

# Partial Cystectomy with Distal Ureteral Resection and Re-implantation for Locally Invasive Cervical Cancer

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**Abstract.** *Cervical cancer is an aggressive gynecological malignancy which can develop local invasion of the surrounding organs. In cases presenting locally advanced disease, the association of neoadjuvant chemo-irradiation might reduce the local invasion and might transform the patient into a candidate for a conservative surgical procedure. However, there are also patients who refuse any association of neoadjuvant treatment; we present the case of a 52-year-old patient diagnosed with a locally invasive cervical tumor involving both ureteral ostia who formally refused any neoadjuvant oncological treatment and urostomy. Total radical hysterectomy with bilateral adnexectomy with partial cystectomy and distal bilateral ureterectomy was performed. The two ureters were re-implanted in the remnant urinary bladder.*

The wide implementation of screening tests for early detection of cervical cancer in association with the administration of neoadjuvant irradiation and cisplatin-based chemotherapeutic protocols has led to a significant decrease of cases in which multiple visceral resections are needed in order to obtain a curative resection (1). However, there are still cases in which this standard protocol cannot be applied and more radical pelvic surgery is required to completely resect the tumor. Anatomically, due to the close proximity of the urinary tract and the gynecological tract, local invasion frequently occurs, especially in aggressive pelvic malignancies (2). The only barrier against tumor propagation remains the compartmental borders which develop during embryonic life and are responsible for the complete

separation of the urinary, digestive and gynecological tract. Initially these compartmental borders represent true natural barriers which are capable of limiting tumor propagation; however, in time, due to the progression of the disease, these barriers will be destroyed and local invasion will occur (3). In these cases, more extended pelvic resections are required.

## Case Report

A 52-year-old patient presented for pelvic pain associated with vaginal bleeding and hematuria. Local examination revealed the presence of a bulky, relatively fixed cervical tumor invading the anterior wall of the urinary bladder. The cystoscopy confirmed the presence of tumor invasion involving both ureteral ostia. The colonoscopy excluded any rectal involvement, while abdominal computed tomography excluded any distant metastases. Initially, the patient was addressed to the Oncology Clinic in order to be submitted to neoadjuvant chemoradiation; she formally refused any oncological treatment but accepted the idea of *per-primam* resection. Preoperatively, when discussing with the patient the possible methods of urinary diversion or reconstruction, she also refused any urinary diversion; the patient accepted to undergo only urinary reconstruction with bilateral ureteral re-implantation. She was submitted to surgery and a radical hysterectomy with bilateral adnexectomy *en bloc*, with partial cystectomy and bilateral ureterectomy, and pelvic and para-aortic lymph node dissection were performed. The continuity of the urinary tract was re-established through a bilateral ureteral re-implantation (Figures 1-3); the two anastomoses were protected by placement of double J urinary stents, which were removed one month postoperatively. The postoperative course was uneventful, the patient being discharged on the twelfth day.

The histopathological examination revealed the presence of a moderately differentiated cervical tumor, with local invasion of the urinary bladder (Figures 4 and 5). The specimen had negative resection margins on the resected urinary bladder and the resected ureteral segments. However,

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postoperatively the patient was re-addressed to the oncology service but again refused any chemotherapeutic treatment. In conclusion, although the patient refused all neoadjuvant and adjuvant therapy, and also refused the idea of total cystectomy and ureterostomy, the tumor was resected in good condition, with macroscopically-negative resection margins. At one year follow-up the patient is free of recurrent disease.

## Discussion

The possibility of re-establishing the continuity of the urinary tract by ureteral re-implantation through neocystostomy was first explored in patients submitted to gynecological surgery for benign conditions in which ureteral lesions occurred during dissection. When it comes to patients submitted to surgery for locally advanced pelvic malignancies involving the urinary bladder trigone, the golden-standard therapy remains pelvic exenteration. However, there are cases in which the local involvement requires only segmental resections of the urinary bladder or of the distal ureters (4, 5). In all such cases in which the pelvic ureter is resected, surgical options include ureteroneocystostomy, which might necessitate urinary bladder or kidney mobilization in order to perform a tension-free suture, ileal ureter, transureteroureterostomy or cutaneous ureterostomy (6-15). Berek *et al.* conducted a study on 16 patients with locally advanced ovarian cancer submitted to ureteral resection during primary cytoreduction in 12 cases and secondary cytoreduction in four cases. The main urinary tract reconstruction consisted of ureteroneocystostomy in five, transureteroureterostomy in five cases, ureteroureterostomy in two and urinary diversion in four cases. In another eight patients, partial cystectomy was also carried out, which necessitated ureteral re-implantation in two cases and urinary diversion in one. Complications occurred in one case with ureteroureterostomy and consisted of anastomosis stricture, and in one case of ureteroneocystectomy, which consisted in the development of a urinary leak. According to this study, the most efficient urinary reconstruction consisted of ureteral reimplantation or transureteroureterostomy (4).

In a study conducted by Hoffman *et al.* involving 4,884 patients submitted to surgery for pelvic benign or malignant conditions, ureteral reconstructions were needed in 46 cases: in 30 cases, reconstruction was performed after iatrogenous lesions, while in the other 16 cases, ureteral surgery was related to local tumoral invasion. The main indications for ureteral resection were: ovarian and recurrent ovarian cancer in nine cases, vaginal cancer in two, recurrent cervical cancer in one case, class V radical hysterectomy, and locally invasive endometriosis in one. In all cases, the continuity of the urinary tract was re-established by ureteroneocystostomy; bilateral ureteral resection and re-implantation associated with urinary bladder elongation was

performed in the case diagnosed with locally invasive endometriosis. One case which necessitated partial resection of the urinary bladder trigone and distal ureterectomy reported persistent urinary frequency and incontinence after surgery, which was attributed to a small bladder capacity. Another complication related to ureteral surgery was the development of a vesico-vaginal fistula in a patient who had been initially submitted to neoadjuvant therapy followed by radical hysterectomy for cervical cancer (2).

When it comes to the efficacy of performing an anti-reflux procedure, while most authors consider that ureteral tunneling should be part of the standard protocol (6-9) others consider that direct anastomosis is enough and tunnelization is only needed in children, and in women who may become pregnant in future (2).

In their study, Manolitsas *et al.* reported the utility of an ileal segment to restore the functional integrity of the renal tract where lower ureteral resection is necessary in gynecological oncology surgery. Ureteroileocystostomy was performed in eight cases; the initial diagnosis was ovarian cancer in six cases, endometrial stromal sarcoma in one case and vaginal cancer in one case. Bilateral urinary reimplantation was performed in a single case. Complications included one death at 38 days from aspiration pneumonia, one pelvic abscess causing ureteric obstruction, and three cases of recurrent urinary tract infection (15).

In a study conducted by Elkas *et al.*, involving 10 patients with locally invasive cervical cancer or recurrent cervical tumors involving the urinary tract, the most often used reconstructive method consisted of ileal interposition or augmentation entero-cystoplasty. In one case, a bladder augmentation was performed, associated with right ureteroileostomy and left ureteroneocystostomy. The authors concluded that ureteroneocystostomy should be the reconstruction of choice whenever extended resections are needed (16).

In a more recent study conducted by Constantini *et al.* regarding the place of urological surgery in gynecological oncology involving 728 patients with gynecological malignancies, reconstructive surgery was performed in 83 cases. Most often, urological resections and reconstructions were performed for primary or recurrent cervical cancer followed by ovarian and endometrial cancer. Ureteroneocystostomy was the reconstruction of choice for 11 cases with locally invasive cervical cancer (through direct reimplantation in six cases and through bladder psoas hitching in five cases); in cases presenting ureteral involvement in the context of recurrent disease, ureteroneocystostomy was performed in 13 cases with recurrent ovarian cancer and in two cases with recurrent cervical cancer. Regarding the early postoperative complications, 17 grade III-V urological complications were registered in women submitted to urological surgery (20.4%) (17).

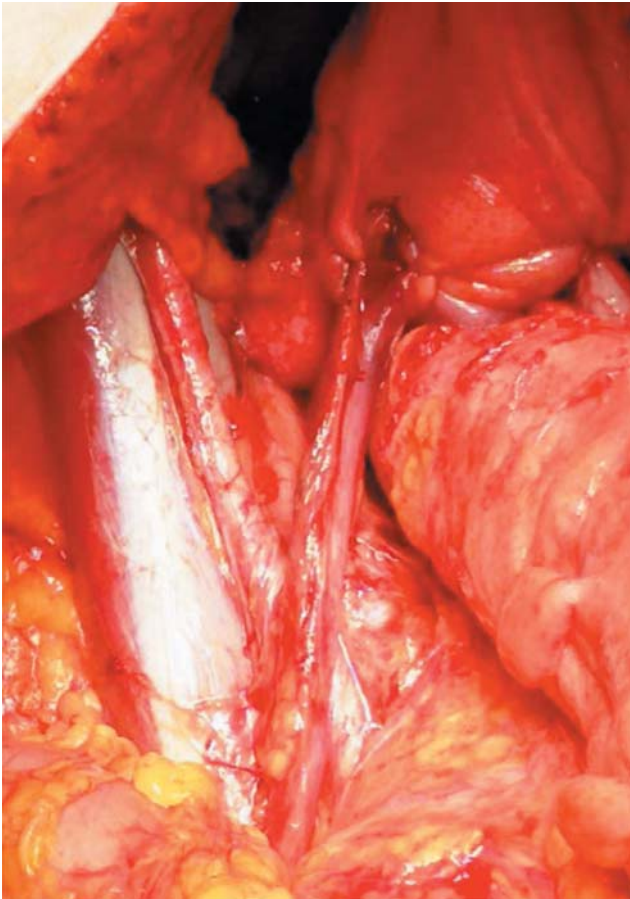


Figure 1. The left ureter was re-inserted into the urinary bladder.

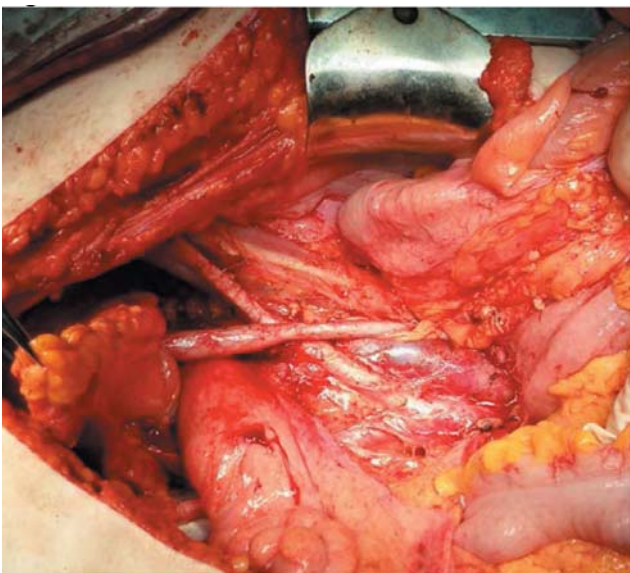


Figure 2. Re-insertion of the right ureter.

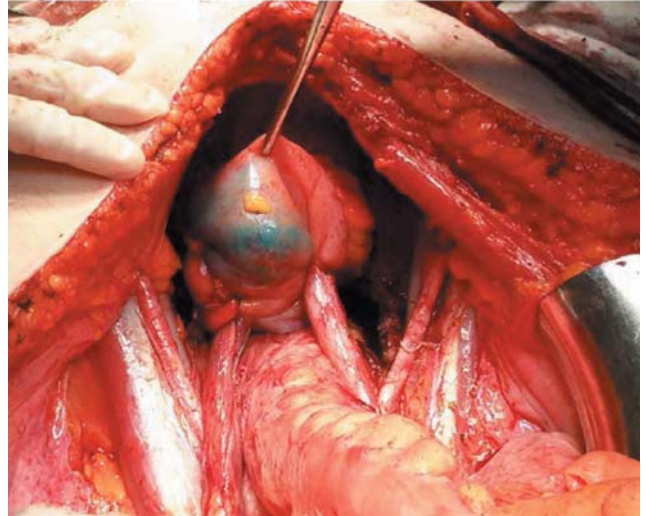


Figure 3. The final aspect after re-implantation, the absence of leaks was tested by injecting methylene blue.



Figure 4. The specimen: total radical hysterectomy with bilateral adnexectomy en bloc with the invaded urinary bladder and ureter, the forceps is placed on the right ureter.



Figure 5. The large cervical tumor has totally destroyed the uterine cavity.



# Conclusion

Although most often the presence of local invasion of the urinary tract is usually a sign of poor prognosis, surgery can be performed under good circumstances. When the administration of neoadjuvant therapeutic protocols is formally refused, as in our case, and for which surgery is the only accepted treatment, it can be successfully applied as a salvage therapy, especially if negative resection margins of the specimen can be obtained. Regarding the possibility of urinary tract reconstruction, bilateral ureteral re-implantation can be safely performed in order to improve the quality of life and to avoid transforming the patient into a permanent urostomy carrier. In our case, the patient refused to be submitted to any neoadjuvant or adjuvant therapy and also refused total cystectomy with bilateral urostomy but did accept surgery consisting of more conservative procedures. Tumor resection *en bloc* with total hysterectomy, bilateral adnexectomy, partial cystectomy and bilateral ureteral resection and reimplantation were successfully performed, with good functional outcomes. When it comes to oncological outcomes, although an anterior exenteration was likely more suitable and resection consisted only of partial cystectomy, the histopathological examination confirmed the absence of any microscopic tumor invasion of the resection margins.

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