Umbilical Hernia and Ventriculoperitoneal Shunt Complications

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Ventriculoperitoneal (VP) shunt is the standard management of hydrocephalus. A wide range of complications have been reported for this procedure including malfunction, infection, pseudocyst, peritoneal complications, and catheter extrusion[1]. The incidence of distal shunt migration has been reported 10% with defined causes[2]. Improvements in surgical techniques and the development of silastic shunt tubing have been helpful adjuncts in reducing the incidence of abdominal complications[3]. We present two children with umbilical hernia and abdominal complications of VP shunts.

The first patient, a four month old girl, had been seen in emergency department with a history of cerebrospinal fluid (CSF) umbilical fistula since 2 weeks ago and peritoneal catheter extrusion through umbilicus since 3 days ago (Fig 1). Her past history included thoracic myelomeningocele surgery and VP shunt for hydrocephalus. She had

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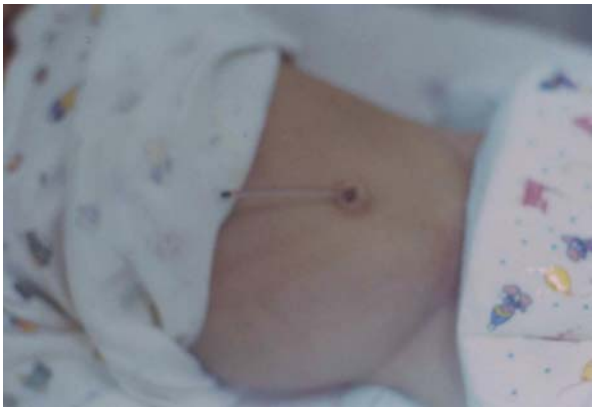

Fig 1: Peritoneal catheter extrusion through umbilicus

small umbilical hernia since birth time. On admission she had low grade fever and CSF leakage from the extruded peritoneal catheter. CSF culture taken from pump was positive for Klebsiella. Abdominal sonography was normal. She was managed with shunt removal, 3 week antibiotic therapy and delayed VP shunt. She died 2 months later with sudden stridor and respiratory distress due to probably Chiari type 2.

The second patient, a three month old girl presented with fever, poor feeding and umbilical CSF fistula. At neonatal period, she had undergone myelomeningocele repair and VP shunt. She had a small umbilical hernia that aggravated by crying. CSF examination was positive for infection with low sugar and high white blood cells but negative culture. Shunt system was removed and she was managed with 3-week antibiotic therapy, external ventricular shunt and delayed shunting. Umbilical hernia was repaired too. Follow-up over 3 years has been uncomplicated.

Protrusion of a peritoneal catheter through the umbilicus and umbilical fistula are rare complications of VP shunt. The pathophysiologic mechanism is unclear but several explanations are proposed. Umbilicus location in the median raphe naturally renders it a place of lesser resistance. It must also be considered that a structural malformation of the abdominal wall may be a contributing factor. A persistent umbilical vein and malocclusion of the vitelline duct could be important[4]. Elevated Intra-abdominal pressure due to increased peritoneal fluid, peritoneal adhesions around the catheter in relation to the parietal peritoneum producing a fibrous tunnel, bridging the distance between the end of the catheter and the umbilicus, periumbilical nonhealing granulation lesion may be contributing factors[5]. Thus it may be rational to correct an umbilical hernia before VP shunting in such cases to reduce the risk of umbilical fistula or extrusion. Weakness of abdominal wall muscles consequent to paresis in high level myelomeningocele can be another cause for shunt extrusion or CSF fistula in our patients.

Umbilical perforation and concomitant CSF infection need shunt removal and antibiotic therapy. Due to concomitant infection, both of our cases were managed with shunt removal, antibiotic therapy, external ventricular drainage and delayed VP shunting.

Shunt infection subsequent to CSF fistula or umbilical perforation must be considered even if ascending infection through shunt is rare. Further, it seems that umbilical hernia may increase risk of umbilical fistula or extrusion of shunt catheter especially in paraplegic myelomeningocele children; thus it is better to consider the correction of umbilical hernia before performing VP shunting.

Key words: Ventriculoperitoneal Shunt; Fistula; Umbilical Hernia; Perforation

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