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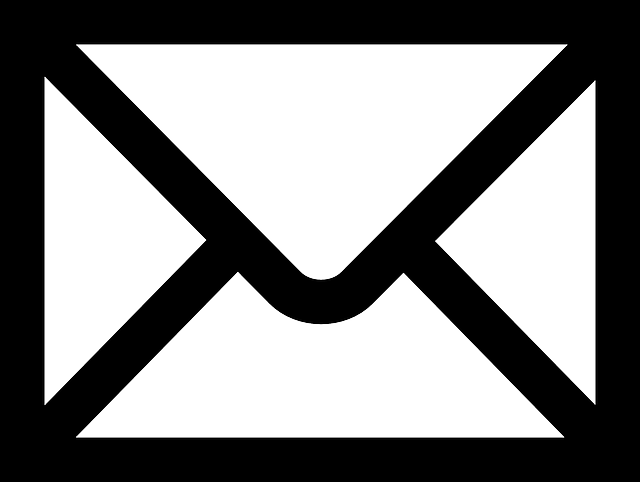
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**Keywords**

Ventriculo Peritoneal Shunt (VPS),

complications,

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Abstract

The role of shunt placement is to divert cerebrospinal fluid (CSF) from within the ventricles to an alternative location most commonly peritoneal space. Ventriculo Peritoneal Shunt (VPS) is associated with many complications viz over drainage, valve failure, breaking of catheter, catheter obstruction, coiling of catheter, spontaneous knot formation, infection and migration of distal catheter and all of them finally leading to obstructive hydrocephalus. One such complication is distal catheter migration to a rare but possible site i.e. scrotum. We reported a case of scrotal migration of shunt as a late complication of VPS insertion.

Background

The role of shunt placement is to divert cerebrospinal fluid (CSF) from within the ventricles to an alternative location (most commonly peritoneal space, rarely to atria, pleural space) and from lumbar space to peritoneal cavity.

Ventriculo Peritoneal Shunt (VPS) is associated with many complications namely over drainage, valve failure, breaking of catheter, catheter obstruction, coiling of catheter, spontaneous knot formation, infection and migration of distal catheter and all of them finally leading to obstructive hydrocephalus [1,2]. One of the rare sites of distal catheter migration is scrotum. Scrotal migration of distal shunt catheter is more common in children due to patent processus vaginalis [3]. We reported a case of scrotal migration of shunt as a late complication of VPS insertion.

Case presentation

An eighteen months old male child, a follow up case of tubercular meningitis (TBM) with hydrocephalus was operated by right VPMP shunt via right Keens point in January 2020 at our tertiary care centre. Post operatively patient's GCS improved and patient was discharged. After approximately 03 months patient presented with gradual increase in size of bilateral scrotum in the past 2 months, intermittent

fever and on & off vomiting and was admitted (Fig.1). On local examination cough impulse was present in the right inguinal region & a tube like structure was palpable in the right hemiscrotum, external genitalia was normal. Neurological examination was normal with no focal neurological deficit, GCS was E4V5M6, head circumference was normal for age, no signs of shunt obstruction were present.

Investigations

X-ray of neck, chest, abdomen & pelvis were conducted which showed an intact VP shunt with extension of the peritoneal end into the right hemi scrotum. USG of inguinoscrotal region was also suggestive of same.

Treatment

Surgical intervention was planned in this rare case. Re-exploration of the abdominal wound was done, the peritoneal end of the shunt was identified and it was pulled and repositioned in peritoneal cavity under C-ARM guidance and the abdominal wound was closed in layers. Post-operative X-ray of chest, abdomen & pelvis showed normal position of peritoneal end of VP shunt (Fig.2).

Outcome and follow up

The child was kept under observation and discharged after 48 hours since the postoperative period was uneventful and was advised for follow up in general Surgery OPD and Neurosurgery OPD.

Discussion

The most common surgery performed worldwide for hydrocephalus is VP shunt [3]. Shunting is performed to divert the CSF from dilated ventricles to peritoneal cavity from where CSF is absorbed. Apart from the morbidity associated with hydrocephalus, shunt surgeries have their own complications which are well known [2-6].The reported incidence of shunt-related abdominal complications is 10-30%[7] Various authors have reported migration of the distal end of peritoneal catheter into the scrotum through a patent processus vaginalis[8-11]. The processus vaginalis may remain patent until 1 year of life in 50-60% cases and until 2 years of life in 40-50% of cases [3]. Rowe et al[12]have explained the aetiology of peritoneal catheter migration, which has been universally accepted over the years by various authors[13]. Peritoneal cavity distension due to draining CSF also prevents the obliteration of processus vaginalis which had also been reported by Ho et al [14] and Ozveren et al[15]. In the present case, a male child had a patent processus vaginalis which was either congenital or because of peritoneal CSF drainage. In our case, right-sided VP shunt was performed and it would be difficult to comment and is another research study topic whether the side has something to do with the shunt migration as there is no such report in the literature comparing the right and left patent processus vaginalis. We used Chabbra medium pressure VP shunt in our case. Shunt migration can occur either as an early or a late complication. Ozveren et al[15] have reported shunt migration within 24 h, while the average length of time reported in other series was 6.8 months. In our case, the time interval was approximately 3 months. Thus this kind of shunt complication needs to be reported and should be kept into mind in dealing with cases who had undergone shunt insertion surgery.

Scrotal VP shunt migration has been reported in 26 children, and the time of presentation varies from 1 month to 2.5 years (mean 3.8 months, median 1 month) after shunting, with 21 out of 26 migrations occurring within 6 months, 88% involving the right side [16].

Ramareddy RS describe the spontaneous resolutionof hydrocele and retreat of migrated peritoneal portion of VP shunt, and also discuss the pathogenesis and management [16].

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