Management of Sterile Abdominal Pseudocyst Related to Ventriculoperitoneal Shunt

Abstract 1456

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There are many known complications associated with cerebrospinal fluid (CSF) shunts. One of the rarer complications with ventriculoperitoneal shunting (VPS) is a sterile abdominal pseudocyst, thought to be due to decreased peritoneal absorption.

This study was undertaken to detail the presentation, evaluation and management of this unusual shunt-related event. Particular attention was paid to the long-term outcomes of the ultimate surgical procedure chosen for CSF-diversion after pseudocyst resolution.
METHODS

• Design: retrospective, observational cohort study

• Inclusion criterion:
  • pediatric patients presenting with VPS-related sterile abdominal pseudocysts between 2013 and 2018

• Exclusion criteria:
  • history of abdominal surgery or shunt revisions within preceding 12 months
  • shorter than 12-month follow-up period

Elements abstracted from chart review:
  • Demographics and clinical presentation
  • Nature of intervention(s) to treat abdominal pseudocyst
  • Nature of final CSF diversion
    • Distal shunt replacement to peritoneum or conversion to another location [i.e., atrium (VAS) or pleural cavity], endoscopic third ventriculostomy (ETV), or shunt removal
    • Use of laparoscopy for peritoneal catheter placement
  • Timing and nature of subsequent shunt failures within 1 year
RESULTS

Patients

• N= 28 (21 male)

• Mean age= 10 years (range 3-19y)

• Hydrocephalus etiology: intraventricular hemorrhage of prematurity (82.1%), congenital (14.3%), Dandy Walker (3.6%)

• History of necrotizing enterocolitis (NEC)= 3 (10.7%)

• History of abdominal surgery= 5 (17.9%)

• Mean time since last shunt revision= 4.4y (range 1 to 10.8y)

• Mean time since last abdominal surgery or NEC diagnosis= 5.3y (range 1.9 to 9.9 years)

• Presenting symptoms: abdominal (22, 78.5%), seizure (2, 7.1%), abdominal and neurological (4, 14.3%)
• All shunts were externalized at presentation with either ventriculostomy placement or externalization of the distal end.

• Externalized for median 5d (range 2-20d)

• Four patients required additional percutaneous drainage of the pseudocyst within 1 day of externalization.

• Infection was ruled out with either pseudocyst or CSF sampling after externalization for at least 48h.
RESULTS
Surgical Management of Hydrocephalus

28 patients with VPS externalized

- 1 patient shunt removed
  - Free of shunts

- 2 patients V-pleural shunt
  - No shunt revision

- 14 patients VAS
  - 1 failed attempt

- 12 attempted VPS
  - 11 VPS
  - 2 patient shunts revised (18%)
    - Distal (n=2)

- 7 patient shunts revised (50%)
  - Proximal (n=1)
  - Distal (n=5)
  - Infection (n=1)
• VPS placement with laparoscopic assistance in 8 cases (66.7%)

• All patients with history of NEC or abdominal surgery underwent VAS, with or without laparoscopic exploration

Shunt failures at 1 year:
• 9 shunt failures (32.1%)
• Total all-cause failure rates: VPS 18%, VAS 50%.

• 2 VPS failures due to a recurrent pseudocyst (one infected)
  • Patient with infected pseudocyst converted to VAS
  • Patient with recurrent sterile pseudocyst internalized to peritoneum
• Management of abdominal pseudocyst was similar across surgeons and institutions, despite lack of standardized protocols.

• The ultimate surgical management of hydrocephalus was left to the discretion of the treating surgeon. This included whether replacement of the catheter to the peritoneum was attempted, and whether diagnostic laparoscopy was used. This introduces bias to this study.

• It is unknown whether children with a history of NEC or abdominal surgery have higher recurrence rates of pseudocysts, as none of these children underwent repeat VPS in this series.

• None of the children underwent ETV or ventriculogallbladder placement in this study, so the natural history of these options in this cohort is unknown.
Sterile abdominal pseudocyst is a rare complication of VPS. The management options are varied.

Laparoscopic-assisted replacement into the peritoneal cavity is a viable and safe option for select patients, especially in those without recent abdominal or shunt-related procedures.

Conversion to other types of shunts can also be considered for recurrent cases or cases in which extensive scarring is found during diagnostic laparoscopy.