

## Laparoscopic Partial Nephrectomy by Transperitoneal Approach: A Case Report

Angelo Joao Peti<sup>1\*</sup>, Mounir Jamali<sup>2</sup>, Youness Boukhelifi<sup>3</sup>, Mohammed Alami<sup>4</sup>, Ahmed Ameer<sup>5</sup>

<sup>1</sup>Resident Physician at the Urology Department of the Mohammed V Military Instructional Hospital – Rabat

<sup>2</sup>Resident Physician at the Urology Department of the Mohammed V Military Instructional Hospital – Rabat

<sup>3</sup>Urologist at the Urology Department of the Mohammed V Military Instructional Hospital – Rabat

Omar Jendouzi: Urologist at the Urology Department of the Mohammed V Military Instructional Hospital – Rabat

<sup>4</sup>Head of the Urology Department at the Mohammed V Military Instructional Hospital – Rabat

<sup>5</sup>Head of the Urology and Nephrology Unit at the Mohammed V Military Instructional Hospital - Rabat

DOI: [10.36347/sasjm.2021.v07i12.002](https://doi.org/10.36347/sasjm.2021.v07i12.002)

| Received: 08.09.2021 | Accepted: 19.10.2021 | Published: 04.12.2021

\*Corresponding author: Angelo Joao Peti

### Abstract

### Case Report

Laparoscopic partial nephrectomy (LPN) is compared to traditional open partial nephrectomy and robotic-assisted partial nephrectomy in terms of oncologic and surgical outcomes for renal tumors after good indication. Studies have shown that the modality is feasible with similar oncologic efficacy and better renal function outcomes compared to laparoscopic radical nephrectomy (LRN) for renal tumors. The main advantages of LPN include decreased estimated blood loss, decreased surgical site pain, shorter postoperative recovery, and nephron preservation. The purpose of this clinical report is to evaluate the surgical techniques and steps and the postoperative sequelae.

**Keywords:** Laparoscopic partial nephrectomy; Traditional open partial nephrectomy; Laparoscopy; Renal tumor.

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## INTRODUCTION

Laparoscopic partial nephrectomy (LPN) was initially performed in 1993 [1]. The development of this procedure has been progressively refined over the past two decades. Partial nephrectomy (PN) has become the gold standard for the surgical management of T1 renal cell carcinoma over the past decade [2]. Studies have shown the modality to be performable with similar oncologic efficacy and superior renal functional outcomes compared to laparoscopic radical nephrectomy for tumors up to pT3a [3]. The main advantages of LPN consist of reduced blood loss and pain at the surgical site, shorter postoperative recovery, and nephron preservation [4].

We report the first case of laparoscopic partial nephrectomy that aims to provide transperitoneal technique, control of the renal pedicle, post-resection hemostasis, renorrhaphy and control of renal function.

## OBSERVATION

Mr. Z. A, 66 years old, with a pathological history of diabetes under treatment, consulted for left

low back pain evolving for 6 months in a context of apyrexia and conservation of the general state. The clinical examination was normal except for a sensibility of the left lumbar fossa. Abdominal ultrasound (Fig. 1) showed a well-limited, round, echogenic and homogeneous left mid-renal mass, deforming the renal contour, measuring 25 x 23 mm. The CT scan (fig.2), showed at the level of the anterior lip a left renal mass, rounded, regular, exophytic and more intense enhancement than the renal parenchyma, measuring 2.9x2.8x2.6 cm without infiltration of the peri-renal fat and renal vessels without anomaly. A magnetic resonance imaging (fig.3), confirms a rounded, exophytic, encapsulated, early enhanced and heterogeneous mid-renal mass measuring 29x28 mm classified T1a, without alteration of the vascular structures. The renal biopsy came back in favor of a histological and immunological aspect pointing to a clear cell carcinoma of the kidney, (grade II WHO ISUP 2016) according to Furhman confirmed by immunohistochemical study in favor of positive labeling of tumor cells. Surgical exploration by transperitoneal laparoscopic approach (fig.4), found a mid-renal exophytic tumor at the anterior lip.

**Transperitoneal partial nephrectomy technique**

The patient is installed in the right lateral decubitus position, or in a 45° oblique position. Four trocars are placed after creation of the pneumoperitoneum with a Veress needle. After locating the psoas muscle, the ureter, the renal artery and vein, the latter two are dissected and selectively clamped for 32 minutes. A partial left nephrectomy was performed through a healthy margin and then a nephrorraphy was performed after selective hemostasis of the intra renal vessels by prolene sutures and hemolok clips (fig.5). The blood loss was 120 cc and the removal of the operative specimen was done by endobag through the umbilical trocar site.

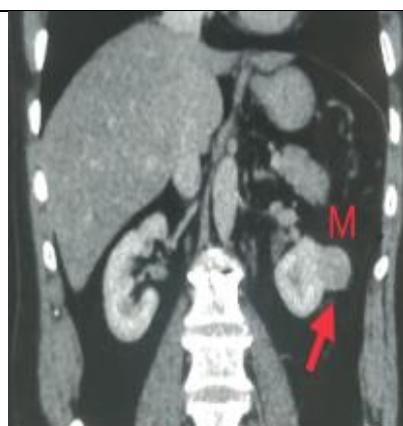
A redon's drain was placed in the trocar site close to the left anterosuperior iliac spine. Placement of

a double J ureteral stent before the beginning of the procedure. The redon drain was put under suction mode and removed when the daily quantity of drained liquid was less than 50 ml.

The postoperative follow-up was simple with removal of the Redon at D2 and the patient was discharged at D3. The macroscopic study of the beige colored tumor specimen (fig.6). The histological study of the surgical specimen confirmed the diagnosis of clear cell renal cell carcinoma of ISUP/WHO grade II, absence of vascular embolism and necrosis, the perirenal fat is unharmed with limit of exeresis is healthy passing to 1mm. (fig.7, 8 and 9). The patient is currently alive without any sign of tumor recurrence on imaging with preservation of renal function after 12 months of surveillance.



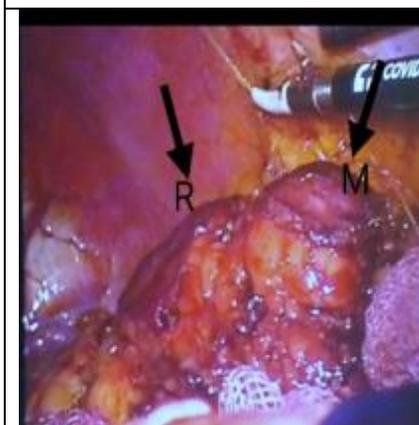
**Fig-1: Ultrasound Left medio renal mass, well rounded 25x23 mm.**



**Fig-2: CT scan: left renal mass, rounded, exophytic.**



**Fig-3: MRI : Rounded medio renal left anterior mass, exophytic, classified T1a**



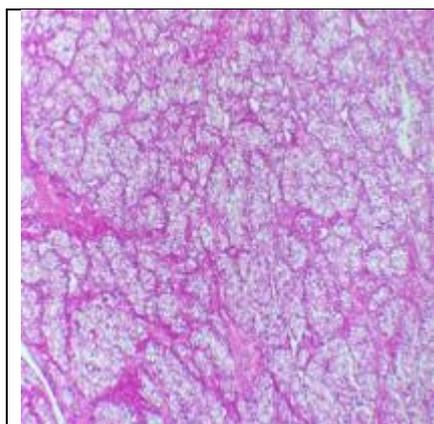
**Fig-4: left medio renal exophytic tumor R- kidney ; M- mass**



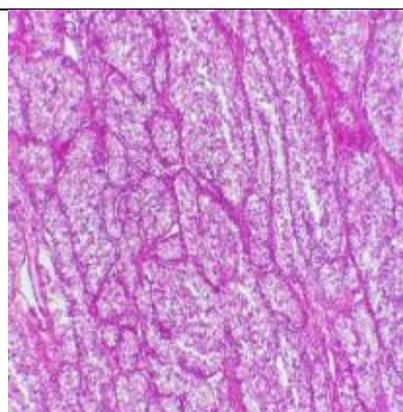
**Fig-5: Nephrorraphy with Prolene threads and Hemlock clips**



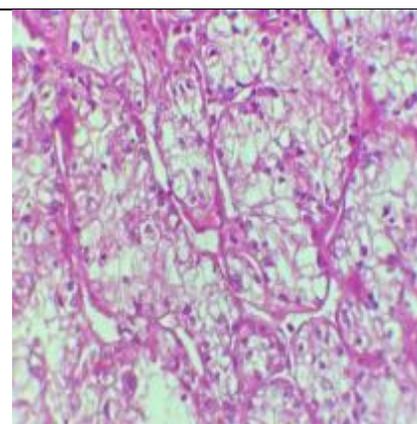
**Fig-6: Macroscopic aspect of the beige colored tumor piece**



**Fig-7: The stroma is small, richly vascularized (HE, G x 200)**



**Fig-8: Carcinomatous tumor proliferation made of nests and compact clusters (HE, 200)**



**Fig-9: Tumor cells are large, with abundant clear cytoplasm and atypical nuclei (HE, G x 400)**

## DISCUSSION

Renal cell carcinoma (RCC) represents 3% of all adult malignancies and is the 3rd most common urological cancer. It is mainly found in men over 55 years of age, with a steady increase in incidence with age [5].

Laparoscopic partial nephrectomy (LPN) has become a reference treatment strategy for small renal masses. For tumors larger than cT1a, LPN has become an optional treatment method because it allows for better preservation of renal function without increasing the positive surgical margin rate [6].

Recently, increasingly complex renal tumors are managed by LPN; although technically challenging, complete tumor resection can be achieved [7]. Warm ischemia time (WIT) has been identified as the most important surgery-related factor affecting renal function in patients who have had LPN [8].

No significant difference was found in our case regarding the estimated postoperative glomerular filtration rate and the occurrence of postoperative chronic kidney disease.

Some authors have suggested that every minute counts when the renal hilum is clamped [9], the majority of these studies indicate a safe WIT cutoff range between 20 and 25 min [9, 10]. In previous studies, the 25-minute WIT cutoff appeared to be the most clinically useful [9, 11, 12]. This was not consistent with our clinical case. Moreover, there was no difference in the positive surgical margin rate [4]. But for clinical stage > T1b tumors, large sample randomized control studies are awaited for evaluation and comparison of long-term oncologic outcomes of LPN with laparoscopic radical nephrectomy.

## CONCLUSION

Laparoscopic surgery is an evolving nephron-preserving technique. The urology peer review

literature reflects an exponential growth in interest, suggesting that this minimally invasive approach is practical and may decrease peri- and postoperative complication.

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