

## Urethral catheter knotting: an avoidable complication

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**Abstract:** Urethral catheterisation is a common and safe procedure performed routinely. The small size of the urethra in a child necessitates the use of an infant feeding tube (Size 5 to 8 F) for catheterisation. Knotting within the bladder is a rare complication with significant morbidity often necessitating surgical or endoscopic removal. Insertion of an excessive length of tube contributes to coiling and knotting. We report an instance of knotting of an infant feeding tube in the proximal penile urethra of a 4 year-old male child requiring urethrotomy to remove it. Awareness of the risk and proper technique can reduce this complication.

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### Introduction

Urethral catheterisation is a common procedure performed at all ages for diagnostic or therapeutic reasons. The small size of the urethra in a child necessitates the use of an infant feeding tube of the Size 5 to 8F.<sup>1,2</sup> The complications of catheterisation include infection, urethral injury, bladder stone formation and inability to deflate the balloon. Knotting within the bladder is a rare complication, with significant morbidity. Few reports in literature have mentioned knotting and its management. Some required surgical or endoscopic intervention.<sup>1,3,4</sup> A similar case has also been reported in Malaysia.<sup>5</sup> The mechanism of knotting and coiling is attributed to insertion of an excessive length of the tube in the bladder.<sup>1</sup> Awareness of the risk and proper technique of catheterisation can reduce this complication.<sup>6</sup> We report an instance of knotting within the proximal penile urethra and the surgical technique required to remove it.

### Case report

A 4 year-old male was admitted to the paediatric surgical ward after catheterisation for urinary retention.

The patient had a history of constipation on and off since he was 6 months of age. He was on regular enemas to help his bowel movements and on two occasions required manual evacuation of faeces under general anaesthesia (GA). During the present admission the patient was constipated for 4 days. He had not passed urine for the past 8 hours and complained of severe abdominal pain. On abdominal examination there was suprapubic tenderness and the bladder was distended to the umbilicus. Per rectal (PR) examination revealed impacted stools. He was provisionally diagnosed as a case of Hirschsprung's disease. A 8F infant feeding tube was inserted in the emergency department to relieve the acute retention of urine. Following this, 300 cc of urine were drained initially and 1100 cc over the next 24 hours. He was given enemas, after which the patient had satisfactory bowel movements. Thirty-six hours after catheterisation there was leakage of urine noted from the sides of the infant feeding tube and it was decided to remove it. On withdrawal, resistance was noted by the house officer who informed the paediatric surgeon. A pelvic radiograph was requested after the paediatric surgeon felt the resistance. It confirmed knotting of the infant feeding tube (Fig 1). The patient was taken to the operating room. Under general anaesthesia gentle traction was tried but failed to dislodge the catheter. We did not have a cystoscope of the appropriate size and with the infant feeding tube in place; it was not possible to attempt an endoscopic approach. The knot was palpable at the proximal part of the penile urethra. The urethra was incised longitudinally over the knot and the catheter was removed (Fig 2). An 8F Foleys catheter was passed per urethra and the urethrotomy wound was sutured with 5 0 vicryl. The Foleys catheter was removed two weeks later and patient was able to pass urine without difficulty. Further investigations confirmed he had Hirschsprung's disease.

### Discussion

Urethral catheterisation is a safe procedure that is frequently performed. In the paediatric age group it is sometimes done to obtain urine sample or in the

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investigation for vesicoureteric reflux which mandates a micturating cystourethrogram. The use of infant feeding tubes in infants and young children predisposes to intravesical knotting. Insertion of excess length predisposes to coiling of the tube within the bladder resulting in the formation of an open loop when it comes in contact with the bladder wall which on removal tightens to form a knot.<sup>1,6</sup> Removal of a knotted tube is challenging and may require GA and surgery. Gentle manipulation and steady traction under GA,<sup>2,4,5</sup> urethral dilatation and manual extraction, and the use of guide wire under fluoroscopy to untie the knot have been reported.<sup>2</sup> With modern techniques and pulsed fluoroscopy, radiation concerns are minimal. Cystoscopic removal of the knot through dilatation of the patent urachus has also been reported.<sup>3</sup> When such measures fail surgical intervention like cystostomy or urethrotomy are required.<sup>1,4</sup> In our case the knot was complex and could not be removed by traction. The absence of suitable cystoscopic instruments necessitated proximal penile urethrotomy. Knotting can be avoided through awareness amongst paediatric and general physicians that the length of catheter passed

should be minimal and just adequate to obtain urine.<sup>2,6</sup> Care must be taken to secure the tube appropriately lest it may fall out or advance into the bladder.<sup>4</sup> Resistance during withdrawal should raise suspicion of knotting. Force should not be used.

### Conclusion

Insertion of excess length of catheter predisposes to knotting which can be avoided. Resistance during withdrawal should alert the clinician of the possibility of knotting. Radiological confirmation is advisable.

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Fig 1. Radiograph showing the Knot.



Fig. 2. Intra operative picture of the Knot. Inset (enlarged view of the knot)

