Case Report

Treatment of Anastomosis Stricture after Bilateral Ileal Ureter Reconstruction by Contralateral Retrograde Approach: Case Report

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A 37-year old woman with locally advanced uterine cervical cancer post concurrent chemoradiation, presented with an early anastomotic stricture after ileal ureter replacement due to the ischemic process during the reconstruction procedure. A bilateral ureteral stent was considered in order to relieve the obstructive uropathy. Multiple attempts were made to cannulate the stricture point between the right renal pelvis and ileal ureter, although all of them failed. The percutaneous contralateral nephrostomy tract was accessed and successfully used to perform retrograde approach cannulation. Balloon dilation at the stricture point and ureteral stent placement were successfully performed without any complications. Therefore, the contralateral retrograde approach for ureteral stent placement during bilateral ileal ureter reconstruction has been demonstrated to be both feasible and safe.

Keywords: *Ureteral stent, Ileal ureter reconstruction, Stricture*

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Ileal ureter reconstruction is one of the treatments used for a complex ureteral obstruction, first used by Goodwin et al in 1959[1]. General indications for intestinal replacement of the ureter are extensive ureteral injury, recurrent calculi, tuberculosis, ureteral stricture, or malignancy. This procedure has become more frequently used for repairing long ureteral tract pathology[2-4]. Nevertheless, a high incidence of complications, especially in a post-radiation abdomen, has been reported. One of the serious complications is ileal ureteral stricture, which has been reported in 3 to 10% of previous studies[4]. Ureteral stenting and balloon dilation is the preferred treatment due to its effectiveness and minimal invasiveness. The antegrade approach is commonly used and practical in order to cannulate the stricture point in proximal anastomosis due to the shorter distance, although it can sometimes fail, and retrograde approach is needed. Our case report described the novel percutaneous retrograde contralateral approach used for an ileal ureter anastomosis stricture occurring after bilateral ileal ureter reconstruction.

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Case Report

The present case report was approved by the Institutional Review Board of Asan Medical Center, University of Ulsan College of Medicine, and informed consent was waived. A 37-year-old woman had undergone palliative, concurrent chemoradiation for locally advanced uterine cervical cancer stage IV with bilateral ureterovesical junction invasion, five years previously. Four years later, she developed a bilateral ureteral obstruction and underwent bilateral, metallic ureteral stenting. One year later, she presented with low urine output, and a renal scan showed a reduction of the GFR of 6.1 ml/minute in the right kidney and 14.3 ml/minute in the left kidney. Drainage failure of the metallic ureteral stent caused by tumor ingrowth was suggested. She then underwent bilateral, ileal ureter replacement surgery. During the operation, extensive bilateral adhesion was noted along the proximal ureter down to the ureterovesical junction. End to side anastomosis between the ureteropelvic junction and the ileal ureter was performed on the right kidney and between the calicostomy and the ileal ureter

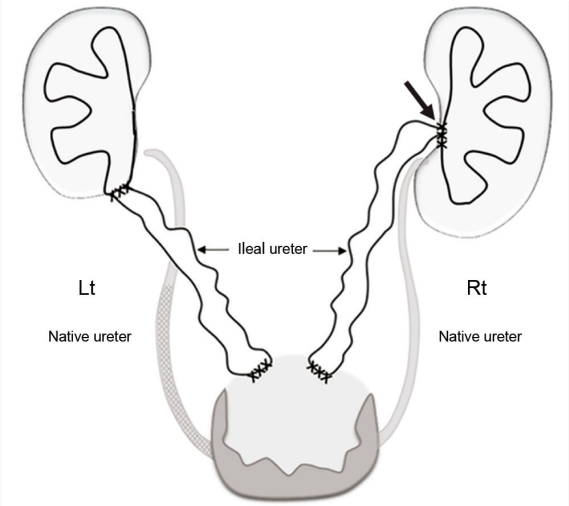

Fig. 1 Schematic diagram of bilateral ileal ureter replacement in this patient (prone position). Black arrow represent severe anastomosis stricture point between the right renal pelvis and the ileal ureter.

on the left kidney. Following anastomosis, an ischemic ileal segment was noted in the bilateral ileal ureters and was caused by mesenteric torsion. While the right ileal ureter could be salvaged, the left ileal ureter had to be sacrificed. An additional short ileal segment was harvested and end-to-end reanastomosis was performed on the left side. Anastomosis between each ileal ureter to the bladder dome was then performed, and no ureteral stent was placed following the procedure (Fig. 1).

Two weeks after the ureter reconstruction procedure, antegrade pyelogram was performed via the retained percutaneous nephrostomy tube and demonstrated the total obstruction point between the right renal pelvis and the ileal ureter anastomosis (Fig. 2). There was partial obstruction at the left calico-ileal ureter anastomosis. The patient's preoperative creatinine level was 2.0 mg/dl. Her preoperative electrolytes were normal. The patient gave consent to perform the bilateral ureteral stent placement. Under local anesthesia and in the prone position, contrast medium was injected in order to confirm the occlusion point between the right renal pelvis and the ileal ureter. A stiff, 0.035" hydrophilic guide wire (Radifocus, Terumo, Tokyo, Japan) was inserted via a nephrostomy tube and a 9-F introducer sheath was placed instead. The stricture point could not be passed through using a 5-F angled-tip catheter (Kumpe; Cook, Bloomington, IN, USA) with a stiff, 0.035" hydrophilic guide wire. A 2.7-F Progreat microcatheter and micro guidewire (Terumo, Tokyo, Japan) were used to cannulate the stenosis point, although they only created a false tract. A contralateral retrograde approach was considered using a 5-F angled-tip catheter with a stiff, 0.035" hydrophilic guide wire passing through the left nephrostomy tract, left ileal ureter, left ileal ureter orifice, urinary bladder, right ileal ureter orifice, and right ileal ureter to the point. Multiple cannulation attempts using a 0.018" guide wire and an angled-tip, 0.035" long hydrophilic guide wire (Radifocus, Terumo, Tokyo, Japan) were performed. Finally, the 0.035", stiff guide wire could be passed through the occlusion point and was caught by the snare loop (Amplatz Goose Neck Snare; Plymouth, MN, USA) via the antegrade approach. An 8-mm, balloon dilation (Mustang; Boston Scientific, MA, USA) was proceeded followed by a double J ureteral stent (Boston scientific, MA) placement using antegrade approach (Fig. 3).

A post-operative, antegrade pyelogram showed contrast passage through the bilateral, ureteral

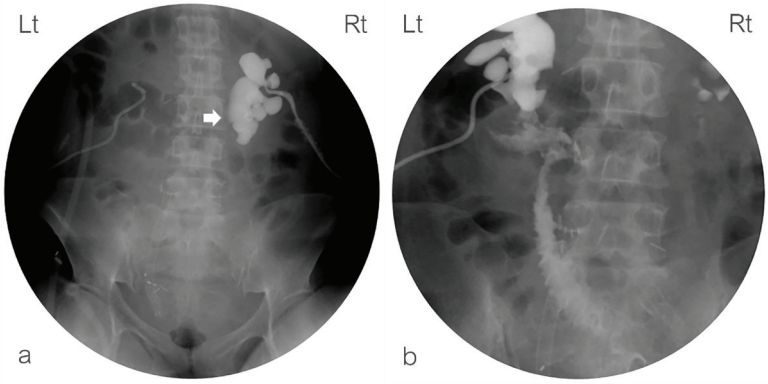

Fig. 2 Antegrade pyelogram in the prone position: a) The right kidney shows complete obstruction at the anastomosis of the right renal pelvis to the ileal ureter (arrow). b) The left kidney shows contrast pass through renal pelvis to ileal ureter.

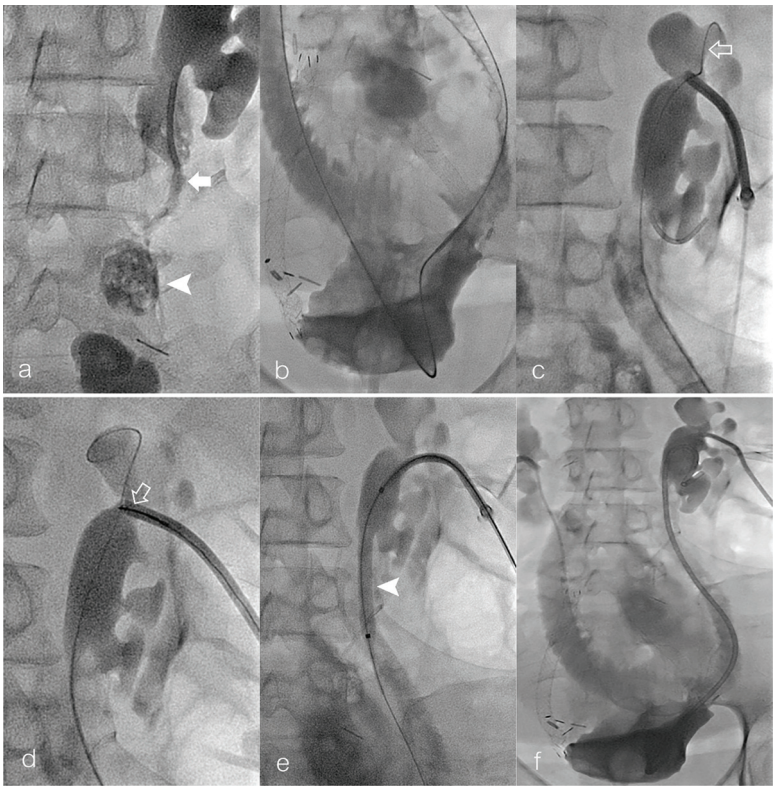

Fig. 3 Fluoroscopic images in the prone position during the ureteral stent placement procedure: a) Demonstrates false tract creation (arrow) and extravasated contrast medium (arrowhead) after multiple attempts of cannulation using the antegrade approach; b) Retrograde approach via contralateral nephrostomy using a 5-F catheter with a stiff, 0.035", hydrophilic guide wire; and c, d) The stiff, 0.035" guide wire was passed through the occlusion point to the right renal pelvis and caught by the snare loop via the antegrade approach (open arrow). e) Balloon dilation (arrow head) was performed at the anastomosis between the right renal pelvis and the ileal ureter. f) Successful placement of the right, ureteral, double J stent and right percutaneous nephrostomy. A left, ureteral, double J stent was subsequently placed (not shown).

stents into the urinary bladder. No major complication was noted. At follow-up, an antegrade pyelogram and renal scan revealed some difficulty regarding contrast medium passage through the right ureteral stent, although there was normal flow of contrast medium through the left ureteral stent into the urinary bladder. The post-operative, creatinine level was normalized to less than 1.3 mg/dl with normal serum electrolyte.

Discussion

Ileal ureter is one of the standard treatment for reconstruction of the ureter, and provides long-term avoidance of nephrostomy tubes and ureteral stents. The need for ureter ileal reconstructive surgery has increased over time resulting from significant injury of the ureter after a complicated endourologic procedure. The reported long-term results of ileum interposition for ureteral obstruction were 68 to 83% over five years of follow-up time[4,5]. For these reasons, ileal ureter has been accepted worldwide and has become more widely accepted for treating complicated ureteral obstructions. The predictable good outcome in the non-irradiated abdomen, such as tuberculosis or ureteral injury, has been reported[4,5]. On the other hand, there was a higher rate of complications in irradiated abdomens or in extensive malignancy such as wound infection, and fistula, and which were some of the long-term difficulties associated with radiation-induced fibrosis, ischemia, and adhesive disease[6]. This indicates that interventional radiology treatment should keep up with these complications.

Regarding ureteral reconstruction surgery, an anastomotic stricture between the ileum and the ureter or between the ileum and the urinary bladder has been reported in previous studies to be approximately a 3.3 to 11% incidence[4,6]. The etiology of anastomotic

stricture could be associated with the ischemic process, perianastomotic fibrosis, post-radiation therapy, or local tumor recurrence. In general, an anastomotic stricture tends to occur as a late complication one year following surgery. Unfortunately, an early stricture may be found within one to two months, probably due to the ischemic process or edematous change, as reported by Poulakis et al[7]. Similar to the present case report, definite evidence of an ischemic ileal segment was found during surgery causing an early anastomosis stricture between the right renal pelvis and the ileal ureter.

In contrast to laparotomy with reanastomosis, which is the standard treatment for a ureteroenteric stricture, balloon dilation with a ureteral stent is a minimally invasive and effective treatment. To our knowledge, there has been no published report regarding the use of an interventional technique for the treatment of an ileal ureter anastomosis stricture. The way to approach the stricture point should be the same as that with any kind of urinary tract stricture. A percutaneous antegrade approach is generally reserved for treatment of proximal or mid-ureteral strictures. An endoscopic retrograde approach is usually used for the treatment of a ureteral orifice or distal ureter. A combined approach is preserved for failure of either the antegrade or retrograde approach[8].

In this patient, as we failed to cannulate the stricture point using the antegrade approach, we, therefore, made the decision to attempt the retrograde approach. The interesting point of ileal ureter reconstruction is the relatively large opening of the ureteral orifice to the bladder, and makes the possibility of using the retrograde approach from the percutaneous contralateral kidney side and without endoscopic assistance. Interventionists who perform this type of procedure should know the type of ileal ureter anastomosis of their patient. A few types of anastomosis were reported including a U-shape configuration, a seven-shape ileal segment or a reverse seven-shape ileal segment and combined Y-shaped common channel transureteroureterostomy into the ileal segment[2,9,10]. A different anastomosis technique could make each procedure a challenging intervention.

The benefit of the retrograde approach from the percutaneous contralateral kidney is no endoscopic assistance need, especially in case of urethral obstruction. Therefore, the procedure can be done in a one-step procedure under local anesthesia. However, the long-distance working tract is a tradeoff and leads to some difficult cannulation and the required use of more tools. We also completed the procedure with some difficulty during cannulation and had to use a longer catheter and guide wire as usual, but there was no complication. We believe that the contralateral retrograde approach could be an alternative access in patient with bilateral ureteral reconstruction due to the relatively large orifice of the ileal ureter to the urinary bladder.

Conclusion

Anastomosis stricture can occur after ileal ureteral reconstruction. The contralateral retrograde approach for ureteral stent placement in bilateral ileal ureter replacement is feasible and safe. It may be the preferred technique for patients after bilateral ileal ureter reconstruction rather than endoscopic assistance route.

What is already known on this topic?

Anastomosis stricture after ileal ureter reconstruction is the one of important complication. Ureteral stent placement is the proper choice of treatment ureteral stricture.

What this study adds?

Contralateral retrograde approach is a new safe method for ureteral stent placement after ileal ureter reconstruction.

Potential conflicts of interest

None.

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การรักษาท่อไตตีบหลังการผ่าตัดท่อไตต่อกับลำไส้เล็กโดยการใส่สายสวนท่อไตผ่านทางผิวหนังด้วยวิธีการเข้าผ่านไตด้านตรงข้าม

สมราช ธรรมธรวัฒน์, Ji Hoon Shin, Yook Kim, Jhih Wei Chen, Bum Sik Hong

รายงานความสำเร็จของการใส่สายสวนท่อไตผ่านทางผิวหนังและไตด้านตรงข้ามในผู้ป่วยหญิง อายุ 37 ปี มีประวัติเป็นมะเร็งปากมดลูกได้รับการรักษาด้วยการฉายแสงและยาเคมีบำบัด หลังจากการรักษา 6 ปี พบมีภาวะท่อไตตีบ ได้รับการรักษาโดยการผ่าตัดต่อท่อไตเข้ากับลำไส้เล็ก หลังจากนั้นพบว่าจุดต่อระหว่างท่อไตและลำไส้เล็กมีการตีบทั้งสองข้าง โดยปกติการใส่สายสวนท่อไตในผู้ป่วยลักษณะนี้ต้องอาศัยการส่องกล้องร่วมกับการใส่สายสวนผ่านทางท่อปัสสาวะ ในรายงานนี้ผู้นิพนธ์ได้อธิบายถึงขั้นตอนการใส่สายสวนท่อไตเพื่อระบายปัสสาวะด้วยวิธีใหม่ คือการใส่ผ่านทางผิวหนังและไตด้านตรงข้าม ซึ่งมีข้อดีคือ ไม่จำเป็นต้องอาศัยการส่องกล้องและนับว่าเป็นทางเลือกใหม่ในการรักษาผู้ป่วยกลุ่มนี้