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Case Report
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Intracranial Migration of Proximal and Distal Components of Ventriculoperitoneal Shunt in the Child

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Abstract

Ventriculoperitoneal Shunt (VPS) is the most frequent method to treat obstructive or normal pressure hydrocephalus in neurosurgical practice. Intracranial coiling of the shunt is a very rare complication in the Child during management of hydrocephalus. Here we report a case of intracranial migration of the proximal and distal components of VPS in the Child.

Introduction

Ventriculoperitoneal Shunt (VPS) is a universally acceptable technique of hydrocephalus management [1]. Shunt failure is frequent complication that occurs in 40% to 70% of cases [2]. One of the complications of VP shunt is migration of the shunt. It can migrate in both cranial and caudal directions. Migration of the proximal and distal catheters of the VPS is an extremely rare event in neurosurgical practice.

Case Presentation

A 14 month old boy was hailing from remote area, presented with symptoms of raised intracranial pressure with large head and a tense and bulging anterior fontanelle. He was shunted 6 months ago due to congenital hydrocephalus and an enlarged head. Recent CT scan revealed that the shunt had completely migrated into the cranial cavity. This was also conformed in X-ray of the Skull (Figures 1 and 2). The migrated shunt could not be recovered as flexible neuroendoscopy was not available in the department. A new shunting was planned but the patient party refused further treatment and was discharged against medical advice.

Discussion

VPS operation was first performed in 1908 by Kausch [3]. It is a universal neurosurgical technique for treating hydrocephalus. This technique has been used even significance increased in Endoscopy Third Ventriculostomy (ETV). Although VPS procedures are simple to perform, certain cases can be highly complicated. VPS is associated with intracranial or intra-abdominal complication such as meningitis, ventriculitis, sepsis, and subcutaneous infection, abdominal complications like pseudo cyst, intestinal volvulus, and spontaneous bowel perforation. One of the complications of VPS is the migration of the shunt. However, it is usually distal or peritoneal catheter that migrates after disconnecting into many locations such as the scalp, mouth, thorax, trans diaphragmatic, heart, pulmonary artery, chest, breast, stomach, gall bladder, liver, urethral, umbilicus, pleural cavity, inguinal canal, scrotum, colon, inguinal hernia sac, bladder, vagina and rectum [1-4]. Migration of the shunt as a whole is extremely rare in the English literature.

The etiology of migration of VPS catheter still remains unknown. However, there are various suggested mechanisms of shunt migration. The direction of shunt migration has been noted to be dependent upon the pressure gradients between cranial and peritoneal cavities. The migration may happen in both upward or downwards directions. Upward migration of shunt may be due to forceful head movements. Distance between the cranial and abdominal ends of shunt in children compared to adults is short which facilitates easier migration intracranially. The shunt is coiled and packed in a box like shape style, so once migrate shunt retained memory of the shunt system can be another hypothesis for coiling [2,5]. Distal rather than proximal shunt migration is more common and presumed to be due to intestinal peristalsis which may pull down the shunt. Some authors believe that it is caused by the formation of a local inflammatory reaction or fibrosis

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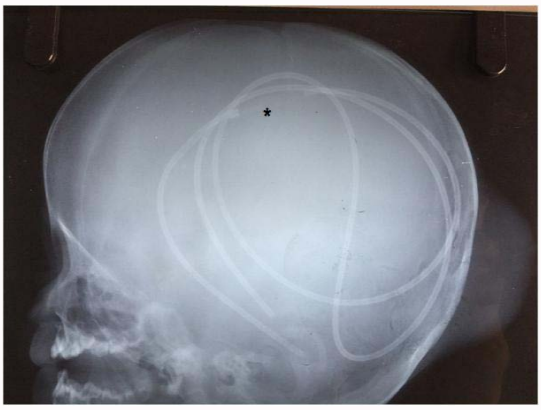

Figure 1: Skull X-ray (Lateral view) showing coiling of the proximal and distal components with reservoir of VPS inside the cranium.

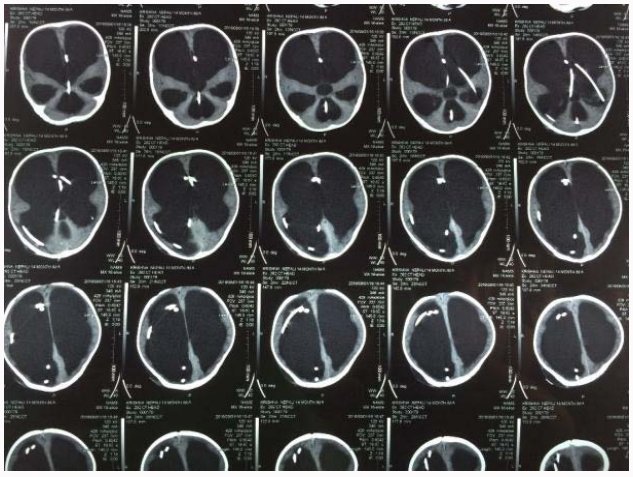

Figure 2: Axial view of brain CT scan reveals shunt migration inside ventricles with hydrocephalus.

around the catheter [6]. Shimizu et al. [7] proposed that stresses due to seizures, and constipation are responsible for shunt migration. Many factors have been attributed for the possible mechanism underlying this rare complication. These include negative sucking intraventricular pressure, positive pushing intra abdominal pressure and tortuous subcutaneous track as well as neck movements. Other factors are related to the patient, the surgical technicalities and to the shunt itself. In our region, the Chhabra shunt systems are applied due to economical cheap. These shunt systems have a valve with a reservoir but the valve is cylindrical with a diameter slightly bigger than the shunt tube. The patient related factors includes the age of the patient, severe and gross hydrocephalus with very thin cortical layer, malnutrition, anaemia, sepsis, and repeated head movements and rotation. Many of these predisposing factors were present in our patient who had a gross head enlargement with very thin cortical layer. In addition, the patient presented was also malnourished and anemic.

In this 21 century, it is essential to minimize shunt related complication and shunt dependent life style. In my opinion, the use of ETV and Choroid Plexus Cauterization (CPC) should be recognized and encouraged for future treatment of hydrocephalus in preferred and fit patients as substitute to shunting procedures [8].

Conclusion

Shunt migration is a rare complication due to increased intra ventricular pressure, intra-abdominal pressure and strong head and neck movements. It can be prevented by use of appropriate operative techniques by experienced neurosurgeon and also making parents aware of preventing such complications.

References

1. Mwachaka PH, Obonyo NG, Mutiso BK, Ranketi S, Mwangombe N. Ventriculoperitoneal shunt complications: A three-year retrospective study in a Kenyan national teaching and referral hospital. Pediatr Neurosurg. 2010;46(1):1-5.
2. Shafiee S, Nejat F, Raouf SM, Mehdizadeh M, El Khashab M. Coiling and migration of peritoneal catheter into the breast: A very rare complication of ventriculoperitoneal shunt. Childs Nerv Syst. 2011;27(9):1499-501.
3. Surcher J, Georgiev K, Euchev Y, Avramov R. Extremely rare complications in Cerebrospinal fluid shunt operations. J Neurosurg Sci. 2002;46(2):100-2.
4. Matthieu V, Marc B, Thines L, Dhellemmes P. Bowel perforation caused by peritoneal shunt catheters: Diagnosis and treatment. Neurosurgery. 2006;58(Suppl 1):76-82.
5. Dominguez CJ, Tiagi A, Hall G, Timothy J, Chumas PD. Subgaleal coiling of the proximal and distal components of a ventriculoperitoneal shunt. An unusual complication and proposed mechanism. Childs Nerv Syst. 2000;16(8):493-5.
6. Hai A, Rab AZ, Ghani I, Huda MF, Quadir AQ. Perforation into gut by ventriculo peritoneal shunts: A report of two cases and review of the literature. J Indian Assoc Pediatr Surg. 2016;16(1):31-3.
7. Shimizu S, Mochizuki T, Nakayama K, Fujii K. Visual field defects due to a shunt valve migrating into the cranium. Acta Neurochir (Wien). 2002;144(10):1055-6.
8. Rajendra Shrestha, Benjamin Warf. Dandy Walker Malformation with Severe Hydrocephalus. Nepal J Neuroscience. 2014;11(2):87-8.