Case Report

Transanal Migration of Ventriculoperitoneal Shunt

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ABSTRACT

Ventriculo-peritoneal (VP) shunt is a universally accepted, most commonly performed cerebrospinal fluid (CSF) diversion procedure for hydrocephalus. However, the procedure is associated with wide variety of complications. Trans-anal extrusion of VP shunt is rare but a well known entity. This is a case report of transanal migration of ventriculoperitoneal shunt in an eight year old male child.

INTRODUCTION

Ventriculo-peritoneal (VP) shunt is one of the commonly performed procedures for the management of hydrocephalus.[1] Although shunts have decreased the mortality and morbidity associated with hydrocephalus, they are still associated with many potentially avoidable complications. The various complications of ventriculoperitoneal shunt surgery are shunt infection, blockage and disconnection, migration of shunt tube, shunt failure, bowel perforation, cerebrospinal fluid (CSF) pseudocyst, inguinal hernia hydrocele etc. The incidence of abdominal complications reported in the literature is 10-30%.[2] Extrusion of distal end of VP shunt through anal opening is rare and a lesser known complication.[3] This case study reports a case of trans-anal migration of the distal end of the VP shunt.

Case Report

An eight year old male child was admitted with complaints of extrusion of shunt tube through anal opening (Figure 1 A). There was no history of fever, vomiting, or headache. Patient was previously operated for midline posterior fossa mass with hydrocephalus. Shunt surgery followed by definitive surgery was done at the age of five years. Examination revealed clear CSF coming out from the tip of extruded shunt tubing. General physical and systemic examinations along with complete

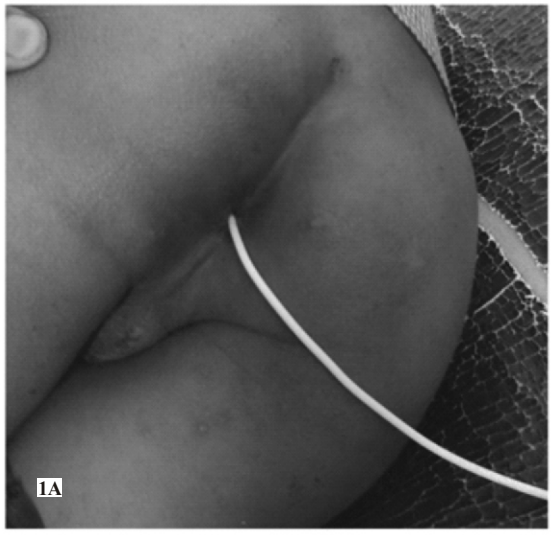

Figure 1A: Distal end of shunt tube extruding from the anal opening.

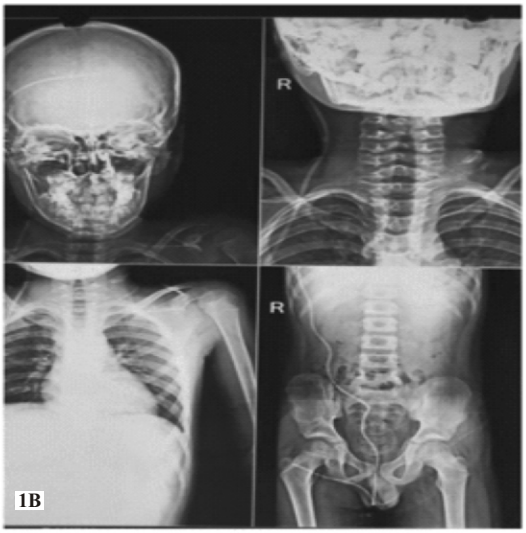

Figure 1B: X ray abdomen and pelvis showing shunt tube coming out from anal opening.

blood counts were unremarkable. X-ray abdomen with pelvis and ultrasonography of abdomen with pelvis showed no evidence of pneumoperitoneum or any collection and distal end of shunt tube was seen coming out through anal opening (Figure 1B).

CSF study from distal extruded shunt tube was normal. Patient was kept nil per oral for 48 hours, intravenous fluids and antibiotics were given, and distal end of the VP shunt was cut through abdominal end and pulled out via anal opening. Proximal end was exteriorized through infra clavicular incision and clamped. CSF culture was sterile. On 4th day post shunt exteriorisation, patient developed headache and CT head showed ventricular dilatation. Immediately, abdominal end was revised and placed back into abdominal cavity through a virgin site. Patient was discharged on 7th post operative day without any complication. CT scan at the time of presentation (after first shunt) and operation are shown in figure 2A and 2B.

DISCUSSION

Ventriculoperitoneal (VP) shunt represents a classical, universally accepted, and commonly used surgical procedure for the management of hydrocephalus.[1] VP shunt diverts CSF from dilated ventricular system to the peritoneal cavity for fluid absorption. Complications associated with VP shunt are numerous and can be fatal. VP shunt complications are classified as mechanical, infective, and functional. These mechanical complications are related to distal peritoneal end of VP shunt and include migration into bowel lumen, intrapleural space, heart, urinary bladder, scrotum, umbilicus, inguinal hernia, and other regions.[4-8] Cases of extrusion of the distal shunt catheter through healed abdominal incisions have been reported.[9] A case of intra-cardiac migration of distal

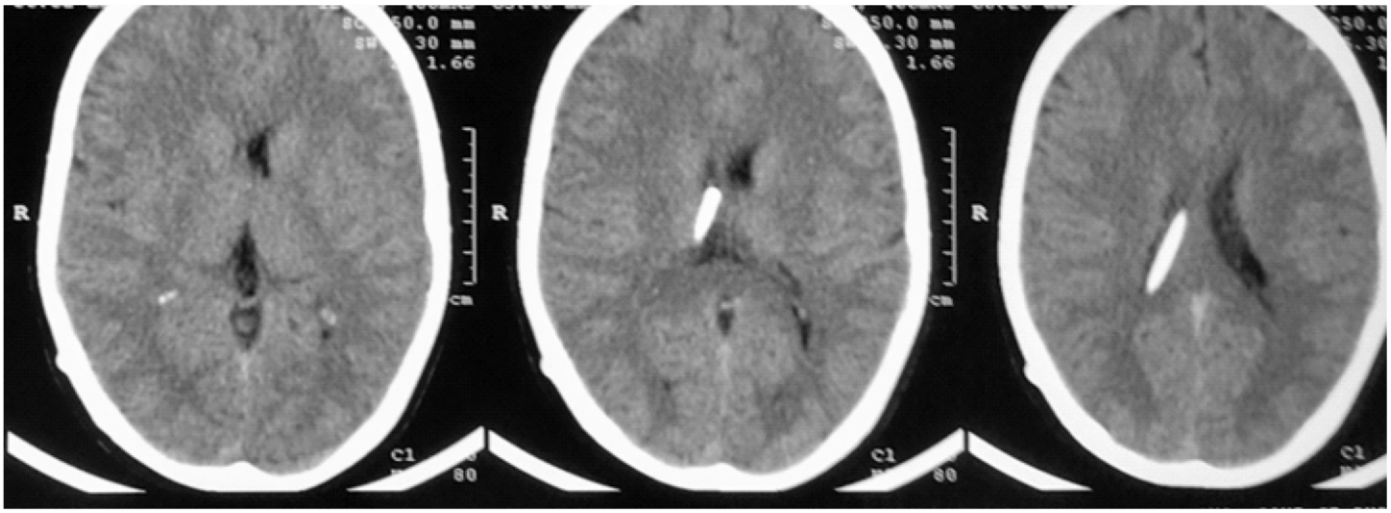

Figure 2 A: CT scan at the time of presentation (after first shunt).

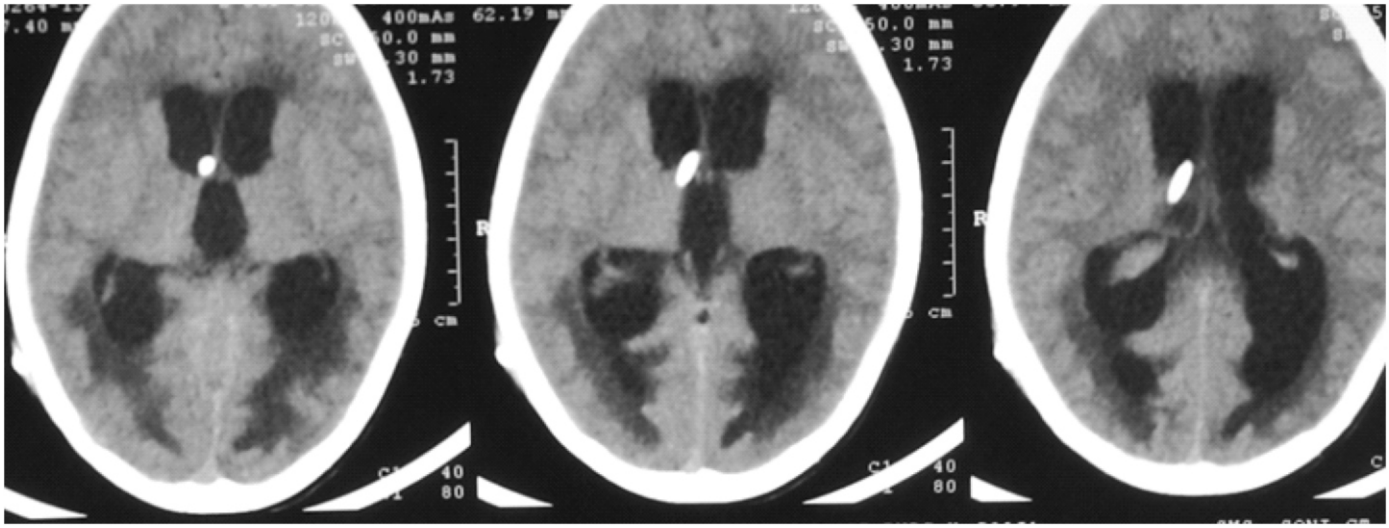

Figure 2 B: CT scan at the time of operation.

end of VP shunt has also been reported.[10] Functional complications include either increased or decreased drainage of CSF.

Intestinal perforation and anal extrusion of a distal VP shunt is an unusual complication. Large intestine is considered the most frequent site of perforation due to VP shunt with an incidence of 0.1-0.7%.[11] The first case of anal extrusion of distal VP shunt was reported by Wilson et al.[12] Since then more than 100 such cases have been reported in literature, predominantly in children. Most of these bowel perforations have asymptomatic course and are diagnosed only after the trans-anal shunt extrusion. Only a small proportion of children have clinical manifestations. Children with meningitis, encephalitis, or ventriculitis due to *E.coli* or other gram negative coliform bacteria should be considered to have an undiagnosed asymptomatic bowel perforation due to VP shunt.[13,14]

The exact basis of VP shunt related bowel perforation has not been fully defined. Various proposed mechanisms include foreign body reaction because of silicon tubing of VP shunt, pressure necrosis, and weak bowel musculature. Local inflammation and resulting fibrosis, adherence of shunt tube, and continuous water hammer effect of CSF pulsations can erode the intestinal wall. Once in bowel lumen, shunt tube is driven downward and forward by peristaltic waves. Poor host immunity, surgical technique, and long shunt tube in peritoneal cavity also contribute to shunt extrusion.

The management of these cases most importantly involves early diagnosis of bowel perforation. X-ray following injection of contrast medium into shunt tubing can give a clue to the diagnosis. The treatment of these cases involves shunt removal, intravenous antibiotics, and re-insertion of shunt at an appropriate time or external ventricular drainage. In case of anal extrusion, distal shunt tube should be divided after traction at an anal verge and remaining shunt assembly should be removed by neck incision. After removal of VP shunt, intestinal perforation heals spontaneously. Emergency laparotomy is required only in cases presenting with features of peritonitis.

In the present case, only presentation was spontaneous protrusion of shunt tube from anal opening. Peritoneal end of shunt tube was divided after traction, as contaminated tube should not be allowed to be in contact with the peritoneum or the shunt tract.[15] It is done to lower the theoretical risk of infection. Revised shunt surgery was done after four days as CSF analysis was normal and patient was discharged asymptomatically.

CONCLUSION

This case shows the importance of close follow up of patients with VP shunts for timely detection and management of potentially fatal complications associated with it.

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