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Case Report

Post-traumatic fractured ventriculo-peritoneal shunt presenting as shunt failure

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ABSTRACT

Shunt malfunction is very common in neurosurgical day-to-day practice. We report for the first time a case of shunt malfunction resulting from breakage of the ventriculo-peritoneal shunt system following a fall and subsequent trauma to the head.

1. Introduction

The placement of a ventriculo-peritoneal (VP) shunt is the most common form of treatment for hydrocephalus. The well-known complications include shunt infection, shunt block, subcutaneous collection of CSF, peritoneal pseudocyst, bowel perforation, intestinal volvulus, catheter disconnection, overdrainage, and extraperitoneal retraction of the catheter through the mouth, umbilicus, bladder, vagina, anus, urethra and scrotum.[1,2]

2. Case report

A 15-year-old male was operated for cerebellar astrocytoma when he was 10-years old. Decompression of the tumor was done, and a ventriculo-peritoneal shunt was put through the right Keen's point. Patient was doing well for 5-years, however he had a slip and fell on the ground with an impact on the right side of the head. He reported to us within 2-days of the injury with a swelling behind the ear and with headache and vomiting. On examination he was conscious, coherent, ambulatory. Fundi showed papilledema. There was limited lateral gaze of the right eye. There was no other neurological deficit. Local examination revealed a non-tender fluctuant swelling in the right retromastoid area along the shunt tube. He was investigated with CT scan head which showed dilatation of the lateral ventricles. The ventricular end of the shunt was in place (Fig. 1). The patient was operated upon. The lower end of the shunt was explored first and no cerebrospinal fluid (CSF) was noted exiting from it. Next the scalp incision was opened and the peritoneal catheter was next pulled up from the scalp incision and we found a fractured shunt just below the bulb (Fig. 2). A new peritoneal catheter

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was tunneled and connected to the ventricular catheter over a connecter. The connecter was secured to the pericranium with a stitch. The free flow of CSF was verified from the peritoneal end. His post-operative period was uneventful. On follow-up he is doing well.

3. Discussion

Ventriculo-peritoneal shunt insertions account for a significant number of neurosurgical admissions and procedures. Although they have resulted in dramatic improvements in patient survival and neurological function, shunts are associated with several complications. They can be complicated by infectious as well as non-infectious causes.[3] The non-infectious causes of shunt failure include obstruction, overdrainage, loculation of the ventricles, abdominal complications and mechanical failure including fracture and kinking of the tube, disconnection of components, migration of the shunt or misplacement.[4] Shunt fracture or disconnection is the second most frequent cause of shunt malfunction in children. Peritoneal catheter fractures occur most commonly in the neck, the area where the tube is subject to mechanical stress.[5,6] The typical presentation of a fractured shunt system is usually quite late after initial insertion and it may be marked by the rapid onset of dramatic symptoms such as headache, nausea, swelling over

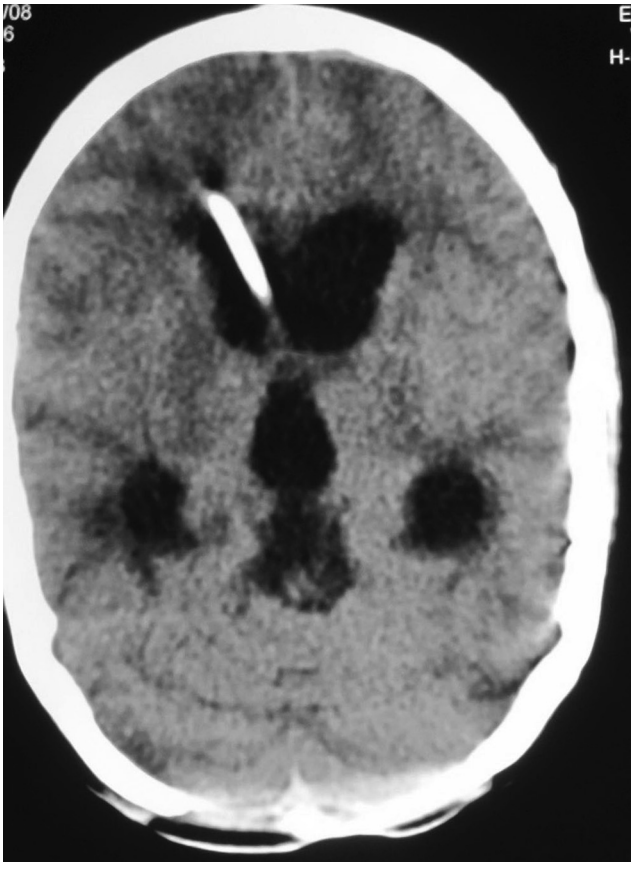

Fig. 1 – NCCT head showing dilated ventricles despite the ventric end of the catheter in place.

Fig. 2 – Intra-operative photograph showing the fractured shunt below the bulb.

the shunt tract often in a location over the shunt fracture or it may occur in a more subtle fashion over a longer period of time.[7]

The risk of shunt fracture is higher in children and this might be due to the ongoing pressure on a part of a shunt located between two fixation points in the growing child.[8] The most common location for a fracture is along the distal catheter segment, often near the clavicle or over the lower ribs.[7] Mechanical stresses, such as lengthening during deformity correction along with calcification and tethering of the tube, predispose the shunt catheter to fracture.[9] The possibility of fracture of the shunt and subsequent malfunction following a trauma to the head should be considered in patients with ventriculo-peritoneal shunts who present with headaches Our case is unique in a way that an operated cerebellar astrocytoma with a functioning shunt got damaged with direct trauma to the head resulting in shunt malfunction which is the first of its kind to be reported in literature.

Conflicts of interest

All authors have none to declare.

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