Residência RP Pediátrica
Publicação Oficial da Sociedade Brasileira de Pediatria
ISSN-Online: 2236-6814

Submitted on: 04/19/2020
Approved on: 05/20/2020

CASE REPORT

Anal extrusion of the ventriculoperitoneal derivation catheter: case report

Larissa Cerqueira Pereira Paes[1], Maria Clara Catani Harbor[2], Fernando Henrique dos Reis Sousa[3], Fabiana Jorge Galdino Barsam[1], Adriana Cartafina Perez- Boscollo[3]

Keywords:
Catheters, Ventriculoperitoneal Shunt, Hydrocephalus.

Abstract

Objectives: To report the case of extrusion of ventriculoperitoneal shunt (VPS) catheter in preschool children and demonstrate the rarity of this event. **Methods:** Review of institutional electronic medical records. **Results:** A 3-year and 7-month-old patient, who underwent VPS at birth due to hydrocephalus, was admitted to a health service with asymptomatic extrusion of the catheter through the anus. During evaluation, she presented painful palpation of the abdomen, but without signs of peritonitis, antibiotic therapy was started and later a joint surgical approach (pediatric surgery and neurosurgery) was performed to remove the VPS. The patient presented a good evolution with the proposed treatment. **Conclusion:** The most used treatment in hydrocephalus is VPS of cerebrospinal fluid. Although effective, its use presents complications such as poor insertion, obstruction, infection or migration of the terminal catheter. Cases with bowel perforation and anal extrusion of the distal shunt are rare and uncommon complications. The assessment and removal of the shunt should be performed quickly to avoid meningitis and ventriculitis due to pathogens in the gastrointestinal tract.

[1] Hospital das Clínicas - Federal University of Triângulo Mineiro, Department of Pediatrics - Uberaba - Minas Gerais - Brazil.
[2] Federal University of Triângulo Mineiro, Institute of Health Sciences - ICS - Uberaba - Minas Gerais - Brazil.
[3] Hospital das Clínicas - Federal University of Triângulo Mineiro, Department of Clinical Surgery - Uberaba - Minas Gerais - Brazil.

Correspondence to:
Larissa Cerqueira Pereira.
Clinical Hospital of the Federal University of Triângulo Mineiro. Rua Av. Getúlio Guaritá, nº 130, Our Mrs. da Abadia, Uberaba, MG, Brasil. CEP: 38025-440. E-mail: larissacerqueira1992@gmail.com

DOI: 10.25060/residpediatr-2022.v12n1-270

This work is licensed under a Creative Commons Attribution 4.0 International License.

INTRODUCTION

Congenital hydrocephalus is a neurological condition of heterogeneous etiology that affects 3 to 4 neonates per thousand live births[1]. Its pathophysiology is believed to be based on an imbalance between CSF production and drainage, or on obstructive factors involving the ventricular system. Recent studies state that about 80% of patients with congenital or neonatal hydrocephalus suffer some degree of residual neurological deficit[2]. In an attempt to improve the survival rates and quality of life of these children, early diagnosis and treatment is necessary.

The main definitive treatment of cases of congenital hydrocephalus is done through *shunts*, such as: PVD, ventricular atrial shunt (VAD), and in rare cases, ventriculopleural or ventriculus vesical shunt and even external ventricular shunt (EVD). Among these, the most common and most used by the neurosurgical team is the DVP. In this procedure, a unidirectional catheter with an intracranial pressure regulation valve system is inserted, which promotes the drainage of CSF from the lateral ventricles towards the abdominal peritoneum, where it will be absorbed.

PVD sometimes requires reoperations due to complications, and one of the rarest complications and the highest morbidity and mortality is intestinal perforation with catheter extrusion, reported for the first time in 1966[3].

CASE REPORT

Patient MJA, female, born on 11/19/2014, 37 weeks and 5 days, weight 3.555 grams, Apgar 8/9, ruptured meningomyelocele and hydrocephalus corrected at birth, with VPD implantation, with description of the procedure without complications. Three days after the approach, the patient evolved with signs of infection in the surgical wound and dorsal cerebrospinal fluid leak, requiring a reapproach at 7 days of life for repositioning of the ventricular catheter and revision of the meningocele. She also presented dehiscence and suture infection on the back, being treated with antibiotic therapy and a hyperbaric chamber. It evolved during the sixty days of hospitalization in a university hospital with improvement of the condition with the measures instituted. He was discharged due to clinical improvement, however, after a period at home, he developed edema in the left occipitotemporal region , where the proximal portion of the derivation was located, with valve obstruction remaining as a diagnostic hypothesis. A second hospitalization was performed in the following month, where the valve was changed, without complications. The patient was discharged home with a functioning valve and no other clinical complaints.

At three years and five months, the patient returned to the children's emergency room of the same health service due to hyperemia in the lateral cervical region, and discontinuity of the shunt catheter was observed in this follow-up. A cranial tomography was performed, which showed the absence of hydrocephalus, and the neurosurgery team chose to perform elective surgical resection of the shunt catheter.

At three years and six months, the patient returned to the health service again due to the anal externalization of the distal catheter of the PVD. She was asymptomatic and the catheter was visualized by her mother during bathing and cleaning of the anus. Upon being evaluated, there was painful palpation of the abdomen, but without consistent signs of peritonitis, and antibiotics were started with coverage for gram-negatives and anaerobes, after requesting catheter cultures and blood cultures, which were all negative. The day after admission, with the hypothesis of peritonitis already ruled out, a joint approach was performed between neurosurgery and pediatric surgery to remove the devices that made up the shunt through 3 routes: an incision in the mastoid region, one in the left hypochondrium and traction by the anus (figure 1, 2). Due to the absence of hydrocephalus, it was decided to remove the valve, with no indication for reinsertion. He was discharged on the eighth postoperative day, with instructions on local heat and prescription of antibiotics and analgesics for two more days, in addition to returning to the neurosurgery outpatient clinic for follow-up. Upon return, the patient was asymptomatic, when it was decided to maintain regular clinical follow-up and perform control imaging exams, when necessary.



Figure 1. Plain abdominal radiograph taken in the supine position, showing anal extrusion of the PVD catheter, with normal distribution of gases and feces in the intestinal loops and absence of gas outside the intestinal lumen.

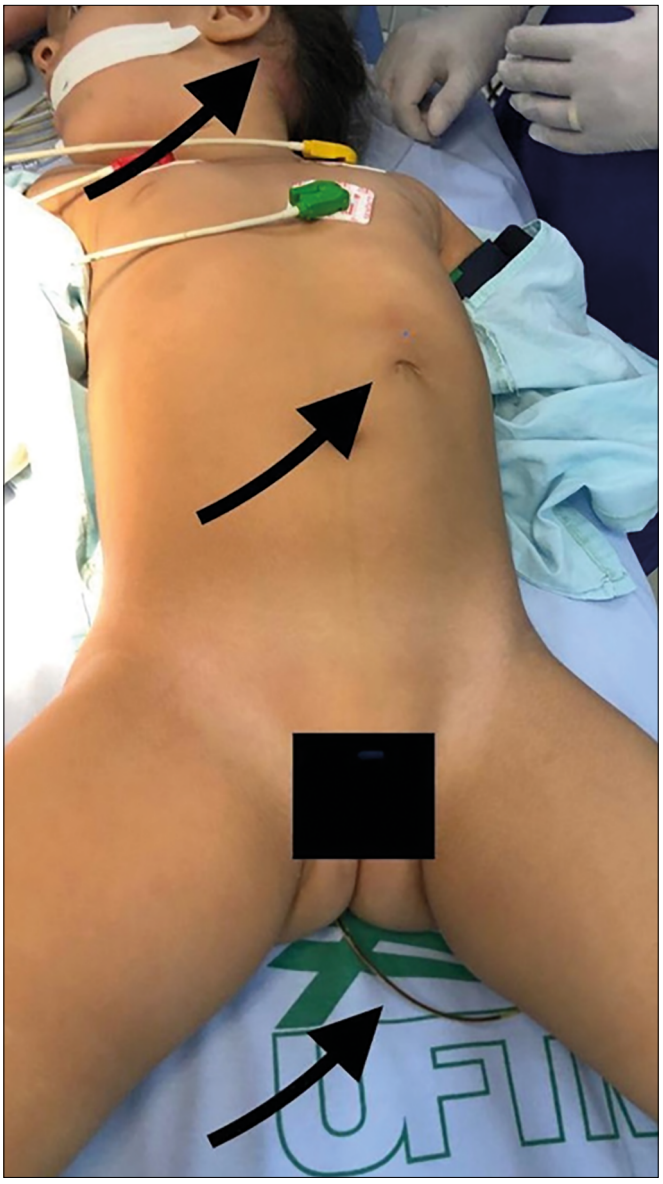


Figure 2. Preoperative image of the patient with arrows indicating the incision of the left mastoid region for removal of the proximal DVP catheter, incision in an old scar in the left hypochondrium for catheter resection from the cervical region to the abdomen and the DVP catheter extruded through the anus.

DISCUSSION

PVD sometimes requires reoperations due to complications, on average 2.5 procedures per patient[4], namely: infection, catheter obstruction, intraventricular cyst, inadequate CSF flow and infection/obstruction together. In addition, the literature reports other less common complications such as cerebrospinal fluid fistulas, catheter disconnections, bad positioning or anal extrusion of a distal catheter[5], in addition to urethral[6], vaginal protrusion or through the anterior abdominal wall[7].

In the world literature, there are several possible causes for extrusion of a shunt, such as poor nutrition, immunosuppression secondary to radiotherapy or chronic use of steroids, incorrect surgical technique, body reaction to PVD components, surgical wound dehiscence and skin ischemia[8]. Intestinal perforation, although it usually presents an insidious and asymptomatic course, in about 25% of cases, it can lead to peritonitis[9]. Due to the weakness of the intestinal muscles, children are more susceptible to intestinal perforation[10]. In other situations, the patient may feel the catheter protrusion through the anus, present symptoms of intestinal rupture, ventriculitis or meningitis. This condition can occur in any intestinal segment, being more common in the colon.

If the diagnosis of peritonitis is confirmed, the condition requires an urgent surgical approach, with exploratory laparotomy. Removal of the abdominal extruded end may not require a formal laparotomy. Mobilization of the shunt catheter from adhesions in the abdominal wound, with gentle removal and observation of any signs of peritonitis within 48 hours of the procedure, can avoid major abdominal surgery[7], as occurred in this case. If, after the procedure with antibiotic therapy[11], infection or air in the abdominal cavity is excluded, close observation should be maintained. For the definitive treatment of the presented condition, control of hydrocephalus and/or management of intracranial hypertension, the following alternatives can be chosen: replacement of the DVP in 24% of the cases, replacement of the DVP for the DVE in up to 10% and simple revision of the valve in 9%, in addition to times when there is no longer any need to use the shunt and it is removed[4].

CONCLUSION

In view of the above, it is concluded that early diagnosis and intervention of complications related to *shunts* performed in the treatment of hydrocephalus, prevent complications and reduce morbidity and mortality. In addition, if nature itself promotes catheter extrusion, adequate and timely treatment is essential, as well as a review of its real need at the time of the procedure.

This report demonstrates the rarity of the case and the importance of this knowledge in the pediatric scientific community.

REFERENCES

1. Cunha AHGB. Hidrocefalia na infância. Rev Bras Neurol Psiquiatr. 2014;18(2):85-93.
2. Uparela-Reyes MJ, Narváez-Rojas AR, Quintana-Pájaro L, Ramos-Villegas Y, Moscote-Salazar LR. Hidrocefalia congénita-neonatal: alternativas terapéuticas a la derivación. Una mirada a la terapia celular. Cir Cir. 2018;86(6):575-82.
3. Wilson CB, Bertan V. Perforation of the bowel complicating peritoneal shunt for hydrocephalus. Report of two cases. Am Surg. 1966 Set;32(9):601-3.

4. Jucá CEB, Lins Neto A, Oliveira RS, Machado HR. Tratamento de hidrocefalia com derivação ventrículo-peritoneal: análise de 150 casos consecutivos no Hospital das Clínicas de Ribeirão Preto. Acta Cir Brasil. 2002;17(Supl 3):59-63.
5. Colli BO, Starr EM, Martelli N. Tratamento cirúrgico do hidrocéfalo em crianças: II - complicações. Arq Neuro-Psiquiatr. 1981;39(4):408-19.
6. Anjankar SD. Urethral protrusion of the distal end of shunt. J Pediatr Neurosci. 2018 Jul/Sep;13(3):371-2.
7. Chugh A, Gotecha S, Amle G, Patil A, Punia P, Kotecha M. Abnormal migration and extrusion of abdominal end of ventriculoperitoneal shunt: an experience of eight cases. J Pediatr Neurosci. 2018 Jul/Set;13(3):317-21.
8. Borkar SA, Satyarthee GD, Khan RN, Sharma BS, Mahapatra AK. Spontaneous extrusion of migrated ventriculoperitoneal shunt catheter through chest wall: a case report. Turk Neurosurg. 2008 Jan;18(1):95-8.
9. Birbilis T, Zezos P, Liratzopoulos N, Oikonomou A, Karanikas M, Kontogianidis K, et al. Spontaneous bowel perforation complicating ventriculoperitoneal shunt: a case report. Cases J. 2009;2:8251.
10. Sarkari A, Borkar AS, Mahapatra AK. Anal extrusion of migrated ventriculo-peritoneal shunt catheter: an unusual complication and review of literature. Asian J Neurosurg. 2016 Out/Dec;11(4):459.
11. Sharifian A, Abdollahi A, Maddah G, Anaraki F, Alvandipour M, Sahebi MA, et al. Spontaneous transanal protrusion of ventriculoperitoneal catheter: a case report. Acta Med Iran. 2013 Mar;51(2):135-8.