CASE REPORT

Doubling back of Foley catheter in urethra in a tetraplegic patient: delayed recognition

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SUMMARY

A 51-year-old man with C-6 tetraplegia had ureteric calculi, developed ureteric stricture and required bilateral nephrostomy. Following change of the left nephrostomy, bloody urine was drained per nephrostomy. The urethral catheter was also changed; bloody drainage per urethral catheter was attributed to blood seeping from the left kidney. The length of the Foley catheter outside the penis appeared correct; therefore, it was presumed that the catheter had been introduced into the bladder. The following day, bladder washout could not be performed due to blockage of the catheter. CT of the kidneys and bladder revealed doubling back of the Foley catheter in the bulbar urethra with the balloon inflated in the urethra. The urethral catheter was removed and another catheter inserted satisfactorily by a senior doctor. From this experience we learned that a 'Long Catheter Sign' will not be positive if the catheter doubles back in the urethra. When in doubt, imaging studies should be performed immediately to check the position of the Foley catheter.

BACKGROUND

Complications of male urethral catheterisation are not uncommon in hospitals. Of 864 urological consultations, 51 (6%) were related to complications arising from male urethral catheterisation during a 1-year period from July 2006 to June 2007 in a tertiary-care teaching hospital.¹ The most common complication was urethral trauma (35/51, 67%). The balloon was accidentally inflated in the urethra in six patients (12%). We report a very unusual case of doubling back of a Foley catheter in the urethra in a spinal cord injury patient, which was captured on CT. This case illustrates the value of carrying out imaging studies of the urinary tract when a catheter does not drain urine soon after its insertion in a spinal cord injury patient. Imaging studies of the lower urinary tract help to reach an accurate diagnosis and take appropriate steps to prevent such complications in order to maintain high standards of patient safety.

CASE PRESENTATION

A 51-year-old man with C-6 tetraplegia had ureteric calculi, developed ureteric stricture and required bilateral nephrostomy. He also had a urethral catheter draining the urinary bladder. Nephrostomy catheters were being changed every 8–10 weeks. The left nephrostomy had got partially blocked so the patient came to the hospital to replace it. The patient was not taking anticoagulants or aspirin. The nephrostomy was changed under fluoroscopic guidance. Subsequently, it began to drain bloody urine.

Following change of the nephrostomy, the patient requested change of the urethral catheter as well. A 16 French Bardex Foley catheter was inserted per urethra. The health professional did not notice any difficulty in introducing the catheter per urethra and inflated the Foley balloon. Fresh blood was drained through the catheter. The length of Foley catheter outside the penis appeared correct; therefore, it was presumed that the catheter had been introduced into the bladder. Bloody drainage per urethral catheter was attributed to bloody urine seeping from the left kidney. The following day, bladder washout could not be performed due to blockage of the catheter. CT of the kidneys and bladder was taken to assess the location of the left nephrostomy tube and urethral catheter.

INVESTIGATIONS

CT of the kidneys and urinary bladder was performed. The radiographer was requested to include the urethra in the area to be scanned. CT revealed the tip of the left nephrostomy in the left renal pelvis and the right in the upper calyx. No hydronephrosis was seen. Three calculi were seen in the right lower calyx measuring 6, 8 and 12 mm in diameter; a 3 mm calculus was seen in the mid-left calyx and two measuring 12 and 18 mm in the lower left calyx. CT also revealed the balloon of the Foley catheter located in the perineum within the urethra (figures 1 and 2). Doubling back of the

Figure 1 Coronal section of CT of the kidneys and urinary bladder (CT KUB) shows the balloon of the Foley catheter in the urethra well below the symphysis pubis; no catheter is seen in the bladder.

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Figure 2 Sagittal section of CT KUB: the balloon of the Foley catheter is seen in the perineum within the urethra.

Foley catheter could be clearly seen in the sagittal image (figure 3). The report did not mention incorrect positioning of the Foley catheter. The treating doctor discussed the images with a senior radiologist, who confirmed that the balloon of the Foley catheter was not located in the urinary bladder but was lying in the urethra and the catheter had doubled back on itself

Figure 3 Sagittal section of CT KUB: Doubling back of the Foley catheter within the urethra is demonstrated. The balloon of the Foley catheter is located in the urethra and bends back on itself in the urethra.

in the urethra. Thus CT confirmed correct placement of the left nephrostomy and incorrect positioning of the Foley catheter.

TREATMENT

After detecting the misplaced balloon of the Foley catheter in the urethra by CT images, the urethral catheter was removed. Following the removal, there was significant bleeding per urethra. A size 14 French Foley catheter was inserted cautiously by a senior doctor. The catheter was inserted to its full length and held in position; a catheter-tip syringe containing 50 mL of sterile saline was attached to it; saline could be injected easily without resistance; no saline was coming out of urethral meatus; the saline could be aspirated back freely. Then the balloon of Foley catheter was inflated. The patient received amikacin 1 g a day for 48 h.

OUTCOME AND FOLLOW-UP

Bleeding per urethra gradually subsided over a period of 4 days. The patient stayed in bed during this period. The following catheter change was performed after a month by a senior doctor and there was no bleeding. The patient was told that in future he should warn health professionals who change his urethral catheter that the catheter might double back in the urethra and extra caution should be exercised. We apologised to the patient for the mishap and reassured him that we had learnt a lesson from this event and would take suitable measures to prevent such complications in future. The patient accepted our apology graciously and no formal complaint was lodged.

DISCUSSION

If the balloon of a Foley catheter is inflated in the urethra, an excessive length of catheter will remain outside the penis. This sign is termed as a 'long catheter sign'. A long catheter sign will also be positive when a Foley catheter has been forcibly pulled out or slips out of the urinary bladder spontaneously following rupture of the balloon by a spiky vesical calculus or the balloon being deflated due to a defective valve.² A positive long catheter sign indicates that the Foley catheter has been placed incorrectly and needs repositioning urgently. This case illustrates that absence of a 'long catheter sign' does not always indicate that the catheter has been placed correctly in the urinary bladder. The tip of the Foley catheter can double back in the urethra giving a deceptive appearance of correct placement, as happened in this case.

Many chronic spinal cord injury patients have complex problems, for example, spasticity of pelvic floor muscles and absence of normal sensation in the urethra, and false passages in the urethra due to previous catheterisations. Therefore, spinal cord injury patients should be preferably treated by senior, experienced health professionals.³

This report describes a mishap that occurred in daily clinical practice. In order to prevent such mishaps, health professionals should be educated regarding possible causes and early detection of doubling back of urethral catheters (see 'Learning points' below). In addition, doubling back of a catheter is more likely to occur with a smaller size catheter (such as a 12 or 14 CH) or with catheters of a certain brand, because catheter flexibility and the material used to make them could be a cause for the misplacement. Some catheters have a radio-opaque marker that would facilitate early detection of the misplacement, as the exact location of the tip of the catheter can be seen on plain X-ray examination or fluoroscopy.

Learning points

- ▶ Absence of a 'long catheter sign' does not always indicate that the Foley catheter is placed correctly.
- ▶ While inflating the balloon of the Foley catheter, if undue resistance is experienced, it indicates that the balloon does not lie within the urinary bladder; the balloon should not be inflated and the position of the catheter should be checked.
- ▶ After inserting the catheter to its full length, urine should drain freely. When the bladder is empty, 30–50 mL of sterile saline should be injected slowly with a catheter-tip syringe, and it should be possible to aspirate the saline freely. If the catheter has doubled back in the urethra, or the tip of the catheter has entered a patulous ureteric orifice, there will be resistance to injecting the saline and aspirating it back.
- ▶ Bleeding following urethral catheterisation indicates urethral trauma and health professional should be alerted to possible complications, for example, a misplaced catheter or urethral false passage.
- ▶ Imaging studies should be carried out without delay to check the position of the tip of the catheter and location of the Foley balloon. The radiologist should look for the position of the Foley catheter and its balloon while reporting CT of the kidneys and urinary bladder. If the balloon of the Foley catheter is not located in the bladder, the radiologist should immediately alert the treating doctor.

Contributors VS managed the patient; developed the concept on reflective learning and wrote the draft. BS was the consultant in charge. GS was the consultant urologist. PH reviewed the medical images.

Competing interests None.

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