

“The light at the end of the tunnel”: Rendezvous procedure to bypass complex ureteric strictures

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Introduction

Ureteral stricture disease is a pathological condition characterized by reduced lumen diameter which impairs the function of the kidneys by obstructing the urinary flow. Complete ureteric strictures present a significant challenge to the surgeon trying to negotiate it. These strictures can be congenital, acquired, benign or malignant. The preservation and protection of renal function depend on the timely identification and initial management of obstructive complications, which are the main features of ureteral stricture disease.

Various surgical modalities have been developed for the treatment of ureteral strictures, ranging from open reconstruction to minimally invasive approaches such as endo-urology, laparoscopy, robotics and interventional radiology.

If the stricture is not complete, passing a guidewire through under fluoroscopic guidance followed by balloon dilatation and endo-ureterotomy would be the best minimally invasive technique available. However, if there is a short but complete stricture (<2 cm segment) ureteroureterostomy would offer the best long-term outcome. In the event of a longer proximal segmental stricture; a more advanced surgical technique needs to be employed. Such techniques span from anastomosis to the contralateral ureter, replacement of the ureter with an ileal segment or a Monti tube and complete disconnection of the kidney with auto transplantation. If the stricture is in a distal segment of the ureter, the options available are ureteric implantation followed by a psoas hitch or a Boari flap technique.¹

Open surgery is expected to be technically difficult in patients who have had repeated abdominal surgery, even with a complete short-segment ureteric stricture. Some of these

patients may have had repeated abdominal surgery making open surgery extremely challenging due to multiple adhesions. In such situations, a simultaneous antegrade and retrograde technique can be employed to achieve luminal patency. The technique “cut to the light” involves one end of the stricture being illuminated with a light source while the core cutting of the stricture is performed from the other end. This is also called the rendezvous procedure (RP); a minimally invasive technique involving a combined antegrade and retrograde approach to cross a complete ureteric stricture.

Case report

A 64-year-old patient with a perforated recto-sigmoid tumour; underwent a Hartmann's procedure followed by a reversal. On follow up he was found to have an obstructed left kidney for which a nephrostomy tube was inserted due to failed antegrade stenting. He was referred to our unit with a nephrostomy for one-year duration. By this time patient had already undergone three abdominal surgeries and completed several courses of chemoradiotherapy with no evidence of recurrence.

Following the administration of general anaesthesia, the patient was positioned in a modified oblique position similar to Galadako- Validivia position. An on-table nephrostogram was performed with the aid of fluoroscopy to delineate the proximal end of the stricture.

Meanwhile, the second surgeon performed a cystoscopy and a retrograde study to locate the distal end of the stricture. A complete stricture of about 2 cm in the mid ureter was evident on fluoroscopy.

With the anatomy of the renal pelvis defined by a nephrostogram, a percutaneous tract was created through the upper calyx of the kidney. This tract was dilated to allow an 18Fr Amplatz sheath. Through this, a flexible cystoscopy was passed with a hydrophilic guidewire which passed down to the stricture. Then the second surgeon inserted a semi-rigid ureteroscope with the aid of a hydrophilic guide wire in a retrograde manner to reach the stricture.

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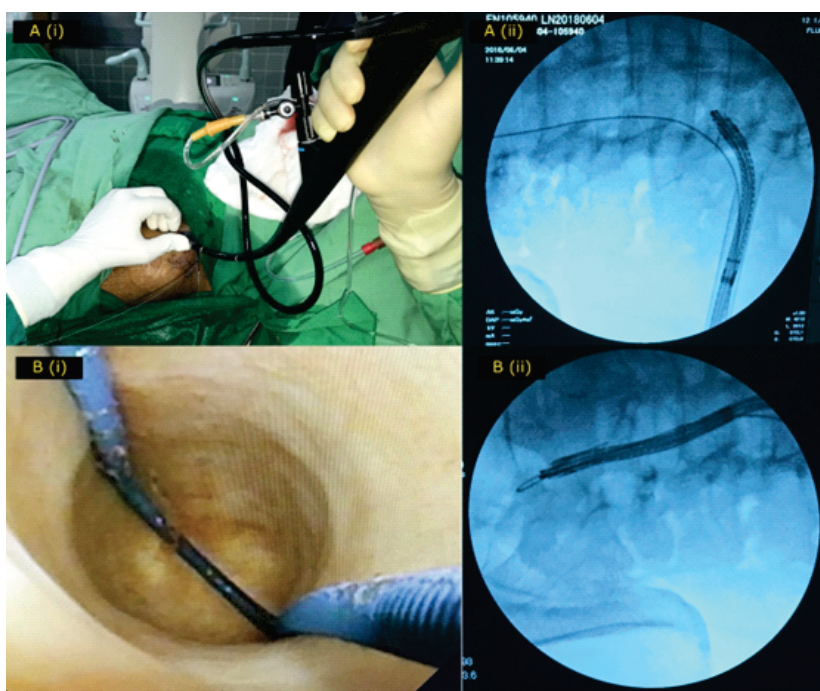


Figure 1

- A. (i) Passing flexible cystoscopy through Percutaneous nephroscope sheath
(ii) Fluoroscopy image
B. (i) Antegrade flexible cystoscopy view of the complete ureteric stricture
(ii) Fluoroscopy image

Then the room lights were switched off and the light pathway of the ureteroscope was visualized through the flexible cystoscope. Using the 100W holmium laser the ureter was cut onto the ureteroscope light aided by fluoroscopy. A retrograde wire was advanced and was identified and grabbed by forceps via the flexible cystoscope and pulled out of the nephrostomy tract to straighten the ureter. Subsequently, ureteric dilator catheters were used for serial dilatation of the strictures segment. Consequently, a 6 Fr ureteric stent was placed across the stricture under fluoroscopic imaging and the nephrostomy was removed after few days. Six months later he had a stent exchange and remains free of ureteric obstruction confirmed on a CT urogram at one year.

Discussion

A hybrid technique that integrates uro-radiology and endoscopy, known as the 'rendezvous' procedure, can facilitate the management of complex strictures by enabling the successful placement of stents, thereby avoiding the need for open surgery or prolonged percutaneous drainage.

Patients with complex ureteric stricture are a heterogeneous cohort making it difficult to compare the outcomes of different procedures. The success of the RP is solely based on the characteristic of the stricture. Recanalization is possible when stricture is less than 1.5 cm, and when there is no severe periureteral fibrosis.

Selecting the appropriate patient with a multidisciplinary approach is crucial. The RP can be an option for patients who are not suitable for open surgical reconstruction. The main

goal is to achieve internal drainage and eliminate the need for nephrostomy or stents in the long term. Post-procedure follow-up is crucial, with repeated imaging and renal function to detect the patients developing a recurrence needing reconstructive surgery.

The first report of using a combined antegrade and retrograde approach for treating an obliterated pelviureteric junction with endopyelotomy was by Bagley. Watson later showed that RP was technically successful in crossing a stricture in 20 patients. The underlying causes were due to complications related to stricture with stones, stricture in patients with carcinoma of prostate and bladder or due previous open surgeries. The patency rates after RP were around 90% at three years. Combined approach is recommended for strictures shorter than 2 cm.⁴

The long-term efficacy of minimally invasive strategies for completely strictures ureters is still debatable, as there is no functional restoration of the ureter, and the stent is surrounded by a fibrotic channel that lacks the features of the normal ureter. Although the short-term results are encouraging risk of recurrence may increase with time.

RP is a salvage procedure for complex ureteric strictures. It is an option for high risk patients where open surgery deemed difficult or too dangerous due to previous multiple abdominal surgeries. Being an endoscopic approach it allows faster recovery. The procedure is recommended for patients unsuitable for open reconstruction surgery.

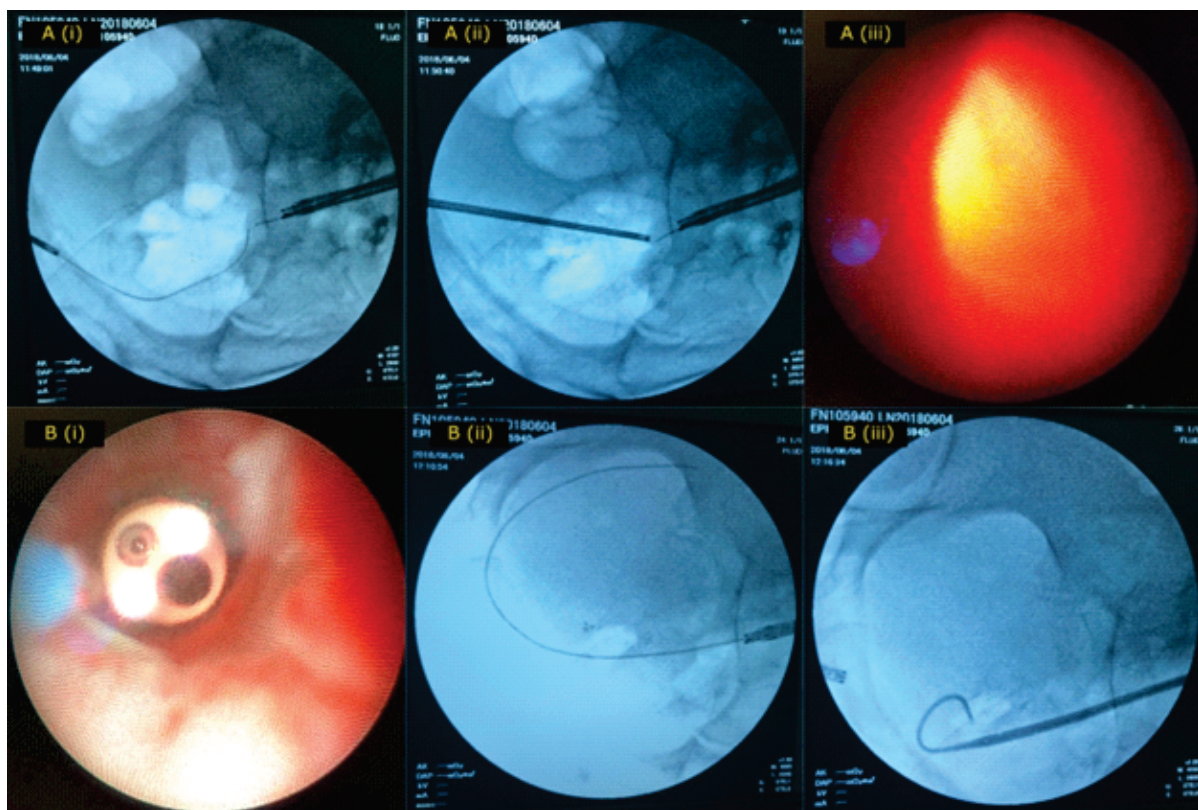


Figure 1.

- A. (i)(ii) Retrograde access through the ureter using ureteroscope
- (iii) Visualizing the light through the stricture
- B (i) Laser stricturotomy performed with ureteroscopy view of the flexible cystoscopy tip
- (ii) Guide wire negotiated stricture
- (iii) Antegrade double J stent inserted

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Learning Points:

- The ultimate aim of rendezvous procedure is to establish internal drainage and renal salvage in order to render the patients free from nephrostomy tube.
- Case selection is vital since the success depends on the stricture characteristics.
- Since there is no functional reconstruction a fibrotic channel is formed around the ureter, so the stent should to be kept longer than usual.
- Long term follow-up is recommended despite promising short term outcomes