CASE REPORT

Intravesical knotting of guide wire during insertion of Foley catheter

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SUMMARY

Guide wires are frequently used in urology for upper and lower urinary tract procedures. Spontaneous knotting of guide wire is a rare complication and only a few cases have been reported in the literature until now. We report a case of spontaneous intravesical knotting of guide wire during per urethral catheterisation that led to retained Foley catheter. The balloon was punctured percutaneously under ultrasound guidance and the whole assembly was removed. Guide wire knot was found near the balloon. The cystoscopy showed normal urethra and bladder. The patient was recatheterised and is doing well.

BACKGROUND

Guide wires have an important role in various urology procedures such as ureteric catheterisation during percutaneous nephrolithotomy (PCNL) and ureterorenoscopy.¹ Guide wires are also used during difficult per urethral catheterisation.² A guide wire is composed of super elastic nitinol alloy with external coating of polytetrafluoroethylene as hydrophilic polymer. This design along with a flexible tip of the wire provides the properties necessary to negotiate the obstruction. The guide wires currently used have many important properties such as pushability, kink resistance, torqueability and bendability.³ We report a unique case of intravesical knotting of guide wire around Foley catheter balloon during per urethral catheterisation in a male child and the technique to manage it with brief relevant review of the literature. To the best of our knowledge, this is the first case report about knotting of guide wire during per urethral catheterisation.

CASE PRESENTATION

A 4-year-old male child presented to us with obstructive lower urinary tract symptoms since birth. Physical examination was unremarkable. On evaluation, the renal function was deranged (serum creatinine 1.9 mg/dL) and urine culture was sterile. Bladder and kidney ultrasound was suggestive of bilateral mild hydronephrosis. Micturating cystourethrogram (MCU) showed dilated posterior urethra with focal narrowing of bulbar urethra. Patient was taken for diagnostic cystourethroscopy to rule out the possibility of posterior urethral valve. Cystourethroscopy revealed high bladder neck and there was no evidence of stricture, valve or obstructive changes in the bladder. Intraoperatively, Foley catheterisation failed due to high bladder neck. A floppy tip guide wire was

then used as a guide to place the Foley catheter per urethra. Following catheterisation and inflating the balloon (with 3 cc distilled water) the guide wire was gently pulled to take it out. The guide wire could not be pulled out completely and got stuck. Further attempts to deflate the balloon of catheter such as aspiration through the side channel and by cutting the balloon channel were performed (figure 1), but were unsuccessful. The catheter balloon was subsequently punctured percutaneously under ultrasound guidance and the entire assembly was removed (catheter along with guide wire). On examination, we found that the guide wire had made a knot around the balloon of Foley catheter which prevented the deflation of balloon (figure 1, inset). Repeat urethroscopy showed no injury to the urethra by taking out the knotted guide wire along with the Foley catheter (with deflated balloon). The patient was recatheterised over a new guide wire.

INVESTIGATIONS

Renal function tests were deranged (serum creatinine 1.9 mg/dL). Urine culture was sterile. Ultrasound of the kidney and bladder revealed bilateral mild hydronephrosis. MCU was suggestive of dilated posterior urethra with focal narrowing distally.

TREATMENT

Subsequently, the Foley balloon was punctured and deflated percutaneously under ultrasound guidance and the entire assembly including knotted guide wire and Foley catheter were gently removed. Repeat urethroscopy was performed which showed normal urethra and bladder. The patient was recatheterised and put on antibiotics, and is doing well.

DISCUSSION

Guide wires were initially created for vascular applications but with time they became a mainstay in almost all endourological procedures.⁴⁻⁶ They differ in their physical properties depending on the material they are made of. Guide wires provide access to a particular part of the urinary tract and they serve as a guide over which catheters and stents can be passed. The stiffer shaft guide wires are reserved for coaxial passage of ureteric catheters, stents and sheaths.⁷

Very stiff guide wires provide good pushability and are less prone to bending.³ Variability in these properties of different guide wires cause bending, kinking, buckling and knotting. Knotting of the guide wires has been reported in the literature describing PCNL,⁸ subclavian vein cannulation and, occasionally, femoral vein cannulation.⁹

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Figure 1 Image showing removed Foley catheter and guide wire. The guide wire knot was found near the Foley balloon (depicted by red arrow) and the balloon channel was cut (depicted by blue arrow). Inlet showing the catheter tip with guide wire knot around it.

Knotting of the urinary catheters has also been described.^{10 11} Previous studies suggest that two factors could be responsible for knotting of the guide wires:

1. Excessive length of the guide wire inserted.^{10 11}
2. The force gets transferred on to the coaxial guide wire during the insertion of catheter.⁹

The possible ways to avoid such complications would be:

1. Insertion of appropriate length of the guide wire inside the bladder.
2. The use of stiffer guide wires instead of flexible guide wires to reduce kinking, bending and buckling of the wires.
3. Gentle movements of the catheter.

In our patient, it seems that the length of guide wire inserted inside the bladder was more which led to spontaneous knotting of guide wire and retention of the Foley catheter.

Learning points

- Spontaneous knotting of guide wire is a rare entity.
- An appropriate length of guide wire should be inserted for catheterisation over it.
- Ultrasound-guided percutaneous puncture of catheter balloon is a simple, safe and effective method to remove the retained Foley catheter.

Competing interests None.

Patient consent Obtained.

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