Synchronous Bilateral Renal Tumors and Prostate Cancer

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Abstract

Introduction and Objectives. Bilateral renal tumors have a rare occurrence, accounting for 1% to 4% of patients with renal cell carcinoma (RCC). Partial nephrectomy (PN) is the first option for treating patients with RCC especially in elective settings. While open PN is still indicated in difficult centrally located or large renal tumors, the laparoscopic approach can be as effective in standard cases. Prostate cancer (PCa) is the second most common cancer in men, accounting for 15% of all the diagnosed cancers. Laparoscopic radical prostatectomy (LRP) is a viable alternative to open prostatectomy. The aim of this paper is to present our management of a patient with bilateral renal tumors and prostate cancer.

Materials and Methods. We present the case of a 65 years old patient, who was referred to our clinic for elevated PSA levels. On ultrasonography and CT examination the patient was diagnosed with a 22 mm right and 21 mm left renal tumors. Prostate biopsy at a PSA of 5 ng/ml showed acinar adenocarcinoma, Gleason score 7 (4+3), stage cT2b, classified as localized intermediary risk. The treatment strategy was to perform staged bilateral 3D LPN and then 3D LRP. Firstly we approached right kidney, then one month later the left. After another month we performed LRP, using an extraperitoneal technique.

Results. We performed LPN on both sides. The operative time was 130 minutes, respectively 140 minutes, and warm ischemia time was 22 minutes, respectively 24 minutes. No major complications and no urinary fistula were encountered in the postoperative setting. Blood loss was approximately 150 ml. All surgical specimens had a minimum 1 mm safety margin of healthy renal tissue. The patient was discharged on the 4th postoperative day. The histopathological examination revealed: RCC on the right side and oncocytoma on the left. For the LRP operative time was 3.5 hours. Blood loss was 250 ml, without intraoperative complications or incidents. The Foley catheter was removed on the day 11th postoperative day. No urinary fistula was encountered in the postoperative course. The patient was discharged on the 4th day after surgery.

Conclusions. In selected cases 3D LPN represents a safe and efficient alternative to open surgery in the management of renal tumors and offers earlier recovery for the patients with less pain and shorter convalescence. LRP offers similar oncologic and functional results as ORP in localized selected cases

Key-words: prostate cancer, renal cell carcinoma, partial nephrectomy, radical prostatectomy, laparoscopy

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Introduction and Objectives

Bilateral renal tumors have a rare occurrence, accounting for 1% to 4% of patients with renal cell carcinoma (RCC). Partial nephrectomy (PN) is the right choice for a cT1a renal mass, but it can also be an option for larger cT1b and cT2 renal tumors [1]. While open PN is still indicated in difficult centrally located or large renal tumors, the laparoscopic approach can be as effective in standard cases.

Prostate cancer (PCa) is the second most common cancer in men, accounting for 15% of all the diagnosed cancers [2]. For men with localized prostate cancer radical prostatectomy (RP) is the primary treatment method. Laparoscopic radical prostatectomy (LRP) is a viable alternative to open prostatectomy.

The aim of this paper is to present our management of a patient with synchronous bilateral renal tumors and prostate cancer.

Materials and Methods

We present the case of a 65 years old patient, who was referred to our clinic for elevated PSA levels. The patient reported no hematuria, no back pain or weight loss. Physical examination findings were insignificant, with normotensive blood pressure and no abdominal sensitivity and with an ECOG performance status of 0. The laboratory data were as follows: hemoglobin 15.7 g/dL; hematocrit 46.9%; blood urea nitrogen 26 mg/dL; creatinine 1.13 mg/dL; eGFR 69 ml/min/1.73m^2; free PSA 1.01 ng/ml; total PSA 5.01 ng/ml. The diagnosis was established through prostate biopsy, abdominal ultrasound and thoracic, abdominal and pelvic CT scan. On the imaging examinations the patient was discovered with 22 mm right and 21 mm left renal tumors and also a 29.8 mm Bosniak I upper pole left renal cyst. No metastatic lesions or pathologically enlarged lymph nodes were found at that moment.

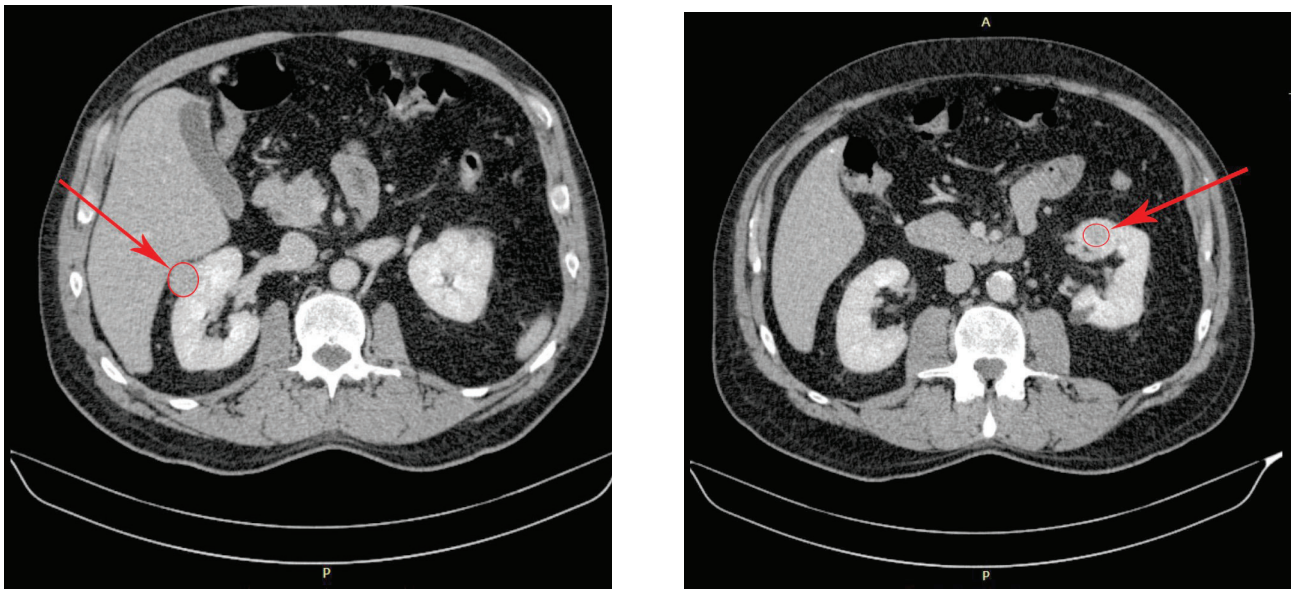
The digital rectal examination (DRE) assessed a 4/4 cm prostate, with a small hard lump in the right lobe, estimating a clinical stage cT2b prostate cancer. The prostate biopsy performed under ultrasound guidance showed acinar adenocarcinoma, Gleason score 7 (4+3), which was classified as localized intermediate risk on the EAU risk chart.

The complexity of the kidney tumors was measured by RENAL nephrometry score and PADUA classification of renal tumours. RENAL nephrometry score was: 4a - low complexity on the right side and 8ah - intermediate complexity on the left side. PADUA score was: 6 on the right side and 11 on the left side.

We decided to perform bilateral 3D laparoscopic partial nephrectomies (LPN) and a laparoscopic radical prostatectomy. The first surgery was performed on the right kidney, considered the easiest, in order to spare as much normal tissue as possible, while also preserving a normal renal function through the contralateral kidney. One month later we moved on with the left partial nephrectomy, and after another month we conducted the laparoscopic radical prostatectomy.

Both 3D laparoscopic partial nephrectomies were performed in similar fashions. After induction of general endotracheal anesthesia a nasogastric tube was inserted to decompress the stomach during surgery, for the transperitoneal approach. An 18 French Foley

Figure 1 Preoperative CT examination



catheter was inserted and the patient was then placed in the modified lateral decubitus position, which allows the bowel to fall away from the kidney. In order to maximize the space between the 12th rib and iliac crest the surgical table was then fully flexed.

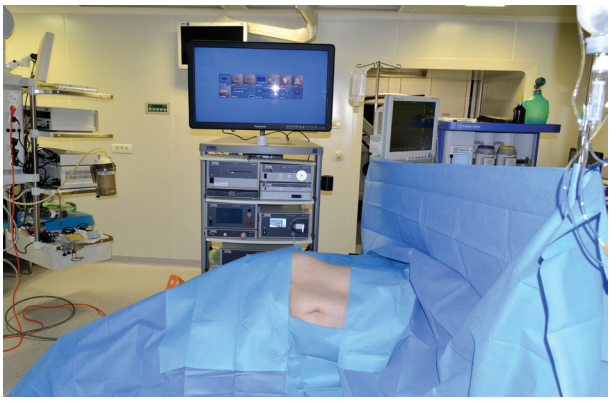


Figure 2 Modified lateral decubitus position

For access we have used three trocars: 12 mm optic port placed pararectally at the umbilicus level through a minimal parietal incision, a 10 mm port also pararectal 2 cm beneath the ribs, and a lateral 5 mm port on the medial axillary line – on the right side. On the left the working ports were inverted as the surgeon was right handed. After inflation the colon was medially reflected along the white line of Toldt, on the left side doing an extensive mobilization of the colonic splenic flexure, while on the right side the duodenum was identified, dissected and rotated medially exposing the IVC. The avascular fascial plane between posterior mesocolon and Gerota's fascia was identified and developed. We identified the ureters and gonadal vascular packets at the lower kidney poles, lateral to the ipsilateral great vessels. Further dissection was conducted to isolate the renal arteries and veins. In order to identify the tumors we dissected the perirenal fat from the surface of the kidneys then the proposed tumor excision border was circumferentially scarred on the renal capsule with the monopolar scissor. The arterial clamping was performed using a vascular Bulldog clamp, prior to tumor resection. A 12.5 g dose of mannitol was given intravenously prior to arterial clamping to lessen renal damage during hypoxia. After clamping the tumor was excised from the renal bed by cold scissor cutting the mass was placed into a laparoscopic bag. Renorrhaphy was achieved through transcapsular and parenchymal sutures clipped on each side with Hem-o-loks in order to exert tension at the closure base. Bulldog clamps were removed and no bleeding had occurred. After hemostasis, the surgical specimens were removed through small parietal incisions performed at the level of camera port, then the specimens were sectioned in order to appreciate the safety parenchymal margins.

As for the last step of the surgical management – 3D laparoscopic radical prostatectomy – an extraperitoneal technique was chosen.

We used 5 trocars: a 12 mm umbilical trocar for the camera, a 10 mm trocar placed on the midline 3 cm above the pubic bone, two 5 mm trocars on each side of the rectus abdominis muscle and another 5 mm trocar at approximately 2 cm medial and superior of the anterior superior iliac spine. We used a balloon dilator through the umbilical incision to create a preperitoneal space anterior to the bladder. Then we performed a laparoscopic pelvic ilio-obturatory lymphadenectomy. After transecting the bladder neck we continued with the dissection of the seminal vesicles and the prostate was isolated form the rectum in an anterograde fashion. The neurovascular bundles were then carefully dissected and preserved and the dorsal venous complex was divided and the urethra transected.



Figure 3 Trocars placement

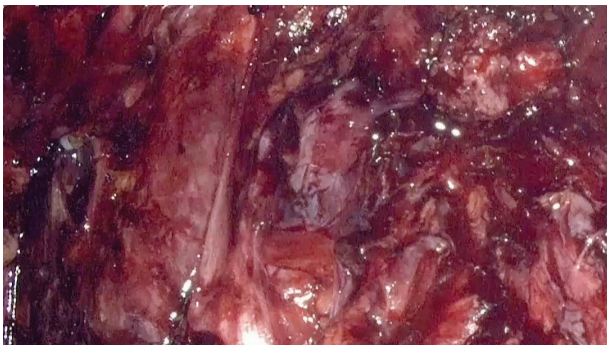


Figure 4 Preservation of neurovascular bundles

The vesicourethral anastomosis was started posteriorly and finished anteriorly with 2 pretied running sutures. After the anastomosis was completed, the prostate and the lymphatic tissue were removed in laparoscopic bag through a small parietal incision performed at the level of camera port.

Results

The operative time of the laparoscopic partial nephrectomies was 130 minutes, respectively 140 minutes, and warm ischemia time was 22 minutes, respectively 24 minutes. The tumor size was 22 mm respectively 21 mm. No major complications and no urinary fistula were encountered in the postoperative setting. Blood loss was approximately 150 ml. All surgical specimens had a minimum 1 mm safety margin of healthy renal tissue. The Foley catheter was removed in the second day and the patient was discharged on the 4th day postoperatively. The histopathological examinations revealed: renal cell carcinoma on the right side and oncocytoma on the left side.

After the second intervention the laboratory data were as follows: hemoglobin 13.5 g/dL; hematocrit 40.2%; white blood cells 7.32×103; blood urea nitrogen 25.7 mg/dL; creatinine 1.03 mg/dL; eGFR 77 ml/min/1.73m^2.

For the LRP operative time was 3 hours and 30 minutes. Blood loss was 250 ml, without intraoperative complications or incidents. The Foley catheter was removed on day 11th postoperatively. No urinary fistula was encountered in the postoperative setting. The patient was discharged on the 4th day after surgery. The histopathological examination identified a prostatic adenocarcinoma pT2cN0 Gleason 7 (4+3).

Discussions

Renal cell carcinoma represents 2-3% of the total neoplasms, with an increasing incidence during the last years, mainly due to the increased use of ultrasonography and computed tomography in patients. Risk factors involved in the etiology of RCC include: smoking, obesity, arterial hypertension and chronic kidney disease. Classifications of RCC include clear cell, papillary, chromophobe, collecting duct and unclassified RCC [3].

Clear cell carcinoma is the most frequent form of kidney cancer, constituting >80% of all cases. Approximately 15-20 percent of surgically resected tumors < 4 cm are benign masses [4]. The most common benign

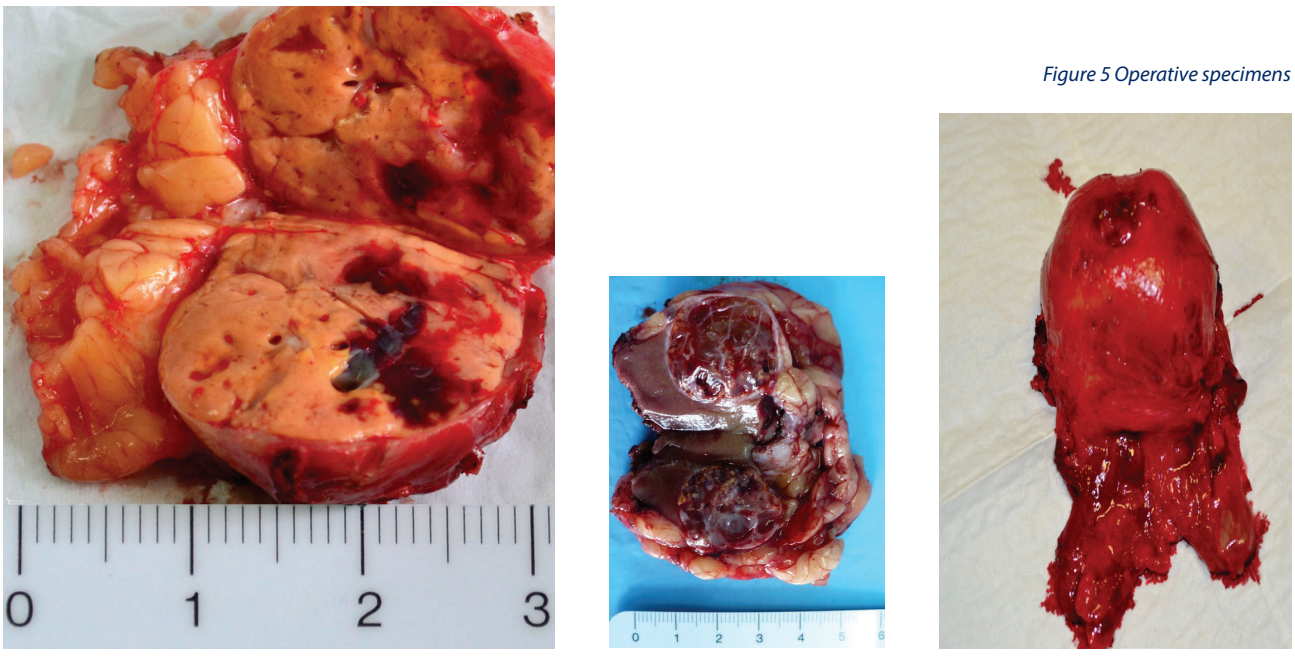


Figure 5 Operative specimens

tumors of the kidney include oncocytoma and angiomyolipoma. Renal oncocytoma is a benign epithelial tumor that is generated from a distal tubule or collecting duct and represents 3-7% of all solid renal masses. This percentage increased to 18% when tumors smaller than 4 cm were considered [5, 6]. The first case of renal oncocytoma was described by Zippel in 1942 [7]. Up to 5% of oncocytomas are bilateral [6, 8]. The most reliable diagnosis method is histopathology because of the inability of CT and MRI to differentiate benign from malignant renal masses.

Standard treatment for renal tumors is represented exclusively by the surgical excision of the tumor. The gold standard technique for partial nephrectomy consists in the tumor removal with an adequate safety margin of healthy parenchyma [9]. PN is the right choice for patients with small renal masses (T1) and minimizes the risk of chronic kidney disease (CKD) or CKD progression [10]. It is also recommended in patients with solitary functional kidney or bilateral renal tumors. In centers with high laparoscopic experience, studies revealed that LPN has similar efficiency to open PN regarding progression free survival and overall survival, therefore we consider that LPN should be the standard approach for selected cases [11].

PCa is suspected on the basis of DRE and PSA levels and confirmed by ultrasound (US)-guided biopsy which is now the standard of care. According to the Partin tables, this patient, with cT2b disease, a PSA level of 5.01 ng/ml, and a Gleason score of 7 (4+3), had a 35% chance of having organ-confined disease, 44% extra-prostatic extension, 11% cancer invading into the seminal vesicles and a risk of lymph node-positive disease of 9%. Radical prostatectomy (RP) is a primary treatment option for men with localized prostate cancer and can be performed by open, laparoscopic or robot-assisted approaches (RALP). First laparoscopic radical prostatectomy was performed by Schuessler in 1991 [12]. In 1998 Guillonneau and Vallancien standardized the laparoscopic radical prostatectomy [13]. The extraperitoneal technique of LRP avoids some potential transperitoneal risks, like peritoneal contamination, bowel injury, the intraperitoneal urine leakage, but has potential disadvantages of a smaller working space [14]. The quality of life of the patient after RP is negatively affected by urinary incontinence. After suppressing the urinary catheter, we recommend our patients pelvic floor strengthening exercises, and afterwards we evaluate the continence status of the patient using the ICIQ – SF questionnaire. The patient recovered his continence at three months after surgery. Erectile dysfunction (ED) remains a significant problem regardless of surgical technique. LRP demonstrates adequate potency rates without compromising oncologic benefit. We have used the Sexual Health Inventory for Men (SHIM) in order to evaluate the erectile function of the patient before and after surgery. The patient was able to complete successful intercourse at 8 months postoperatively with SHIM score of 19 points.

There are no significant differences between oncologic, urinary function and sexual function outcomes for those approaches [15]. Laparoscopic radical prostatectomy (LRP) and RALP decrease the duration of hospital stay and blood transfusion rates over open RP [16].

Conclusions

3D laparoscopic surgery offers earlier recovery for the patients, with less pain, shorter convalescence and reduces morbidity. LPN represents a safe and efficient alternative to open surgery in renal tumor management, in selected cases. LRP has similar oncologic and functional results with open radical prostatectomy in localized cases, with intermediary or low risks. The extraperitoneal approach, reduces the operating time and the risk of peritoneal contamination, bowel injury, the intraperitoneal urine leakage and allows later adjuvant radiation therapy. LRP offers better preservation of the neurovascular bundle because of magnification and a better vesicourethral anastomosis. The main advantages of 3D laparoscopy versus classic laparoscopy are represented by a shorter operating time and a steeper learning curve because the surgical gestures are performed more precisely due to improved depth perception.

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