusion of peritoneal part of VP shunt catheter, and was managed by removal of peroral extruded part of catheter, external ventricular drainage and delayed shunt revision. Three weeks later, she was admitted again with extrusion of part of peritoneal catheter through old abdominal wound, and needed reinsertion of peritoneal catheter into the peritoneal cavity through different abdominal site. Follow-up done two months later her abdominal wound were healed well and she was also doing well.

Figure 1. Clinical photograph showing extrusion of peritoneal catheter of VP shunt through healed abdominal scar.

Figure 2a. Clinical photograph showing peroral extrusion of peritoneal catheter of VP shunt.

Figure 2b. Operative photograph showing retrieval of peritoneal part of VP shunt catheter through abdominal incision.

Figure 2c. Operative photograph showing removed extruded part of shunt catheter and remaining used as external ventricular drainage.

Figure 2d. Operative photograph showing CSF drops at the tip / end of peritoneal catheter.

Figure 3. CT scan of head showing dilated ventricles and shunt within the right lateral ventricle.

Figure 4. Clinical photograph showing extrusion of peritoneal part of VP shunt catheter through old abdominal wound.
4. Conclusion

Peroral extrusion of peritoneal catheter is an extremely rare complication following VP shunt operations, and mostly seen in children. The clinical diagnosis is obvious due to the finding of peroral extrusion of shunt catheter. The management of such a case depends upon many factors and must be individualized.

References


