Scrotal migration of ventriculoperitoneal catheter and hydrocele resolving spontaneously

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ABSTRACT

Shunt migration is a rare, but reported complication of ventriculoperitoneal shunt and migration of the same through the processus vaginalis is known. We present a 20-month-old boy who presented with migration of the ventriculoperitoneal shunt tube through the patent processus vaginalis and a subsequent hydrocele. The hydrocele and migrated shunt resolved spontaneously.

Key words: Hydrocele, patent processus vaginalis, ventriculoperitoneal shunt

INTRODUCTION

Ventriculoperitoneal (VP) shunt is the treatment of choice for congenital hydrocephalus.[1-3] Displacement, disconnection, and migration are the mechanical complications of the shunt. The peritoneal catheter of VP shunt may migrate into the gastrointestinal tract, abdominal wall, bladder, vagina, scrotum, lateral ventricle, or mediastinum.[1-3] Incidence of hydrocele following VP shunt varies from 3.8 to 6%.[3] Standard treatment of scrotal migration is reposition of the shunt and closure of the patent process vaginalis (PPV).[4]

In this article, we describe the spontaneous resolution of hydrocele and retreat of migrated peritoneal portion of VP shunt, and also discuss the pathogenesis and management with review of the literature.

CASE REPORT

A 20-month-old boy who had undergone meningomyelocele (MMC) repair and VP shunt insertion for congenital hydrocephalus in neonatal period presented with scrotal swelling since 2 weeks.

Access this article online	
Quick Response Code:	Website: www.ijns.in
	DOI: 10.4103/2277-9167.102300

On evaluation he had left hydrocele with the shunt tube palpable in it [Figure 1], opened anterior fontanel, and no signs of raised intracranial pressure. Shunt examination revealed patent peritube sheath between disconnections in postauricular region and slow filling of the chamber with cerebrospinal fluid (CSF). Shunt series confirmed disconnection and coiling of VP shunt in left scrotum with its tip pointing toward the peritoneal cavity [Figures 2 and 3]. Plain Computerized Tomography (CT) scan of head revealed moderate hydrocephalus with Evans ratio of 55% [Figure 4], shunt tube disconnection, and proximal shunt tube tip in the ventricle. As the child was unfit for general anesthesia due to anemia and asymptomatic with respect to hydrocephalus, he was scheduled for the elective revision of the shunt and bilateral processus vaginalis ligation after correction of anemia. However, after a month on follow-up, when he was taken up for shunt revision, the tubing backed out of the scrotum and the hydrocele resolved spontaneously [Figures 1 and 3]. Peritubal sheath of Chhabra shunt was mobilized and opened at disconnection site. Reposition of ventricular end revealed clear CSF under moderate pressure. Shunt tube was reconnected and proximal catheter fixed to pericranium after the confirmation of distal patency. He has been followed until 36 months without recurrence.

DISCUSSION

The processus vaginalis normally remains patent in 60-70% of infants in the first 3 months of life, 40% from the age of 2 years through 16 years, and 15-30% in adults at necropsy.[1-4]

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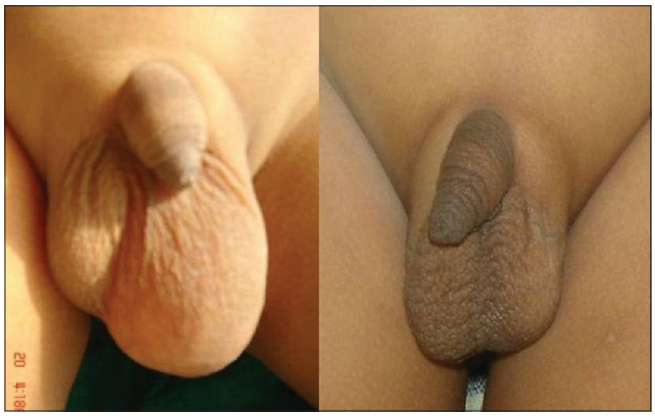

Figure 1: Scrotal hydrocele with VP shunt (left) and spontaneous resolution (right)

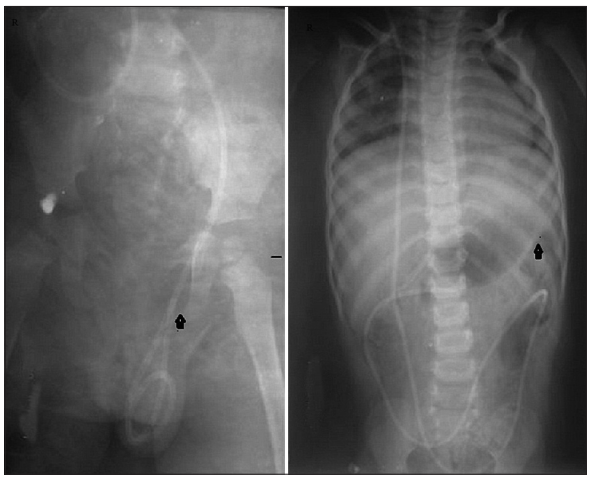

Figure 3: Plain X-ray abdomen: Scrotal coiled VP shunt with tip intraperitoneal (arrow) (left) reverting spontaneously back to peritoneal cavity (right)

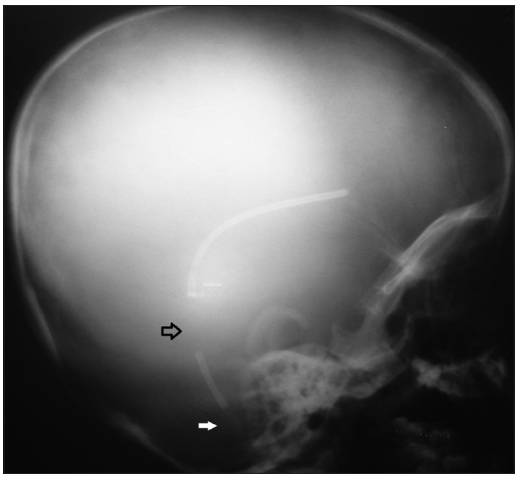

Figure 2: Skull lateral X-ray view reveals disconnection (hollow arrow) and chamber (solid arrow)

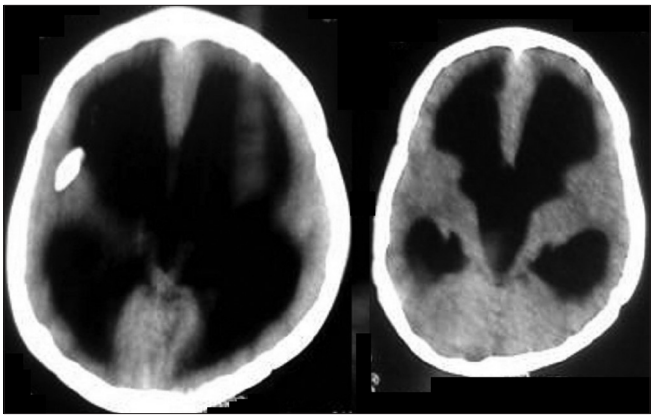

Figure 4: Preoperative CT scan shows moderate hydrocephalus and proximal shunt tube tip in the ventricle

Scrotal VP shunt migration has been reported in 26 children, and the time of presentation varies from 1 month to 2.5years (mean3.8months, median1month) after shunting, with 21 out of 26 migrations occurring within 6 months, 88% involving the right side.[1] Our patient presented as late as 19 months after surgery and on the left side.

High intra-abdominal pressure due to CSF inflow to peritoneal cavity, impaired absorption (idiopathic / inflamed peritoneum), and large MMC with abnormal neuromuscular function prevent the spontaneous closure of PPV.[1,3-8] Small peritoneal volume, younger children, PPV, the almost vertical anatomical relationship between the superficial and deep inguinal rings in the infant, gut peristalsis, omental activity, long length tubes, effects of gravity, chronic catheter irritation, and fluid flow from the tubing with trough effect are the probable hypotheses for the scrotal swelling and tube migration.[1,3-10]

Peritoneal catheter migration occurs with or without shunt disconnection.[2,3,5,10] Persistent fibrous tract between disconnections was acting as the fluid conduit and maintaining the slow drainage of CSF. Crofford and Balsam (1983) had reported spontaneous migration of scrotal shunt tube back into the peritoneal cavity.[2] Our case and Crofford and Balsam's case had shunt tube tips pointing toward the peritoneal cavity. PPV, gut peristalsis, increased abdominal pressure, and ascitis fluid flow around the shunt tube might have caused the scrotal complication in our child.[1-10] Gut peristalsis might have pulled back the coiled shunt tube and resolved the hydrocele spontaneously. PPV was ligated in all scrotal complications of VP shunt.[1-10] However, in our patient, we deferred the PPV ligation after counseling with parents about spontaneous resolution of scrotal complication, lesser incidence of PPV, incarceration, and hydrocele after 2 years.[1-4] This conservative approach for spontaneous resolution of scrotal complication has not been reported.

CONCLUSION

Spontaneously resolving hydrocele and "retreat" of a migrated peritoneal portion of a VP shunt is rare and unique.

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How to cite this article: Ramareddy RS, Alladi A. Scrotal migration of ventriculoperitoneal catheter and hydrocele resolving spontaneously. Indian J Neurosurg 2012;1:172-4.

Source of Support: Nil, **Conflict of Interest:** None declared.