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Two unusual complications of ventriculoperitoneal shunts in the same infant

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Abstract Ventriculoperitoneal shunts have been associated with many different complications. We describe two rare complications in a 10-month-old girl. To the best of our knowledge, protrusion of ventriculoperitoneal shunt through the knee has not been reported before.

Introduction

Most pediatric patients with hydrocephalus are treated with ventriculoperitoneal (VP) shunt placement, with shunt malfunction being relatively common. A variety of shunt complications have been reported in the literature, including shunt migration, infection, cerebrospinal pseudocyst formation, and neoplastic metastasis [1]. We describe a 10-month-old girl with two unusual complications of VP shunts: protrusion of the catheter from the knee, and perforation of small bowel.

Case report

A 10-month-old girl with two VP shunt catheters was brought to the emergency room by her parents, with the chief complaint of plastic protruding from her left leg. Ten days before this emergency room visit she had developed a small lump in the anterior left thigh above the knee. The presumptive diagnosis at this time was that of a pustule at this location. Shunt series radiographs were obtained and demonstrated protrusion of one of the catheters through the left thigh and anterior to the left knee (Fig. 1). This catheter had been placed 2 months earlier. At surgery, the tube was blocked with blood clot and there was no cerebrospinal fluid (CSF) drainage. This catheter was surgically removed. Two months later, the patient presented with symptoms of sepsis. Shunt tap and culture grew *Serratia marcescens*. Computed tomography (CT) of the abdomen was highly suspicious for intraluminal migration of shunt tubing (Fig. 2). Under fluoroscopy, contrast medium was injected through the shunt and confirmed the location of the tip of the catheter in the small bowel (Fig. 3). This shunt was removed and replaced at a later stage.

Discussion

VP shunting is commonly used to decrease ventricular dilatation in patients with hydrocephalus. It is generally a safe and effective procedure; however, shunt malfunction and complications are not uncommon. Shunt obstruction and breakage are the two most common types of malfunction. Bowel perforation and protrusion from the anus by shunt tubing have been reported [2, 3, 4]. In patients with VP shunts, when abdominal symptoms or ventriculitis are present, perforation of the gastroin-

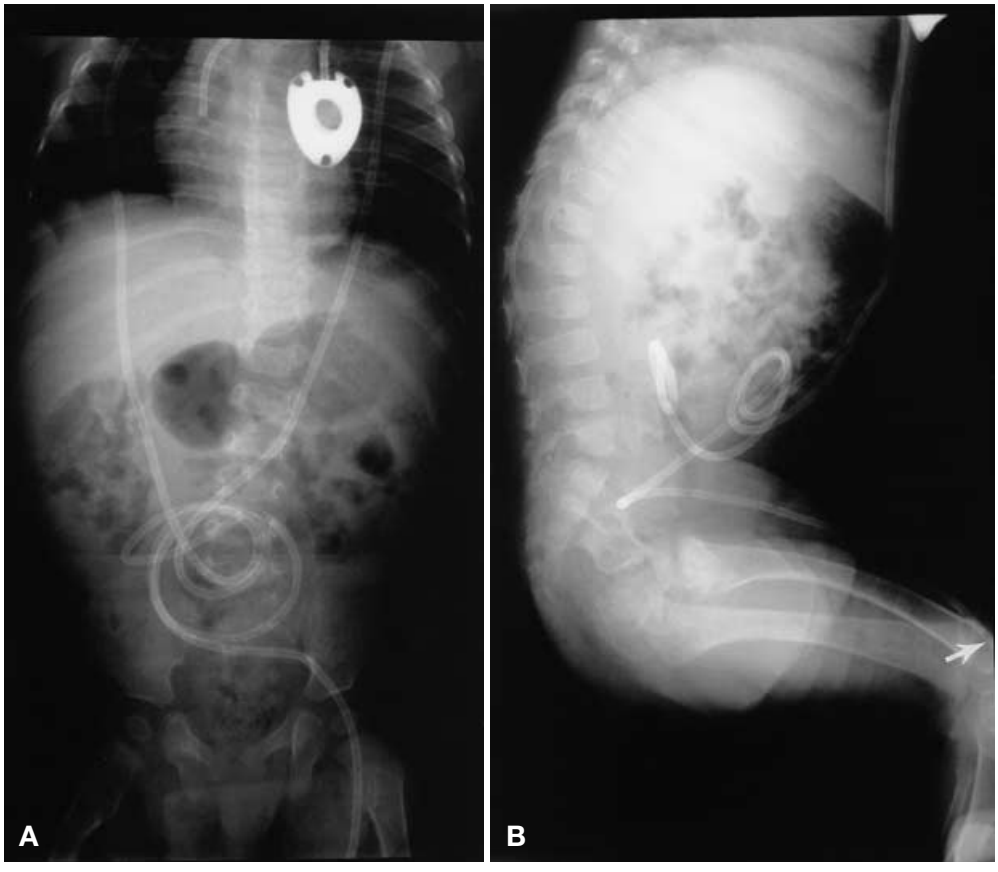

Fig. 1 A, B Frontal and lateral shunt series show migration of the shunt catheter through the left thigh and protrusion of the tip anterior to the left knee

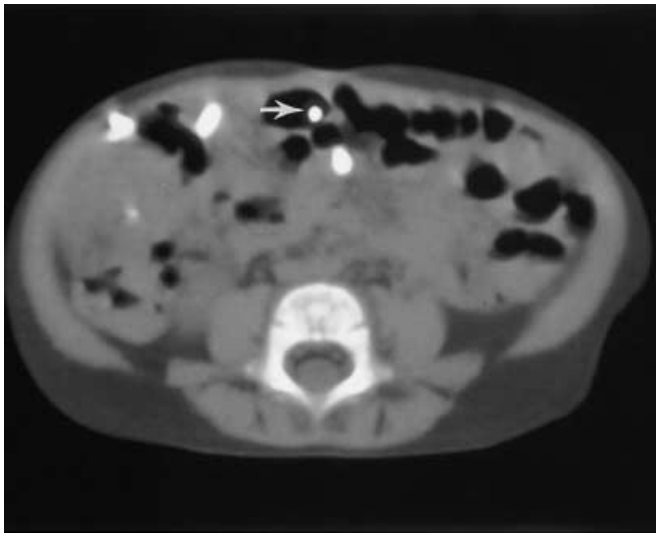

Fig. 2 Axial non-contrast computed tomographic (CT) scan through mid-abdomen is highly suspicious for intraluminal migration of shunt tubing

Fig. 3 Contrast injection after shunt tap shows contrast medium outlining the small bowel and confirms intraluminal location of the shunt tube

testinal tract should be suspected [2]. Shunt removal and antibiotics are effective treatments in this circumstance [4].

There are a few case reports of protrusion of shunt tubes from the neck, abdominal wall, chest wall, umbilicus and vagina in the literature [1, 5]. To the best of our knowledge, this case is the first report of migration of shunt catheter into the lower extremity. In patients with VP shunts who develop sepsis or skin infections, shunt migration should be suspected, and appropriate laboratory and radiographic evaluations are needed.

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