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PROCEEDINGS

LATE DIAGNOSIS OF URINARY PERITONITIS DUE TO A LESION OF THE LEFT URETER DURING LAPAROSCOPIC ANTERIOR RESECTION OF THE RECTUM— LAPAROSCOPIC SOLUTION. CLINICAL CASE AND LITERATURE REVIEW

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ABSTRACT

Ureteral lesions are a rare complication of colorectal surgery. This type of surgical procedure is the second most common cause of such complications, second only to gynecological operations, which account for around 50%. According to the localization of the lesion, they are grouped into three types: injury to the proximal, middle, and distal part of the ureter, with the latter being the most common—around 80–90%. Most of the lesions are not recognized intraoperatively and sometimes the diagnosis can be delayed significantly. The time of diagnosis and the localization of the injury are crucial to the choice of treatment. We present a case of a patient, with a late diagnosis of lesion of the left ureter after the laparoscopic anterior resection of the rectum, which was treated with a laparoscopic uretero-ureteral anastomosis with simultaneous double-J catheterization. We also present a short literature review on the subject.

Keywords: *urinary peritonitis, laparoscopic anterior resection, rectum, ureteral lesion, ureter*

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INTRODUCTION

Iatrogenic lesions of the ureter are a rare but severe complication of pelvic surgery, which often leads to significant morbidity. Their occurrence varies from 0.07% to 1.7% in gynecological operations, while in colorectal surgery it varies between 0.24% and 1.9% (1). As an overall percentage, gynecological surgery accounts for 50–80 %, while the percentage for colorectal procedure is around 9%, with the

other cases occurring in urological and vascular surgery. Depending on the location of the lesion, we distinguish lesions of the proximal (from the pyelon to the upper margin of the sacroiliac joint), middle (from the upper to the lower margin of the sacroiliac joint), and distal (encompassing the part from the lower margin of the sacroiliac joint to the confluence with the urinary bladder). Up to 91% of the injuries occur in the distal third. Only around a third of all lesions to the ureter are recognized intraoperatively, although, if diagnosed and treated during the primary operation, this could prevent several further complications (urinoma formation, abscess, urinary peritonitis, systemic infection, sepsis). With regard to reaching an intraoperative diagnosis, the authors suggest a low threshold of suspicion and meticulous dissection of the ureter along its entire course in complicated circumstances (previous surgery, radiotherapy, etc.) (3). When the diagnosis is not made intraoperatively, patients usually present themselves with abdominal and flank pain, fever, clear secretion from the drainages, with hematuria being a relatively uncommon finding. The gold standard for establishing the diagnosis is retrograde pyelogram and, if it is impossible—CT venous pyelogram. Depending on the location of the lesion, the choice of treatment varies significantly. When the injury is to the proximal and middle third of the ureter, usually the method of choice is primary uretero-ureteral anastomosis with double-J catheterization, with some more severe lesions in the middle third requiring either transuretero-ureterostomy, Boari flap, or psoas hitch technique (mobilization and attaching the urinary bladder to the psoas muscle). When the injury is to the distal third, the method of choice is reimplantation of the ureter into the bladder (2). In more complicated situations, ileal conduit or auto transplantation should be considered.

CASE PRESENTATION

We present the case of a 58 y.o. female patient, admitted for surgical treatment of a known tumor on the rectosigmoid junction. As comorbidities the patient had cholelithiasis, as well as arterial hypertension. The patient was indicated for a laparoscopic anterior resection with simultaneous cholecystectomy. During laparoscopy it was found that the tumor infiltrated the left broad ligament of the uterus. The tumor was detached from the latter, using a bipolar device (both forceps and LigaSure™) (Fig. 1). No leakage of urine was detected during the procedure.

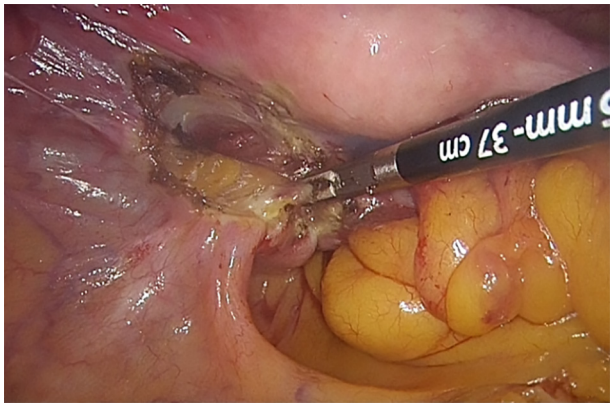

Fig. 1. The most likely site of the injury.

The operation proceeded as planned, with no further technical difficulties. What followed was a complicated postoperative period, with protracted postoperative ileus, pain and distension particularly in the lower abdomen, as well as a persistent serous secretion of around 100 mL daily. On the sixth postoperative day the secretion tended to decrease, and the drain was removed. After resumption of oral intake and full mobilization, the patient was discharged. Afterwards the abdominal pain persisted, as well as lack of appetite, nausea, and dysuria. The patient was consulted with a urologist and a diagnosis of urinary infection was made. Despite starting antibiotic treatment, the symptoms did not subside. On postoperative day 38 the patient was readmitted. An abdominal ultrasound was performed, which

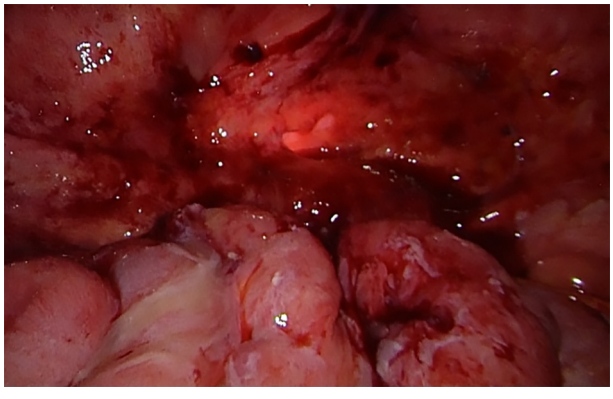

Fig. 2. The abdomen during the re-laparoscopy.

found abundant free fluid in the abdominal cavity, with sonographic characteristics of exudate, thrombosis of the right portal branch as well as suspicions of peritoneal carcinosis. On the 40th postoperative day, a second laparoscopy was performed upon which severe inflammatory adhesions on all parts of the abdomen, clear yellowish exudate, mainly in the pelvis—initially interpreted as lymphocele, were discovered (Fig. 2).

A sample for biochemical analysis was taken, which showed extremely high levels of urea concentration (63.2 mmol/L versus 2.6 in the serum). Afterwards, a transcystic retrograde pyelogram was performed, which found extravasation of contrast fluid in the distal third of the left ureter. An attempt was made to simultaneously catheterize the ureter, which was unsuccessful. On the 45th day since the first operation, the patient underwent another laparoscopy, the site of the lesion in the distal third of the ureter was verified (partial transection of the latter), a double-J catheter was inserted transcystically and was secured in the proximal part. The edges of the lesion were excised and the defect was sutured with a 4/0 Prolene suture (Fig.3, Fig. 4). What followed was a smooth postoperative period with early resumption of oral intake and mobilization. On postop day 8, another abdominal ultrasound was performed, which did not find any residual fluid in the abdomen. After 2 months the double-J catheter was removed. On the follow up exams, 6 and 12 months after the repair, there were no pathological CT findings.

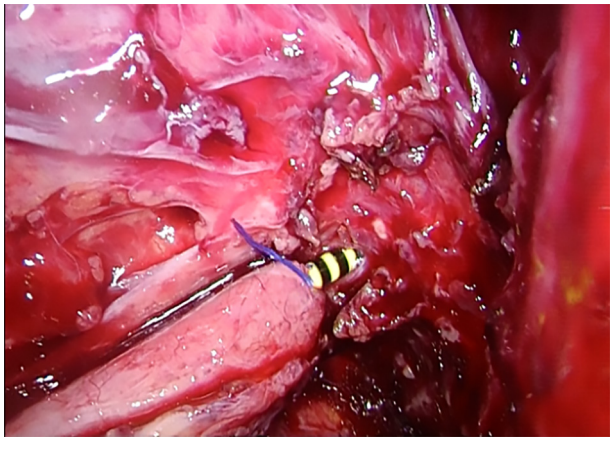

Fig. 3. The ureter after the insertion of the double-J catheter.

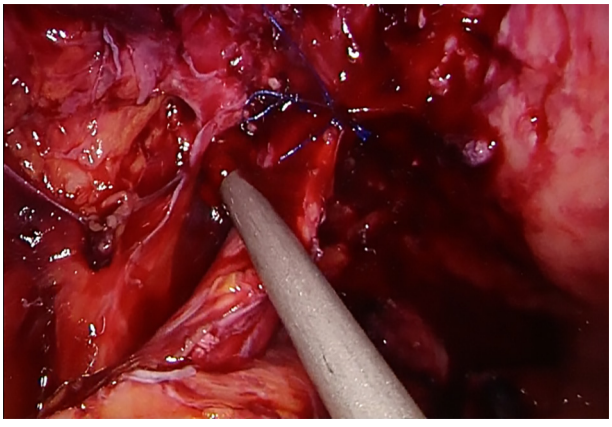

Fig. 4. The ureter after the suturing.

LITERATURE REVIEW

A retrospective study by Halabi et al. (1) analyzing all colorectal surgeries performed in the USA for the 2001–2010 period, showed a frequency of around 0.28 % for all ureteral lesions. As the main risk factors, it pointed to procedures of the left colon and rectum (left hemicolectomy, anterior resection and amputation of the rectum), the presence of adhesions, operations due to malignancy and diverticulitis. The study showed a slightly lower frequency of lesions in emergency cases vs. elective surgeries (2.4 vs. 3/1000). Laparoscopic techniques showed a somewhat protective effect, with frequency of lesions dropping to 1.1/1000 vs. 2.8/1000 in open surgery, but the conversion rate increased significantly to 7.8/1000. Another study from Zafar SN et al. (4), which reviewed a multicentric database of over 95 000 colorectal surgeries, performed between 2005 and 2010, discovered an overall frequency of ureteral lesions of 0.6% in all cases, with open surgeries showing an overall higher frequency of 0.66% vs. 0.53%). Cases which were converted from laparoscopic to open were excluded, since the study team was unable to determine whether the injury happened during the open or laparoscopic stages of the intervention. Another retrospective study of Aguilera A et al. (5), analyzing all abdominal surgeries in a single center for a period of 12 years, examined the time of diagnosis of the lesion, with most of the lesions (59%) not being recognized. A statistically significant difference was found in regard to the intraoperative diagnosis of ureteral injuries in open surgeries: 61% vs. 36% in laparoscopic, which was explained by the author with the limited point of view in laparoscopic surgery. Due to

the fact that treating the lesion during the initial surgeries achieved more favorable results, many authors have examined the possibility of preoperative ureteral stenting as a potential solution, with easier recognition and possibly prevention of the ureteral injury. A meta-analysis from Hird AE et al. (6), examining 98 507 cases, did not find a significant reduction in the catheterized group compared with the control group, but did discover a significant lengthening of the operative time. With regards to treatment, the American Association of Urologists (7) recommends treating the injuries during the primary surgery. In hemodynamically stable patients and in cases where hemodynamic instability or technical issues are present, they recommend ligation of the injured ureter with temporary nephrostomy. With regards to less severe lesions (contusion, thermal injury) insertion if a double-J stent is sufficient. Depending on the location of the injury, treatment varies. In cases where the lesion is in the middle third of the ureter, it is recommended, whenever possible, to perform a primary anastomosis on a ureteral stent. Regarding the distal segment of the ureter, the recommendation is to reimplant the ureter in the urinary bladder (depending on conditions with or without psoas hitch, Boari technique) or uretero-ureteral anastomosis on a double-J stent. According to the authors, the operative techniques can be performed both laparoscopically and conventionally. Kim et al. (8) examined retrospectively laparoscopically treated ureteral lesions in 5 different centers for a period of 5 years. He examined 61, in whom three different techniques were performed—uretero-ureteral anastomosis, ureterocystostomy, with or without psoas hitch. The operative techniques show excellent short- to midterm outcomes, with median hospitalization, blood loss and duration of ureteral stenting comparable to those in open surgery. During the one-year follow-up, three (4.9%) patients developed strictures, which is comparable to the results in the conventional group. Another study by Rassweiler et al. (9) looked at 20 patients operated for ureteral strictures, 10 of whom laparoscopically and the other 10—using conventional techniques, with the results showing longer operative time in the laparoscopic group, but less blood loss, postoperative pain, time of resumption of oral intake and hospitalization in the latter group.

CONCLUSION

Ureteral lesions are a rare but severe complication of colorectal surgery. Every colorectal surgeon should be familiar with the potential location of the ureteral injury, as well as the therapeutic options. The intraoperative diagnosis of the lesion decreases the likelihood of developing of several complications. Laparoscopic treatment of these lesions is with proven effectiveness and safety, with the advantage of decreasing the hospitalization period and postoperative pain.

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