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Original Research Paper

Cardiothoracis

VENTRICULO-ATRIAL SHUNT : A DEFINITIVE MANAGEMENT FOR RECURRENT FAILED VENTRICULO-PERITONEAL SHUNT - A CASE REPORT.

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ABSTRACT The treatment of hydrocephalus dates back thousands of years back. In the 1950s with the milestone development of the Holter-Spitz valve in the Children's Hospital in Philadelphia the treatment of hydrocephalus was revolutionised and surgery became the standard of treatment. However the procedure is not free of complications. Complication can range from equipment failure to those at the ventricular or peritoneal ends of the shunt. Both these usually require urgent interventions if not immediate surgical ones. Here we discuss about the definitive management of a case with recurrent failures of ventriculo-peritoneal shunt in the form of utilisation of other body spaces for CSF drainage, here, right atrium.

KEYWORDS :

INTRODUCTION

CSF diversion is required in many neurosurgical conditions. A ventriculoperitoneal shunt (VPS) is usually the first-line option for patients with hydrocephalus. But when peritoneal shunting fails or is contraindicated, other spaces are utilised like the pleura and atrium[1]. Ventriculoperitoneal shunt failure requires urgent management and surgical intervention[2]. Studies found that age at shunt placement, etiology of hydrocephalus, type of hydrocephalus and previous treatments before shunt surgery were factors associated with shunt survival[3]. Nulsen and Spitz were the first to describe ventriculoatrial shunt (VAS) placement. Studies investigating long-term outcomes in the 1960s to 1990s revealed similar shunt revision, durability and infection rates for both shunt types. However, more severe complications, such as arrhythmias, thromboembolic complications, pulmonary hypertension, and shunt nephritis are encountered in VA shunts[4].

Case Study

A full term institutional vaginal delivery male child with a history of delayed cry and poor 1st minute APGAR score at birth, presented to us at nine years of age with complaints of abdominal distension since 10-15 days. There was no history of fever, vomiting, headache, seizures, syncope, constipation or diarrhoea. The patient has history of recurrent abdominal distension associated occasionally with pain and vomiting. He had history of lumbosacral meningomyelocele repair with medium pressure (ventriculo-peritoneal) VP shunt placement on 23.10.2015 in age of day 03 of life. He then presented with complaints of abdominal distension and a vague abdominal lump and ultrasound revealed a massive perisplenic collection surrounding the tip of VP shunt for which he underwent exploratory laparotomy and excision of CSF pseudocyst on 26.11.2021. He then presented with abdominal distension and vomiting. Per abdomen examination revealed a soft, non-tender lump about 4x4 cm in the left hypochondriac region. Abdominal ultrasound revealed a loculated collection about 120cc in volume in left hypochondriac region extending up to umbilicus, with thick fluid and intervening septae with VP shunt in situ suggestive of CSF pseudocyst. He underwent revision of distal end of shunt with excision of CSF pseudocyst on 29.12.2023. He was discharged in a stable condition. About 1 month later he again presented with abdominal swelling since 3 days and ultrasound showed a 15 x 12 cm cystic lesion around the distal end of VP shunt in the abdominal cavity. He then underwent exploratory laparotomy with pseudocyst excision with omentectomy with shunt tip replacement on 21.01.2024. He was then discharged with stable vitals, tolerating oral feeds well and passing stools. But again he developed complaints of abdominal distension and presented with abdominal lump about 8 x 6 cm in size in right hypochondriac region. Ultrasound revealed a large thin walled anterior abdominal wall collection with VP shunt tip in situ suggestive of pre-peritoneal CSF pseudocyst. He then underwent drainage of pseudocyst with revision of distal end of VP shunt on 07.03.2024. Few weeks later he again developed abdominal distension which was managed conservatively. He was then referred to our department for further management. He was evaluated thoroughly. His 2D ECHO was suggestive of situs solitus, laevocardia with normally placed great vessels, normal chamber dimensions, normal biventricular function and an ejection fraction of 60%. There was no ASD, VSD, PDA or COA. He underwent right ventriculo-atrial shunting via a right posterolateral thoracotomy through the right fourth intercostal space on 20.04.2024. Peritoneal end of the right VP shunt was taken out and inserted in the right atrium through the right auricle around purse string sutures. He was vitally stable, afrebile, tolerating orally and passing flatus and stools normally. He was thus discharged. On outdoor follow up he was stable with no complaints of vomiting, fever, pain abdomen or distension. His abdominal girth had also reduced.

DISCUSSION

The treatment of hydrocephalus underwent three stages of evolution. From neither medical or surgical to medical and finally surgical. Despite a long history and experience in the surgical management of CSF shunting and with the advances in additional medical facilities, VP shunting is associated with a lots of complications. Some complications can be recurrent and add to patient morbidity. One such complication is recurrent failure of distal or peritoneal end of VP shunt causing shunt failure and cystic collections in the peritoneal

cavity. This case report also cites one such complication and provides solution to this problem in the form of ventriculo-atrial shunt as the definitive management of recurrent VP shunt failure. This appears to be a viable treatment option.

CONCLUSION

Thus from this case report we can conclude that ventriculo-atrial shunt can serve as a definitive treatment option for patients with recurrent VP shunt failure as there are less chances of blockage, less risk of bowel injury or perforation. As the CSF fluid is sterile, risk of endocarditis is also less. Thus considering all these merits VA shunt is a viable option for management of failed VP shunt.

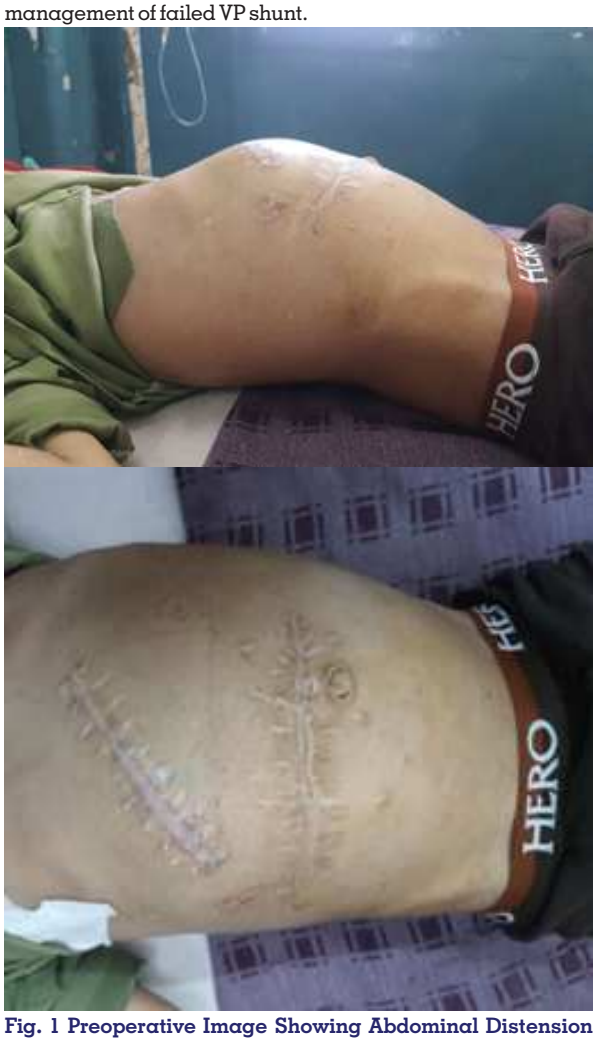
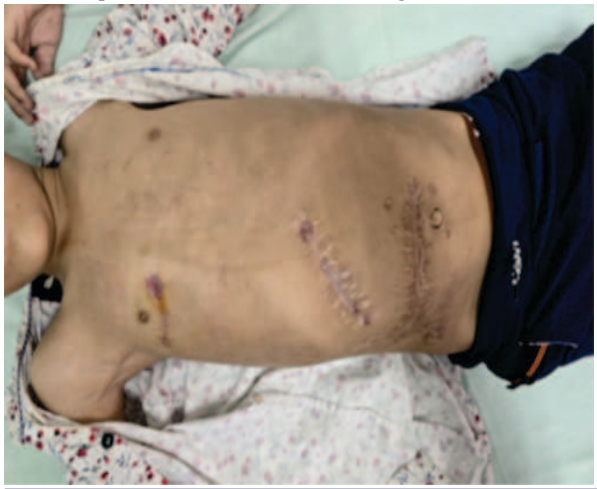


Fig. 1 Preoperative Image Showing Abdominal Distension and Multiple Scar Marks of Previous Surgeries



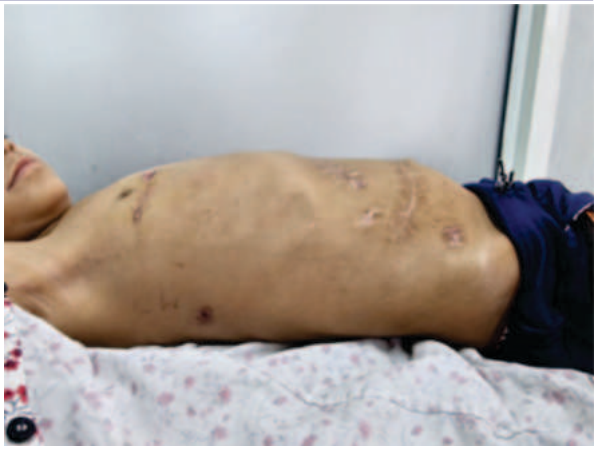


Fig. 2 Post-operative Image Showing Relief From Abdominal Distension and Scar Mark of Right Anterior Thoracotomy Incision.

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