CLINICAL CASE

Ureter substitution with cecal appendix in a patient with ureteral stricture: a first case report in Mexico and a literature review

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Abstract Over a span of 20 years, urologic, gynecologic, and general surgery operations were responsible for 42%, 34%, and 24% of injuries, respectively. In 1912, Melnikoff described the first substitution of a ureter with the vermiform appendix as treatment for ureteral stricture.

Aim: Our aim was to present herein a case of ureter substitution with the cecal appendix to promote the feasibility of the procedure and to describe the first experience at a tertiary care hospital in Mexico.

Materials and methods: A 35-year-old woman was diagnosed with right distal ureteral stricture secondary to injury after a total abdominal hysterectomy and right nephrostomy placement.

Results: Given that the course of the stricture was approximately 10 cm, transposition of the appendix was decided upon. The cecal end of the appendix was previously isolated and splinted with a double-J ureteral stent and then anastomosed to the ureter with the end-to-end method and the distal end was reimplanted into the bladder with the Politano-Leadbetter technique. At 11 months after the procedure, the patient presented with adequate progression, was asymptomatic, and the control imaging studies showed satisfactory passage of urine from the kidney to the bladder, with no pyelocaliceal dilation or stricture.

Conclusions: There are various advantages to using the appendix as a substitute material, among which are good contractibility, availability to be moved with a blood supply, the fact that it does not absorb urine, the possibility to create a submucosal tunnel to prevent reflux, and a caliber similar to that of the ureteral lumen.

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Introduction

The development of high endoscopic ureteral surgery and the multiple procedures at the level of the pelvis have led to an increase in the frequency of iatrogenic ureteral stricture. Ureteral injuries can occur during abdominal procedures that are open or laparoscopic, or vaginal or endourologic. In a retrospective review of 165 patients with iatrogenic ureteral injuries over a period of 20 years, the majority of injuries were due to endourologic procedures. Urologic, gynecologic, and general surgery operations were responsible for 42%, 34%, and 24% of the injuries, respectively.1 Ureteral injury is the most common complication in pelvic surgery and presents in 1 to 10% of the procedures.1 2

Proximal ureteral strictures are a complex challenge for the urologist, therefore he or she must be familiar with a wide variety of surgical skills and strategies for their management. There are numerous options for repairing them and the decision can be complicated. It should be influenced by the characteristics of each patient and the experience of the surgeon.3 Distal ureteral strictures, even though they are long, can often be managed with ureteral reimplantation and the most widely used techniques are the Psoas-Hitch or Boari flap. Minimally invasive therapeutic options, such as ureteral stent placement, nephrostomy catheter, balloon dilation, and endoureterectomy are used, despite their low success rates. They are even lower when the strictured segment is larger than 1 cm, in ischemic strictures, and in those injuries involving the middle ureter.4 However, ureteroneocystostomy with the Boari flap, ureteroureterostomy, ileal interposition, and autotransplantation are not always possible.

In 1912, Melnikoff first reported on the use of the vermiform appendix as a ureteral substitute.5 Since then, others have reported on ureteral substitution with the appendix for the repair of defects involving the proximal and distal ureter, the left ureter, and right renal pelvis diversion into the left ureter. The technique has also been described in children.6

Clinical case

A 35-year-old woman had a past history of ovarian cancer. She underwent surgery during which injury to the right ureter was detected and repaired by open-end catheter placement. After its removal, the patient presented with ureteral stricture and right pyelocaliceal dilation. A nephrostomy was placed in July 2014 and the patient was referred to our service. Nephrostography showed the absence of contrast medium passage at the level of the iliac crest consistent with stricture of the middle third of the ureter. The patient was programmed for a Politano-Leadbetter ureteral reimplantation.

The mid-incision approach was used and the patient was examined. Ureterolysis revealed a stricture of approximately 10 cm. After case evaluation and when conditions allowed, transposition of the appendix was performed. The appendix was isolated from the mesentery, preserving its irrigation by the appendicular artery. The transpositioning of the appendix that was previously referred to our service. Nephrostography showed the absence of contrast medium passage at the level of the iliac crest consistent with stricture of the middle third of the ureter. The patient was programmed for a Politano-Leadbetter ureteral reimplantation.

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Aim

The aim of our study was to present the first case report in Mexico of right distal ureter stricture repaired through cecal appendix transposition and to present a review of the literature.

Results

The patient presented with intraoperative bleeding of 350 ml and uresis of 790 ml. She remained stable during the first 24 h with Penrose drain outputs of 35 and 40 ml in the left and right drains, respectively. Nephrostomy output was 550 ml and transurethral catheter output was 125 ml. The drains were removed with outputs of approximately 5 ml. The patient had satisfactory progression after a hospital stay of 6 days. She was released with a transurethral output of 650 ml and nephrostomy catheter output of 175 ml in 24 h. The double-J ureteral stent was removed at 8 weeks, the nephrostomy catheter was closed for removal after the radiologic evaluation. Patient progression was satisfactory 11 months after the procedure. She was asymptomatic and the control imaging studies showed adequate passage of urine from the kidney to the bladder, with no pyelocaliceal dilation or stricture (fig. 5).
Figure 5  Passage of the contrast medium through the right ureter 11 months later.

Discussion

There are very few case reports of appendix transposition. In our first experience in right ureter substitution with a proximal end-to-end anastomosis and antiperistaltic Politano-Leadbetter reimplantation, we obtained early and late results similar to those reported in the literature. The control follow-up will be an important step in this first case report in Mexico.7-9

Conclusions

There are various advantages to using the appendix as a ureteral substitute that include good contractility, ability to be mobilized with its blood supply, the fact that it does not absorb urine, the possibility of creating a submucosal tunnel to prevent reflux, and the similarity in caliber to that of the ureteral lumen. It has the limitations of varying length, a possible prior inflammatory process, and the risk for infection.

Ethical responsibilities

Protection of persons and animals. The authors declare that no experiments were performed on humans or animals for this study.

Data confidentiality. The authors declare that no patient data appear in this article.

Right to privacy and informed consent. The authors declare that no patient data appear in this article.

Financial disclosure

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Conflict of interest

The authors declare that there is no conflict of interest.

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