

Trans-Oral Migration of VP Shunt Tube Through Gastric Perforation with Review of Literature

Sharma Deen D^{1*}, Meena Atul², Shukla Arvind K³, Sharma Pramila², Raipuria Gurudatt¹

¹Resident, ²Assistant Professor, ³Professor,
Department of Pediatric surgery, SPMCHI, SMS Medical College, Jaipur, Rajasthan, India.

ABSTRACT

Ventriculo-peritoneal (VP) shunt surgery is one of the standard procedures for the management of the hydrocephalus in children. Abdominal complications account for about 10–30% of VP shunt procedures.

We report a case of trans-oral migration of the VP shunt through perforation in the posterior gastric wall. Very few cases of trans-oral migration of VP shunt have been reported in the English literature. We are reporting a case of congenital hydrocephalus, operated on 25th day of life for VP shunt surgery which was presented to us at the 8 month of age with trans-oral migration of distal end of VP shunt. Through this case we want to add in information and providing the comparison for the management in such type of rare cases and to frame a protocol for the same.

Key words: Ventriculo Peritoneal Shunt, Trans-Oral Migration, Gastric Perforation, Complications.

*Correspondence to:

Dr. Deen Dayal Sharma,
3, Old Transit Hostel,
Gandhi Nagar, Jaipur, Rajasthan.

Article History:

Received: 25-09-2016, Revised: 19-11-2016, Accepted: 20-05-2017

Access this article online

Website: www.ijmrp.com	Quick Response code 
DOI: 10.21276/ijmrp.2017.3.3.062	

INTRODUCTION

Hydrocephalus is common in the paediatric age group and associated with many complications. There is no ideal system for CSF diversion, and VP shunt surgery is one of the universally accepted procedures in the management of hydrocephalus. It has been estimated that 40-50% of children and up to 29% of adults will experience a failure of the shunt within the first year.¹ Numerous complications are associated with VP shunt surgery, especially with abdominal end. Spontaneous bowel perforation is a rare complication of a VP Shunt surgery, seen in only 0.01-0.07% of cases.^{2,3}

Age stands out as the main risk factor for bowel perforation, with about 70% of patients less than five years of age.^{2,4} The peritoneal end of the shunts, which perforate the bowel, extrude most commonly through the anal orifice (61.9%).⁵ Trans-oral extrusion is extremely rare; very few cases, probably not more than ten, have been reported in the English literature.

Most of patients with trans-oral extrusion were below 12 years of age except one adult case. Our patient is the youngest, eight months of age, and as younger as the one which was reported earlier.⁶ Most of the patients were female children, in contrast to the slight male preponderance in bowel perforation.^{4,5}

CASE HISTORY

A 25 days old male child, presented to us with a progressively increasing head circumference, a tense bulging anterior fontanel with upward gaze paresis. CT scan of the head showed gross hydrocephalus. A right-sided VP shunts surgery was done using Chhabara's low pressure, slit & spring type of silicone VP shunt.

The child readmitted at 8 months of age, with complaints of vomiting soon after breast-feeding. The child's mother noticed some white tube like structure protruding into the throat while feeding and every time when the child cries.

On examination, the child was asymptomatic. The abdomen was soft and bowel sounds were present, had no symptoms suggestive of bowel obstruction. No signs and symptoms of any febrile illness were present. Anterior fontanel was flat. Chamber of VP shunt was compressible and fills quickly while releasing of pressure, suggestive of proper shunt functioning. Percutaneously, the shunt was palpable in continuity from above downwards, from skull to abdomen without any visible sign of shunt tract inflammation. Head circumference was 49 cm which is more than 90 percentile and body weight was 6 kg which is less than 25 percentile for the age.

Plain X-ray of body parts (Figure 1) including skull, chest and abdomen had not shown any displacement of the cranial end of the shunt tube. The peritoneal end was seen as ascending tracing of the shunt tube from abdomen to the oral cavity through thoracic cavity, suggesting distal shunt tip migration into the mouth.

Ultrasound of the abdomen was normal. Laboratory examinations, including TLC were within limits. CSF, aspirated from the shunt chamber, sent for culture and sensitivity. The child was kept on empirical IV antibiotic therapy, nil by mouth and IV fluids for 48 hours. Laparotomy was planned after obtaining sterile CSF culture report.

Shunt tube was visible on laryngoscopy while intubation (Fig 2). Intra operatively, the shunt tube was seen entering into the

posterior wall of stomach with flimsy adhesion around it. The tube was pulled out gently and repositioned back into the abdominal cavity. Gastric perforation was left for spontaneous healing. Post-

operative outcome was uneventful. The child started feeding after 2nd post-operative day and was discharged on 10th post-operative day. On follow up, the child is alright, without any complaints.

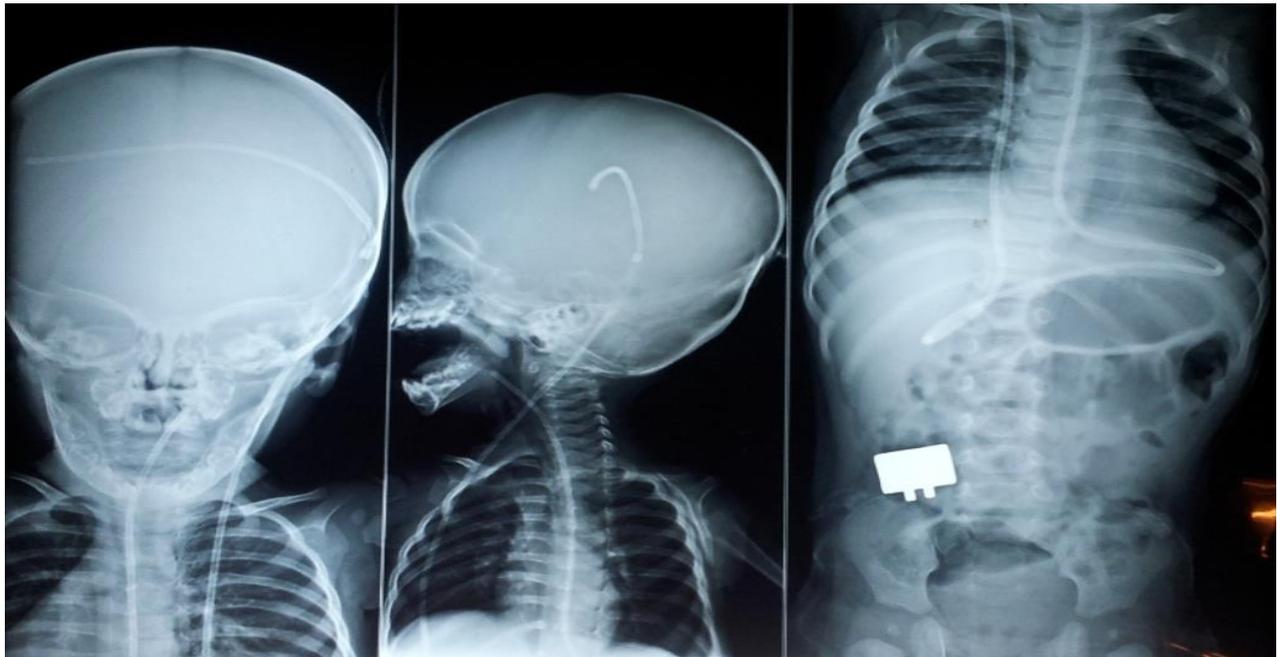


Figure 1: Plain X-Ray (AP & Lateral) Skull, Chest & Abdomen: showing no displacement of shunt tube and upward tracing of distal end of shunt tube into the mouth



Figure 2: Visible distal end of shunt tube during Laryngoscopy in the intubated child.

DISCUSSION

VP shunt tube extrusion through the mouth in these few numbers of cases is not yet clear. It is possible that proximal gut perforation plays an important role. 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.

Various mechanisms have been suggested, including foreign body reaction, poor nutritional status with weakening of the intestinal wall, and stiff end of the shunt tube causing pressure necrosis.

Because of weak bowel musculature, children are more susceptible to intestinal perforation.⁴

Most cases of bowel perforation caused by peritoneal catheter occurred well after the surgery, suggesting that they resulted from a chronic inflammatory process rather than traumatic event.⁷

Due to the small number of cases reported, the correct line of management is still not certain. The first step in the management should be to look for CSF infection and for shunt tract inflammation. Broad-spectrum antibiotic should also be started at admission and removal of the tube should be done, as described in previously published literature.

As far as shunt removal is concerned, it doesn't stand true in our case, as we have repositioned the distal end of shunt tube back into the peritoneal cavity with assumption that proximal perforations of the stomach or proximal jejunum are less prone to have severe infectious complications than are perforations of the distal intestine like the colon with evidential support of sterile CSF culture and blood TLC within limit.

The management of these cases is difficult and needs to be individualized. The standard method of treatment is removal of the extruded shunt system, control of infection, improvement of general condition followed by CSF diversion procedure except in our case where shunt tube was repositioned back into peritoneal cavity under the umbrella of antibiotics and in absence of any signs of infection.

In majority of the asymptomatic bowel perforations, the perforation of the bowel was treated conservatively.⁶

Bowel perforation and shunt tube extrusion do not always have a benign course. Park et al.⁴ reported 20% mortality in the 50 cases they reported. A low threshold of suspicion is needed to diagnose bowel perforation, as less than 25% of patients with

bowel perforation exhibit signs of peritonitis.³ Prolonged diarrhoea with abdominal symptoms in a shunted patient should warn of a possible perforation. CSF cultures have been found to be positive in 23 of 45 patients with bowel perforation, with E.Coli being the most common organism.³ A shunted patient presenting with ventriculitis or meningitis due to an enteric organism, should be presumed to have a silent bowel perforation and should be investigated for the same.

CONCLUSION

Among all the other known complications VP shunt surgery, trans-oral migration of distal end of VP shunt is a very rare complication. This situation needs an individualized, planned approach that includes IV antibiotics, removal or reposition of VP shunt and treatment of CSF infection if present. As only few cases have been reported till date, through this case we want to add in information and help to frame a protocol for the same.

REFERENCES

1. Wu Y, Green NL, Wrench MR, Zhao S, Gupta N. Ventriculoperitoneal shunt complications in California: 1900 to 2000. *Neurosurgery* 2007;61:557-63.
2. Yilmaz MB, Egemen E, Tonge M, Kaymaz M. *Turkish Neurosurgery* 2013, Vol: 23, No: 2, 285-8.
3. Satyanarayana S, Wylen EL, Baskaya MK, Nanda A. Spontaneous bowel perforation after ventriculoperitoneal shunt surgery. case report and a review of 45 cases. *Surg Neurol* 2000;54:388-96.
4. Park CK, Wang KC, Seo JK, Cho BK. Transoral protrusion of a peritoneal catheter: A case report and literature review. *Childs Nerv Syst* 2000;16:184-9.
5. Odebode TO. Jejunal perforation and per oral extrusion of a peritoneal shunt catheter. *Br J Neurosurg* 2007;21:235-6.
6. Sridhar K, Karmarkar V. per oral extrusion of ventriculoperitoneal shunt: Case report and review of literature. *Neurol India*. 2009; 57:334–6.
7. Danismend N, Kuday C: Unusual complication of ventriculoperitoneal shunt. *Neurosurgery* 1988;22:798.

Source of Support: Nil. **Conflict of Interest:** None Declared.

Copyright: © the author(s) and publisher. IJMRP is an official publication of Ibn Sina Academy of Medieval Medicine & Sciences, registered in 2001 under Indian Trusts Act, 1882.

This is an open access article distributed under the terms of the Creative Commons Attribution Non-commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

Cite this article as: Sharma Deen D, Meena Atul, Shukla Arvind K, Sharma Pramila, Raipuria Gurudatt. Trans-Oral Migration of VP Shunt Tube Through Gastric Perforation with Review of Literature. *Int J Med Res Prof*. 2017; 3(3):303-05. DOI:10.21276/ijmrp.2017.3.3.062