

Spontaneous Intravesical Knotting of a Feeding Tube in a Late Preterm Neonate: A case report

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Received: 28 June 2020

Accepted: 7 September 2020

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DOI 10.5001/omj.2022.05

Abstract

Feeding tubes (FT) have been commonly used as urinary catheters in neonates and children. Though commonly a safe procedure, it may cause serious problems if the catheter spontaneously knots inside the bladder. We report a case of a spontaneous knotting of an intravesical Fr 6 feeding tube in a late preterm female baby following urethral catheterization to collect a urine sample. The knotted catheter was removed via suprapubic cystotomy. The infant had a good post-operative recovery.

Keywords: Feeding tube; Urinary catheterization; Catheterization complication.

Introduction

Urine catheterization using feeding tubes is a common procedure in neonatal intensive care unit (NICU) daily practice.¹ Urine catheterization is often required in cases of fluid retention to collect urine and occasionally for radiological studies.² Feeding tubes sizes Fr 5, Fr 6 or Fr 8 are commonly used due to their availability and ease of use.³ Although the procedure is safe, some complications were reported, including trauma during insertion, hematuria and tube knotting within the urinary bladder.³ However, Knotting of the tube within the bladder is not common;

consequently, its removal may be a major challenge. In this case, we report a spontaneous knotting of the feeding tube within the bladder in a late preterm female infant.

Case Report

Verbal consent has been obtained from the parents to write this case report. A 44-year-old multigravida (9), multipara (6) woman delivered a late preterm female infant at 34 weeks of gestation by cesarean section under general anesthesia due to the baby being in a transverse lie. Antenatal steroids were administered four hours prior to delivery. Apgar scores were 7 and 9 at 1 and 5 minutes, respectively. The baby developed respiratory distress and was admitted to the NICU. The mother had gestational diabetes and her previous pregnancy was positive for Group B Streptococcus infection. In the NICU, the infant was put on nasal continuous positive airway pressure (nCPAP) and was started on intravenous antibiotics ampicillin and gentamycin. She was noted to have asymmetrical intra-uterine growth restriction (IUGR) with a birth weight of 1.68 kg (3–10th percentile), head circumference of 31 cm (10–50th percentile) and length of 45 cm (50th percentile). The respiratory support was weaned off after 7 days. The patient remained on nasogastric feeding for 4 weeks with difficulty to establish oral feeding. Therefore, further investigations were performed, including head ultrasound, tandem mass spectrometry, serum ammonia, and urine for organic acid. The infant was catheterized with an Fr 6 infant feeding tube to collect urine for organic acid analysis. 24 hrs later while removing the catheter, the nurse and on-call physician noticed significant resistance. Examination of the child shown that the catheter was deeply introduced into the bladder and become lodged at the catheter level of 11 cm. A supine x-ray of the abdomen showed a spontaneous true knot in the feeding tube in the bladder (Figure 1). After consulting with the pediatric surgeon, attempts by the surgical team to pull the feeding tube were unsuccessful. The infant went for surgical intervention under general anesthesia. Following failed attempts of a guide-wire endoscopic retrieval, suprapubic cystotomy was successfully performed. The feeding tube was found to be knotted in the urinary bladder. The knot was about 4 cm from the tip of the catheter (Figure 2). Following removal of the feeding tube, the urethra and the bladder mucosa were evaluated, and no further complications were detected. A Foley's catheter was inserted into the bladder for urinary drainage for 5 days, during which the infant was administered antibiotics. The infant made a good post-operative recovery and was discharged after 7 days.

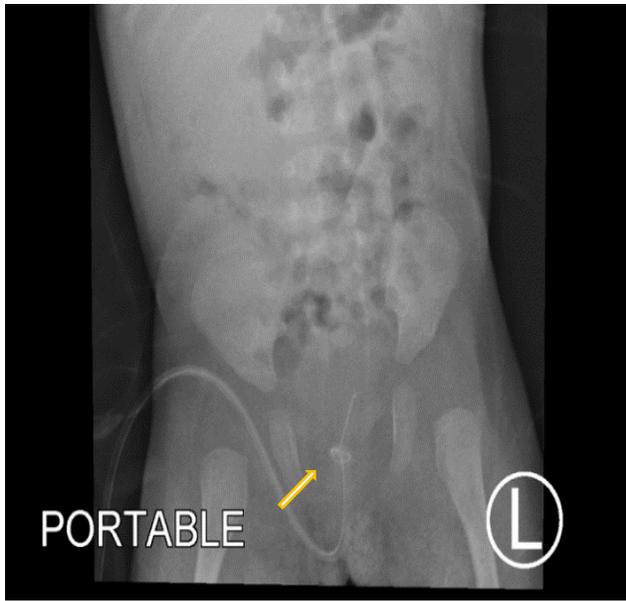


Figure 1: An X-ray, showing the knotted catheter in the bladder of a late preterm female infant (Arrow).



Figure 2: Post-operative photo showing the knotted catheter (Arrow).

Discussion

Although urinary bladder catheterization is a common and safe procedure in neonatal practice, it is not free of complications.¹ Using feeding tubes are commoner than using Foley's catheters due to unavailability of an adequate size, mainly in preterm babies. It has been reported that knotting of catheters is more frequent in males and more common in neonates and children, with an incidence of 0.2 per 100,000.^{3,4} Recognizing the complications of urinary catheterization in newborn babies is important. Among these complications, trauma during insertion, hematuria and tube knotting within the urinary bladder. Risk factors related to catheter knotting are mainly due to insertion length, catheter diameter, material physical characteristics, catheterization technique and anatomic factors of the patient.⁵

Attention should be taken when inserting the catheter. Some strategies for catheter insertion have been reported to minimize the complications including,⁶ using short catheters with stander length, intermittent catheterization and foley catheters should be placed into the hub before bulloon inflation to avoid urethral trauma. The urethra in males is 5 cm at birth, 8 cm at age 3 and reaches 17 cm in adults; though in females it ranges from 2.2 cm at birth to 2.5–3.8 cm in adults.⁷ The recommended standard length of catheter insertion should not exceed 5–6 cm in term newborns and 2.5–5 cm in premature babies.⁶ In this case scenario excessive insertion of the catheter (11cm) was the main reason for knotting fo the tube.The most common reasons for knotting of the tube in the bladder were reported to be excessive lengthening of the catheter (>10cm) and using an improper technique during inserting and securing the feeding tube.^{8,9} Other risk factors include over distened urinary baldder, bladder spasm , the use of small size catheters (Fr10)^{4,10} and the failure to secure the cathter to prevent further progression into the bladder^{3, 4,10}..

There are conservative management strategies that should be attempted before surgical intervention, which including untangling the knot by means of an endoscopic retrieval guidewire, and constant traction under anesthesia.^{9,11,12} The complications following constant traction may result in urethral injury. However, the technique is inadequate for the cases of bulky knots or true knots, such as in this case.

Using the guidewire manipulation technique has been reported to be sometimes useful in cases when the knot is loose. However, in the current case, this technique was ineffective. Instead, suprapubic cystotomy was used as an alternative to remove the knotted catheter from the bladder. In fact, suprapubic cystotomy has been reported to be a cost effective method and a practical

approach in such cases.^{4,8} However, possible post-operative complications, such as bladder dysfunction and urethral stricture, were reported in literatures and need long-term follow-up.¹³

Conclusions

Insertion of a feeding tube for urinary catheterization in neonates require caution, precision and proper training. Although complications are rare, they could be hazardous and should always be suspected. It is essential to carefully select the catheter insertion length according to the age and sex of the infant to avoid complications. Long-term follow-up is recommended in some cases to monitor any potential post-operative complications.

Acknowledgements

Funding: Nil.

Conflict of interest: None declared.

Ethical approval: Not required.

Verbal consent has been taken

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