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Transoral Migration of the Inferior End of a Peritoneal Catheter: A Rare Complication of Ventriculoperitoneal Shunt

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Abstract : ***Ventriculoperitoneal (VP) shunt is the most commonly used technique for the treatment of hydrocephalus. It essentially involves two types of complications (infectious and mechanical). Transoral migration of the inferior end of the peritonealcatheteris a rare but dangerous complication. A review of the literature from search engines, PubMed, ScienceDirect, googlescholar, in English with the keywords "ventriculo-peritoneal shunt", "complications" and "transoral migration" identifies, only 8 cases of transoral migration published. We report the case of a 2-year-old male infant who had undergone VP shunt for tetra-ventricular hydrocephalus. Tenmonthslater, the patient had a protrusion of the peritonealcatheter in his mouth. Ablation of the VP shunt, with placement of an external ventricular shunt was performed. Antibiotic therapy was administered followed by a VP shunt referral. The evolution was favorable***.

Keywords: Ventriculoperitoneal shunt; Transoral migration; Complications

1. Introduction

Ventriculoperitoneal (VP) shunt is one of the most commonly used surgical techniques in the treatment of hydrocephalus. However, itis not free of complications, essentially infectious or mechanical. Transoral migration by intestinal perforation is a rare complication, occurring in less than 0.1% of cases [8], and may result in fatal meningeal infection if not diagnosed promptly. A review of the literature from search engines, PubMed, ScienceDirect, googlescholar, in English with the keywords "ventriculo-peritoneal shunt", "complications" and "transoral migration" identifies, only 8 reported cases (Table 1) [1, 2]. We report the case of a 2-year-old male with VP shunt ten months before the on set of this complication.

2. Observation

It was a 2-year-old male infant who underwent a ventriculoperitoneal shunt in September 2017 for tetra-ventricular hydrocephalus of malformative origin. The postoperative course went well and the symptoms of intracranial hypertension decreased significantly. The patient was readmitted in June 2018, at 10 months postoperative for convulsions + fever at 39 ° C associated with vomiting, incessant crying and externalization of the distal DVP catheter through the mouth.

Clinical examination, there was macrocranium with a head circumference of 72 cm, an alteration of the neurological state with a tendency to drowsiness, an extrusion of the inferior end of the peritoneal catheter into the oral cavity (Figure 1) and lack of defense or abdominal contracture.

Standard radiographs of the valve path revealed complete disappearance of the inferior end of the peritonealcatheter and extrusion of the inferior end of the peritoneal catheter into the oral cavity (Figure 2).The postoperative brain scan showed active hydrocephalus, with laminated parenchyma, pneumoventriculia, and frontal abscess (Figure 3). The ventricular catheter was in place.

There was a biological inflammatory syndrome made of leukocytosisat 18000 / mm3, a reactiveprotein C at 96 mg / l and a sedimentation rate at 21 mm in the first hour and 26 mm in the second hour.

Patient was operated on for the removal of the VP shunt, followed by the placement of an externalventricular (EV) shunt. The perforation was located in the duodenum and the fistula repaired surgically.

Cyto-bacteriological and chemical examinations of the CSF (cerebrospinalfluid) and ventricular catheter resulted in purulent Klebsiella pneumonia emeningitis susceptible to cefotaxime and gentamicin. Antibiotic therapy adapted for 21 days intravenously was conducted. The cyto-bacteriological and chemical examinations of the control of the LCS found a clear liquid, 02 elements / mm3, normoglycorachie with 0,44g/l, light hyperproteinorachie with 0,52g/l and the absence of germ. The brain scan of control found a hydrocephalus, but a sterilization of the infectious center. A VP shunt has been rested. The evolution was favorable, with resolution of the vomiting and recovery of the initial neurological status.

3. Discussion

VP shunt is currently the gold standard for hydrocephalus. Survival after VP shunt is estimated at only 40% and 50% in the second year [3, 9]. 24 to 47% of patients have postoperative complications, 25% of which are abdominal complications, mainly mechanical [2]. Complications typically include ventricular catheter obstruction (63.2% of cases), peritoneal catheter obstruction (23.5%), disconnection (1.4%), and malposition (1.4%) [5]. 40% of

cases of abnormal VP shunt involve the peritoneal catheter [9]. The frequency of migration out of the peritoneal cavity is 8.6%. The incidence of spontaneous perforation of the digestive tract is between 0.1 and 1% [10]; in this case, the inferior end of the peritoneal catheter is most often exteriorized by the anal orifice (61.9%) [7], whereas the transoral extrusion is extremely rare, with only 8 cases reported in the literature (Table 1).

Several risk factors associated with perforation of the digestive tract have been identified: young age, since 70% of cases were less than 5 years old [5]; a female preponderance [4]. Obesity, with a BMI> 30, also appears to be a contributing factor [4, 5]. Factors related to abdominal conditions include history of digestive surgery, liver failure and constipation [2].

Several hypotheses concerning the mechanisms inducing digestive perforation have been advanced. Direct trauma during surgery or contact and adhesion between the peritoneal catheter and the bowel causing an inflammatory reaction and ulceration and perforation of the intestinal wall may explain the migration of the catheter into the tube digestive [2]. However, it seems that the length of the peritoneal catheteris the major factor incriminated in this type of complication. Excessive length causes a risk of perforation and migration not onlyinside the digestive tract but also in otherorgans [10]. With respect to ascending migration with transoral extrusion of the catheter, several theories could explain this phenomenon, but no conclusion can be drawn because of the limited number of reported cases. However, several factors play a role, such as proximal perforation of the digestive tract, recurrent vomiting, infection, and constipation [6]. In this case, we believe that the intestinal perforation was mechanical due to the excessive length of peritoneal catheter.

The diagnosis may be obvious if the catheter completely exceeds the oral cavity. Like the present case. This is less the case when the catheter is not visualizable, especially when symptoms are dominated by vomiting and signs of peritoneal irritation are not found on examination. The standard radiograph of the valve path in most cases shows angulations and an abnormal path of the peritoneal catheter. The radio-opacification of the catheter can sometimes be useful.

The treatment usually consists of meningeal infection to remove the valve device completely, setting up a EV shunt if necessary, antibiotic therapy adapted to isolated germs. Laparoscopic or open surgery may be imperative in difficult cases. Evolution is unpredictable [6]. Mortality of about 20% has been reported in various series [2]. The prognosis is often threatened by CSF inoculation with virulent enteric pathogens. LCS culture isolates a Gram-negative bacillus in 50% of cases. These germs are the most frequently responsible for meningitis in this context [10].

4. Conclusion

VP shunt causes multiple complications. Transoral migration of the inferior end of the peritoneal catheter is a rare but serious complication. Diagnosis is easy in the majority of cases. Morbidity mainly involves a meningeal infection. Digestive perforation should therefore be suspected in cases of meningitis in patients withVP shunt. Knowledge of risk factors and clinical signs is a guarantee of adequate and effective care to limit morbidity and mortality.

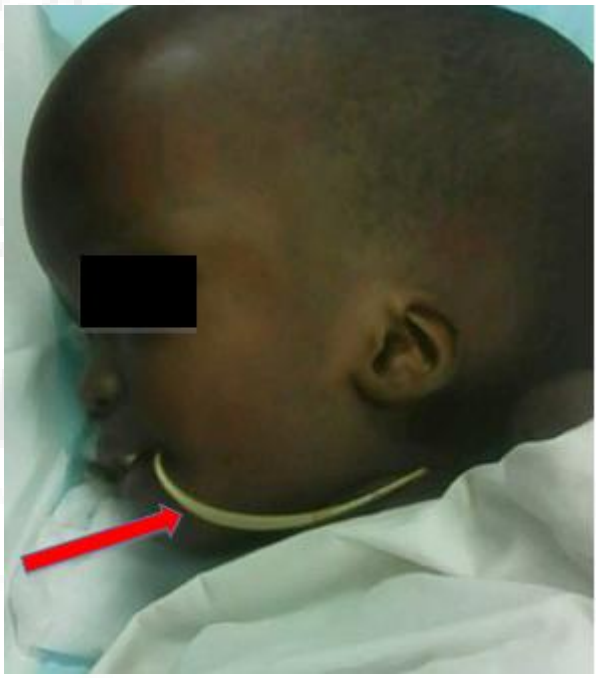

Figure 1: Photo showing extrusion of the ventricul operitoneal shunt's peritoneal tip through the mouth (red arrow).

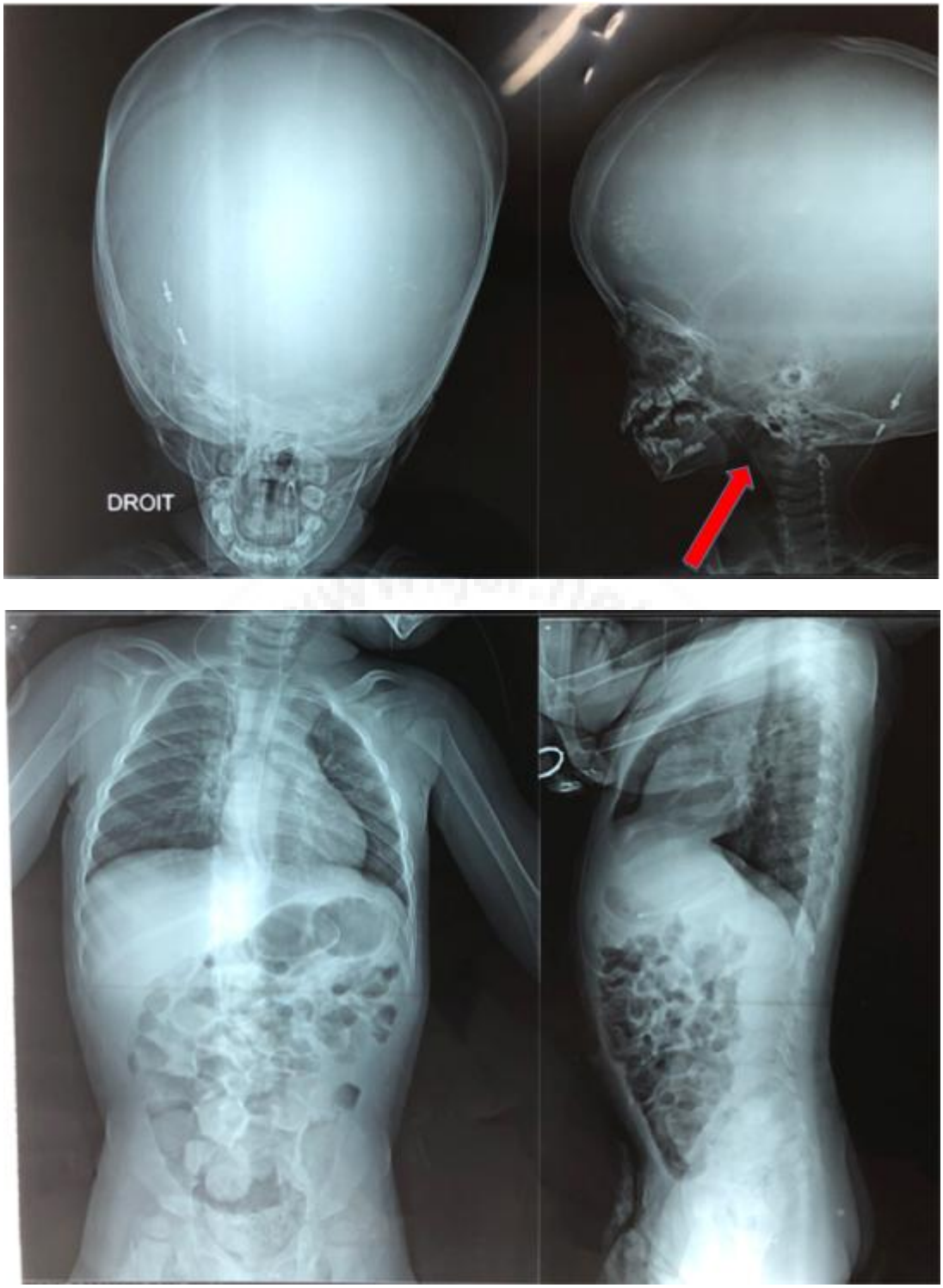

Figure 2: Radiograph showing complete disappearance of the inferior end of the peritoneal catheter and extrusion of the lower end of the peritoneal catheter into the oral cavity (redarrow).

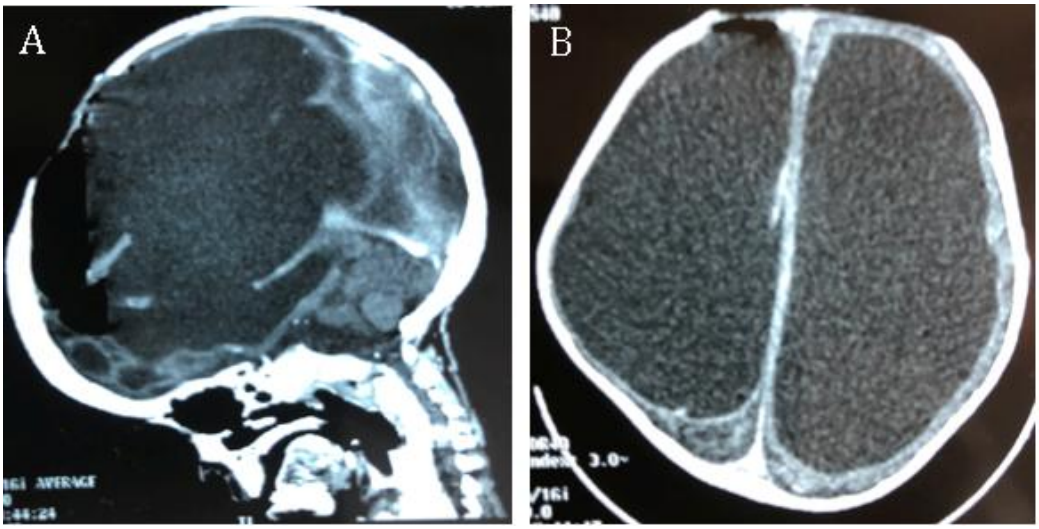

Figure 3: Postoperativebrain scanin sagittal (A) and axial (B) sections showing active hydrocephalus, pneumoventricular and frontal abscess

Table 1 : Cases of transoral migration of the lower extremity of the peritonealcatheter reported in the literature

	Age (years)	Gender M/F	History of gastrointestinal surgery	History of valve revision	Time to onset of complication (month)	Perforation site	CSF Infection
Griffeth	9.5	F	No	No	3	Stomach	yes
Park	5	F	No	No	48	Stomach	No
Fermin	1.5	F	No	No	6	Trachea	No
Odebode[7]	1.5	F	No	No	6	Jejunum	No
Jimenez[6]	11	F	Yes	No	–	Stomach	No
Sridhar	1	F	No	No	6	Stomach/Jejunum	No
Berhouma[2]	2	M	No	No	15	–	Yes
Badri[1]	4	M	No	No	1	Jejunum	No
Present case	2	M	No	No	10	duodenum	yes

5. Declaration

Authors declare that this article does not have the object of publication or submission to another journal. The authors declare no conflict of interests

References

[1] Badri M., Gader G., Belkahla G., Kallel J., Zammel I. Transoral migration of the inferior end of a ventriculoperitoneal shunt: A case report withliteraturereview. Neurochirurgie 64 (2018) 203–205

[2] Berhouma M., Messerer M., Houissa S., Khaldi M. Transoral protrusion of a peritonealcatheter: a rare complication of ventriculoperitoneal shunt. PediatrNeurosurg, 44 (2) (2008), pp. 169-171

[3] Borgbjerg B., Gjerris F., Albeck M. Frequency and causes of shunt revisions in differentcerebrospinalfluid shunt types. Acta Neurochir (Vienna), 136 (1995), pp. 189-194

[4] Browd S., Ragel B., Gottfried O. Failure of cerebrospinalfluid shunts: part I: obstruction and mechanicalfailure. PediatrNeurol, 34 (2006), pp. 83-92

[5] Di Rocco C., Marcheses E., Velardi F. A survey of the first complication of newlyimplanted CSF shunt devices for the treatment of non tumoral hydrocephalus.ChildsNervSyst, 10 (1994), pp. 321-327

[6] JimenezMoya A., Penela Velez De Guevara T., Gracia Remiro R., Romero Escos D., Santana Rodriguez C., Reig Del Moral C. Extrusion of a ventriculo-peritoneal shunt catheterthrough the mouth Esp Pediatr, 54 (2001), pp. 609-610

[7] Odebode T. Jejunal perforation and per oral extrusion of a peritoneal shunt catheter. Br J Neurosurg, 21 (2007), pp. 235-236

[8] Olsen L., Frykberg T. Complications in the treatment of hydrocephalus in children. A comparison of ventriculoatrial and ventriculoperitoneal shunts in a 20-year material. Acta Paediatr Scan, 72 (1983), pp. 385-390

[9] Patwardhan R., Nanda A. Implantedventricular shunts in the United States: the billion-dollar-a-yearcost of hydrocephalustreatment. Neurosurg, 56 (2005), pp. 139-144

[10] Satyanarayana S., Wylen E., Baskaya M., Nanda A. Spontaneousbowel perforation afterventriculoperitoneal shunt surgery. Case report and a review of 45 cases. SurgNeurol, 54 (2000), pp. 388-396