Case report

LARGE LOWER ABDOMINAL CEREBROSPINAL FLUID PSEUDOCYST 6 YEARS AFTER A VENTRICULO-PERITONEAL SHUNT: CLINICAL FEATURES AND SURGICAL MANAGEMENT

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Abstract The very low incidence of cerebrospinal fluid collection, which forms a large intra-abdominal pseudocyst, as a complication of ventriculo-peritoneal shunt, brings about a diversity in surgical management. A case of large abdominal cerebrospinal fluid pseudocyst, which migrated down to adhere with the lower small intestine was reported. The patient was an unmarried 25-year old, woman who had one year of pregnant like distended abdomen six years after a placement of ventriculo-peritoneal shunt. The preoperative diagnosis was not conclusive by physical examination and ultrasonography. The difficulty of the operation was to dissect the thirty centimeter diameter cyst with minimal bowel injury and prevent its recurrence. Clinical features and correlated symptoms as well as the pseudocyst inclusive treatment were described and discussed.

Keywords: abdominal cerebrospinal fluid pseudocyst, ventriculoperitoneal shunt, surgical management

Harsh(1) first described an intra-abdominal collection of cerebrospinal fluid (CSF) to form a pseudocyst, as a rare complication of ventriculo-peritoneal (VP) shunts. Since then, some single case reports were published from different countries.(2-5) This is the first reported case from Nakornping Hospital that describes the clinical profile and surgical management.

Case report

A 25-year-old unmarried women presented with about one year of progressively expanding lower abdomen, especially in a standing position. Gynecologists were convinced that her features were not compatible to pregnancy, but she still felt extremely embarrassed among her classmates and relatives. Six years ago she developed a communicating hydro-
cephalus long after bacterial meningitis had been cured by antibiotics. She had undergone placement of a VP shunt six years ago. The discomfort and anorexia she experienced became intolerable for two weeks before her admission to hospital. The patient was afebrile. The vital sign was normal, but in spite of a half-month of inadequate food intake her weight rose from 54 to 56 kilograms. Abdominal examination revealed a large, non-tender, immobile mass with a smooth surface and soft consistency extending from slightly above the umbilical region to the pubic area. A chest and abdominal X-ray showed normal position of the thoracoabdominal part of the VP shunt. The complete blood count (CBC) showed neither leukocytosis nor anemia (Hb = 11.4, Hct 34.1, WBC = 6480). The renal function was normal (BUN = 11 Creatinine = 1). Her serum electrolyte indicated a slight hyponatremia (Na = 129) and preoperative normal saline was given intravenously. Since ultrasound and gynecological examination suggested a large cyst in the lower abdomen, laparotomy exploration was indicated and performed with the participation of a gynecologist. A large 30 centimeter cystic mass, which bonded severely to the omentum and most of the small bowel, was revealed. There was neither a connection with an ovary nor the uterus and a gynecological condition could be excluded. The sac content of 4,500 cc of clear yellowish fluid was sucked out. Opening the pseudocyst was needed in order to obtain good control of the dissection. A VP shunt catheter was found to be lengthwise within. There was unpreventable injury to the small bowel when the cyst wall was indistinguishable from many loops of ileum. To free the loops on top of the small bowel, some external fibrotic parts of the cyst wall had to be left on the bowel serosa. A bottleneck like narrowing at the point of the cannula entrance in the sac from the right subdia-phragmatic region toward the retroperitoneal part of duodenal prevented further tracing for complete removal of the pseudocyst. After confirming patency, the fifteen centimeter distal end of the VP shunt cannula was relocated in the right lateral paracolic space. Blood oozing from many raw surfaces was carefully controlled by low voltage cautery and grasping with small forceps. Thorough washing with warm saline was performed before layer-by-layer closure of the abdominal wall. The cystic wall was submitted for histopathological examination. There was low-grade fever during the first three days postoperatively when continued nasogastric suction and intravenous fluid maintenance were administered. Analgesic and antibiotics were needed. Then, the patient was encouraged to start active ambulation to prevent adhesion and recurrence of the pseudocyst. A neurosurgeon consultation postoperatively suggested that the VP shunt was still functioning well and this rare complication was unlikely to recur if the patient exercised regularly. External ventricular drain or ventriculoatrial shunt was not recommended. However, abdominal sonography performed a week later showed no fluid collection in
the abdomen. Meanwhile, a seven day course of antibiotics was given for the uneventful predischarge period. A histopathologist reported no malignancy in the irregular fibrotic layers without epithelial lining. The patient experienced no complication, and there had been no recurrence of the pseudocyst after 6 months of follow-up observation. Since it took 6 years for the original pseudocyst to form, a regular 10-year annual follow-up is planned.

Discussion

The abdominal CSF pseudocyst is an infrequent complication of VP shunts. The past incidence of this condition varies from 1 to 4.5%. (6-9) Rainov et al reviewed 115 cases from the literature and added 14 of their own. (9) The formation of intraperitoneal adhesion was thought to arise as a result of the reaction of mesothelium to either a catheter or CSF, with formations of intraperitoneal adhesions. The factors incriminated in the etiology included shunt infection, sub clinical peritonitis, previous laparotomy, and high protein content of the CSF associated with an antigen-antibody reaction. (10) Infection was an important predisposing factor, but it was not accounted for in all cases. (11) In this report, a case tentative diagnosis was made by plain abdominal x-ray and could be verified by laparotomy. With the characteristic VP shunt floating in the thickening sac wall, Pathi reported that ultrasound and CT investigations would allow early recognition of this complication. (12) Different treatment of the cyst was carried out. A ventriculoatrial shunt or insertion of the distal catheter into the right atrium was performed with a successful outcome. (3,4,9-11,13) Relocation of the shunt failed to prevent reaccumulation of cerebrospinal fluid. (4,10,14) When the cysts were infected, externalizing ventricular shunts were used temporarily. (8,9,11,13) Kim et al. reported laparoscopic drainage of a CSF pseudocyst of which a position was excised they then removed the shunt catheter from the residual cavity and repositioned it within the peritoneal cavity in a 12-year-old boy. (15) If this case was definitely able to diagnose preoperatively, it is my opinion that laparoscopic drainage can be expected to lower the difficulty of a laparotomy and the formation of intraperitoneal adhesions. The decision to explore laparotomy, partial excision of the cyst and relocation of the VP shunt was made on the basis of surgical common sense. The large thirty centimeter cyst adhered to the small bowel and disturbed its movement. Months of reabsorption would not be tolerated. Furthermore, laparotomy allows visual confirmation of adequate flow of the CSF from the end of the catheter after it is repositioned. However, the greatest advantage of laparotomy lies in its ability to assess the entire abdominal cavity for the presence of adhesions and undertake adhesiolysis whenever necessary. This allows placement of the catheter in the quadrant of the abdomen with the maximum absorptive surface. Though larger pseudocysts tend to be sterile, smaller ones are more often
infected, but some degree of shunt infection is common and antibiotics have been needed in many reports, even in suspected cases. In conclusion, to reduce the recurrence of an abdominal CSF pseudocyst once it has complicates the VP shunt, as in this case, it is justifies to use a full course of postoperative antibiotics.

References
ที่ตั้งท้องส่วนล่างอัลตราซาวนด์ทางคลินิกและการรักษาทางศัลยกรรม

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บทคัดย่อ ถุงซิสเทียมขนาดใหญ่จากท่อระบายน้ำสมองและไขสันหลังในช่องท้องส่วนล่างอัลตราซาวนด์ทางคลินิกและการรักษาทางศัลยกรรมมีอุบัติการณ์ที่ดีในการพบถุงซิสเทียมขนาดใหญ่จากท่อระบายน้ำสมองและไขสันหลังในช่องท้องหลังการใส่ท่อระบายน้ำสมองเพื่อให้การดูแลรักษาทางศัลยกรรมมีความหลากหลายได้รายงานผู้ป่วยซึ่งมีถุงซิสเทียมขนาดใหญ่ในช่องท้องเกิดขึ้นจากท่อระบายน้ำสมองและไขสันหลังอัลตราซาวนด์มีผู้ป่วยเป็นสาวไชยเดือน 25 ปี ซึ่งท้องโต клиนิกตั้งครรภ์มา 6 ปี ผู้ป่วยมีอาการหลั่นเลอะเลื่อม ผู้ป่วยมีอาการคลิ้นิกตั้งครรภ์มา 6 ปี จากการตรวจร่างกายและอัลตราซาวนด์ การผ่าตัดและการรักษาตามสมัยสัตนิยมโดยให้การให้สาคัญในการขับขันเพื่อป้องกันการกลับมีถุงใหม่ที่เกิดจากการผ่าตัด

คำอ้างอิง: ถุงซิสเทียมขนาดใหญ่ในช่องท้อง การระบายน้ำสมองและไขสันหลัง