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RESEARCH ARTICLE

Abdominal cerebrospinal fluid pseudocyst following ventriculo-peritoneal shunt surgery: A case report and review of literature.

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Abstract

Abdominal cerebrospinal fluid (CSF) pseudocyst is an uncommon complication following ventriculo-peritoneal shunt surgery. We report a case of 1 year 6 months old female baby who presented with complaint of progressive abdominal distension since last 1 month. At 1 month of age, right ventriculo-peritoneal shunt placement was done for obstructive hydrocephalus due to congenital aqueductal stenosis. Physical examination revealed a palpable abdominal cystic lump. USG of whole abdomen suggested large cystic space occupying lesion (18.6×13 cm) in anterior abdomen. CT scan of whole abdomen also suggested upper abdominal large cystic mass lesion with tip of VP shunt within it. After checking all baseline investigations exploratory laparotomy was performed. A large CSF pseudocyst was noted in upper abdomen. Deroofing of the cyst and repositioning of VP shunt catheter were done. VP shunt catheter was patent and functioning normally. Surgeons should be aware of this possible complication because early diagnosis and treatment would improve the clinical outcome and reduce the patient's suffering and distress.

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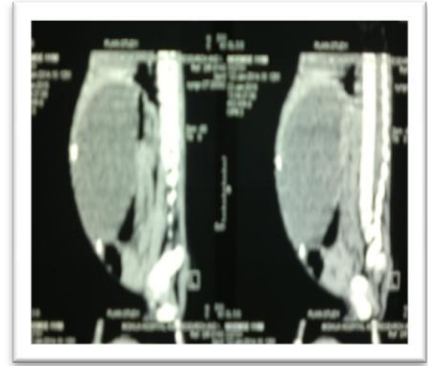
Introduction:-

Abdominal CSF pseudocyst formation in patient with VP shunt is an unusual complication and commonly presents with abdominal lump and with features of raised intracranial pressure in children. Delay in diagnosis of this complication can lead to progressive increase in size of cyst as it is not lined by epithelium. Hence, no resorption of CSF takes place leading to increased intracystic pressure and malfunctioning of VP shunt manifested by hydrocephalus and raised intracranial pressure. We report this uncommon complication in a patient with no objective evidence of infection and briefly discuss the aetiology and various modes of management. A written informed consent was obtained from the patient party for this case report and any accompanying images.

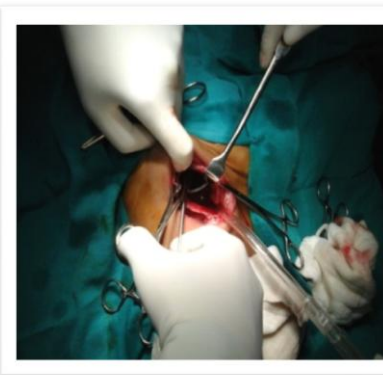
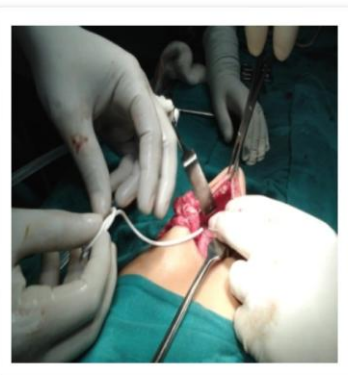
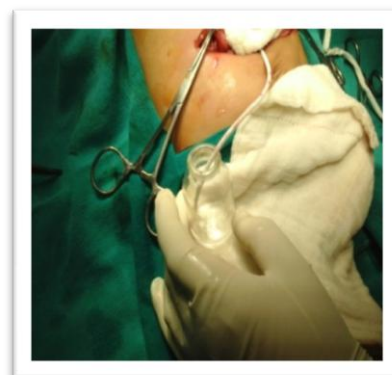
Case report:-

We report a case of 1 year 6 months old female baby who presented with complaint of progressive abdominal distension since last 1 month. At 20 days of age, right VPS placement was done for obstructive hydrocephalus due to congenital aqueductal stenosis. There were no history of fever and no history suggestive of raised intracranial pressure. On admission, her vital signs were stable. Her physical examination revealed a palpable abdominal cystic lump which was well-defined, smooth, non-tender and moving with respiration. It was dull to percussion.

Plain X-ray of abdomen (Fig 1) showed VP shunt in-situ. USG of whole abdomen (Fig 2) suggested large cystic space occupying lesion (18.6×13 cm) in anterior abdomen. There was no free fluid in the abdomen. CT scan of whole abdomen (Fig 3) also suggested upper abdominal large cystic mass lesion ($19 \times 13 \times 9$ cm) with tip of VP shunt within it. CT scan of brain revealed no enlargement of ventricles.

**Figure 1:-** Abdominal X-ray.**Figure 2:-** Ultrasound film of abdomen.**Figure 3:-** CT scan film of abdomen.

Haematological examination (Blood RE) including LFT and KFT were within normal limit. After checking all baseline investigations exploratory laparotomy was done under general anaesthesia. A large CSF pseudocyst was noted in upper abdomen (Fig 4). Deroofing of the cyst and repositioning of VP shunt catheter were done (Fig 5).

**Figure 4:-** CSF pseudocyst.**Figure 5:-** Deroofing of cyst.**Figure 6:-** Collection of CSF sample.

VP shunt catheter was patent and functioning normally. The cyst fluid was clear, straw-coloured. It was sent for analysis (Fig 6). The analysis showed a total cell count of 3, all being lymphocytes. Proteins were 35 mg% and sugar 60 mg%. Cyst fluid was sterile as per culture and sensitivity report. CSF fluid analysis report was normal. She had an uneventful recovery and was discharged on 4th postoperative day.

Discussion :-

VPS is the most common treatment procedure for hydrocephalus; however, it is not free of complication. Shunt complications are reported to occur at a rate of approximately 26%¹. Different complications like CSF loculation and cyst formation, perforation of the viscera, migration of the shunt, bowel obstruction secondary to adhesions and metastatic spread via the shunt, appendicitis, hernia have been reported².

Abdominal cerebrospinal fluid pseudocyst is a uncommon (less than 1% to 4.5%^{3,4}), but potentially life-threatening complication of VPS placement. It is seen as a thin-walled cystic mass around the shunt tip, which is filled with cerebrospinal fluid. The wall is composed of fibrous tissue without epithelial lining. The underlying mechanisms involved in the formation of the cerebrospinal fluid pseudocyst remain unknown; however, inflammation, either sterile or infectious, is usually regarded as the main causative factor⁵.

The symptoms of abdominal cerebrospinal fluid pseudocysts in adult patients are abdominal pain, distention, and a palpable abdominal mass. Thus, adults predominantly present with abdominal signs only. On the other hand, in pediatric patients, symptoms of shunt malfunction, such as headache, nausea, and vomiting are more common⁴.

A small amount or no peritoneal fluid is found in the patient with a normally functioning VP shunt. Ultrasonographic evidence of a larger, localized or loculated collection is abnormal and suggests CSF pseudocyst.

CT scanning, which provides accurate localization, has now replaced other imaging modalities as the modality of choice.

Differential diagnoses of an abdominal cystic mass include abdominal abscess, lymphocele, seroma, cystic lymphangioma, cystic mesothelioma, mesenteric cyst, benign cystic teratoma, cystic spindle-cell tumor, pancreatic pseudocyst, and duplication cyst ⁶.

The time between the last VPS surgery and collection of abdominal cerebrospinal fluid has been reported to range from 3 weeks to 10 years ⁷. Treatment of abdominal cerebrospinal fluid seems controversial. Therefore, many treatment algorithms have been described, such as laparotomy with wide excision of cystic walls, paracentesis and aspiration of the cystic fluid, CT-guided or ultrasound-guided aspiration of the pseudocyst ⁸. In 1995, Kim et al first described the laparoscopic management of a CSF pseudocyst, which involved excision of a portion of the cyst and repositioning the catheter within the peritoneal cavity ⁹.

Conclusion:-

Surgeons should be aware of this possible complication i.e. abdominal CSF pseudocyst formation in a patient with VP shunt because early diagnosis and treatment would improve the clinical outcome and reduce the patient's suffering and distress.

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