

Pseudocyst Intra-Abdominal: A Rare Complication of Peritoneal Ventriculo Shut about a Case

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ABSTRACT

Ventriculoperitoneal shunt is a shunt system that derives excess LCS from the ventricular cavities into the peritoneal cavity. The intra-abdominal pseudocyst (PKIA) is a rare complication. We report our experience on two observations.

Keywords: Hydrocephalus, Ventriculoperitoneal shunt, Pseudocyst, Intra-abdominal

INTRODUCTION

Ventriculoperitoneal shunt is a shunt system that derives excess CSF from ventricular cavities (hydrocephalus) to the peritoneal cavity. Various complications have been noted (infectious, mechanical, hemorrhagic). The intra-abdominal pseudocyst (PKIA) is a rare complication, reported in the literature by some authors and whose physiopathological mechanisms and management is not yet well codified [1-4]. We report our experience on two observations.

OBSERVATION 1

6 year old patient followed for post-meningitic hydrocephalus that underwent a ventriculoperitoneal shunt. Immediate operative follow-up was simple with good positioning of both ventricular and abdominal catheters as evidenced by a cranioencephalic CT scan and an ASP radiograph (**Figure 1**).

At day 10 postoperative, the patient is readmitted for localized abdominal pain in the left flank. An abdominal CT showed a retro-peritoneal fluid collection with the distal tip of the intra-cystic abdominal catheter. Surgical revision is performed with intraperitoneal catheter repositioning and cyst evacuation puncture. The immediate postoperative course is marked by an amendment of the painful symptomatology. At D5 of the recovery, there are pains of the right hypochondrium. The abdominal ultrasound performed found a fluid collection under the hepatic for

which a guided echo puncture was performed to evacuate the cystic content and relieve the patient. This collection was quickly reformed after 5 days of surveillance with a larger volume.

After 2 other echo guided punctures not allowing drying up the collection, it is performed a surgical treatment: a ventricular atrial bypass. The ventricular atrial bypass was performed after checking the sterility of the LCS. The postoperative course was simple. On a follow-up of 6 months, the patient remained asymptomatic both neurologically and abdominally. No thromboembolic complications were noted.

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Figure 1. ASP radiograph showing the 2 abdominal catheters with an aerocolumn: On the right, the non-productive extra-cystic drain (1) and on the left, the productive intra-cystic drain (2).

OBSERVATION 2

A 22-year-old patient who underwent a ventriculoperitoneal by-pass at the age of 15 for malformative hydrocephalus presents with abdominal pain, abdominal meteorism and constipation. In his antecedents, a surgical revision is reported for a valve disconnection and obstruction of the proximal catheter which motivated the establishment of a second bypass system left 2 years ago. The objective clinical examination is an ascitic oedemato syndrome with a sign of flow and ice. The transparietal puncture revealed a citrus liquid, transudate-type, germ-free. Abdominal pelvic CT showed an intraperitoneal cyst with the distal end of the intra-cystic abdominal catheter. There is also a second abdominal catheter in connection with the old shunt system. These different catheters were also objectified on an x-ray of the ASP (**Figure 2**). A laparotomy with excision of an intra-peritoneal cyst was performed (**Figure 3**) and repositioning of the active abdominal catheter associated with nonproductive catheter ligation. The immediate operative follow-up was simple and at a follow-up of 4 months, no recurrence was noted.



Figure 2. Abdominal CT sagittal section peritoneal catheter supplying the pseudocyst.



Figure 3. Pseudocyst after exeresis by laparotomy.

DISCUSSION

The complications of ventriculoperitoneal shunt are numerous. The diagnosis is most often suspected at the clinic and confirmed by neuroradiological explorations. The pseudo abdominal cyst is a rare complication of ventriculo-

peritoneal shunts. It has already been described in different series, but in your minute proportions [1-4].

It can occur at any age and would be more common in the pediatric population. Its delay of occurrence is variable. We noted delays of 10 days and 2 years, respectively, this delay is estimated by some authors ranging from 5 days to 5 years [1,5]. Its manifestation is dominated by abdominal signs, namely abdominal pain that can be associated with a progressive increase of the abdomen. It can thus be defined clinically by signs of ascites. To a degree, signs of intracranial hypertension can be observed. The least invasive and most accessible examination is ultrasound [6]. It allows to make the diagnosis but also to perform punctures for the biological analysis. In certain situations, such as that of patient 2, ultrasound is not enough. It is more useful to perform abdominal CT. It not only objectifies the cysts but allows to orientate oneself on the possible shunt responsible for the cyst and to plan the intervention. Again, CT allows to circumscribe the cyst and differentiate it from ascites [7,8]. It makes it possible to follow the evolution of the cyst and to see its possible intra-abdominal displacements. Indeed, in the absence of flanges, we can note a migration of the collection. The guided radio punctures have an analgesic purpose in the decrease of the volume of the collection thus of the abdominal distension. In his studies notes the impact of guided echo puncture on symptomatology [7].

One of the major issues that must be addressed is whether or not there is an infectious origin. It conditions the support protocol. Hahn et al. reported that infection was the major factor in the formation of pseudocysts (80%) and pointed out that all cases of pseudocystic abdomen should be considered to be caused by infection [2]. In our series, we did not find an infection that justified the administration of antibiotics.

Several hypotheses have been put forward concerning the formation of the pseudo cyst. But to date, none of them has been accepted unanimously. For now, inflammatory and infectious processes are being discussed. To these should be added factors such as peritonitis, anterior abdominal surgery with peritoneal adhesions, failure of peritoneal resorption of LCS by physiological peritoneal dialysis disorder [6,9-12]. In addition, we can also mention another parameter. That of the surface of the peritoneum which could play an important role in the resorption of the LCS [13,14]. PKIA support is still being paid. We have observed (patient 1) that the evacuation punctures is not a definitive solution. It essentially helps to relieve abdominal symptoms. Secondly, it was objectified an evolutionary recovery both clinical and radiological [15].

In spite of the surgical history of patient 2, laparotomy with cyst evacuation and repositioning of the abdominal catheter were performed. It is preferable to laparoscopy especially in cases of proven flanges. The evolution has been favorable. However, with regard to bridles objectified during surgery, the latter may not be safe from recurrence. Indeed, Laurent

et al. [16] has already made a case in his study. What one could not determine is the probable delay of recidivism if it were to take place. Moreover, this approach gives us the opportunity to consider a gesture that can be considered as ultimate. It will be a question of carrying out a ventriculo-atrial bypass already envisaged also by certain authors [6,12].

In cases where ventriculo-atrial by-pass has been indicated in pediatric patients, a significant fact must be taken into account. A possible operative recovery in view of the growth of the patient will be considered. The atrial catheter may become too short with possibilities to externalize [15]. These will need to be closely monitored on the one hand for the monitoring of cardiopulmonary complications but also on mechanical ones related to the length of the catheter.

The therapeutic possibilities are diverse. They vary according to the authors. Evacuation punctures, catheter repositioning after cyst evacuation, laparotomy or laparoscopy have been reported. In his study of a case and after a review of the literature, Laurent et al. [16] assume that better results could be obtained. This is the combination of two principles: external drainage and then repositioning a new abdominal catheter in another peritoneal location after a delay of approximately 2 weeks. It will be associated with antibiotic coverage in this interval [6,12,16].

CONCLUSION

Ventriculo-peritoneal shunt is the treatment of choice in communicating hydrocephalus. The pseudo intra-peritoneal cyst is a rare complication whose first description dates from 1954. Its main clinical manifestations remain an abdominal symptomatology with sometimes signs of intracranial hypertension. Its physiopathology remains mixed. He was incriminated against certain factors that could be at the origin of its occurrence. Its management, which is still not codified, remains based on the experience of each team with diverse results. A review of the literature should be established to develop a consensus of treatment.

REFERENCES

1. Chung JJ, Yu JS, Kim JH, Nam SJ, Kim MJ (2009) Intra-abdominal complications secondary to ventriculo-peritoneal shunts: CT findings and review of the literature. *AJR* 193: 1311-1317.
2. Hahn YS, Engelhard H, McLone DG (1985-1986) Abdominal CSF pseudocyst: Clinical features and surgical management. *Pediatr Neurosci* 12: 75-79.
3. Harsh GR (1954) Peritoneal shunt for hydrocephalus utilizing the fimbriae of the fallopian tube for entrance to the peritoneal cavity. *J Neurosurg* 11: 284-294.

4. Hsieh CT, Pai CC, Tsai TH, Chiang YH, Su YH (2006) Hepatic cerebrospinal fluid pseudocyst: A case report and review of the literature. *Neurol Soc India* 54: 86-88.
5. Blount JP, Campbell JA, Haines SJ (1993) Complications in ventricular cerebrospinal fluid shunting. *Neurosurg Clin N Am* 4: 633-656.
6. Mobley LW 3rd, Doran SE, Hellbusch LC (2005) Abdominal pseudocyst: Predisposing factors and treatment algorithm. *Pediatr Neurosurg* 41: 77-83.
7. Coley BD, Shiels WE 2nd, Elton S, Murakami JW, Hogan MJ. (2004) Sonographically guided aspiration of cerebrospinal fluid pseudocysts in children and adolescents. *AJR Am J Roentgenol* 183: 1507-1510.
8. Pernas JC, Catala J (2004) Case 72 pseudocyst around ventriculoperitoneal shunt. *Radiology* 232: 239-243.
9. Roitberg BZ, Tomita T, McLone DG (1998) Abdominal cerebrospinal fluid pseudocyst: A complication of ventriculo-peritoneal shunt in children. *Pediatr Neurosurg* 29: 267-273.
10. Rainov N, Schobess A, Heidecke V, Burkert W (1994) Abdominal CSF pseudocysts in patients with ventriculo-peritoneal shunts. Report of fourteen cases and review of the literature. *Acta Neurochir (Wien)* 127: 73-78.
11. Hashimoto M, Yokota A, Urasaki E, Tsujigami S, Shimono M (2004) A case of abdominal CSF pseudocyst associated with silicone allergy. *Childs Nerv Syst* 20: 761-764.
12. Salomão JF, Leibinger RD (1999) Abdominal pseudocysts complicating CSF shunting in infants and children. Report of 18 cases. *Pediatr Neurosurg* 31: 274-278.
13. Krediet RT (2000) The physiology of peritoneal solute transport and ultrafiltration. In: Gokal R, Khanna R, Krediet RT, Nolph KD (eds) *Textbook of Peritoneal Dialysis*. Springer, Dordrecht, pp: 135-172.
14. Rippe B, Krediet RT (1994) Peritoneal physiology - Transport of solutes. In: Gokal R, Nolph KD (eds), *The Textbook of Peritoneal Dialysis*. Springer, Dordrecht, pp: 69-113.
15. Arnell K, Olsen L (2004) Distal catheter obstruction from non-infectious cause in ventriculo-peritoneal shunted children. *Eur J Pediatr Surg* 14: 245-249.
16. Laurent P, Hennecker JL, Schillaci A, Scordidis V (2014) Récurrence d'un kyste abdominal de liquide céphalo-rachidien chez un adolescent de 14 ans porteur d'un drain ventriculo-péritonéal. *Archives de Pédiatrie* 21: 869-872.