

CLINICAL IMAGES

Ventriculoperitoneal shunt failure from spontaneous knotting of the peritoneal catheter

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A 15-month-old girl with hydrocephalus from an intraventricular hemorrhage presented to the emergency department with irritability, lethargy and vomiting. Our neurosurgery team had inserted a ventriculoperitoneal shunt 10 months earlier. Computed tomography of the patient's brain showed enlarged ventricles relative to postoperative imaging from when she had been asymptomatic. The child was brought to the operating room for exploration and revision of her shunt.

At the time of surgery, the ventricular portion of the catheter was disconnected from the valve. Good flow of cerebrospinal fluid was seen, suggesting a properly functioning ventricular catheter. The peritoneal portion of the shunt was disconnected from the valve and tested, showing no flow through the peritoneal end of the catheter. For this reason, the entire shunt was replaced. When the peritoneal end of the shunt was removed from the abdomen, it was found to be doubly knotted (Figure 1), which was the likely cause of the shunt's failure. Because there was no evidence of knotting at the time of first insertion, we hypothesize that the normal peristaltic movements of the bowel caused the catheter to knot. We do not routinely perform imaging for shunts after insertion, so we could not determine exactly when the shunt knotted.¹ It is possible that the shunt was inadvertently loosely knotted at the time of insertion. Following shunt replacement, the child returned to her baseline level of functioning.

Shunt failure is unfortunately quite common; most infants with a shunt require revision of the shunt at some point in the first three years after insertion.² Despite the high failure rate, shunting remains the mainstay of treatment for symptomatic hydrocephalus in children and adults. Most patients with shunt failure present with signs of raised intracranial pressure, such as irritability, headache, nausea, vomiting and lethargy.³ Shunt failures usually occur at the ventricular end of the shunt,⁴ with blockage of the ventricular cath-



Figure 1: Complete ventriculoperitoneal shunt showing a double-knotted peritoneal catheter after removal from a 15-month-old girl who presented with signs and symptoms of shunt failure. Inset: Close up of the double knot.

eter by debris. Knotting of the peritoneal catheter with subsequent shunt failure remains an uncommon complication of shunting.⁵

References

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