CASE REPORT

Intracranial Migration of a Ventriculoperitoneal Shunt

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ABSTRACT

Objective: Total intracranial migration of the shunt is a rare complication of ventriculoperitoneal shunt placement for treatment of hydrocephalus. The authors report a case of total intracranial migration of ventriculoperitoneal shunt in a child with a very large head and discuss the possible causes and management.

Key words: Ventriculoperitoneal shunt. Shunt migration. Hydrocephalus.

INTRODUCTION

One of the complications of ventriculoperitoneal and ventriculoatrial shunt placement for hydrocephalus is the migration of the shunt. Shunts can migrate both upwards and downwards.1,2 Total intracranial migration of the shunt is a rare complication of ventriculoperitoneal shunt placement.1,3,4 It is more frequent with hard and spring loaded shunts. We report a case of total intracranial migration of a ventriculoperitoneal shunt using the Chabra shunt system. (the Chabra VP shunt system is like a standard VP shunt except that it has a cylindrical reservoir such as that of a Holter shunt system with a sialistic pump chamber and a single proximal spring loaded valve and as such is no different from a Holter shunt system).

CASE REPORT

A male child was born by normal vaginal delivery at 36th week of gestation. After 3 months the child presented with symptoms of raised intracranial pressure with large head and a tense and bulging anterior fontanelle. As the child came from a remote area, where medical facilities were not available, initial treatment had been delayed. At the time of presentation the child had gross hydrocephalus with increasing head circumference (FOC: Fronto occipital diameter), which at presentation, was over 75cm. A CT scan showed grossly dilated ventricles and a very thin cerebral cortex. A ventriculoperitoneal shunt was placed on the right side using a Codman subcutaneous tunneller and inserted into the peritoneal cavity with the help of a cut cannula and trocar. The subcutaneous reservoir was anchored to the subcutaneous tissue with 3/0 braided silk and the incisions repaired in two layers with 3/0 vicryl and 3.0 braided silk. The child had an uneventful postoperative course and was discharged on the 10th postoperative day. At the time of discharge, the anterior fontanelle was soft and sunken.

After 3 weeks, the child was brought back to hospital with symptoms of raised intracranial pressure, a bulging and tense anterior fontanelle and appeared to have a blocked ventriculoperitoneal shunt. CT scan showed that the shunt had totally migrated into the cranial cavity. This was more obvious on skull X-ray, which showed the ventriculoperitoneal shunt in the cranial cavity (Figures 1 and 2). A new shunt was placed on the left side. The migrated shunt could not be retrieved as the facility of neuroendoscopy was not available in the unit at that time. The child had an uneventful recovery and was discharged on the 9th postoperative day. He has been followed-up for two and a half years and he has remained well.

DISCUSSION

Ventriculoperitoneal shunts are routinely placed for the management of hydrocephalus. A rare, although well reported, complication is the migration of ventriculo-
peritoneal shunts, which accounts for 0.1-0.4% of all complications. The shunts may migrate after fragmentation but often migrate intact. The migration may occur in both cranial or caudal directions and the direction of shunt migration has been reported to be dependent upon the pressure gradients between cranial and peritoneal cavities. A number of mechanisms have been suggested for shunt migration. These include vigorous head movements by the child which may be responsible for upward migration of shunt and shorter distance between the cranial and peritoneal ends of shunt in children compared to adults which facilitates easier migration intracranially. Shimizu et al. reported a case with visual problems and seizures. They suggested that stresses due to seizures, and constipation are responsible for shunt migration. Gupta and Mann reported a case of shunt migration in a child with Dandy Walker Cyst; Cerrón-Rojas et al. reported a case of simultaneous cephalic migration of a ventriculoperitoneal shunt into the intraventricular and subdural spaces. These authors concluded that intracranial migration occurs due to detachment of shunt at distal end (technical fault), underlying disease (porencephaly), dynamic factors causing expulsion (gut peristalsis), dynamic translocation factor (neck movements), dynamic attraction factor (increased CSF reabsorption) and unishunt catheter (offering no resistance to passage through the trepanation orifice). Technical fault has also been reported in some studies as a cause of migration.

In our patient, none of the above predisposing factors were operative. It appears reasonable to infer that the shunt migration occurred due to technical reasons such as premature failure of anchoring sutures, which resulted in early release of the shunt. This, together with the very large size of the head, resulted in mechanical forces, which allowed for excessive shunt movement and migration. A careful attention to the operative technique, with more careful placement of the anchoring suture in the child with large head, could have probably prevented this complication.

REFERENCES