BRIEF REPORT
General Urology

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A Novel Technique for Stent Placement During Ureteroureterostomy

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Abstract

Ureteroureterostomy is a surgical procedure involving the end-to-end anastomosis of transected ureters, often supplemented with ureteral stenting to promote healing and prevent strictures. Traditional stent placement methods, such as cystoscopy-guided or fluoroscopic techniques, can be resource-intensive and time-consuming. In this study, we introduce a novel, resource-efficient technique for intraoperative ureteral stent placement that eliminates the need for patient repositioning, cystoscopy, or additional guidance modalities. The method involves a modified Double J stent with a longitudinal incision at the predicted site of anastomosis, facilitating guidewire insertion and stent placement over the wire without repositioning or specialized equipment. We demonstrate the applicability of this technique across various clinical scenarios, including ureteral strictures, traumatic injuries, and oncologic resections, with no observed instances of stent malposition or retention. This approach offers a simplified, cost-effective alternative to existing methods, potentially reducing operative time and resource utilization during ureteroureterostomy procedures.

Keywords: Endourology, general urology, reconstructive urology

Introduction

Ureteroureterostomy is a surgical procedure in which two parts of a transected ureter are anastomosed, in an end-to-end fashion. The procedure can be done by laparotomy or laparoscopy (1).

A ureteral stent is commonly employed in this procedure with the intent to assist with healing of the anastomosis and urinary drainage. Ureteral stenting may prevent recurrent strictures as shown in experimental animal studies (2).

There are several methods for intraoperative stenting, including using visual guidance, cystoscopy guidance, fluoroscopic guidance, and so on (1,3,4). These techniques may be cumbersome and inefficient in terms of resource use.

In the present study, we propose a new method for stent placement during ureteroureterostomy that does not require repositioning or cystoscopy and may decrease surgical time.

Surgical Technique

Depending on the level of injury (and thus the expected location of ureteroureterostomy), an incision was made to access both ureters, typically via a lower abdominal approach. The ureters were carefully dissected free from surrounding tissues, and any diseased segment of the affected ureter was excised as needed. The ends of both ureters were spatulated longitudinally at 12 and 6 o'clock (approximately 1-2 cm) to create wide openings. The ureters were then approximated and brought close together without tension.

The ureters were sutured end-to-end using interrupted absorbable sutures (4-0 Vicryl), with careful placement through the mucosa and submucosa of both ends to ensure a watertight, tension-free anastomosis (5). A multi-length, 26 cm, 6 Fr Boston Scientific ureteral stent (Boston Scientific, Marlborough, MA, USA) is prepared for insertion. The stent is modified by a 1-2 cm through-and-through or one-sided longitudinal incision using a scalpel. The incision corresponds to the predicted level of

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anastomosis (Figure 1). For example, if the level of anastomosis is predicted to be 3 cm from the ureteropelvic junction, the incision in the stent is centered at about 3 cm from the proximal mark on the stent. The stent is then introduced into the abdomen. We locate the distal end of the ureter and pass the stent to reach the bladder. Then, we insert the guidewire through the incision in the stent proximally until it reaches the renal pelvis before the stent is inserted into the ureter over it. The wire is then removed through the incision in the stent. Finally, we perform ureter reconstruction with interrupted sutures without tension over the stent. All steps of the technique are depicted in Figure 2.

We use this technique in several scenarios, such as ureteral stricture repair, iatrogenic transection of the ureter, segmental ureteroureterostomy in patients with transitional cell carcinoma, ureterolithotomy, and trauma surgery, such as in the cases of gunshot wounds during minimally invasive or open surgery. In our experience, we did not note occurrences of retained stent fragments or malpositions of the stents (Table 1).

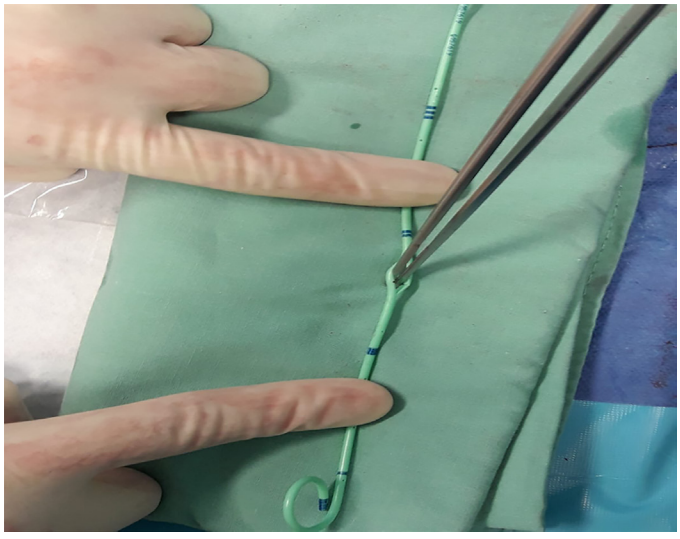

Figure 1. An incision is made in the stent

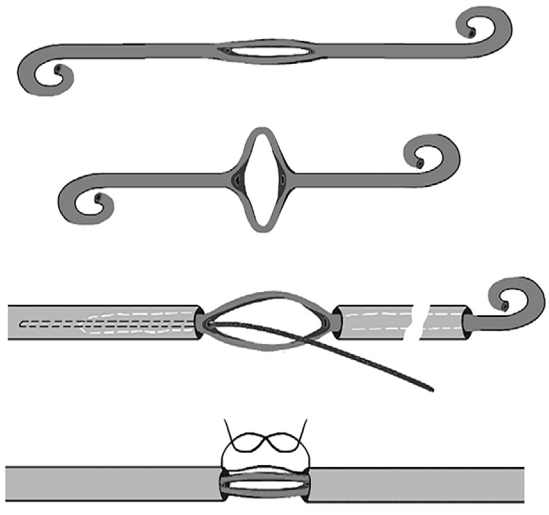

Figure 2. Steps depiction

Discussion

During laparoscopy and open surgery alike, stent insertion may be technically difficult and time-consuming. The most common method of stent insertion during laparoscopic procedures is through retrograde cystoscopy, but this method requires repositioning the patient in a lithotomy position, the use of additional sterile equipment, and is time-consuming (1); others described an antegrade fashion through a nephrostomy. During open surgery, a stent can be placed at the end of the operation, mostly via retrograde cystoscopy.

In 2023 Limbachiya et al. (6) described positioning the patient in low Trendelenburg before initiating the laparoscopic ureteroureterostomy so that cystoscopy and ureteral stent could be performed without the need to reposition the patient. A guide wire is inserted into the ureter and advanced under vision through the distal ureteral end into the proximal ureteral end, following the stent placement process in the same manner.

Stent placement in both directions through the open ureter has been reported on one occasion. In 2008, Brichart et al. (7) described a way to insert the stent with only laparoscopy. First, they inserted a guidewire into the bladder via the distal ureteral end and passed a stent over it until it reached the bladder. The guidewire was then removed from the stent, and a second guidewire was placed in the stent through one of its lateral side holes. This allowed the stent to be placed in the renal pelvis. The guide wire was then removed, and the ureter was sutured over

Table 1. Patient's characteristics	
Variable	**n (%)**
No. of patients	**12**
Mean age, years	**56**
Gender	
Male	3
Female	9
Side	
Right	**6**
Left	**6**
Location of the injury	
Lumbar	**8**
Pelvic	**4**
Surgical approach	
Open	**8**
Lap	**4**
Surgical success	**100%**
Malposition rate of the stent	**0**

the stent with interrupted sutures. The problem this method presents, is that the second guidewire needs to be very small, so as to pass through the side holes.

Conclusion

In the present report, we propose a new technique for ureteral stent placement during ureteroureterostomy that does not require patient repositioning or use of cystoscopy or other guidance methods, and is resource efficient.

Ethics

Informed Consent: Informed consent was obtained from the patient.

Footnotes

Authorship Contributions

Surgical and Medical Practices: A.T., Concept: M.T., A.T., Design: M.T., A.T., Data Collection or Processing: A.M., Analysis or Interpretation: T.T., Literature Search: T.T., Writing: T.T.

Conflict of Interest: No conflict of interest was declared by the authors.

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