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Managing of Upper Pole Right Renal Mass Using Partial Nephrectomy: Case Report

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ABSTRACT

Background: The publishing of improved oncological and functional outcomes over radical nephrectomy has led to a shift in the management of small renal malignancies toward partial nephrectomy. In order to treat renal cancer, a surgeon would often make an incision in the patient's abdomen and remove part of the kidney using an open partial nephrectomy.
Objective: We aimed to assess efficacy of management of upper pole right renal mass using partial nephrectomy.
Patient and methods: A female patient 49 years old housekeeper with no special habits and BMI was 30 kg/m^2. She presented to Urology Unit in Al-Ahrar Teaching Hospital with accidently discovered right upper pole renal mass 6 X 5.5 cm with no other urological symptoms. CT with contrast showed enhanced mass of upper pole not reaching hilum and normal contralateral kidney with good enhancement. Management done using partial nephrectomy.
Results: The patient was operated under general anesthesia in left lateral position. Supra 11th rib intercostal incision was done with complete exposure of the kidney and pedicle control. Pathology showed free margin, and the tumor was confirmed to be an oncocytoma.
Conclusion: As an alternative to the more thorough open radical nephrectomy (Which removes the entire kidney along with any surrounding lymph nodes, fatty tissue, and adrenal gland) when cancer is present, partial nephrectomy may be considered. Preoperative radiological pictures made the diagnosis of renal oncocytoma or renal cell carcinoma (RCC) challenging, particularly in cases where a big mass is visible. Histopathological analysis of the mass was the only way to confirm the diagnosis.
Keywords: Right renal mass, Partial nephrectomy, Oncocytoma.

INTRODUCTION

After publications showing better oncological and functional results with partial nephrectomy (PN) compared to radical nephrectomy (RN), it has become the treatment of choice for small renal tumors (clinical T1a-b) [(1)]. When Spencer Wells accidentally destroyed a third of a kidney while removing a peri-renal fibroadenoma in 1884, he performed the first open percutaneous nephrostomy (OPN). The first intentional OPN for angiosarcoma was attributed to Czerny three years later [(2, 3)]. Renal hypothermia and a better knowledge of the kidney's segmental artery supply led to significant advancements in nephron-sparing surgery in the 1960s. The rising incidence of incidentally detected tiny renal masses has further transformed the function of PN in modern medical imaging. More and more PN procedures are being performed using robotic and laparoscopic techniques as urology embraces the gradual transition from open to minimal invasive surgery (MIS) [(4)].

Because of this, the function of OPN has been greatly reevaluated. With more intricate tumors and more difficult clinical settings, surgeons have been able to test the limitations of nephron-sparing surgery, which is becoming increasingly popular. The importance of OPN in the age of MIS is debatable, but according to the most recent international standards, kidney preservation should be the top concern [(5, 6)].

The global prevalence of primary RCC has been on the rise, mainly because of the extensive use of cross-sectional imaging techniques like ultrasonography and computerized tomography (CT). Now that most little kidney tumors are discovered by accident, over half of all renal neoplasms are in the T1a stage when they are diagnosed [(7, 10, 11)]. Improved mortality rates are a direct result of this. The goal for surgery to preserve as much renal parenchyma and nephrons as possible has been driven by the associated stage migration towards earlier stages of the disease. The potential of nephron-sparing surgery to improve the preservation of long-term renal function and, by extension, to decrease the risk of cardiovascular and metabolic problems, has recently gained widespread recognition. These practical results are noteworthy since patients who receive PN have a very high rate of cancer-specific survival (85–96%) at 10 years following surgery [(11, 12, 13)].

Acute kidney injury (AKI), urinary fistula, and transfusion-requiring blood loss are common consequences following OPN [(14)]. The complexity and size of a tumor are factors that raise the risk. A time-sensitive problem that can necessitate angiographic or surgical intervention is post-operative hemorrhage. It is possible for the kidney, renal hilum, or other structures to cause bleeding. Constantly keeping an eye on things like post-operative pain, vital signs, hemoglobin patterns, and drain tube outputs (if used) will help with early detection. The patient should be evaluated for possible segmental arterial bleeding and angioembolization should be considered early if their condition worsens quickly or if they have needed more than two units of blood transfusion [(15)].

Rare but potentially fatal arteriovenous fistulas and renal artery pseudoaneurysms might manifest with blood in urine, bleeding at the site of the wound, or pain in the flank. Embolization is another option for managing this [(16)]. In our case we aimed to assess efficacy of management of upper pole right renal mass using partial nephrectomy.

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Clinical course: A female patient 49 years old housekeeper with no special habits and BMI of 30 kg/m^2. She was presented to our unit in Al-Ahrar Teaching Hospital with accidently discovered right upper pole renal mass 6 X 5.5 cm with no other urological symptoms. CT with contrast showed enhanced mass of upper pole not reaching hilum and normal contralateral kidney with good enhancement.

Multislice CT of the abdomen and pelvis with multiple axial cuts showed right kidney large heterogeneous solid mass in its upper pole measuring 60 X 55 mm with focal bulging of the capsule to renal pelvis with heterogeneous contrast enhancement extending posterior to the posterior perirenal fat planes, which was blurred between the mass and paravertebral muscles indicated picture of renal solid mass with normal opacification of both renal artery and vein (Figure 1).

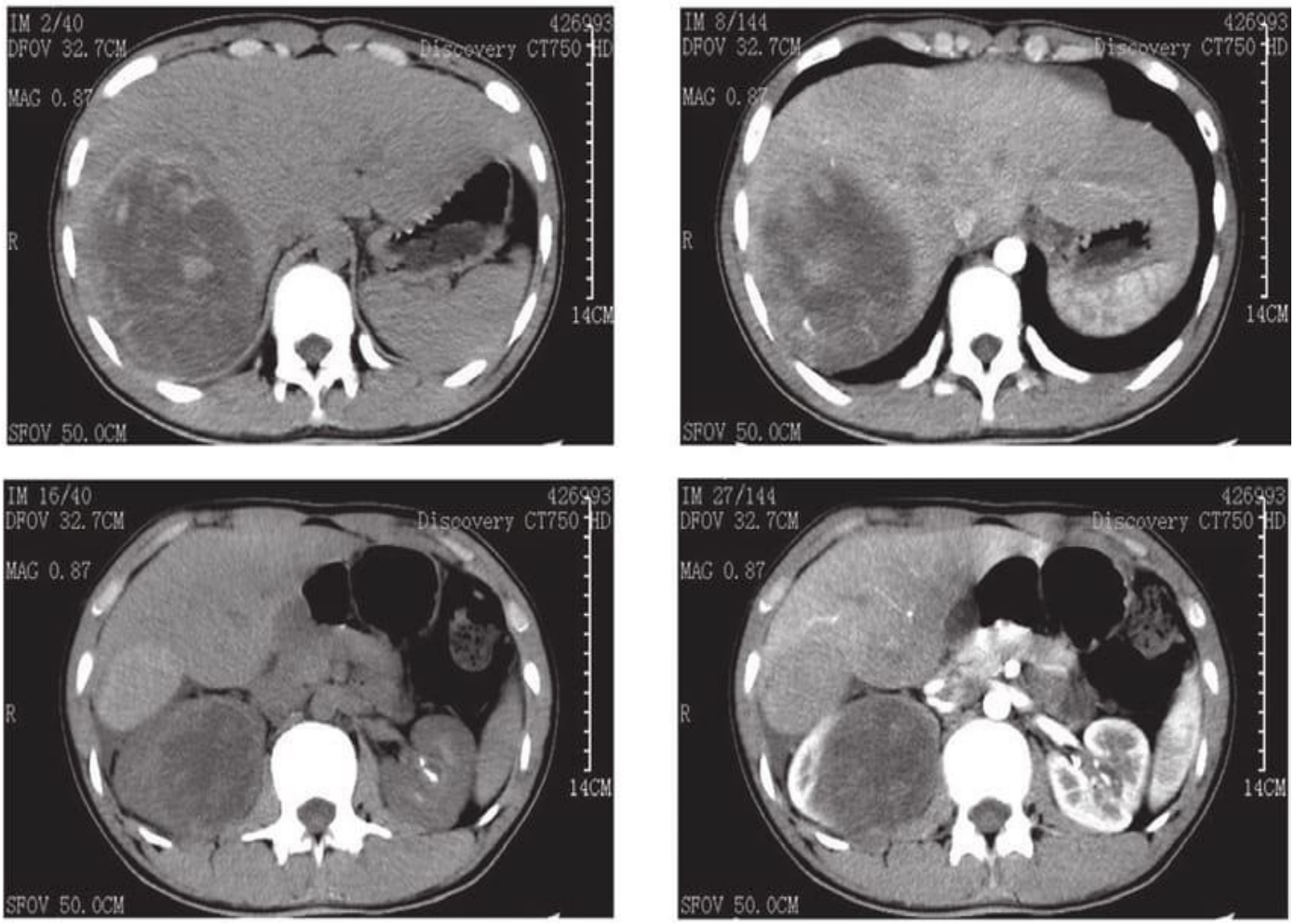

Figure (1): Multislice CT of the abdomen and pelvis showed the right kidney with large heterogeneous solid mass in its upper pole measuring 60 x 55 mm with focal bulging of the capsule to renal pelvis with heterogenous contrast enhancement.

Procedure:

Preoperative lab was requested and was normal. Echocardiography was normal. The patient was operated under general anesthesia in left lateral position. Supra 11th rib intercostal incision was done with complete exposure of the kidney and pedicle control.

After anesthetic induction, intubation, and the placement of an indwelling catheter to monitor urine output, the patient must be carefully positioned such that enough exposure to the retroperitoneum can be achieved. In order to open the space between the costal border and iliac crest, the patient was positioned in the lateral decubitus position, with the flank covering the break in the table. This allowed the table to be flexed. While, making sure that the patient was securely fastened to the table and ensuring sufficient anesthetic access, it was necessary to pay close attention to potential high-pressure locations, such as the axilla (brachial plexus risk), the bottom hip (pressure sore risk), and the forearms (radial or ulnar nerves). To prevent difficulties during surgery, it was important to use a surgical approach that allows for good access to the kidneys' upper and lower poles, as well as the tumor and renal hilum. To avoid operating on tissues inside the abdomen that are located inside the sac, surgeons typically made a wide or classic flank incision above the 12th rib. This method was frequently detailed with or in addition to removing the outermost third of the eleventh or twelfth rib. A combination of sharp and blunt dissection to create the retroperitoneal space, with access to the renal pedicle through medial kidney rotation was done. A plane connecting Gerota's fascia, the quadratus lumborum, and the psoas can be created by snipping and separating any perforating blood vessels that emerge from the body's surface during blunt dissection. Retraction medially of the descending colon or the right colon/duodenum was required for each surgical site. In order to access the renal hilum, it might be necessary to mobilize the kidney further from the retroperitoneum.

Ischemia:

Reducing renal turgor made the bulk in endophytic lesions more palpable, improving vision during resection to minimize partial tumor excision, and prevent excessive blood loss. All are reasons why control of renal arteries is crucial. After 11 minutes of heated ischemia, a partial nephrectomy was performed.

Resection:

The capsule can be sharply dissected using a blade or diathermy, and then the specimen's deep edges can be developed with tenotomy scissors. We do not recommend enucleation because of the potential of micro-invasion into normal renal parenchyma when dissecting the pseudocapsule around the tumor. Deep margins, like all margins in entirely endophytic lesions, were more difficult to define than the peripheral borders of exophytic lesions. Then, closure of pelvicalyceal system with 4/0 vicryl and closure of parenchyma with 1 vicryl. Finally, closure of wound with drain fixation and DJ was fixed endoscopically for 1 month.

Post-procedure:

Gross pathology of the specimen showed partial nephrectomy 8 x 7 x 3 cm showing part of kidney 6 x 6 x 4.3 cm. Cut section showed brownish mass 6 x 5 x 3 cm with central stellate fibrotic scar. Tumor does not invade renal capsule grossly. Tumor was 0.5 cm from the resection margin.

Microscopy: A benign renal tumor formed of sloid compact nests of oncocytic cells with rich eosinophilic cytoplasm, rounded regular nuclei with central nucleolus. Cells showed focal mild atypia, but no appreciable mitotic or hyperchromatic activity. Renal capsule was intact. Margin of incision was free. Picture was consistent to be diagnosed as oncocytoma.

DISCUSSION

The therapy of choice for localized renal cell carcinomas (RCCs), where it is physically possible, is partial nephrectomy (PN). Preserving parenchyma and, by extension, renal function, is the main benefit of nephron-sparing surgery. On the other hand, the higher surgical risk outweighs this benefit due to the rise in popularity of laparoscopic and robotic minimally invasive partial nephrectomy, the function of open PN (OPN) has evolved in modern times. In complicated patients, such as those with a single kidney, many tumor foci, and a long history of surgery, OPN offers many benefits, including better renoprotective measure application. Meaning it is still a useful method in modern urology [17].

Direct, high-quality comparisons between OPN and minimally-invasive PN methods have been hard to come by so far. Inadequate information about tumor complexity, retrospective designs, and inadequate data sets are some of the limitations of many studies. When it comes to perioperative morbidity, minimally invasive methods are known to be better. But functional and oncological outcomes are still very similar [15, 16].

In a prospective observational study comparing the perioperative outcomes of open, robotic, and laparoscopic percutaneous nephroplasty (PN) in 2,331 patients, **Bravi *et al.*** [18] discovered that open PN was linked with a shorter ischemia time than robotic and laparoscopic procedures. Among all renal epithelial tumors, oncocytomas account for 3% to 7%. They are more prevalent in men, and are most often found in those over the age of 50. These tumors, however, are extremely rare in children [19].

Patients suffering from Birt-Hogg-Dube syndrome frequently exhibit this lesion. On average, these individuals will get 5.3 kidney tumors during the course of their lifetime. The majority of these lesions are oncocytomas and chromophobe renal cancer [20].

Imaging is often the first point of evaluation. It is possible to find oncocytomas by chance. Differentiating

benign oncocytomas from malignant lesions such renal cell carcinoma cannot be done with any degree of certainty using radiologic imaging. On the other hand, imaging frequently shows core scar and hypervascularity [21].

What made our situation interesting was that most cases where big tumors were detected by radiography turned out to be malignant. Core biopsies, small needle aspirations, or surgical removal can all be used to assess kidney masses. Because of the tiny size of oncocytomas, active surveillance is often recommended to some patients. This is because 20–45% of small renal tumors turn out to be benign [21].

When compared to renal cell carcinomas, renal oncocytomas tend to be smaller and typically cause no symptoms at all. Although, it is normally impossible to tell these lesions apart, a core scar with fibrous extensions—the so-called "spoke-wheel appearance"—may lead one to assume oncocytoma. It is challenging to clinically differentiate between these lesions due to their similarity in radiographic features. According to recent studies, oncocytomas make about 3% to 7% of solid tumors in the renal cortex [22].

This case report emphasizes that oncocytomas should be included in the differential diagnosis of large renal masses, since our case was discovered accidently as she was asymptomatic. This go in line with **Çevik *et al.*** [23] who assessed the symptoms of left scrotal edema in a 72-year-old male patient who presented to the outpatient department. An unexpectedly large tumor consistent with renal cell carcinoma (RCC) was seen during an ultrasound (US) of the right kidney. The results of the abdominal computed tomography (CT) scan showed a heterogeneous mass of soft tissue density and central necrosis, with an axial diameter of 167×146 mm, which is consistent with RCC. The right renal vein and inferior vena cava did not show any signs of tumor thrombus. A subcostal incision was made in the front of the patient to facilitate the open radical nephrectomy. The pathology report showed a kidney oncocytoma measuring 17×15 cm.

CONCLUSION

Partial nephrectomy may be an alternative to a more extensive open radical nephrectomy, which involves the complete removal of a cancerous kidney, and sometimes the adrenal gland situated above it, along with the surrounding lymph nodes and fatty tissue. It is difficult to differentiate renal oncocytoma from RCC on pre-operative radiology images, especially when a large mass is present. The definitive diagnosis can only be made by histopathological examination of the mass.

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