CASE REPORT

Preventing intra-urethral migration of a guidewire during antegrade placement of a JJ stent: a technical modification

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SUMMARY

A JJ stent is usually inserted in antegrade fashion after percutaneous renal surgery. We describe a new technical modification for antegrade stent insertion that prevents intraoperative intra-urethral migration of the guidewire and saves operative time and cost.

BACKGROUND

A percutaneous approach is preferred to manage renal stones (percutaneous nephrolithotomy), large upper ureteric stones (antegrade ureteroscopic removal of stone) and ureteropelvic junction obstruction (antegrade endopyelotomy). Insertion of a stent is a vital addition to these procedures. With the invention of the tubeless percutaneous nephrolithotomy (PCNL) technique, JJ stenting has become an innate procedural step.¹ Although stent insertion can be performed by using either an antegrade or a retrograde approach, the antegrade approach is preferred due to ease of insertion with minimal urethral manipulation. The various techniques of antegrade JJ stenting after PCNL described in the literature include a 'reverse-zebra' technique,² passing the JJ stent over a 'through-and-through' guidewire technique³ and a 'pull and push' technique.⁴ However, intra-urethral migration of the guidewire during antegrade JJ stent placement with these procedures is quite common and leads to an increase in operative time and radiation exposure when placing its distal end back into the bladder. We present a simple technical modification by which intra-urethral migration of the guidewire during antegrade JJ stent placement can be prevented.

CASE PRESENTATION

A 46-year-old woman presented with right flank pain for the past 6 months. On evaluation, ultrasound abdomen and non-contrast CT revealed 2.7 cm right renal calculus with bilateral normal renal parenchymal thickness. The patient's renal function tests were within normal limits.

TREATMENT

The patient underwent right percutaneous nephrolithotomy under regional anaesthesia in a prone position. A 6 Fr ureteric catheter was placed cystoscopically in the lithotomy position, before placing the patient in the prone position. The stiff end of a Terumo guidewire (hydrogel coated) was passed through the ureteric catheter retrogradely and

retrieved through the Amplatz sheath. Under fluoroscopic guidance, the guidewire was pulled antegradely until the floppy end of the guidewire was positioned at the level of the pubic symphysis, and the ureteric catheter was withdrawn through the urethra. Repeated attempts at making the floppy end of the guidewire coil inside the bladder failed, as at each attempt the guidewire would migrate into the urethra (figure 1). The bladder was filled with 150 cc saline and the catheter clamped. The catheter balloon was tucked at the bladder neck by pulling the catheter outwards. The guidewire was now again advanced antegradely. This time, its floppy end successfully coiled inside the bladder. The JJ stent was then placed over it (figure 2).

DISCUSSION

JJ stent insertion is a usual adjunct procedure performed after completion of various percutaneous renal procedures. It eliminates the requirement of nephrostomy to a large extent, hence reducing postoperative pain and duration of hospitalisation.¹ Stent insertion can be carried out using either an antegrade or retrograde approach. The antegrade approach is preferred as it does not require patient repositioning. Many techniques have been described to place the stent antegradely.

In the reverse-zebra technique,² the stiff end of the guidewire is passed through the ureteric catheter retrogradely, and is retrieved through the Amplatz sheath. The guidewire is pulled antegradely until its floppy end is positioned at the level of ischial spines, and the ureteric catheter is withdrawn through the urethra. The guidewire is now

Figure 1 (A–B) Repeated attempts at making the floppy end of the guidewire coil inside the bladder failed, and the guidewire migrated into the urethra instead. The catheter balloon has been inflated with contrast only for delineation of the location of the balloon.

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Figure 2 The Foley catheter was pulled out gently to tuck its balloon over the bladder neck (A). The guidewire was now again advanced antegradely. This time, its floppy end successfully coiled inside the bladder (B). The JJ stent was then placed over it (C).

advanced to coil its floppy end in the bladder followed by JJ stent placement over it.

The 'through-and-through' technique³ involves passing the stiff end of the guidewire through the ureteric catheter retrogradely, and retrieving it through the Amplatz sheath. The ureteric catheter is removed through the urethra and the JJ stent is then inserted over the guidewire antegradely up to the level just above the pubic symphysis. Under fluoroscopy, the guidewire is first pulled gradually until its lower floppy end is seen just above the symphysis and then advanced to coil the wire inside the bladder. Over this wire, the JJ stent is advanced so that its lower end gets coiled in the bladder.

In the 'pull and push' technique,⁴ the ureteric catheter is gradually withdrawn antegradely until its lower end lies just above the pubic symphysis. A guidewire is then passed antegradely through the ureteric catheter until its floppy end gets coiled in the bladder. Under fluoroscopic guidance, the ureteric catheter is withdrawn and JJ stent placed antegradely over the guidewire.

Using these techniques, when the floppy end of a straight tip guidewire is advanced antegradely to coil inside the bladder, it sometimes migrates into the urethra. The attempts to reposition it often result in failure. This increases the fluoroscopic exposure and the overall operating time. In females, the guidewire may extrude into external genitalia leading to contamination and necessitating guidewire replacement.

With our modified technique, that is, first ensuring a state of partial bladder fullness to have room for the wire to coil easily and then tucking the Foley catheter balloon to the bladder neck to occlude the internal urethral meatus, the guidewire does not enter the urethra and it coils well inside the bladder. These modifications help in reducing the radiation exposure and associated operative time in replacing the end of the guidewire back into the bladder.

We have used this technique in 17 of 150 PCNL cases in the last 2 years and have encountered no difficulty in placing the

stent antegradely. We did not face any intra-urethral migration problem in even a single case. Our modifications are straightforward, and simple to learn and practice as an adjunctive procedure in percutaneous renal surgeries. In females, it avoids the guidewire from getting spoiled and thus proves to be cost-effective.

Learning points

- Clamping of the Foley catheter after retrograde bladder filling and tucking the Foley catheter balloon to the bladder neck during JJ stent placement prevents intra-urethral migration of antegradely advanced guidewire.
- It also reduces the radiation exposure and associated operative time in replacing the distal end of the JJ stent back into the bladder.

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Competing interests None declared.

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REFERENCES

- 1 Telha KA, Alba'adani TH, Alkohlany KM, *et al.* Tubeless percutaneous nephrolithotomy with double- J stent compared with external ureteral catheter to decrease postoperative complications. *Saudi Med J* 2010;31:1137–40.
- 2 Maheshwari PN, Andankar MG, Khera R, *et al.* Antegrade JJ-stenting after percutaneous renal procedures: the reverse zebra technique. *Indian J Urol* 2001;17:191–2.
- 3 Lumerman JH, Smith AD. Technique of endopyelotomy. In: Yachia D, ed. *Stenting the urinary system*. Oxford: Isis Medical Media, 1998:181–9.
- 4 Ratkal JM, Sharma E. Antegrade JJ stenting after percutaneous renal procedures: the 'pull and push' technique. *Arab J Urol* 2015;13:91–3.

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