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Laparoscopic Partial Resection of Tu Formation of a Kidney, Combined with Pyeloplasty

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ABSTRACT

Introduction: Laparoscopic partial nephrectomy is increasingly performed for selected small renal masses as it has been shown to provide similar oncological outcomes to open partial nephrectomy. However, LPN is a technically challenging procedure. The need for hilus clamping is associated with the possibility of renal damage associated with warm ischemia.

Pyeloplasty is a method of surgical treatment for obstruction of the pyeloureteral junction caused by stenosis or the presence of an aberrant vessel pressing externally. As a result, hydronephrosis of the kidney is observed, requiring the performance of deobstructive measures. Today, the classic method of open pyeloplasty has been replaced from the laparoscopic technique.

Objective: We present a clinical case of laparoscopic partial resection of Tu formation of the right kidney combined with laparoscopic pyeloplasty of the same kidney.

Materials and Methods: A 62-year-old patient with established hydronephrosis of the right kidney and a nephrostomy placed in another medical institution. On this occasion, the patient made a consultation with a urologist with the aim of operative treatment and removal of the nephrostomy. The subsequent CT scan of the abdomen revealed hydronephrosis of right kidney with stenosis of the PUJ, an additional finding was Tu formation with a diameter of 40 mm., located in the area of the upper pole, on the dorsal surface of the kidney.

A laparoscopic pyeloplasty was performed, followed by a partial resection of the Tu formation. The operative time was 210 min. Blood loss 150 ml. No complications were observed in the early and late operative period. The patient was discharged on the 5th day.

Conclusion: The laparoscopic technique can also be used in more complicated cases, maintaining its advantages over open surgery - mini-invasiveness, short hospital stay, minimal blood loss and quick recovery of the patient.

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Introduction

With the introduction of new technologies and programs for the prediction and prevention of malignant diseases of the kidney, smaller (T1a) formations, suspicious for tumor lesions, are being detected. They represent 66% of newly discovered renal carcinomas [1]. Renal cell carcinoma represents about 3% of all cancers, with the highest incidence occurring in Western Europe [2].

Laparoscopic partial nephrectomy (LPN) is increasingly being performed for selected small renal masses, as it has been shown to provide similar oncological outcomes to open partial nephrectomy (OPN). However, LPN is a technically challenging procedure. Even in expert hands, this procedure has been shown to have a potentially high complication rate. Specifically, bleeding requiring blood transfusion, urine leakage, and positive margins are among the most common complications. Furthermore, the need for hilum clamping raises the question of possible renal injury related to warm ischemia. Conversely, many OPN series that report more complications are representative of higher-risk groups, as defined by older age, increased comorbidities and symptoms, and decreased renal function [3].

Pyeloplasty is a method of surgical treatment for congenital obstruction of the pyeloureteral junction (UPJ), caused by stenosis or the presence of an aberrant vessel pressing externally, as well as for acquired stenosis - after inflammatory episodes, kidney stone disease, iatrogenically caused.

Laparoscopic pyeloplasty as an option for the treatment of ureteropelvic junction obstruction combines the advantage of open reconstruction with direct image magnification and the possibility of precision in performing the plasty. First described as a minimally invasive treatment option by Schuessler et all in 1993 as a transperitoneal approach, while the original retroperitoneal approach to pyeloplasty was first reported by Janetschek et all in 1996 [4].

Objective

We present a clinical case of laparoscopic partial resection of a Tu formation of the right kidney combined with laparoscopic pyeloplasty of the same kidney.

Materials and Methods

The patient was a 62-year-old man with established hydronephrosis of the right kidney and a nephrostomy tube placed in another medical institution. History of previous laser lithotripsy in the ureter-several years ago. Subsequent stenosis of the ureter and subsequent sequential placement of a stent and after its extraction due to persistent hydronephrosis, a nephrostomy tube was also placed. On this occasion, the patient came for consultation with a urologist for the purpose of surgical treatment and removal of the nephrostomy. After an ultrasound examination after preliminary occlusion of the nephrostomy, the presence of pronounced hydronephrosis was established, as well as a small Tu formation in the area of the upper pole of the right kidney. The subsequent abdominal CT scan confirmed hydronephrosis of the right kidney with stenosis of the UPJ, the additional finding - Tu formation with a diameter of 40 mm, located in the area of the upper pole, on the dorsal surface of the kidney with the appearance of renal cell carcinoma. It was also found that the left kidney had a nephrosclerotic appearance and reduced size,which further obliged the team to perform organ-preserving surgery (Figure 1, Figure 2).

Abdominal CT Scan

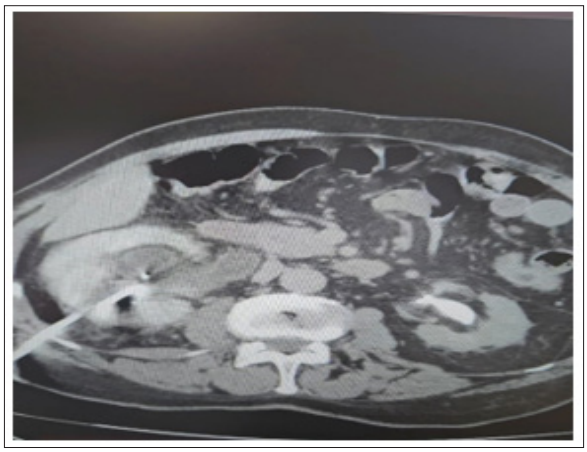


Figure 1: Presence of a Nephrostomy Tube on the Right Kidney and a Nephrosclerotic Kidney on the Left

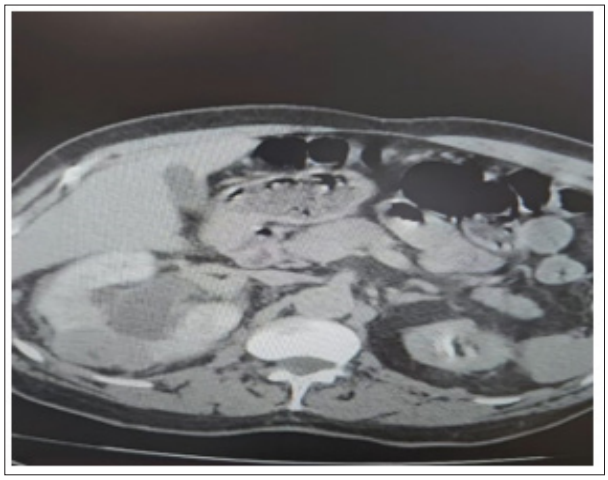


Figure 2: Data on Hydronephrosis and Tu Formation on the Right Kidney

Preoperatively, the paraclinic did not detect any pathological changes - no changes in peripheral blood count, coagulation status, biochemistry (preserved renal function), and uroculture - sterile urine.

Methods

A decision was made to perform a single-stage laparoscopic pyeloplasty and partial resection of the Tu formation. Like any surgical intervention, laparoscopy has indications and contraindications, which the operator must take into account. One of the first steps in patient selection is to take a detailed history and learn about the history of previous surgical interventions, as well as comorbidities. Concomitant diseases, especially such as chronical obsructive pulmonary disease, should be discussed in detail with the anesthesia team, due to the possibility of difficulty breathing during laparoscopic surgery. All standard examinations that are performed during any intervention under anesthesia are also required during laparoscopy [5]. The patient was operated on at the University Hospital "Deva Maria" - Burgas, by the surgical team of the Urology Clinic with operator Dr. S. Stanimirov.

A decision was made to use a transperitoneal approach during the surgical intervention due to the location of the tumor formation. The surgical intervention began with pyeloplasty initially and then moving on to partial resection of the tumor formation. We considered that given the difficult-to-access position of the Tu formation on the dorsal surface of the upper pole of the kidney when starting the surgical intervention with partial resection, this would make the plastic surgery difficult afterwards due to the need to mobilize the kidney.

The patient was placed in the left lateral position on the operating table. He was previously placed under general inhalation anesthesia. An 18Ch urethral catheter was placed.

The first optical port 12mm was placed. by Hasson's method. This was followed by the placement of 3 working ports - two 10mm. and one 5mm. at a standard place for transperitoneal access. The retroperitoneum was reached by opening the parietal layer of the peritoneum along Told's line. The ureter was dissected and the pyelon of the right kidney was reached (Figure 3, Figure 4).

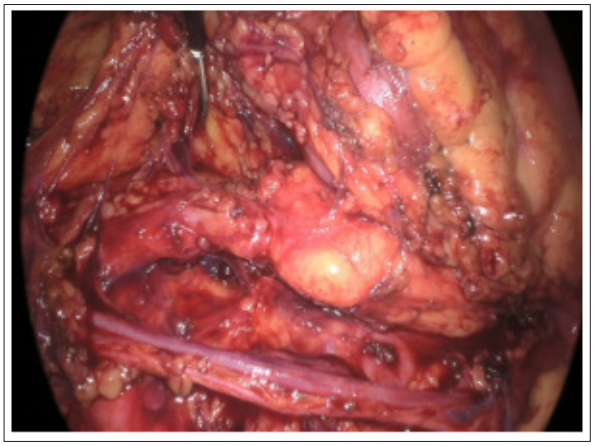


Figure 3: Dissection of the Ureter and Kidney Pyelon

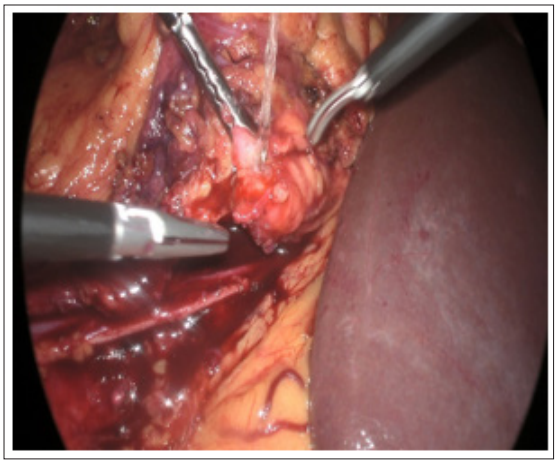
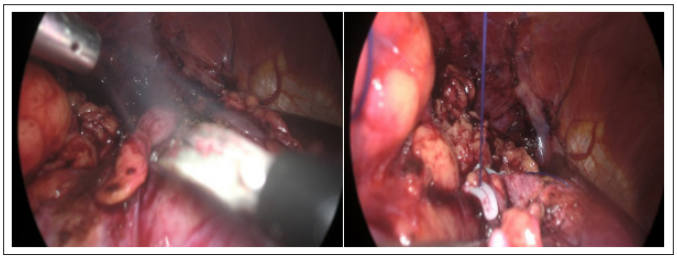


Figure 4: Incision of UPJ with Stenosis

Y-V plasty was performed. 4/0 slowly absorbable suture was used. Needle 19 mm., single, interrupted sutures, with a 6Ch, double J stent previously placed. The surgical intervention continued with the partial resection of the Tu formation. The a. and v. renalis dex were dissected. The kidney was mobilized and the formation was visualized in the area of the upper pole, on its dorsal surface. The a. renalis was clamped and the partial resection was performed. The defect was sutured with 3/0 slowly absorbable suture, 26mm needle. (Figure 5, Figure 6).

During the resection, there was no evidence of involvement and, respectively, penetration to the pyelocalyx system. A marginal section was taken for histological verification and certainty of the radicality of the resection. The operative time was 210 min., warm ischemia time 18 min. Blood loss 150 ml. The following instruments were used during the surgical intervention: bipolar clamp-Yohan type, monopolar scissors, ultrasonic scissors, two needle holders, vascular clamp-Bulldog type, dissector-Right angle type, pump.



Figures 5 and 6: Performing Partial Resection of the Tu Formation

Results

The early postoperative period was uneventful, without complications. The patient received standard antibiotic therapy with 2 g of Ceftriaxone daily, Fraxiparine 0.4 fl.,infusions and standard painless medicaments, we also used a gastroprotector as prophylaxis - Famoditin.The patient was verticalized on the first postoperative day. Small amounts of water were also started on the same day. We did not observe activation of the contact drain. No complications were observed in the late postoperative period. The patient was permanently without fever, without the need of painless medicaments after the 2nd postoperative day. Nephrostomy was extracted after 1 week postoperatively.Stent extraction after a month. Retrograde ureterography - normal.From histology: RCC,(Renal Cell Carcinoma) hypernephroid variant, Furman 2nd stage. No positive margins. Referred for follow-up in oncology.

Subsequent 5 CT FDG scan postoperatively at 3 months - no metabolically active areas in the right kidney.

Discussion

There are many publications in the literature on the performance of partial nephrectomy for renal cell carcinoma compared with conventional open access. Laparoscopic partial nephrectomy (LPN) is increasingly being performed for selected small renal masses as it has been shown to provide similar oncological outcomes to open partial nephrectomy (OPN). However, LPN is a technically challenging procedure. Even in expert hands, this procedure has been shown to have a potentially high complication rate. Conversely, many OPN series that report more complications are representative of higher-risk groups, as defined by older age, increased comorbidities and symptoms, reduced renal function, and poorer tumor characteristics (size and depth) [6].

Regarding the use of laparoscopy in the plastic surgery of the UPJ and the technical difficulties at the beginning - prolonged operating time, unsatisfactory results, with the accumulation of sufficient experience these difficulties were overcome. Today, the use of the laparoscopic approach has a number of advantages over the routinely used open access in the past [7]. Pyeloplasty can be performed via transperitoneal and retroperitoneal access. Most authors advise using the transperitoneal access at the beginning of the learning curve. The retroperitoneal is associated with the need for more experience due to the small operating space and difficult orientation. At the same time, the retroperitoneal access has advantages in terms of avoiding all possible complications when using the intra-abdominal access. A number of authors compare the two accesses in terms of complications, duration, need for additional anesthesia, hospital stay and success rate [8-14].

From the study of the results presented by various authors, it is clear that laparoscopic pyeloplasty is today the method of choice, combining all the advantages of laparoscopy and excellent postoperative results for the patient (all authors report a high success rate). The operative time is quite wide according to the different centers, but this is an expected result. Since this type of operations is invariably associated with a learning curve and is suitable for an advanced team in this type of surgery. At the same time, a low rate of complications and a small number of days of hospital stay are observed in all of them [15].

Conclusion

The clinical case is of interest due to the combined pathology of the right kidney, which represents a challenge for the surgical team. An additional complication is the nephrosclerotic changes of the left kidney, which required organ-preserving surgery. We present the good possibilities of the laparoscopic method, which gives us all the advantages of mini-invasive surgery, without disrupting oncological control, as well as restoring kidney drainage.

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