

Distal conservative urinary tract resections and reconstructions for locally advanced gynecologic malignancies

Abstract

Due to the anatomical proximity of the urinary and gynecological tract, malignant processes originating from the gynecological viscera might involve the distal segments of the urinary tract, imposing the performance of en bloc resections. However, the demanded procedure widely varies in regard to the location of the invaded area as well as the other anatomical particularity of the patient. This is a literature review of the most commonly performed urinary tract resections and reconstructions for locally advanced gynecologic malignancies including ureteral resection and reimplantation, partial cystectomies with cystoraphy or augmentation cystoplasties and anti-reflux procedures such as psoas hitch or Boari flaps.

Keywords: ureteral resection, partial cystectomy, ureteroneocystostomies, psoas hitch, Boari flap

Introduction

Gynecological malignancies continue to be common cancers affecting women worldwide. Unfortunately, an important number of cases are diagnosed in advanced stages of the disease when local invasion is already present. In all these cases multiple visceral resections have been proposed to obtain a good local control of the disease. When it comes to the urinary tract involvement by locally advanced gynecological tumors, a significant number of patients are diagnosed with large pelvic tumors with gross invasion of the urinary bladder or of the ureters, necessitating radical procedures such as anterior pelvic exenterations. However, in certain cases presenting less extensive lesions more conservative procedures might be performed⁽¹⁾. Although benign myometrial lesions recognise a higher prevalence in young women, leiomyomas and adenomyosis showed to play an important role⁽²⁾.

Unilateral or bilateral ureteral resections and reconstructions

Segmental ureterectomy in locally advanced gynecological cancer is performed whenever the tumoral process involves the distal ureter. The resection can be performed unilaterally or bilaterally, depending on the extent of the lesion. However, in all cases an oncological safety margin of 0.5-1 cm should be provided in order to achieve negative resection margins. The surgical procedure continues with the ureteral reimplantation in the remnant urinary bladder through a transvesical or an extravesical procedure and the selected reconstructive procedure is in close connection with the defect length⁽¹⁻⁴⁾.

In cases necessitating short ureteral resections the ureteral continuity is established by a direct uretero-ureterostomy

while distal ureteral involvement are usually treated by ureteral reimplantation through a ureteroneocystostomy^(3,5).

Whenever a transvesical procedure is the option of choice, the reconstruction phase begins with mucosal sectioning at 2-3 cm supero-laterally from the initial orifice, on a length which is usually three folds longer than the diameter of the ureter itself. The ureter is sutured at the urinary bladder mucosa with separate stitches. The resulting ureteroneocystostomy is protected by placing an urinary stent while the urinary bladder will remain catheterized with a Foley catheter for the next 21 days. The cystotomy will be sutured by placing a two layer suture with absorbable stitches.

The extravesical technique begins with the incision of the adventitia and the detrusor muscle on 3 cm on the posterolateral wall of the bladder and exposing the mucosa. The second step of the procedure consists in the resection of a small area of the mucosa with a similar diameter with the transected ureter followed by the insertion and fixation with absorbable stitches of the ureter. In the meantime the detrusor muscle is sutured upfront the ureter in order to create an anti-reflux procedure⁽⁶⁾.

In cases necessitating extended ureteral resections, various procedures of urinary bladder mobilization might be performed. One of the most common ones is known under the generic name of "psoas hitch" and consists of the urinary bladder fixation at the ipsilateral psoas muscle with absorbable stitches, attention being paid not to interrupt the genitofemoral nerve⁽⁶⁻⁸⁾. In certain cases, urachus ligament might be sectioned in order to provide a better exposure of the bladder. Most studies recommend that the psoas fixation should be performed at the level or above the bifurcation of the common iliac artery; however, the exact location of the

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anchoring stitches vary on depend on the length of ureteral resection and psoas muscle anatomy^(9,10).

However, tension free anastomosis remains the critical success factor for a urinary tract reconstruction in order to avoid both ischemia and secondary strictures⁽¹¹⁾.

Whenever the ureteral resection is even larger and psoas hitch technique cannot provide a tension-free anastomosis, a Boari flap can be taken in consideration⁽¹²⁾. The combination between psoas bladder hitch and Boari bladder flap was first described by Kelami in an animal model⁽¹³⁾. The procedure consists in creating a flap from the posterior wall of the urinary bladder. At the level of the ureteral reimplantation the diameter of flap should be three times higher than the ureteral diameter. The distal ureter is reinserted in the urinary bladder through a submucosal tunnel and is fixed to the urinary bladder mucosa with resorbable separate stitches. The cystoraphy is sutured with a double layer of resorbable stitches. The ureteral anastomosis is protected by placing a double "J" ureteral catheter while the urinary bladder drainage is provided by keeping in place the urinary catheter for the next three weeks while the flap is fixed at the psoas muscle with protection in regard to the genitofemoral nerve.

More recently, laparoscopic ureteral reimplantation using Boari flap has been reported with good results in terms of intraoperative and early postoperative outcomes⁽¹⁴⁾.

One of the largest studies comparing the outcomes for laparoscopic and open techniques of ureteral reimplantations for distal ureteral strictures comes from Rassweiler and al. and was published in 2006⁽¹⁵⁾. The study included 10 patients submitted to surgery by a laparoscopic approach and the reported results were compared to those reported in a control group of 10 cases submitted to open surgery. Among these patients, the authors reported the case of a 69-year-old female with medical history of uterine cancer and pelvic radiotherapy in which a gross pelvic lymph node mass with ureteral invasion was found. The authors showed that, although in the laparoscopic group the operative time was longer, the mean amount of blood loss, analgesic requirements, time to oral intake and hospital in stay were significantly lower in the laparoscopy group. Moreover, while in the subgroup of laparoscopic surgery no significant postoperative complication occurred, among patients submitted to open surgery two patients experienced major complications including urinary leaks and anastomotic strictures. The study concluded that the laparoscopic approach for ureteral

reimplantation following resection for ureteral strictures can be safely performed and, in the meantime offers the patient the advantages of minimally invasive techniques⁽¹⁴⁾.

When the tumoral process involves both ureteral ostium, a bilateral ureteral resection followed by bilateral ureteral reimplantation using an antireflux procedure might be taken in consideration. The procedure can be performed with good results and similar rates of postoperative complications when compared with unilateral reimplantation⁽¹⁵⁾.

Partial cystectomy

Partial cystectomy can be taken into consideration whenever a limited urinary bladder wall invasion is revealed. The procedure is feasible even if the invasion are includes one or both ureteral orifices, the invaded ureter being re-inserted in the remnant urinary bladder throughout one of the processes previously described. Whenever the remnant urinary bladder has a low estimated volume (i.e. under 150 ml, predisposing to continence troubles), augmentation cystoplasty using digestive segments might be performed with good results. The most commonly used digestive systems include an ileal, ileo-colic segment or the sigmoidian loop. However, most authors prefer using a small bowel loop. An important number of cases necessitating augmentation cystoplasty have been previously submitted to neoadjuvant pelvic radiotherapy, affecting both the tumoral process and the adjacent pelvic organs, therefore a segment of non-irradiated centro-abdominal viscera is the option of choice. The technique was inspired by the one performed in pediatric surgery in order to treat high grade vesico-ureteral reflux in children with neurogenic bladder⁽¹⁶⁾.

Conclusions

Although conservative management of the lower urinary tract invasion due to gynecological cancer is not a common situation, whenever the extent of the disease is limited, segmental resections of the urinary tract can be taken into consideration with good results in terms of short term and long term outcomes. Moreover, the development of the new minimally invasive techniques provided the possibility of performing these procedures in a more conservative manner, improving the early postoperative outcomes of these patients. In the meantime, the functional outcomes of the laparoscopic approach are comparable with the ones achieved by the open surgical approach. ■

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