

Modalities for reconstruction of the bladder reservoir after pelvic exenterative operations

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Abstract

Currently there are four feasible options for lower urinary tract reconstruction in radical interventions for gynaecological neoplasms: an incontinent form involving skin deflection, a continent skin reservoir requiring catheterization via stomy, continental rectal reservoir with storing and eliminating urine through the rectum and a continent neobladder with antireflux mechanism. We will present the case of a urethral tumor recurrence in a patient after total hysterectomy with bilateral anexectomy for moderately differentiated endometrial neoplasm and surgical conduct for bladder reconstruction and maintenance of the patient's continence. There are several aspects to be considered when a bladder reconstruction is performed: the ability to develop a low pressure reservoir with an effective antireflux mechanism that protects the upper urinary tract, a suitable mechanism for storing urine, and providing the necessary vascularity to prevent complications. The benefits of this surgical intervention in patients with radical interventions for oncological indication are related to the maintenance of the continence and the preservation of the quality of life. There are methods that are not continent such as the Bricker bag or ureterostomy and methods that preserve the continence: appendicular reservoir and methods of reconstruction with ileal segment and umbilical stomy. Orthotopic neobladder with T antireflux mechanism is a feasible option of maintaining continence in patients with bladder reconstruction.

Keywords: reconstructive surgery, bladder reconstruction, ileal reservoir, genital neoplasm

Introduction

Urinary diversions are recommended in situations when the bladder is not capable of functioning under safe parameters as a reservoir to store urine or after radical cystectomy. Surgeons have been performing urinary diversions for almost 150 years. In 1852, Simon performed the first ureteroproctostomy⁽¹⁾. Since then, the procedures used for urinary diversion have been perfected and the patient results have seen improvement.

Nowadays, urinary diversions are divided into two categories: continent diversions and incontinent diversions which require external storage units. Orthotopic neobladder reconstruction offers the patient an advantage regarding the integrity of the body image and improved quality of life⁽²⁾.

Case Report

We present the case of a 69-year old patient that presented in our clinic with a vaginal tumour. The patient history reveals that in 2016 she underwent a total hysterectomy with bilateral adnexectomy for a well differentiated endometrial adenocarcinoma endometrioid type.

On the 25th of May 2016 the patient received an endometrial biopsy with the histopathological result of tubulovillous endometrioid carcinoma with large areas of necrosis. Babes-Papanicolau cytology was atypical squamous cells of undetermined significance with

non-specific inflammation. On the 16th of June 2016 surgical intervention is performed and total hysterectomy with bilateral anexectomy is practiced.

The postoperative progression was favourable. Histopathological result: tubulovillous endometrioid carcinoma, well differentiated (G1), infiltrative up to half of the thickness of the myometrium and endocervix (pT2a).

FIGO/TNM staging: pT2apNxpmx (stage IIA), adenomyosis of the uterine body, chronic sclero-atrophic bilateral salpingitis, chronic cervicitis – with parcellar areas of cervical intraepithelial neoplasia (CIN) 1 (low-grade squamous intraepithelial lesion) and ovaries with bilateral serous cysts. Immunohistochemistry tests revealed Ki67 – 30% positive proliferation index, ER – positive in 40% of tumor cells, PR – positive in 70% of tumor cells, p53 – negative.

On the 13th of November 2017, the patient exhibits an urethral tumoral formation for which biopsy was performed with the result of poorly differentiated adenocarcinoma. Immunohistochemistry tests revealed a 60% positive ER in tumor cells, 70% positive PgR in tumor cells, p 53 positive in dispersed tumor cells, WT1 positive, PAX8 positive and Ki67 positive in 80% of tumor cells.

The histopathological aspect correlated with immunohistochemistry tests support the diagnosis of poorly differentiated endometrioid carcinoma of genital origin (Figure 1).

Received:
March 22, 2018
Revised:
April 18, 2018
Accepted:
May 10, 2018

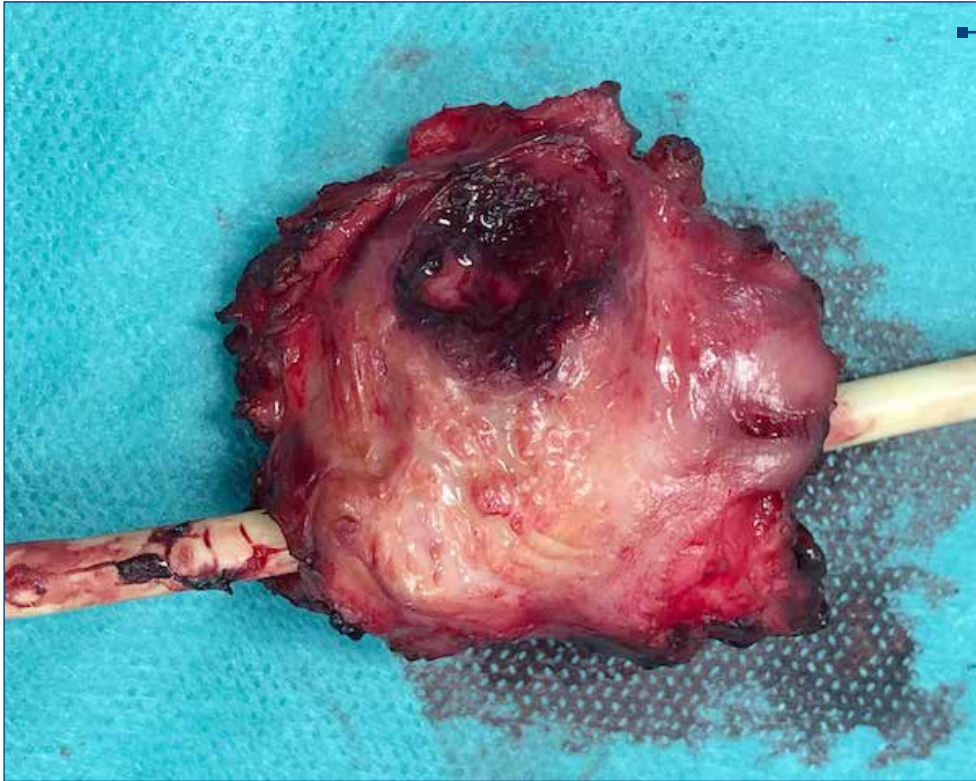


Figure 1. Excised specimen of the infiltrating urethral tumour

The clinical examination revealed an infiltrating vaginal tumour of 2/1 cm at the level of the urethra. A biopsy was performed with the diagnosis of adenocarcinoma.

After obtaining informed consent, the patient underwent the following surgical procedure: excision of the infiltrating urethral tumour with surgical oncological margins, partial anterior vaginectomy, total urethrectomy, reconstruction of the vagina using a Martius graft with a preserved vascular pedicle, orthotopic neobladder with ileal conduit which was exteriorized at the level of the umbilicus, a valve with antireflux mechanism, suprapubic cystostomy for protection, bilateral pelvic lymphadenectomy, pelvic drainage and Retzius drainage.

Histopathological result from the intervention from 25th January 2018: urinary tract wall with hyperplasic focal urothelium, presenting marginal, intraparietal, carcinomatous tumor infiltration, rounded polygonal cell anastomoses and trabeculae, perineural invasion present, invasion undetectable in the lympho-vascular system. Urethral resection limits without carcinoma invasion.

The histopathological aspect correlated with the patient's history is consistent with the diagnosis of malignant intraparietal malignant tumor infiltration, extrinsic to poorly differentiated endometrioid carcinoma. A number of 11 lymphatic nodes were examined showing sinus histiocytosis, immunoreactive aspect.

On 4th of May 2018, the patient presented with a small vaginal bleeding episode. The clinical examination revealed a wound granuloma. In this context, we decided to excise the thread granuloma with histopathological result of connective tissue, numerous thin-walled vessels and inflamed lymphoplasmocitary infiltration.

On 15th of June 2018, the patient performed a magnetic resonance imaging control with the post-operatively favorable evolutionary outcome result. No signs of pelvic loco-regional recurrence. No secondary abdominal or pelvic lesions. Images with adenopathy or pelvic lymph images with constant or discreet appearance and minimal dimensional growth. Without any abdominal adenopathy.

This antireflux technique is created using an afferent ileal segment. In order to facilitate and achieve an optimal vascularization of the afferent ileal segment that constitutes the antireflux mechanism a series of mesentery windows ("Windows of Deaver") must be created followed by placement of Penrose drains into each window.

Several sutures are placed through these windows in order to connect the afferent ileal segment to the serosa of the two segments of the reservoir.

The afferent limb is tapered, and the two ileal segments are divided next to the mesentery from the cone up to the orifice of the afferent segment.

The incision is conducted laterally to the antimesenteric edge and continued upward. In this manner,

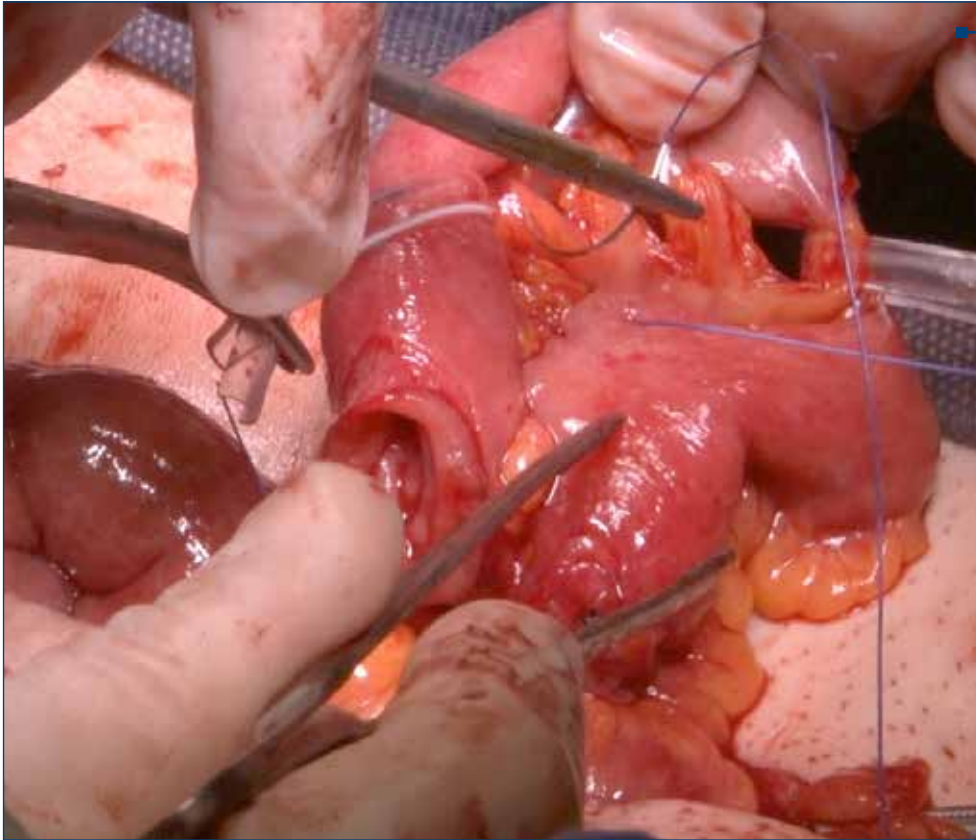


Figure 2. Sutures being placed in the Windows of Deaver to connect the afferent ileal segment to the serosa

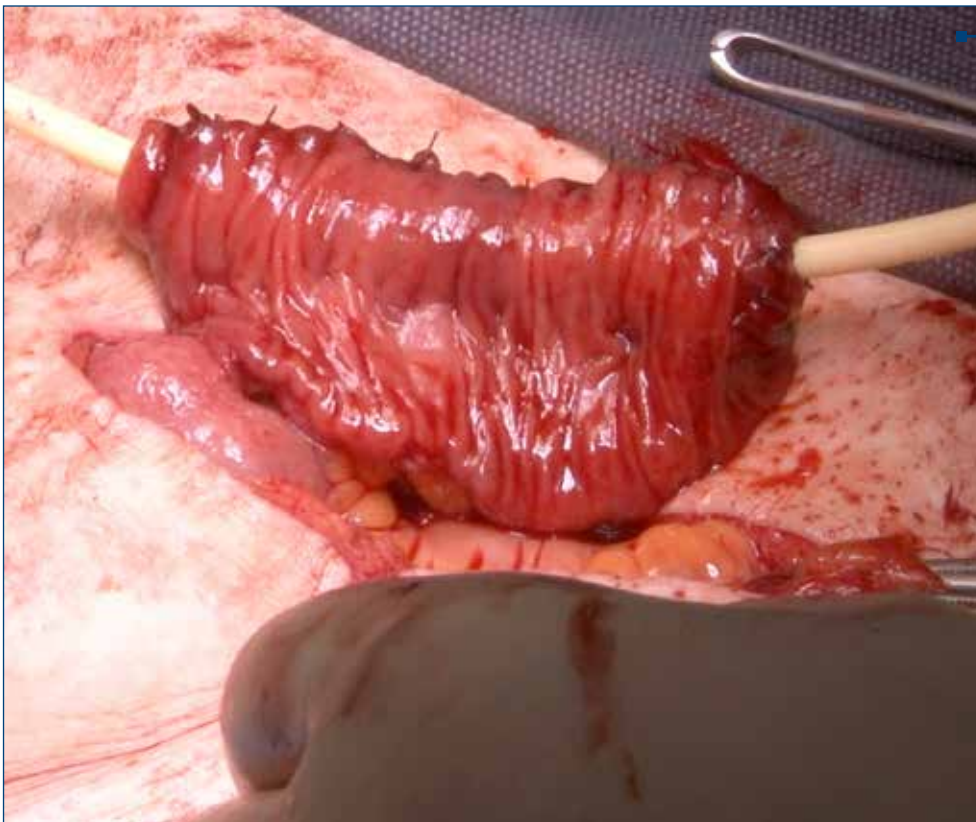


Figure 3. The two ileal flaps are created and placed onto the afferent ileal segment in order to create the antireflux mechanism

the two ileal flaps are created and placed onto the afferent ileal segment in order to create the antireflux mechanism (Figure 2).

The postoperative evolution was favourable. The patient was discharged after 5 days. The umbilical urinary Foley catheter was removed on the 14th day postoperatively.

The patient reported reduced urine output during follow-up and presented with mucus deposits that obstructed the cystostomy. This was resolved after washing with 20 ml of saline solution.

The suprapubic cystostomy that was placed for protection which was removed 1 month after the surgery. After this, the patient underwent intermittent self-catheterization. Three days after the patient presented with urinary retention which was resolved in the hospital (Figure 3).

Discussion

There are some important aspects that should be taken into consideration in a patient proposed for orthotopic neobladder. The first aspect is the ability to develop a low-pressure reservoir with an efficient antireflux mechanism which is needed in order to protect the upper urinary tract⁽³⁾.

We must mention the importance of preoperative work-up and thorough assessment of the renal function prior to the intervention. Affected renal function is also a contraindication of this procedure. The kidney will have to make an additional effort to excrete the degradation products due to the fact that the urine will have a longer contact with the intestinal segment. The degradation products will be partially resorbed and then excreted.

Due to the fact that the bowel's microstructure is different from that of the urothelium the neobladder will have a higher reabsorption capacity. This will give

rise to some short-term and long-term complications.

The use of bowel segments in the reconstruction of the neobladder exposes the patient to some short and long-term complications. These complications arise in accordance with the segment that has been used and its length (Table 1).

Short-term complications include: fistula, urinary retention and recurrent urinary infections. During the follow-up period, patients that have undergone orthotopic neobladder reconstruction must be evaluated for urinary tract infections.

Approximately 25% of patients present with asymptomatic bacteriuria and urinary tract infections. A less common complication is urosepsis⁽⁵⁾. Factors that are associated with higher risk of urinary tract infections in patients that underwent neobladder reconstruction are: female gender, residual urine volume after voiding, increased body mass index and diabetes^(6,7,8).

Long-term complications that arise during orthotopic neobladder reconstruction are related to: hyperchloremic metabolic acidosis, electrolyte imbalance, B12 vitamin malabsorption, cholelithiasis, nephrolithiasis and infections⁽⁹⁻¹²⁾.

Conclusions

Orthotopic neobladder with T pouch an antireflux mechanism with ileal segment is a feasible option of maintaining continence in patients with bladder reconstruction. Orthotopic neobladder has some advantages compared to other forms of urinary diversion. This procedure requires doctor-patient counselling. Compared to other forms of urinary diversion, patients who underwent orthotopic reconstruction reported a better quality of life. ■

Conflict of interests: The authors declare no conflict of interests.

Table 1 The implications of bowel resections depending on the site. Adapted after Thurairaja et al.⁽⁴⁾

Resected segment	Increases	Decreases
Ileal	Risk of stone formation* Renal (oxalate)* Gallbladder (cholesterol)* Risk of neurologic deficit*	Vitamin B12 absorption* Bile acid absorption* Lipid absorption* A, D, E, K Vitamin*
Ileocaecal	Colonic organisms rate of proliferation Steatorrhea Stone formation secondary to bile acid loss Stool frequency	Intestinal transit time
Colonic		Salt and water reabsorption - diarrhoea Storage capacity

*Resections up to 60 cm are well-tolerated. The risk of malabsorption increases in cases with resections larger than 100 cm.

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