



LAPAROSCOPIC TRANSPERITONEAL URETEROURETEROSTOMY COMBINED WITH RETROGRADE FLEXIBLE URETEROSCOPY ASSISTANCE FOR URETERAL STRICTURE- CASE SERIES OF SEVEN PATIENTS

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SUMMARY:

Most strictures of the ureters are detected and usually occur in the part of the ureter when the calculus has been trapped for a long time, after ESWL or as a complication of transureteral lithotripsy after the introduction of the holmium laser. The treatment of these strictures varies and depends on many parameters, the most important being the type of stricture, severity, length and location. In many cases, endoscopic treatment with stenting is the first choice of treatment performed retro or antegrade. In case of failure or contraindication for endoscopic treatment, ureteral reconstruction can be performed by open, laparoscopic or robotic techniques. Laparoscopic ureteroureterostomy is a preferred minimally invasive technique for the treatment of benign ureteral strictures.

Keywords: ureteral stricture, ureteroureterostomy, laparoscopic, endoureterotomy, robotic,

INTRODUCTION:

Most strictures of the ureters usually occur in the part of the ureter where the calculus has been stuck for a long time, in cases after ESWL, or as a complication of transureteral lithotripsy after the introduction of a holmium laser in which iatrogenic injury is done to the ureter. Factors that may contribute to the development of ureteral strictures include surgical procedures (iatrogenic strictures), stone impact, radiation therapy, penetrating traumatic injuries, and idiopathic disorders. Iatrogenic trauma is the most common cause of ureteral stricture, with most injuries occurring after gynecological (64%) or general surgical procedures (25%), especially if a laparoscopic approach has been performed [1].

It is of paramount importance to distinguish the cause of ureteral stricture, as the treatment of ureteral strictures varies depending on the etiology of the stricture, location and length.

The first line of treatment for stricture of the ureter up to 2 cm is endoscopic treatment, which can be done with a holmium laser (endoureterotomy) or with balloon ureteral dilatation with subsequent stenting of the ureter with special stents for endoureterotomy. If the stricture recurs, re-

peated dilatation and laser endoureterotomy are not recommended as the success rate is low. Laser endoureterotomy should be considered a reasonable treatment option in selected patients with a good success rate of 65% [2].

Surgical reconstruction of the ureters remains the gold standard for the treatment of strictures over 2 cm, as it is associated with a higher success rate of 95-100%.

While open surgery remains the basis for ureteral reconstruction, continuous improvement of laparoscopic and robotic technology are expanding their application as minimal options for invasive treatment. Compared to traditional open surgery, these techniques are associated with less post-operative pain, reduced hospitalization, shorter recovery, and improved cosmetic result[3].

The main goal of ureteral surgery is to create patency of the urinary system from the pyelone to the bladder by surgical removal of the affected part of the ureter and reconnecting it to normal healthy ureteral tissue. Surgical considerations that are critical to a successful anastomosis include preservation of the vessels of the ureter, adequate mobilization of the ureter, and construction of a waterproof and tension-free anastomosis [4]. Laparoscopic surgery is accepted as the standard of care in urological reconstructive procedures because it provides reduced morbidity to the patient with equivalent surgical success and a better quality of life. Laparoscopy has an important drawback which is the inability to determine exactly where the stricture of the ureter is, as well as its length. This inability of the sensation which we have in open surgery is a disadvantage in laparoscopy [5].

Here we report our first cases of ureteral stricture operated with transperitoneal laparoscopic uretero-ureterostomy combined with retrograde flexible ureteroscopy to identify the location of the stricture.

MATERIAL AND METHODS:

We present a series of seven patients with benign stricture of the ureter, caused after successful endourological treatment of stuckstone with a long stay in the ureter.

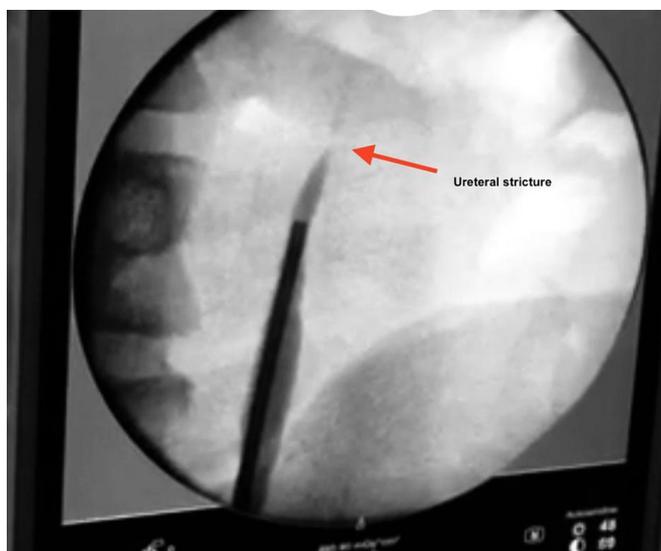
Three of the patients were men and four women, ranging in age from 19 to 58 years. In five patients, the steno-

sis was found on the right side, and in the other two patients on the left side.

Three of the patients underwent laser endoureterotomy with poor results and recurrence of the stricture. The location of the stricture in these three patients was in the middle third of the ureter with a length of 1.5 cm, and the time from laser ureterotomy to recurrence was 3 months. In the remaining four patients, strictures were found in the middle third of the ureter in two cases and in the other two in the proximal to the middle third of the ureter. Their length varied from 1.5 to 2 cm, and all four patients underwent laparoscopic surgery without prior endoureterotomy.

The most common complaints of patients were low back pain, high blood pressure or urinary tract infection. In all patients, the diagnosis was confirmed by ultrasound and retrograde ureterography [Fig. 1].

Fig. 1. Retrograde pyelography showed left ureteral stricture



Laparoscopic transperitoneal access was preferred in all patients. The patient is first placed in a lithotomy position, and ureteroscopy is performed, followed by insertion of a guidewire into the ureter, after which the patient is turned and placed in a lateral lumbar position, keeping the guidewire sterile so that the flexible ureterorenoscope can be inserted. This was followed by the pneumoperitoneum created with the Veres needle and subsequent placement of the trocars using three to four 2x5 mm and 2x10 mm trocars. The surgical technique involves several stages: first, we open the posterior plate of the peritoneum and find the ureter. In most cases, the ureter is inflamed and tightly fused with the surrounding tissue. After removing the adhesions and ensuring a sufficient possible length of the ureter, the assistant places a retrograde flexible ureteroscope and moves it to the distal end of the stricture along the previously placed guidewire in the ureter. This is followed by switching off the light of the laparoscope, whereby the tip of the urethroscope becomes visible and is located at the distal end of the stricture [Fig.2].

After resection of the distal part of the ureter, incision of the ureter to the proximal part is started until normal healthy tissue is reached. The damaged part with the stricture is resected laparoscopically [Fig.3]. This allows us not to cut normal tissue, which preserves the length of the ureter for subsequent anastomosis.

After placement of a guidewire on which the stent is placed, we perform the anastomosis ureteroureterostomy with a continuous suture, the most commonly used suture material is Vicryl 4/0 [Fig.4]. The operation ends with the placement of a drain.

Fig. 2. The view in the operation theater- flexible and laparoscopic view, the appearance of the ureteral stricture after turn off the light of the laparoscope

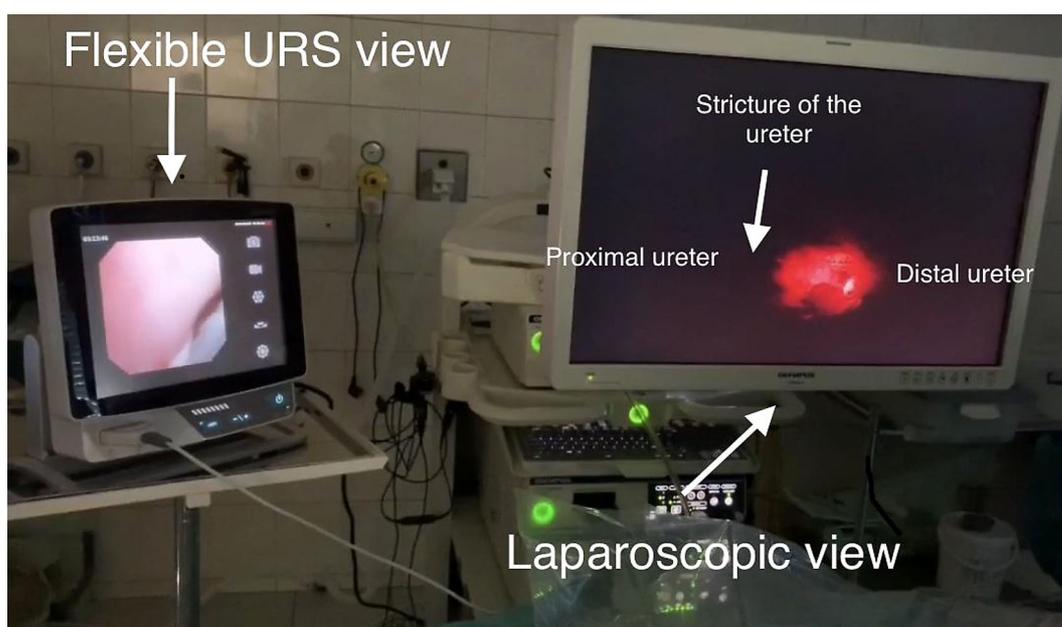


Fig. 3. Laparoscopic view of the ureteroscope in the ureter after removing the stricture

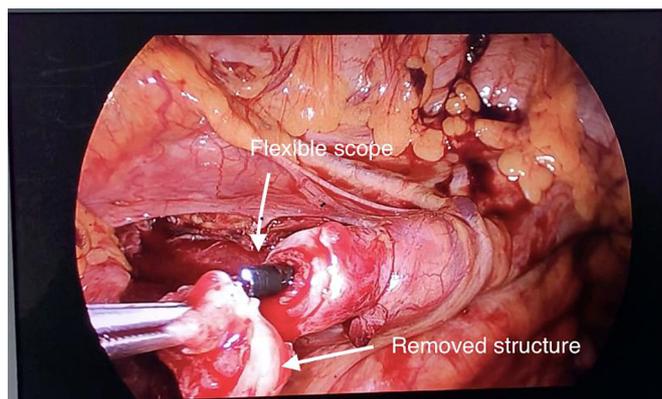
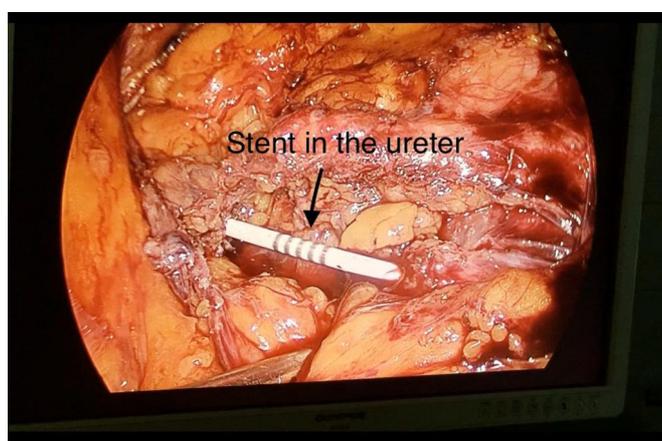


Fig. 4. Laparoscopic view of the stent in the ureter



RESULTS:

The mean operative time was 60 minutes, with minimal blood loss. In none of the cases was a conversion performed. Patients were discharged 4 days after surgery without complications. The stent was extracted 30 days after surgery with concomitant semi-rigid ureteroscopy with pyelography. We did not find stricture and hydronephrosis in all cases. At 3 months of follow-up, no clinical or radiological manifestations of the stricture were observed in all patients. Patients were recommended for follow-up examinations at 6 months and the first year of surgery.

CONCLUSION:

The surgical method for the treatment of ureteral strictures is determined depending on their etiology, location, length, degree of impairment of renal function and the experience of the surgeon.

However, given the benefits of laparoscopy, it should be preferred to open surgery as an approach to treating patients with a ureteral stricture. We believe that this technique of laparoscopic ureteroureterostomy using a flexible ureteroscope that preserves the length of the ureter and only removes the damaged part is a safe and effective, minimally invasive procedure for refractory stricture of the ureter located in the upper or middle third of the ureter.

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