INTRODUCTION

Ventriculoperitoneal (VP) shunt is one of the most common surgical procedures performed for the management of congenital hydrocephalus. However, this procedure is frequently associated with various complications.\(^1\)

Extrusion of VP shunt through umbilicus is rare and very few cases have been reported so far.\(^2\) However, extrusion through umbilicus after perforating the urachal remnant is extremely rare, hence this case is reported.

CASE REPORT

A female child of one-and-a-half-year old presented with purulent discharge from umbilicus for 5 days and protrusion of a tube through it for 2 days. There was no significant history of abdominal problem, fever or fits. The patient had undergone surgery for VP shunt at 25th day of life for congenital hydrocephalus. She had remained symptoms free till this complication. On physical examination, child was healthy, weighing 8 kg, with head circumference of 42 cm. The shunt reservoir was normally functioning. Abdomen was soft and non-tender with protrusion of VP shunt through umbilicus (Figure 1). Patient was treated with broad spectrum antibiotic before referral. Ultrasound of brain showed mildly dilated lateral ventricles, while abdominal sonography revealed matted bowel loops and twisted VP shunt tube at umbilical region. X-ray abdomen showed VP shunt tube twisted at centre of abdomen. Complete blood picture showed hemoglobin of 11.3 g%. The total leukocyte count was 13000 mm\(^3\) and neutrophils were 60%. Detailed report of Cerebrospinal Fluid (CSF) revealed glucose level of 50 mg/dl, protein level of 60 mg/dl and polymorphs were 4/cumm. Pus cells and CSF cultures were negative.

Under antibiotic cover, exploration was undertaken, an infected urachal cyst (urachal remnant) with a diameter of approximately 1.5 cm was revealed (Figure 2). A part of VP shunt after perforating the urachal remnant was extruding through the umbilicus without being kinked, while the rest of the distal tube was intermingled with bowel loops. Sigmoid colon was adherent to urachal remnant. That and the other matted bowel loops were freed, urachal remnant was excised, and the shunt tube was removed. Postoperative recovery was uneventful. Shunt was re-inserted after few days with clear CSF.

DISCUSSION

Ventriculoperitoneal shunts are among the most common surgical procedures performed by the neurosurgeons as well as pediatric surgeons. An estimated 750,000 peoples have hydrocephalus and 160,000 VP shunts are placed each year worldwide.\(^3\) Peritoneum is selected as most common distal site for shunt placement because of its larger absorptive area.
Complications of shunt surgery are well-described and have been divided into infective, mechanical and over drainage related. They are also categorized as abdominal and extra-abdominal according to site. In this case, complication was infective as well as abdominal. Abdominal complications are reported 10-30%, which are perforation of viscera, pseudocyst formation, CSF ascites and umbilical fistula, but protrusion of VP shunt through umbilicus is rarely reported in literature. In this case, complication was extremely rare showing perforation of urachal remnant and protrusion of shunt through umbilicus while distal end was inside the peritoneal cavity without being kinked and CSF leakage. Reasons for visceral perforation by VP shunt tube are considered as foreign body reaction, infection, pressure necrosis and silicone allergy. In this case, it was difficult to comment on probable reason of umbilical perforation but it was assumed that low-grade infection, foreign body reaction, weakened walls of urachal remnant by the tension of contents and pressure necrosis might all be contributing factors for perforation of the urachal remnant as well as the umbilicus.

Ultrasound and X-ray of abdomen are good diagnostic tools for intestinal obstruction, localized intra-abdominal collection and congenital intra-abdominal lesions. In this case, ultrasound detected matted intestinal loops at centre of abdomen, but could not reveal the sub-umbilical urachal remnant probably because of empty perforated cavity. X-ray also showed twisted VP shunt in the central abdomen.

Anchoring of shunt tube to peritoneum and short intra-abdominal VP shunt tube have been proposed to lessen the complication of VP shunt. Management depends upon the presentation of complication. Sharma et al. mentioned that in case of peritonitis, umbilical abscess and protrusion of shunt through umbilicus laparotomy is mandatory with removal of shunt. We followed that suggestion and removed the VP shunt, drained the umbilical abscess with excision of urachal remnant, followed by re-insertion of VP shunt.

The present case highlights the rarity of complication in association with VP shunt. However, one should also keep in mind the rare problems of shunt surgery.

REFERENCES