Case Report

Transoral migration of peritoneal end of ventriculoperitoneal shunt with perforation of gastro-esophageal junction: a case report of a rare complication

Gupta R[1], Mala TA[2], Gupta A[3], Paul R[4], Malla SA[5], GuptaAK[6]

Abstract:

A rare complication of ventriculoperitoneal (VP) shunt is presented. A 11-year old boy presented with a tube coming out of the mouth. He had multiple VP shunt done earlier. Clinical features, laboratory investigations and imaging studies showed that the peritoneal end had perforated the gastro-oesophageal junction and then prolapsed trans-orally. The shunt was removed and he made an uneventful recovery. Though migration of the peritoneal end of the shunt tube into various organs is known, to our knowledge, only six/seven cases have been reported in the English literature of a shunt tube coming out of the mouth and this is the next. The management of this very rare problem is discussed.

Keywords: migration; peritoneal end; transoral; oral extrusion; gastro-esophageal junction; hydrocephalus; ventriculoperitoneal shunt

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Introduction:

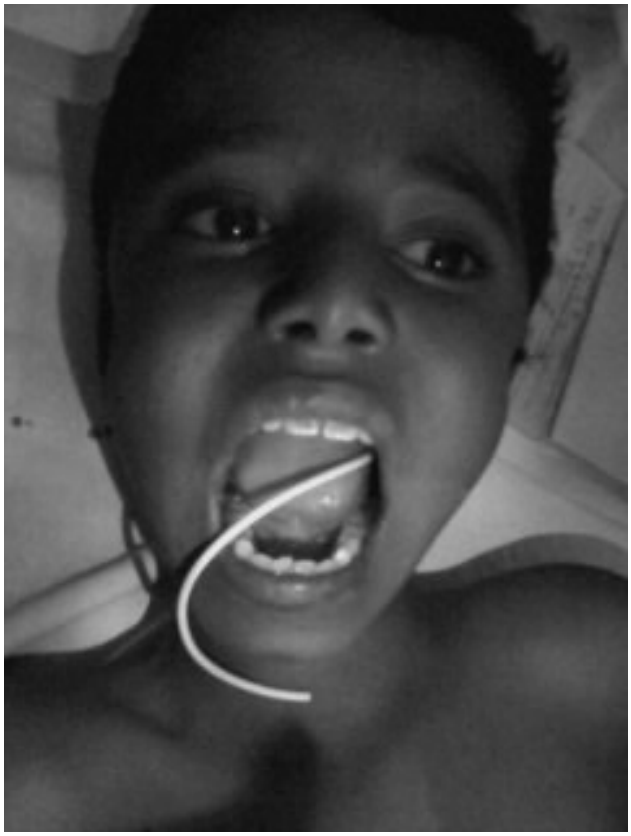
Ventriculoperitoneal shunt (VP) is one of the most common neurosurgical procedures done. Unfortunately, it also has a high-complication rate which varies widely. Out of this, abdominal complications account for about 25%. The peritoneal end of the ventriculoperitoneal (VP) shunt has been associated with complications such as pseudocyst formation, perforations of hollow viscus, penetration into solid organs and abdominal wall and protrusion outside body particularly through the abdominal incision and umbilicus. Perforation of the bowel occurs not infrequently followed by distal migration of the catheter. However, we report here a very rare case of proximal migration of the peritoneal catheter, after perforating the gastro-oesophageal junction and coming out of the mouth. Strategies in the management of this complication are reviewed. An individualized approach is essential for the successful treatment of this rare complication. To our knowledge, only six such cases have been reported in the English literature and this is the seventh.

Case Report:

This 11-year-old boy had VP shunt (Chhabra-slit-in-spring silicone shunt) done for congenital hydrocephalus 10 years before. He had multiple shunt surgeries done before for shunt malfunction, two on left and one on right side.7 months back he was also operated for infected left VPMP shunt and then at that time shunt was removed owing to shunt infection. This time he presented with history of a tube coming out his mouth about 12 hours prior to admission along with persistant vomiting, headache and high grade fever [fig 1]. He had a bout of vomiting

1. Dr Rahul Gupta, Resident Paediatric Surgery, Department of Paediatric Surgery, SPMCHI, SMS Hospital, Jaipur Rajasthan India
2. Dr Tariq Ahmed Mala, Postgraduate Department of Surgery, ASCOMS and Hospital Jammu (J&K) India-180017
3. Dr Atul Gupta, Resident Paediatric Surgery, Department of Paediatric Surgery, SPMCHI, SMS Hospital, Jaipur Rajasthan India
4. Dr Rozy Paul, Medical Officer, Jaipur Rajasthan India
5. Dr Shahaid Amin Malla, S.S Medical College Rewa (M.P) India
6. Dr Arun Kumar Gupta, Professor Paediatric Surgery (M ch Paediatric Surgery) , Department of Paediatric Surgery, SPMCHI, SMS Hospital, Jaipur

Corresponds to: Dr Tariq Ahmed Mala, Postgraduate Department of Surgery, ASCOMS and Hospital Jammu (J&K) India-180017. **Email:** drtariq_6481mala@rediffmail.com



and then a tube came out of the mouth. On examination, he was conscious, oriented but sick looking. He was febrile 103.5° F, having tachycardia with bounding pulse. He was neither anemic nor jaundiced. Found to be undernourished with 19 kg weight. Abdomen was soft with bilateral subcostal scars of previous operations. There was no tenderness and bowel sounds were heard. The peritoneal end of the tube was found to be coming out of his mouth. On compressing the reservoir, cerebrospinal fluid (CSF) did not drain, indicating that probably the shunt was not functioning. There was no evidence of peritonitis but clinically the patient was showing features of infection. Total leukocyte count (TLC) was 17900/cu mm, with polymorphonuclear leucocytosis of 88%. Hemoglobin, renal functions and electrolytes were normal.

Radiological Investigations

X-rays of the skull, chest, and abdomen were taken and fluoroscopy was performed which showed that the tube was a single entity and in continuity with the ventricular end. There were tubes bilaterally seen to be coming out of the skull and reaching the peritoneum subcutaneously in a normal manner. X-ray of the abdomen did not show any air under the diaphragm.

Upper GI contrast study was performed to see for the site of perforation in the GI tract and dye was also pushed through the shunt tubing to delineate the shunt tract. After doing radiological workup it was confirmed that shunt tube entered the stomach at the gastro-esophageal junction from the peritoneal cavity and looped into the oesophagus and was seen coming out of the mouth.

Course in hospital

The patient was taken up for surgery under general anesthesia (GA). A skin incision was given behind the ear over the chamber, ventricular end of the shunt was disconnected from the peritoneal end and both the ends were removed by gently pulling the tubes. There was no fracture of the tube and incision was primarily closed. Postoperatively he was kept nil orally for 48 hours to look for any leak or peritonitis and since the abdomen was soft and site of perforation had sealed spontaneously, he was started on oral feeds. He remained asymptomatic for 5 days and made an uneventful recovery and was able to take normal food. Patient remained asymptomatic not requiring a new shunt post removal as his other shunt was probably working well. He remained asymptomatic at the time of discharge 1 week later and till date (10 months later).

Discussion:

A VP shunt is the commonest pediatric neurosurgical procedure done. Complications are common and migration of the peritoneal end into virtually every abdominal organ has been reported. Perforation of bowel by VP shunts is rare and the incidence is only 0.1-0.7% of shunt surgery[1, 3].There are reports of migration of the peritoneal catheter of VP[1,2] shunts with intestinal perforation[1,3], Vaginal, uterine[3] , urinary bladder[3] and gallbladder perforation[4] have been reported. Pneumothorax[4] intestinal obstruction or volvulus[5] is also seen. Extrusion through the anus[4], umbilicus[6], abdominal incision[7] and into the scrotum, chest, heart, and pulmonary artery have been reported. Upward migration of VP shunts[8] has also been reported. Very few cases have been reported in the literature about this very rare complication[9-11], Ventriculitis[12] and peritonitis[3] complicating migration of the tube have been recognized. The possible factors responsible for gut perforation in VP shunt patients are thin bowel wall in children, sharp and stiff end of the VP shunt[9, 14], use of trocar by operating surgeons[15] chronic irritation by the shunt [16] previous surgery, infection and silicone allergy[17]

Why the transoral migration of ventriculoperitoneal shunt in this small number of cases occurs is not clear. Normally, peristalsis would have pushed the shunt tube distally and out of the anus. It is possible that proximal gut perforation plays a part. Once perforated and lying in the stomach or the jejunum, forceful repeated vomiting and retching may cause the tube to travel into the oral cavity. Surprisingly, here the tube has perforated the gastro-oesophageal junction proximally and up the oesophagus to emerge out of the mouth.

Due to the small number of cases reported, the correct line of management is not certain. The first step in the management should be to look for CSF infection and for shunt tract inflammation. Broad spectrum antibiotic cover for gut flora. The presence of infection was seen in the case of Kothari et al[12] which corresponds to our case study as there was some delay in seeking medical attention. In the case of Park et al there was absence of infection. Institution of antibiotics and early removal of the shunt precluded the setting in of meningitis. Park et al did laparoscopic exploration for the tube removal while no such procedure was necessary in our case. We removed the shunt by gently pulling it by giving an incision behind the ear and our maneouver was similar to the one done by Kothari et al[11]. This entailed pulling the extruded shunt tube through the peritoneal cavity but removal of the shunt presented no problem and feeding was instituted as there was no clinical evidence of peritonitis.

Most patients will need replacement of the shunt device after treatment of the bowel perforation and any infection. Our patient, however, remained asymptomatic not requiring a shunt post perforation as his other shunt was probably working well. In a patient with simple bowel perforation and no other complications, a formal laparotomy is not required while in patients with intraabdominal complications, urgent laparotomy should be undertaken. If detected on time and managed properly, the results are good.

Conclussion:

An extremely rare complication of VP shunt is presented, viz, transoral migration of the peritoneal end of VP shunt. The shunt tube was removed uneventfully and without any abdominal intervention.

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