CASE REPORT

Knotted urethral catheter: a twist in the tail

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SUMMARY

Inadvertent knotting of infant feeding tubes used for clean intermittent catheterisation (CIC) is a rare complication in paediatric patients. The small flexible tubes used in infants if advanced too far into the bladder may form a knot as the bladder empties. Surgical intervention is required especially if it is lodged in the urethra. We present a case of a baby boy aged 4 months on CIC with a 6 Fr feeding tube, which required a meatotomy for removal. Education while instituting CIC must emphasise the length of catheter insertion, the chance of knotted catheter and steps to take if it occurs. A dedicated urotherapy nurse would be ideal.

BACKGROUND

Clean intermittent catheterisation (CIC) is considered the standard of care in patients with neurogenic bladders. Straight fine, flexible catheters (infant feeding tubes) are commonly used for this purpose, especially to accommodate the small calibre of the infant urethra. Catheter knots have been estimated to occur in 0.2 per 100 000 catheterisations in children.¹ There have been case reports of children on CIC who have developed this complication.²⁻³ To the best of our knowledge, this complication is known to develop in neonates and infants on CIC and in neonatal intensive care units.⁴⁻⁶ We highlight the importance of using age-appropriate catheters size and depth of insertion to avoid this complication.

CASE PRESENTATION

A baby boy aged 4 months was on CIC following myelomeningocele repair. The mother had inserted a 6 Fr infant feeding tube to 9 cm and emptied the

bladder. On withdrawing the catheter, she found a resistance at 5 cm and immediately reported to the emergency department.

INVESTIGATIONS

An abdominal radiograph showed the catheter coiled in the penile urethra (figure 1).

TREATMENT

Under general anaesthesia, the prepuce was retracted and the tip of the catheter could be felt 4 mm from the tip on the ventral surface. Attempts at guide wire manipulation and traction failed. A 2 mm meatotomy facilitated removal of the catheter. A tight simple knot was noted at the distal end of the catheter (figure 2). A check cystoscopy was done which showed mild mucosal abrasions for 5 mm from the tip. He was catheterised overnight and voided well on catheter removal.

OUTCOME AND FOLLOW-UP

The mother continues to do CIC to facilitate bladder emptying by inserting a 6 Fr infant feeding tube to 6 cm.

DISCUSSION

CIC is effective for continence and renal protection in children with neurogenic bladder. The procedure is well tolerated when instituted early in life giving the caregiver confidence and the child a sense of routine. The main complications with CIC are urinary tract infections and urethral trauma. Catheter retention due to knotting is rare but has been reported in infants and children.²⁻³ This most possibly relates to the length of catheter inserted and the flexibility of the catheter. When an excess length of pliable catheter is inserted, the tip loops through a coil of catheter. As the bladder empties and closes around the catheter, the knot forms and subsequently tightens when attempts are made to remove the catheter.⁷

Carlson and Mowery have tabulated the appropriate catheter size and depth of insertion by age and sex.² They advise the use of 5–8 Fr tubes to be inserted to 6 cm in infant boys. In our patient, a 6 Fr tube was inserted to 9 cm. Although the size of the tube was appropriate, a long length was inserted causing the knotting. Sustained traction with full

Figure 1 Plain radiograph showing the knotted catheter (arrow).

Figure 2 Knot in the catheter.

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bladder with or without anaesthesia and/or urethral dilatation, endoscopic retrieval, percutaneous suprapubic retrieval, guide wire manipulation used for loosening the knot and open cystostomy are options for knotted intraluminal catheters.³ Urethral

Learning points

Clean intermittent catheterisation (CIC) is a safe and effective in children with neurogenic bladder.

Education while instituting CIC must emphasise the length of catheter insertion, the chance of knotted catheter and steps to take if it occurs. A dedicated urotherapy nurse would be ideal. Awareness of this potential complication and high index of suspicion will help prevention and early detection. Although knotting of urethral catheters is rare, removal represents significant morbidity, such as general anaesthesia, radiation exposure during fluoroscopy, transient haematuria, stricture formation, jeopardy of reconstruction in urethroplasty stents.

The maximum use of non-invasive methods for the removal of the knotted catheter is essential.

Understanding the urethral anatomy in term and preterm, male and female infants and appropriate selection of catheter size, length, flexibility and proper technique of insertion and securing in keeping with peculiar anatomy of neonates and infants in this age group help prevent this complication.

Intravesical and intraurethral knotting of catheters have been reported more commonly in males than females, and more commonly in neonates and children than adults for indwelling and one-off insertion and removal of catheters alike.

retention usually requires surgical removal if guide wire manipulation and traction have not worked. In our case, we were able to extract the catheter with a 2 mm meatotomy, thus avoiding extensive urethral manipulation. A check cystoscopy was done in addition to document the status of the bladder considering the neurological status of the child and to confirm the extent of injury by the knot to the rest of the urethra.

Contributors SJ: manuscript preparation, review and administrator. DDD : photograph editing.

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