Case Report

Pseudocyst of Abdomen Presenting as a Huge Abdominal Mass after Ventriculoperitoneal Shunt: A Case Report

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Abstract

A ventriculoperitoneal shunt is a major surgical modality to relieve intracranial pressure in patients with hydrocephalus. Shunt obstruction and infection are the most common complications following shunt surgery whereas VP shunt-associated pseudocyst formation is a rare complication. These are the cystic space without the epithelial lining, filled with fluid around the distal tip of the catheter.

In this case report, we present you a 47-year-old male who underwent VP shunt placed a year back presented with huge abdominal swelling, headache, and weight loss. CT scan of the abdomen showed abdominal pseudocyst with the peritoneal end of the shunt within the cyst.

Though the exact mechanism is not known, abdominal adhesion, multiple revisions, obstruction, or dislodgement are thought to predispose to the formation of a pseudocyst.

Introduction

Ventriculoperitoneal (VP) shunting is the gold standard treatment for adult and pediatric hydrocephalus. After VP Shunt, cerebrospinal fluid (CSF) diverts to the peritoneal cavity where an extensive area of the serosal layer absorbs it. Shunted patients may present later with complications like intestinal obstruction, intestinal perforation, shunt infection, abscess, bladder perforation, Shunt obstruction, and pseudocyst rarely.

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Case Presentation

A 47-year-old gentleman who had placement of the VP shunt a year back in Manipal Teaching Hospital, Pokhara, Nepal. This time he presented in the OPD with the gradual distention of the abdomen and significant weight loss for 6 months. He also had a headache for the last 3 months. There was no history of fever, vomiting, seizures, and weakness of limbs. His general condition was poor and emaciated. His vitals were normal, and he was conscious, oriented to time, place, and person. There were no cranial nerve abnormalities, bone defects, or focal neurological deficits. The abdomen was grossly distended with prominent veins over the anterior abdominal wall and the umbilicus was everted. The shunt chamber was compressible and there were no signs of inflammation over the shunt tube tract. Imaging studies were inevitable. CT scan of the abdomen upon admission showed a large abdominal pseudocyst with the peritoneal end of the shunt within the cyst. CT scan of the head revealed the ventricular end of the shunt in situ with dilation of ventricles. The patient underwent surgery. Exploration of the abdomen was done with the removal of the distal end of the shunt. There was a spontaneous free flow of CSF from the shunt. We drained about 14 liters of xanthochromic fluid from the cyst fig. CSF was clear, the distal end of the shunt was resited within a peritoneal cavity in another quadrant. CSF analysis was done with following findings: 15 cells with predominantly lymphocytes(98%) and neutrophils(2%), no atypical cells, sugar 40 mg/dl (RBS-85 mg/dl), protein 269 mg/dl. Following surgery, there was a relief of abdominal distention and headache.

Discussion

Pseudocyst following VP shunt was first described by Harsh when he reported a periumbilical cyst with a shunt in 1954. Complications following the VP shunt are common and revision surgeries are expected in many patients in their lifetime. Revision surgeries are common in the pediatric population. Shunt Obstruction is the most common cause of shunt malfunction followed by shunt infection.1 An abdominal pseudocyst is a rare complication following VP shunting(1-4.5%). It may present from 4 months to 11.3 years of primary surgery.2 Pseudocysts are the fluid-filled cystic space formed around the distal tip of the catheter and it consists of fibrous tissue without the epithelial lining. Abdominal adhesion following shunt infection, multiple shunt revisions, obstruction or dislodgement, peritoneal reaction to shunt could be the predisposing factors but the pathophysiology is still unknown.3 Infection rate is reported as 17% to 80%, and S. epidermis and Staphylococcus aureus are the most common isolated microorganisms from the site. Though thought predominantly due to infection transient and latent infections might be underdiagnosed leading to the formation of the pseudocyst.3,4 There is a collection of CSF in the abdomen and is not absorbed or poorly observed leading to the formation of a cyst.5 During the implantation of the catheter inside the abdomen if Glisson's capsule is damaged it can cause subhepatic-extrahepatic pseudocysts. Similarly, if hepatic parenchyma is penetrated intrahepatic pseudocysts can be formed.6 A cyst may be unilocular or multilocular and of various sizes.7 Pseudocyst generally presents with abdominal pain, distention of the abdomen rather than shunt obstruction. Children mainly present with features of raised intracranial pressure, such as headache and nausea while adults present mainly of abdominal signs.8

USG and radiography are sufficient for making a diagnosis of pseudocyst but CT can be more valuable regarding the exact location and size of the pseudocyst, location of shunt catheter and to exclude acute abdominal cases.4,9

The treatment of pseudocyst is debatable. Treatment depends on whether the CSF inside the pseudocyst is infected or not. USG guided aspiration and analysis are done to diagnose infection and also to alleviate abdominal pain.10 Generally, exploration of the abdomen with exteriorization of the distal end until the cyst is reabsorbed, placing the distal end in another quadrant of the abdomen or pleural cavity or right atrium is done in non-infected cases. If an infection is present, implantation of an external ventricular drain and replacement of the shunt is required after appropriate antibiotic therapy.4,9 Laparoscopic cyst excision and laparoscopic shunt installment are other modalities that are gaining popularity nowadays.11 In our case, open laparotomy with removal of the distal end of the shunt and repositing within the peritoneal cavity in another quadrant was done. One study showed 19.8% and 24.2% chances of recurrence in children and adults respectively, with low odds of recurrence in children whose catheter was repositioned into nonperitoneal space.9 Another study found the positioning of the catheter in the retro-hepatic position decreases recurrences.12

Conclusion

Although the chances of pseudocyst occurrence are there in every patient after undergoing VP shunt, it is an uncommon complication. It generally presents with abdominal pain and distention. Diagnosis can be made by radiological evaluation. Repositioning of the distal end of the catheter may be adequate for cyst regression. It is important to understand and discuss more cases for truly understanding complications of VP shunt and decrease the burden of hospital stay and revision surgery in both childrens and adults. So all physicians are advised to be aware of the potential complication besides neurosurgeons and pediatricians.

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