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Huge Abdominal Pseudocyst Following Ventriculoperitoneal Shunt Mimicking Massive Ascites

Ventrikülo-Peritoneal Şant Sonrasi Masif Asiti Taklit Eden Dev Abdominal Psödokist

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ABSTRACT

Abdominal cerebrospinal fluid (CSF) pseudocyst is an uncommon complication of ventriculo-peritoneal shunts. During the initial surgery a ventriculo-peritoneal catheter was inserted for associated hydrocephalus in the neonatal period. And then the once revision of the shunt was applied. After six years this operations, we present a case of a 6-year-old girl has huge abdominal CSF pseudocyst. She presented with abdominal distension mimicking ascites for 2 weeks. A CT scan of the abdomen revealed a large cystic mass in the abdomen with pseudocyst walls. An exploratory laparotomy was performed and the cyst was extirpated with revision of the shunt. Histological examination revealed a pseudocyst with endothelial lining and cerebrospinal fluid inside. Sometimes, it becomes very difficult to identify the source of these cysts which mimics ascites and misdiagnosed as ascites. We report this uncommon case with a brief review of the literature.

Keywords: Abdominal complication, ascites, CSF pseudocyst, ventriculo-peritoneal shunt.

ÖZET

Abdominal beyin omurilik sıvısı (BOS) psödokisti ventrikulo-peritoneal şantın nadir bir komplikasyonudur. İlk Ameliyatını yenidoğan döneminde hidrosefali için bir ventrikülo-peritoneal kateter yerleştirildikten sonra bir defa da shunt revizyonu uygulanmış. Biz bu ameliyatlardan altı yıl sonra büyük bir abdominal BOS psödokisti olan 6 yaşındaki bir kız olguyu sunuyoruz. Hastamız 2 haftadır olan asit takliti eden karın şişliği ile başvurdu. Abdominal BT ile karında büyük bir psödokist duvarları olan kistik kitle saptandı. Eksploratris laparotomi yapıldı ve kist ekstirpe edilerek şant revizyonu yapıldı. Histolojik incelemede endotel döşeli bir psödokist içinde beyin omurilik sıvısı tespit edildi. Bazen, asit ve asiti taklit eden kistlerin kaynağını belirlemek zor olur. Biz bu nadir olguyu kısa bir literatür incelemesi ile sunuyoruz.

Anahtar Kelimeler: Abdominal komplikasyon, asit, BOS psödokisti, ventrikülo-peritoneal şant.

Introduction

Regardless of the pathological entity, the traditional treatment of hydrocephalus consists of the placement of a cerebrospinal fluid (CSF) shunt to divert the excess CSF from the ventricular system (1). Ventriculo-peritoneal (VP) shunts are most commonly utilized. Shunt complications are reported to occur at a rate of approximately 26% (2). Many complications associated with the peritoneal end of a VP shunt have been reported (3, 4). These include CSF loculation and cyst formation, perforation of the viscera, migration of the shunt, bowel obstruction secondary to adhesions and metastatic spread via the shunt (5, 6). The development of an abdominal cerebrospinal fluid (CSF) pseudocyst is an infrequent complication (7). Herein, we presented a case who had huge abdominal pseudocysts are part of the differential diagnosis of ascites especially in the pediatric ages.

Case Report

A 6-year-old female was admitted to our hospital with complaints of ascites and lack of appetite for a week. She had noticed a visible distension of the abdomen with appearance of a lump for 2 weeks. The lump had gradually increased. Her past history showed that she had been operated previously ileocolic resection and anastomosis for ileal atresia in the neonatal period. At the time of this surgery, VP shunt was inserted for the management of the associated hydrocephalus and myelomeningocele. Three years ago, she had shunt revision operation for malfunctioning of the shunt. Abdominal distension occurred during the last 15 days. The distension was painless and it caused shortness of breath. There was no history suggestive of raised intracranial pressure.

On examination the VP shunt was functional. She denied vomiting, hematemesis, melena, or any other constitutional symptoms. She had decreased appetite and constipated. Urinary system was normal. On her clinical examination, she was cachectic with blood pressure of 110/70 mmHg and pulse rate was regular with 78/min. Abdomen was diffusely distended involving all quadrants. Umbilicus was centrally placed but not stretched and flat. Skin was normal without any dilated veins but scar of previous transverse incision was present. There were no neurological findings, nor was evidence of papilledema. Lump was noted in the sternum extending into pelvis. The lump was ascites and well-defined, smooth, non-tender and moving with palpation. Fluid thrill was present. Biochemical and hematological laboratory investigations (leukocyte counts: 14200/mm3, hemoglobin: 14 gr/dl (hematocrit 40%), platelets: 450000/mm3, aspartat amino transferase: 35 IU/L, alanin amino transferase: 25 IU/L, total bilirubin: 0.5 mg/dl, albumin: 4 gr/dl, prothrombin time: 14 sec (1.1 INR), blood urea nitrogen: 10 mg/dl, creatinine: 0.6 mg/dl, erythrocyte sedimentation rate: 22 mm/h) were normal. We aspirated the sample from the lump to perform the differential diagnosis of ascites. The sample fluid remained sterile. The protein content of the sample was found 30 mg/dl.

Abdominal and pelvis ultrasonography (USG) revealed a large ascites in the abdomen. It revealed a free severe fluid in the abdomen. An immediate computed tomographic (CT) scan of the abdomen and brain was done (Figure 1. A-B). The CT scan of brain revealed no abnormality with the shunt in the ventricles. There was too extreme impression of ventricular dilatation. The abdominal CT scan showed a large, welldefined cystic mass without internal echoes, septations or contrast enhancement measuring 22 x 17 x 21 cm with walls (3-4 mm thickness) in the abdomen, displacing the stomach and intestine to the left and up. It showed a curved catheter (the shunt tube) within. The VP shunt was seen traversing the abdominal wall and entering the cyst. The pancreas and peripancreatic fat planes were normal. A diagnosis of CSF pseudocyst was thus suspected on the basis of history and radiological findings. The patient was taken up for exploratory laparotomy. A huge cyst was found at surgery lying outside the peritoneal cavity. They were adherent to the anterior abdominal wall, lying between the intestinal walls and peritoneum. The cyst measured approximately 18 x 17x 13 cm and was filled with clear CSF. The VP shunt tip was situated in the cyst. The cyst wall was resected and the VP shunt was replaced in the peritoneum. The patient was discharged on the 7th day post operatively. On follow-up examination after six months no abnormality was detected except continued ventriculomegaly (Figure 1. C-D).

Discussion

Encysted collections, also known as abdominal CSF pseudocysts, are uncommon complications and the incidence varies from less than 1% to 4.5% of VP shunts (3). Although the pathophysiology of pseudocyst is still controversial; infection, peritoneal adhesions,

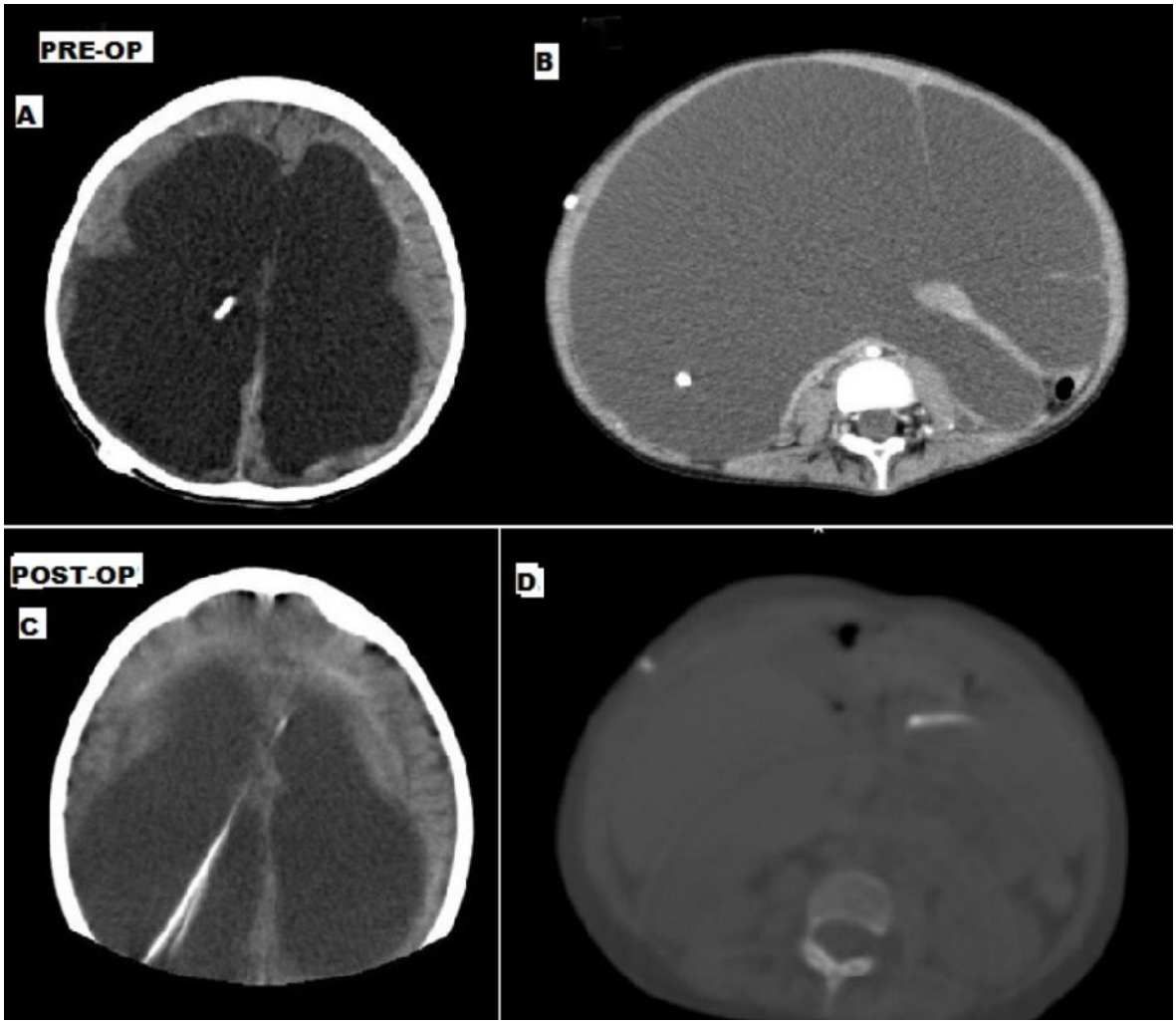

Figure 1: (A): The axial CT image reveals hydrocephalus with a ventriculoperitoneal shunt (white object). (B): The axial CT image shows a VP shunt catheter within the abdomen. There is a large hipodensity fluid accumulation surrounding the distal VP shunt catheter and the loops of bowel are not seen. (C) Non-contrast axial CT scans of the patient, taken 6 months after extirpated pseudocyst with revision of the shunt, showing a shunt catheter and persistent ventriculomegaly. (D) The axial CT shows a VP shunt catheter within the abdomen and ascites were disappeared.

high protein content of CSF and an inflammatory response to the catheter material have been shown as responsible factors. In this case, there was no evidence for infection or high protein content of the CSF. However, the previous gastrointestinal operation could be responsible causation (8).

Patients usually present clinically with signs and symptoms of shunt malfunction and increased intracranial pressure with a decreased level of consciousness and vomiting (1). Abruptly, presented patient had no symptoms of raised intracranial tension which are expected due to obstruction produced by an increased pressure within the cyst with a pressure gradient exceeding that required for adequate CSF drainage through the shunt (8). She was presented with abdominal features mainly.

Kariyattil and et al. found that patients with an abdominal pseudocyst tend to be older, present with symptoms suggestive of shunt blockage and have had previous infections (8). Furthermore, the samples from abdominal fluid are generally to be infected. In this case, patient is very young and she had no previous infections.

The radiological investigation should begin with plain abdominal X-ray graphs. By this method, very large pseudocysts will be seen as displacement loops of bowel (1). Ultrasonic diagnosis of abdominal pseudocysts, it is important to identify the shunt tube within the lesion. Although we performed abdominal USG, it was unable to distinguish a generalized fluid collection of ascites from a loculated collection of the pseudocyst. In these situations, computed tomographic scan can be useful. It has also been reported that abdominal ultrasonography may not be practical to distinguish a large abdominal pseudocyst from an ascites (9). Using CT, the exact extent of the mass, as well as the density of the fluid, can be easily assessed. The density measurements approximate those of water, and a homogeneous mass or blood can be excluded. There should be no change in density measurements within the cyst following IV contrast (10).

Cerebrospinal fluid ascites, which is often a differential diagnosis in such cases, is an entirely different entity and an excessive accumulation of CSF in the peritoneal cavity resulting from an inability of the peritoneum to absorb the CSF even in the absence of liver pathology (11). Pseudocysts can be differentiated from ascites by their characteristic displacement of the bowel gas pattern on abdominal films and by the absence of shifting dullness (3). Generally, CSF ascites has been resulted from secondary to various causes including infections, tumors especially origined from choroid plexus, shunt-disseminated metastasis and foreign body reaction to the peritoneal catheter (8). It should be mentioned that common point of these conditions have led to be high protein content of the CSF. Abdominal symptoms were the type of presentation for patients with ascites, whereas shunt malfunction was the type of presentation in 60% of those with pseudocysts (6). Culture-proven infection, abdominal surgery, and the number of revisions seemed to be more common in cases with pseudocysts than in ascites. Alternative drainage sites were required in the treatment of patients with ascites, and reimplantation in the peritoneum was possible in 66.7% of those with pseudocysts (8).

The treatment of the pseudocysts involves the exploratory laparotomy followed by surgical removal of the catheter with or without excision of the pseudocyst wall and placement of a new catheter intraperitoneally in a different quadrant or an intra-atrial shunt (8). The peritoneal cavity could then be re-used for shunting once the cyst had reabsorbed. This sometimes requires conversion to an atrial or pleural shunt before reutilization of the peritoneal cavity (2). If the cysts are infected, antibiotics should be administered with surgical management (1). Even though CSF pseudocysts have been also treated by aspiration of the cyst or by laparoscopic method, we planned exploratory laparotomy since the huge cyst was adherent to the anterior abdominal wall. Laparoscopic management reduces the risk of a laparotomy and the formation of intraperitoneal adhesions (12).

In conclusion, abdominal CSF pseudocyst is an uncommon complication of VP shunts. The diagnosis of abdominal CSF pseudocyst should be taken into consideration in patients with VP shunt presenting with abdominal complaints (even not having neurological signs). However after the operation the dilatation of ventricles may have been persistent.

Conflict of interest: The authors clearly declare that they have no conflict of interest or any financial or material supports related to the case report presented.

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