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Modern possibilities of urorectal fistula laparoscopic fistuloplasty

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Abstract

Objective. The aim was to study the laparoscopic fistuloplasty possibility of the urorectal fistula (URF) that has occured after the rectal resectionin patient with colon cancer and to determine the ways to improve the results of the treatment for this complication.

Clinical case. Patient N., 60 y. o., underwent the successful laparoscopic fistuloplasty of the URF that has occurred after surgical treatment for colon cancer and adjuvant polychemotherapy.

Conclusion. The minimally invasive fistuloplasty is possible and has a good tolerability even in patients with oncopathology after extended pelvic surgical treatment and chemotherapy. Due to the operation specific this kind of surgery should be performed only in center with high laparoscopic and pelvic surgery experience.

Key words: urorectal fistula; laparoscopic fistuloplasty.

Relevance. Large cases of urogenital fistula are associated with surgical intervention, which cause difficulties in rehabilitation and, despite tht life danger absence, significantly reducing its quality. According to the literary review by Christopher J. Hillary and his co-workers, 75.4% of fistula have iatrogenic etiology, 62.7% of these complications are after transabdominal hysterectomy, 12.7% of other surgical interventions on pelvic organs (PO), including coloproctological operations. [1]

The fistuloplasty issue of urovaginal fistula has been the subject of a large number of analytical studies comparing various fistuloplasty techniques and surgical approaches. Most of these studies demonstrate high rates of successful reconstructive surgery, and in countries with a high level of medical care this indicator is significantly better than in the less developed countries, 93% and 79.7% respectively. Moreover, despite the variability of the treatment tactics, all specialists who have extensive urogenital fistula plastic experience indicate that the optimal terms for reoperative intervention are at least 6 weeks from the fistula appearance, which avoid inflammatory changes and measure the true borders of damaged tissues. Regarding obligatory permanent catheterization of the bladder at the preoperative stage, there is no consensus, but some authors describe spontaneous healing of fistula with prolonged catheterization of the bladder in 6.9% of cases. [2] Of course, patients who have more unsuccessful fistuloplasty after oncology operations, after radiation and chemotherapy, weren`t included in this study.

The the urorectal fistula (URF) reconstruction question is less refreshed in the modern scientific literature. Although this complication is considered rare, it is classified by Clavien-Dindo complication international classification as a grade IIIb complication, i.e. requires repeated surgical intervention, which degrades the life quality and leads to additional material costs. [3]

In most cases, the cause of URF is unrecognized or inadequately eliminated rectum damage during oncourologic interventions, such as radical prostatectomy and radical cystectomy. The URF diagnose is not difficult: clear pathognomonic signs (the presence of gas bubbles and intestinal contents in the urine during urination, inflammatory changes in the urine, which are not eliminated by antibiotic therapy) that force the specialist to assume this complication and send the patient to a specific examination - cystography, cystoscopy, rectoscopy, computer tomography (CT) with intravenous contrast injection. In most cases, a cystogram in 2 projections and cystoscopy are enough to confirm the fistula presence, but when it`s reconstructive intervention planning CT is more informative.

Essential factor, reducing such complication risk, is rightly considered the surgeon experience. However, the indication expansion for surgical treatment with locally advanced cancer of PO, using the radiation and polychemotherapy in the oncological treatment creates additional risks for the URF formation in 11.3%, even with intraoperative damaged rectum elimination. [4] The number of rectal injuries is much higher in open prostate cancer surgery v.s. laparoscopic or robotic (0.50% compared with 0.17%) surgery. There is a small number of minimally invasive URF reconstruction publications that promote transanal fistuloplasy technique, but it`s applicable only to fistulas localized in the urethrovesical anastomosis zone. [5, 6, 7]

Fistula formed after extended colorectal surgery is usually localized above the bladder trangle or in fold between ureters, which creates the technical difficulty for adequate damaged tissues excise without the ureteral damage risk. To reconstruct such fistulas traumatic transabdominal access is required, which is particularly unfavorable for patients after radiation or chemotherapy.

Objective. To study the possibility of laparoscopic fistuloplasty of the urorectal fistula (URF) that has occured after the rectal resection in patient with colon cancer and to determine the regulations that will improve the results of treatment for this clinical category.

Clinical case. Since autumn 2017 patient N., 60 years old, had the periodic episodes of bloating and obstipation, resolved for two times a week. After 1 month, the patient's condition became worse by the pain addition in the lower abdomen and intermittent febrile fever. In this regard the patient presented in the primary health care center at the residence place. After duty surgeon consultation a contrast CT examination of the abdominal cavity (AC) and PO was performed with further therapeutic tactics determination. There was the lower third of the sigmoid colon tumor with perforation signs and pericancrozal abscessing with minimal mesenteric reaction. After that the patient presented to the Reconstructive

Center (University Clinic) of Odessa National Medical University (UC), where has been performed an interventiont: Laparotomy. Infiltrate mobilization. Abscess dissection. Obstructive anterior rectal resection (Hartman type). The patient was discharged from the hospital for 7 postoperative day with improvement and further received 6 courses of adjuvant polychemotherapy according to the XELOX standard. 1 month after the latest course of chemotherapy, the patient was hospitalized to the surgical department of the UC to undergo the reconstructive phase of the operative intervention (closure of the colostoma). On 7.02.18 the operation in scope of laparoscopic visceral adhesiolysis, mobilization of both colostomy and rectal stump with the subsequent circular descendorectoanastomosis was performed. 4 days later the patient complained of gases and feces escaping the urethra while urination. According to the cystography data, X-ray signs of bladder-intestinal fistula were revealed. The patient was performed laparotomy with the protective loop ileostoma forming and the efferent loop ligation. The bladder was catheterized with the Foley catheter (20 Ch) and a wait-and-see tactic was undertaken.

After 21 days the patient underwent cystoscopy: a fistula with a diameter of about 10 mm localized 5 mm to lateral from the left ureteral ostium was found while the bladder mucosa was inflamed and hydropic. Considering the early postoperative period, inflammatory tissue changes in the fistula and the absence of the upper urinary tract urodynamic disturbances, the urethral catheter was removed and the patient continued medical anti-inflammatory therapy on an outpatient basis.

After 3 months, the patient was re-hospitalized to the UC with complaints of constant discomfort and social disadaptation associated with uncontrolled urinary excretion through the rectum. According to the control contrast CT scanning of abdominal and pelvic organs, signs of bladder-intestinal fistula, severe adhesive process of pelvic organs, loop ileostoma were described. CT-signs of tumor recurrence and metastases were not revealed. A multidisciplinary concilium consisting of oncological surgeons, urologists and chemotherapists made a decision on the possibility of reconstructive surgical intervention to eliminate fistula with laparoscopic access with the condition of the urologist participating the surgical team.

On 03, July under general anesthesia in the lithotomy position, a control cystoscopy was performed in order to evaluate the fistula topography according to the left ureter ostium. Inflammatory changes in the bladder mucosa were not observed, the scarring margins around the fistula aperture were clearly visualized. The attempt of left ureter catheterization failed because of its deviation in the intramural portion due to its proximity to the fistula. Then the

patient was transferred to Trendelenburg position, pneumoperitoneum was applied, trocars were installed in their standard position for laparoscopic surgery on pelvic organs. The visceroadhesiolysis was performed in a "cold-way" in combination with the ultrasound scalpel "Lotus" use. After that the posterior leaf of the peritoneum was dissected and the posterior bladder wall was extraperitonized.

In the small pelvis cavity both ureters' juxtavezic portions and the urinary arteries were visualized, so it allowed to monitor these anatomical structures during the operation and to avoid their damage. No signs of the tumor process recurrence or lymphadenopathy were not revealed. It was found a complete dissociation of previously imposed descendo-rectal anastomosis, which subsequently led to elongated operation terms. The posterior bladder wall was widely perpendicularly dissected in the fundal part, so a good visualization of ureters, the urinary bladder, the anus and the fistula was provided (Figure 1).

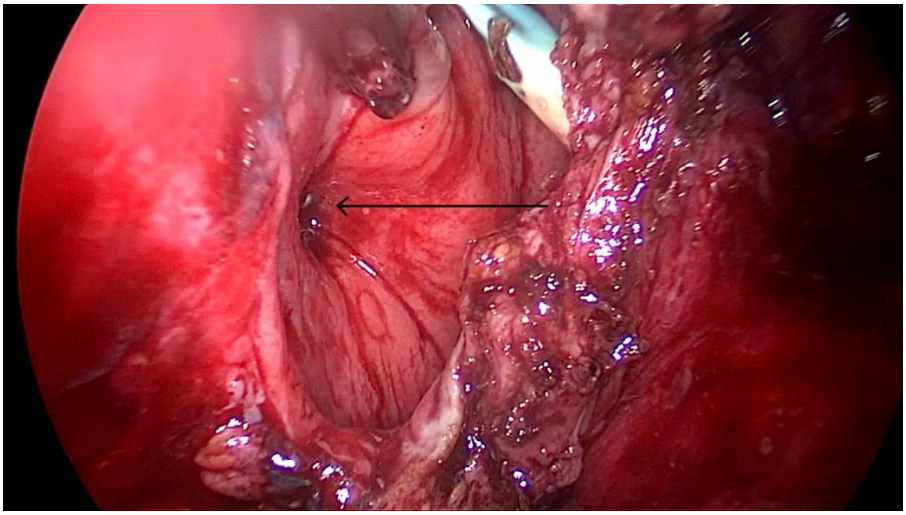

Fig. 1 - Dissected urinary bladder. The arrow indicates the fistula.

Due to the close fistula location to the left ureter intramural portion, the second one was stented with an ureteral stent 6 Ch. In a "cold" way, in combination with the ultrasonic scalpel Lotus, the bladder mucosa around the fistula was circularly dissected, the fistula was excised with surrounding scar tissue (Fig. 2.3).

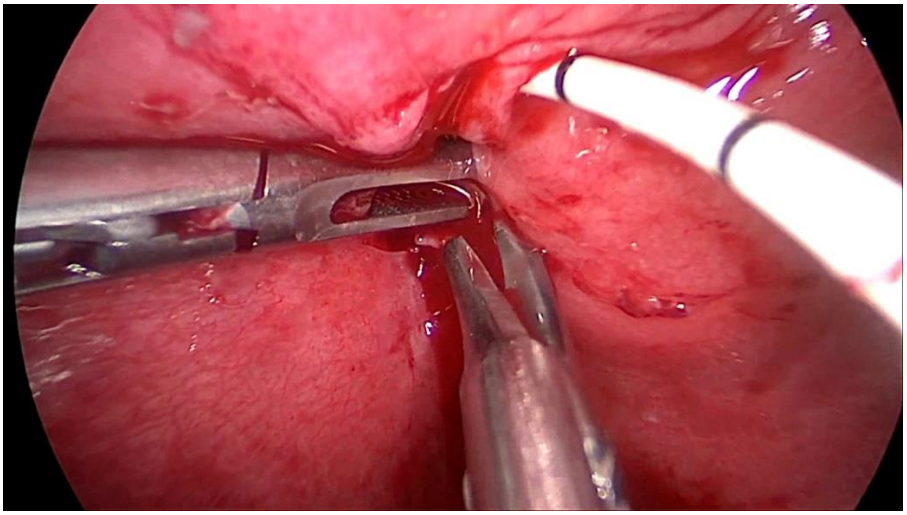

Fig. 2 - Excision of the fistula in a "cold-way".

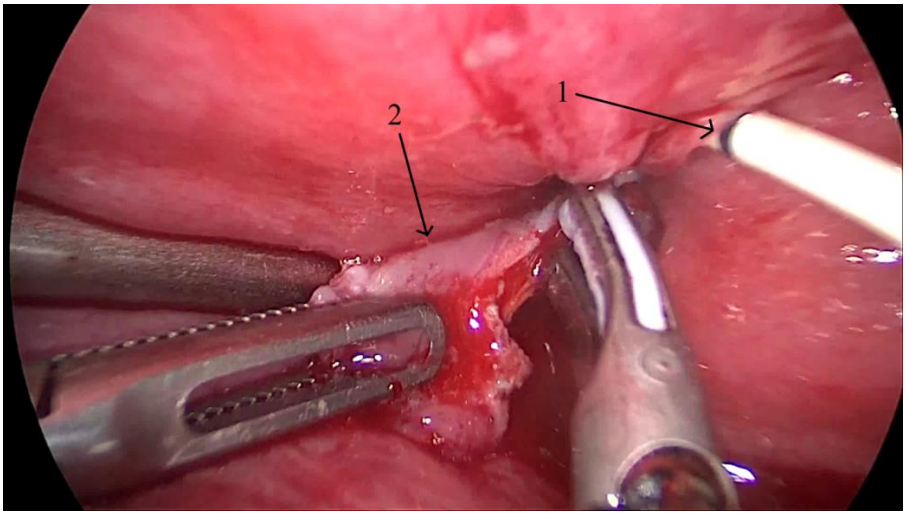

Fig. 3 - Excision of the fistula with the ultrasonic scalpel "Lotus".

1 - the ostium of the stented ureter

2 - fistula tissue

The criterion for sufficient excision was the rectal mucosa visualization. The walls of the bowel and bladder were prepared and divided (Figure 4).

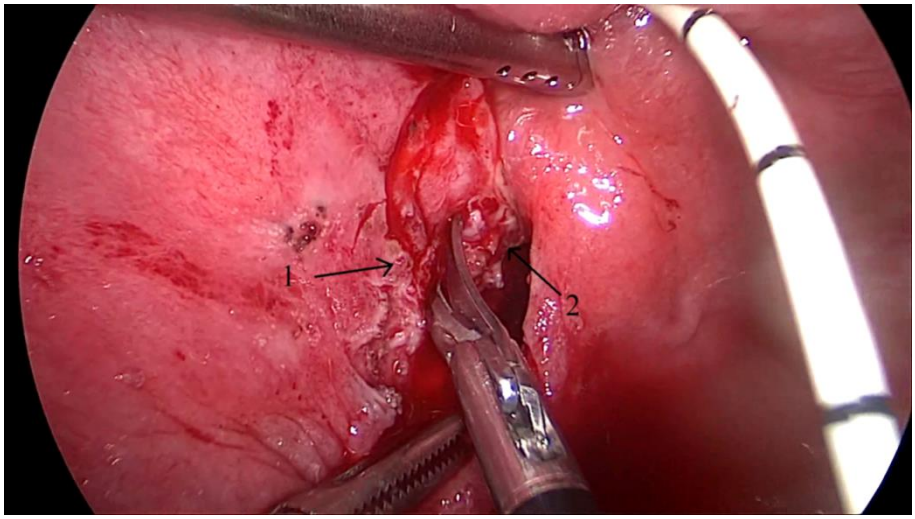

Fig. 4 - Separation of the bladder and rectum walls.

1 - the wall of the bladder

2 - the wall of the rectum.

Defects of the walls of both hollow organs were sewn with a single continuous suture in the cross direction with the "Vicryl 4.0" thread (Figure 5.6).

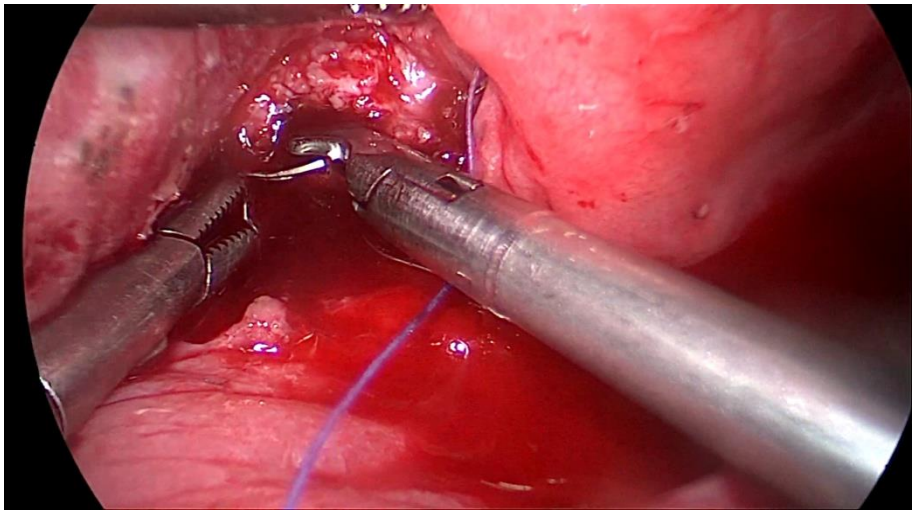

Fig. 5 – Rectal wall closure with «Vicryl 4.0».

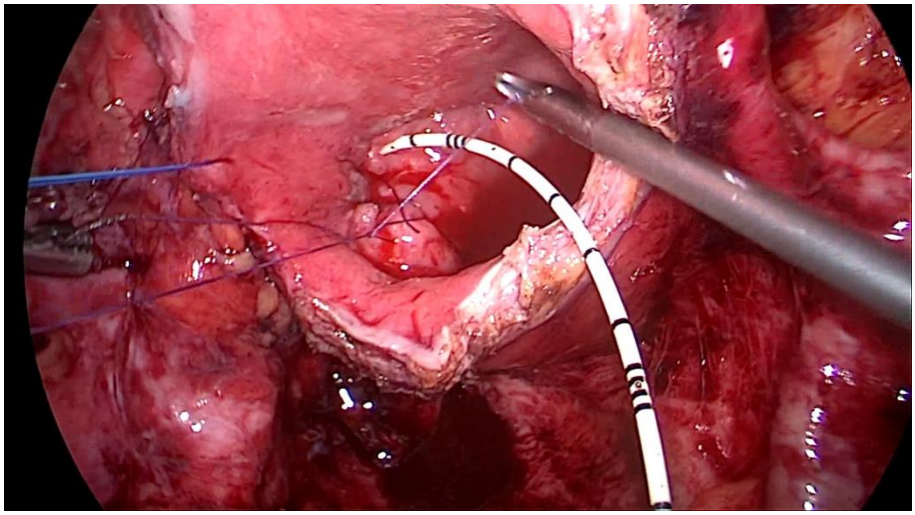

Fig. 6 – Bladder wall complete closure with «Vicryl4.0».

After that ureteral stent was removed, urinary flow from ureteral ostia was visually controlled. Urinary bladder was closed with double-layered running suture «Vicryl 3.0». Urethral catheter Foley (18 Ch) was placed (Fig. 7).

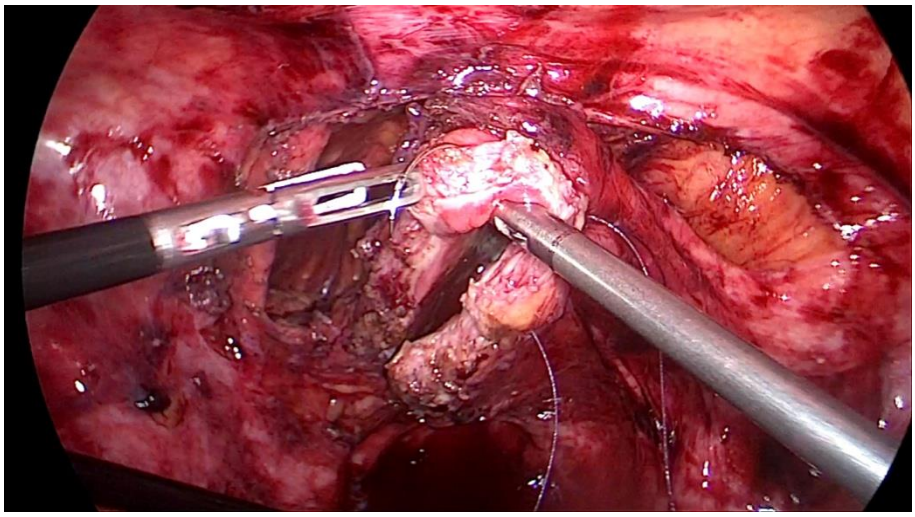

Fig. 7 – Urinary bladder closure with «Vicryl 3.0».

The bladder was instilled with methylene blue solution to control the suture hermeticism, no leak was mentioned. Rectum stump was futher mobilized to construct descendorectoanastomosis with circular stapler (Covidien EEA DST 28 mm). Bubble-test was negative. There were no postoperative comlications. The patient was discharged on 6th postoperative day. Control cystography on the 11th day showed no signs of urinary leak or fistulas. The urethral catheter was removed. After 2 months on follow up the physical status remains satisfactory with no fistula recurrence. The patient is a candidate for stoma reversal 3 months past fistuloplasty.

Conclusions:

1. Hollow organs integrity should be controlled during surgical interventions for locally advanced pelvic malignancies

2. Chemotherapy and radiotherapy increases the risk of vesicorectal fistulas after extensive pelvic surgery

3. Vesicorectal fistula should be managed operatively not earlier than 2 months after because of local inflammation

4. Laparoscopy ensures adequate visualization and organ restoration with minimal trauma

5. Wide urinary bladder incision with ureteral stenting prevents ureteral ostia injury during fistula dissection

6. These kind of surgical interventions should be performed in facilities with sufficient experience of laparoscopic abdominal and urological surgery.

Conflicts of Interest: The authors have no conflicts of interest to declare.

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