Perforation of the intestine by a Raimondi peritoneal catheter

Case report

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The authors report a case in which the cut end of a Raimondi peritoneal catheter apparently caused intestinal perforation and contamination of the shunt system. The authors advise that if this type of catheter is to be divided the cut should be distal to the end of the sharp wire contained in it, which otherwise will protrude.

KEY WORDS • hydrocephalus • ventriculitis • peritonitis • ventriculoperitoneal shunt

Perforation of the bowel by a ventriculoperitoneal shunt is an unusual, but previously reported, complication in the treatment of hydrocephalus.1-4 This report emphasizes the danger of cutting the shunt through its wired portion.

Case Report

A 6-week-old boy was diagnosed as having noncommunicating hydrocephalus on the basis of pneumoencephalography, and was treated with a Hakim (50-mm transmission pressure) ventriculoperitoneal shunt; the head circumference subsequently decreased from 46.5 to 44.0 cm. At 10 months of age the peritoneal end of the shunt system became obstructed by a loculated cavity around the tip of the peritoneal catheter. At surgery the functioning Hakim valve and ventricular limb were left in place; since the peritoneal end needed replacement and lengthening, the valved tip of a Raimondi peritoneal catheter was cut off to avoid having two valves in the system. The infant was treated with parenteral and intrashunt methicillin, since the fluid in the loculated peritoneal cyst was cloudy and a culture from the fluid grew Staphylococcus epidermidis. The infection cleared without further surgery.

At 15 months of age he was treated at another hospital for status epilepticus, urinary tract infection, and otitis media; medications used included phenobarbital and ampicillin. When transferred to the University Hospital after 3 weeks of treatment he had a skin rash, increasing lethargy, vomiting, anorexia and a temperature of 38°C. The head circumference was 50.5 cm. Aspiration of the shunt revealed a complete ventricular-end obstruction and a normally transmitting Hakim valve and peritoneal catheter. Ventriculostomy was established by a frontal twist drill; the intracranial pressure
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was 180 mm of saline. A gram stain of the fluid removed showed gram negative rods, a glucose of 3 mg%, and a protein of 395 mg%; *Escherichia coli* was grown from these cerebrospinal fluid (CSF) specimens. He was started on intramuscular and intraventricular gentamicin. On the fourth hospital day the entire ventriculoperitoneal shunt was removed. The peritoneal end was grossly contaminated with bowel contents which were bilirubin positive. From these contaminants *Bacteroides*, *Klebsiella*, and *E. coli* were cultured; all organisms were sensitive to gentamicin. Subsequent to this he rapidly became afebrile and showed no signs of intra-abdominal infection. He was switched to chloramphenicol 3 days later and the ventriculostomy was removed. Ventricular tap 6 days after the shunt removal showed normal pressure and sugar, and no growth on CSF culture; the CSF protein was 1100 mg%. Neurologically he returned to his preinfection status. Chloramphenicol was discontinued 1 month after operation.

When seen at the age of 17 months, the patient's occipitofrontal circumference was 49.5 cm; he had no signs of infection, was neurologically unchanged, and appeared to have arrested hydrocephalus.

**Discussion**

Examination of the transected Raimondi catheter removed at the time of surgery revealed that the spring wire was protruding beyond the Silastic tubing (Fig. 1). This phenomenon could be reproduced each time a similar catheter was cut with an ordinary pair of surgical scissors. We believe that this wire contributed to or caused the intestinal perforation which subsequently led to retrograde shunt infection with *E. coli*. If a peritoneal shunt catheter with no valve is needed, the Raimondi catheter should be cut through the valve portion of the tip that is distal to the point where the wire terminates.

**References**


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