ISSN: 2457-0400

Impact Factor: 7.675

WORLD JOURNAL OF ADVANCE HEALTHCARE RESEARCH

www.wjahr.com

Volume: 10, Issue: 5

Page N. 176-185

Year: 2026

Original Article

Coden USA: WJAMA3

THE OUTCOMES OF ONE YEAR FOLLOW UP OF LAPAROSCOPIC PARTIAL NEPHRECTOMY

[*1]Hussam Raed Abbood, [2]Ula Mohammed Al-Kawaz

[1]M.B.Ch.B.
[2]M.B.Ch.B., F.I.B.M.S. Urology, F.E.B.U.

Article Received: 02 April 2026 **Article Revised:** 23 April 2026 **Article Published:** 01 May 2026

***Corresponding Author: Hussam Raed Abbood**

M.B.Ch.B.

DOI: https://doi.org/10.5281/zenodo.19913767

How to cite this Article: [*1]Hussam Raed Abbood, [2]Ula Mohammed Al-Kawaz (2026). The Outcomes Of One Year Follow Up Of Laparoscopic Partial Nephrectomy. World Journal of Advance Healthcare Research, 10(5), 176–185.

ABSTRACT

Background: Partial nephrectomy involves the complete removal of the tumor while ideally preserving the function of the normal kidney tissue. This operation offers several advantages over radical nephrectomy; including improved overall survival rates and a reduced risk of cardiovascular death. **Objectives:** To determine the outcomes after laparoscopic partial nephrectomy with respect to changes in kidney function, local recurrence and distant cancer metastasis. **Methods:** This is an interventional study. It was conducted at Al-Kadhimiya Teaching Hospital in Al-Karkh, Baghdad, from June 1, 2024, to November 30, 2025. The study included 20 patients with renal tumors who underwent laparoscopic partial nephrectomy with one year of follow-up. The questionnaire consisted of five sections. The first section covered the patients' demographics. The second section covered preoperative patient characteristics. The third section covered hospital and surgical information. The fourth section covered postoperative information at the time of discharge. The fifth section covered postoperative follow-up visits at the first, third, sixth, and twelfth months. **Results:** Among the study participants, 12 (60%) patients were males and 8 (40%) patients were females, with male to female ratio of 1.5:1. The mean ± standard deviation age of the study patients was 58.1 ± 13.98 years, while the mean ± standard deviation BMI of the study patients was 29.13 ± 3.98. Statistically significant difference between males and females regarding their mean age (P value = 0.023). while no statistically significant difference found between them regarding their mean BMI (P value = 0.592). The study found that 7 (35%) patients had hypertension, followed by diabetes in 3 (15%) patients. While 1 (5%) patient suffer from duodenal ulcer. The median operation time was 2.75 hours. The median hospital stays of the study patients was 1 (1-2) day. Only 1 patient reported operative complication that was ureteric injury which was repaired by surgical suturing over stent. Four patients had a grade I rating after surgery, while only one patient had a grade II rating according to the Clavien-Dindo classification of surgical complications. Follow up visits showed that the means of serum creatinine gradually increased, while the means of estimated glomerular filtration rate seem to be slightly decreased over the study time interval. At one year follow-up, 18 patients (90%) had no evidence of local recurrence or distant other organ metastasis, while two patients one patient was diagnosed with local recurrence at the 6th month visit and another one diagnosed with distant metastasis at the 12th month of follow up visit. All of the patients stay alive but 2 of them alive with the cancer at the 12th month. **Conclusions:** Patients treated by partial nephrectomy had excellent overall survival rate after one year of the operation. Patients treated by this operation have mild decrease in their estimated glomerular filtration rate and mild increase in their serum creatinine level.

KEYWORDS: Follow up, Kidney, Laparoscope, Part, Result.

INTRODUCTION

Partial nephrectomy (PN) or nephron-sparing surgery for the treatment of renal tumors was first described by Czerny in 1890, but this approach was infrequently used until the 1980s.[1] Interest in PN for renal cell carcinoma has subsequently been stimulated by advances in renal imaging, experience with renal vascular surgery for other conditions, improved methods for preventing ischemic

damage, growing numbers of incidentally discovered renal tumors, greater appreciation of the potentially deleterious effects of chronic kidney disease (CKD), and encouraging long-term survival in patients undergoing this form of treatment.[2] Partial nephrectomy entails complete local resection of the tumor while optimally preserving normal functioning parenchyma within the involved kidney.[3]

Partial nephrectomy has become the standard surgical treatment for localized small renal masses (clinical T1a). In the presence of a normal contralateral kidney, presuming that the mass is amenable to this approach[4] The complexity of PN is influenced by tumor size, its invasiveness and location.[5]

Partial nephrectomy offers several advantages over radical nephrectomy (RN) due to the preservation of renal parenchyma. Partial nephrectomy is associated with better overall survival and a lower risk of cardiovascular mortality related to (diabetes, hypertension, coronary artery disease, stroke, chronic kidney disease).[6,7] Importantly, PN is oncologically non-inferior to RN for cT1 renal cell carcinoma (RCC) in terms of cancer-specific survival, as prior experience with "elective" PN for T1a RCC demonstrated local recurrence rates of 1-2%, and overall cancer-free survival well over 90%.[8] Most local recurrences observed after PN in this setting are a manifestation of undetected microscopic multifocal RCC; which are found distant from the previous tumor bed.[9]

Absolute indications for partial nephrectomy include a tumor in a single kidney, impaired renal function, and a familial condition that increases the risk of recurrent renal cell carcinoma. Moreover, studies showing oncologic equivalency of partial nephrectomy to radical nephrectomy in stage T1 tumors, as well as superiority in renal function preservation, enhancing the usefulness of elective partial nephrectomy.[10,11]

Preserving renal function is crucial for preventing chronic kidney disease as well as end-stage renal disease and dialysis. A glomerular function rate of less than 60 mL/min/1.73 m^2 is considered chronic kidney disease, and it has been shown to be an independent risk factor for mortality, hospitalization, and cardiovascular disease. As a result, it has been speculated that excessive application of radical nephrectomy for tumors might result in increased non-cancer specific mortality.[12] This study aims to identify the outcomes of laparoscopic partial nephrectomy regarding change in renal function, local recurrence and distant metastases for up to one year following laparoscopic partial nephrectomy.

PATIENTS AND METHODS

Administrative agreements

The study was conducted with permission from the Scientific Council of the Iraqi Board of Health Specializations in Iraq. Approval was also obtained from the Directorate of Health in Al Karkh and the Administration of the Al-Immamain Al-Kadhumain medical city. They were informed about the nature and scope of the study.

Ethical consideration

All participants were interviewed by the investigator to explain the objectives of the study and to obtain consent before data collection. The collection of data was kept confidential and will not be divulged except for study purposes.

Study Setting

The study was conducted at Al-Immamain Al-Kadhumain medical city in Baghdad Al Karkh side. Al Kadhimiya Teaching Hospital.

Study design

To achieve the objectives of the present study, an interventional study was conducted. Data were collected prospectively from the participants. Verbal informed consent was obtained, and a modified questionnaire was used to assess the outcome of laparoscopic partial nephrectomy during one-year duration.

The Study Period

Data were collected over one and a half year, from the 1st of June 2024 to the 30th of November 2025.

Case definition

All available patients with renal mass for which laparoscopic partial nephrectomy was done with subsequent 1 year follow up. These patients were treated at Al-Immamain Al-Kadhumain medical city during the study period.

Study sample

Twenty patients were involved in the study and completed one year follow up.

Inclusion Criteria

- Patients aged of more than 18 years.
- Primary kidney mass.
- Non metastatic tumor.
- Patients with minimal one year follow up visit.

Exclusion Criteria

- Patients younger than 18 years old.
- Patients with metastatic tumor.
- Patients with chronic kidney disease on hemodialysis.
- Patients with renal transplant.
- Patients who converted to radical nephrectomy due to intraoperative complications.
- Patients with less than one year of follow up.
- Patients with insufficient data.

Steps of the study

The concept and aims of the study were explained to the patients. Patients who already signed the consent were admitted one day before their operation.

Patients were initially evaluated by taking history and performing physical examination including vital signs 2-3 days before the operation, in order to exclude those who were unfit for the study. After that, the patient was sent for routine preoperative blood and urine investigations (complete blood count, erythrocyte sedimentation rate, blood urea, serum creatinine, serum electrolytes, serum calcium, random blood sugar, serum alanine aminotransferase, serum aspartate aminotransferase, total serum bilirubin, total serum protein, serum alkaline phosphates, coagulation panel, urinalysis and viral screening for hepatitis B, hepatitis C and human immunodeficiency virus). Furthermore; radiological imaging including abdominal ultrasound, chest x-ray and if renal function is adequate, intravenous contrast-enhanced CT-scan of the chest, abdomen, and pelvis were done in order to determine preoperative clinical staging and tumor diameters. Moreover; magnetic resonance imaging (MRI) of the abdomen was used at the surgeon's discretion for staging purposes especially at the setting of renal vein or inferior vena cava tumor thrombus was highly suspected.

Each patient was seen by the anesthetist and internist three days before operation to ensure patient fitness for operation and to facilitate patient follow up after operation. One-half hour before operation after application of intravenous cannulation, the patients received intravenous fluid, 1 gram of cefepime vial, 10 mg of metoclopramide ampoule and 40 mg omeprazole vial (infused in 100 ml of normal saline during 30 minutes).

Postoperatively; the patients were kept for three days under cefepime vial injection (1 gram every 8-12 hours) and were then shifted to oral cefixime 400 mg every 24 hours for 5 days. Additionally; the patients were kept one day on intravenous fluids, analgesia, and compressing stocking as a prophylaxis for thromboembolism. Oral intake restarted in the next day depending on the patient's bowel motion or passing flatus. Urine output was measured by urine bag connected to the urinary system by Foley's catheter which was kept to next morning until patient can get to towel. Collecting system injury was assessed by drain tube volumes which was kept according to the patient drain output. Patient discharge usually done 1-2 days after operation if the patient condition was stable. After that the patients were followed for one year to assess their surgical and oncological outcomes. Patients were followed for 1, 3, 6 and 12 months according. The recorded data transferred to excel sheet in order to be statistically analyzed.

Surgical Procedure

The patient was kept in 70-degree lateral decubitus position; a gel dome positioner is placed vertically behind the shoulders. The upper arm extended over the chest, slightly bent, and rested softly on top of the lower arm and chest, or hanged over lateral arm lifting board, while the lower arm was supported by an arm board. As shown in (figure 2).

Figure 2: Positioning with the side of pathology up and securing the pressure areas and fixing the chest and pelvis to avoid patient slipping off the table.

The anesthesiologist and anesthetic equipment were positioned at the patient's head, while the scrub nurse and instrument trays was placed at the patient's feet, the surgical equipment table was placed opposite the surgeon to allow for easier instrument movement, the monitors were kept on both side of the patient. The surgeon assistant stood on the same side as the surgeon until the specimen was extracted, then he switched in to the other side. As shown in (figure 2).

Figure 2: Mass extraction through an abdominal wall opening at one port site.

Two-centimeter lateral to umbilicus, a small incision (10 mm length) was done, 5 mm port with safety trocar was inserted in this incision while grasping of the wound edges by towel clip and pulling of the abdominal wall by hand. Inflation of CO_2 was done, then the 5 mm trocar was exchanged with 10 mm port with safety trocar. Optical camera was inserted through the port to check if there was any bowel injury at the insertion site then it was turned up to face the abdominal wall to allow the insertion of the other port under direct vision. As shown in (figure 3).

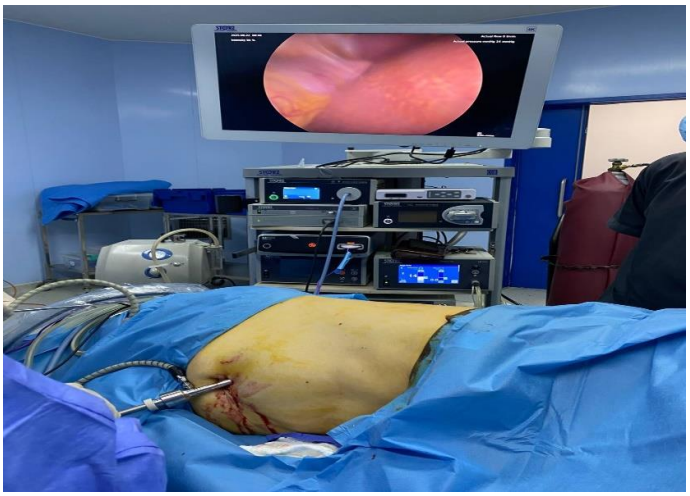

Figure 3: Insertion of the first port (camera).

To create a triangle under direct vision for the left side, a second 10 mm port was positioned subxiphoidally, followed by a 5 mm port positioned approximately 2 cm medial and above to the anterior superior iliac crest. As shown in (figure 4).

Figure 4: Site of the ports inserted into the abdomen.

An additional 5 mm port was inserted for liver retraction or retraction of the mass while excision. The colon was mobilized medially across the Toldt's line using a grasper and scissors when the intraabdominal pressure was 12 mmHg.

The renal artery and vein were dissected independently. The kidney was detached from the surrounding tissues using a LigaSure device. During the operation, clampless dissection started, but if significant bleeding was noticed, a bulldog clamp was used to clamp the major renal artery for 20-30 minutes after renal pedicle dissection in order to control bleeding during removal of the tumor with safe margins, starting by marking the tissue around the mass with cautery and then start dissection by scissor which attached to cautery on the marked tissue around the retracted mass (by grasper or by the sucker). The renal parenchyma was sutured in a running way using 2-0 absorbable polyglactin suture. The bulldog clip was then taken off the renal artery and the intraabdominal pressure was lowered to 5 mmHg to monitor for bleeding. An endo bag (Endo Catch Gold, Medtronic, MN) was used to remove the specimens from the trocar incision, and a drain was positioned at the surgical site. As shown in (figure 5).

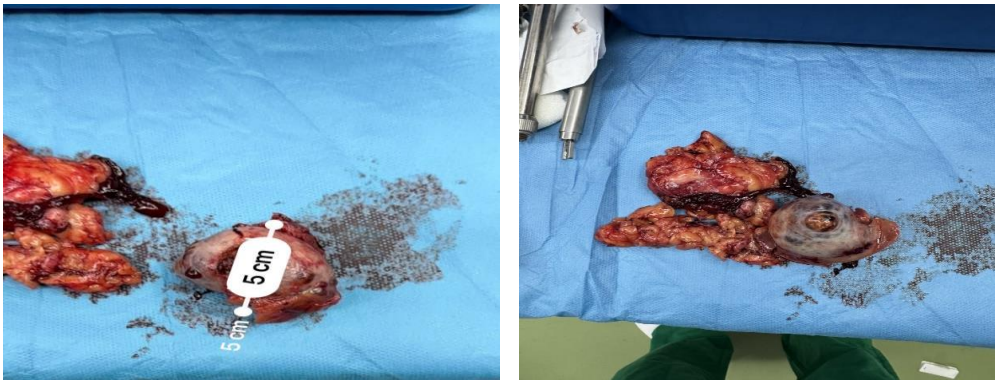

Figure 5: Mass after extraction with measurement of longest diameter.

Study parameters

The first part of the questionnaire covers patients sociodemographic and anthropometric information, including the patient's age, gender, and body mass index (BMI) depending on the formula of weigh in kilogram divided to the square of height in meter squared.[31] The second part for patients' preoperative characteristics, including the clinical T stage, tumor diameter on CT/MRI and past medical history (diabetes mellitus, hypertension, coronary artery disease, stroke and chronic kidney disease). The third part for postoperative characteristics, including postoperative T, N stages, patients' tumor grade, surgical margin, tumor diameter and histological type. The fourth part for surgery and hospitalization including warm ischemia time, length of stay and Clavein-Dindo scale.[27] The fifth part for follow up at 1, 3, 6 and 12 months after operative for creatinine level, estimated glomerular filtration rate, CT-scan findings if the patients performed, patient status and other note if present.

Statistical Analysis

Data has been managed and analyzed by special programs using computer facility (Microsoft Office 2016: word & excel program).

Statistical data were analyzed using SPSS, version 29. The number (percentage) and mean ± standard deviation was calculated for demographic data. Chi square test was used for categorical variables. The differences between continuous variables were assessed by Student T-test. Wilcoxon signed rank test was used for non parametric variables. A p-value of < 0.05 was considered as statistically signify.

RESULTS

The study involved 20 patients who underwent laparoscopic partial nephrectomy, comprising 12 males (60%) and 8 females (40%), resulting in a male-to-female ratio of 1.5:1. The mean age was 58.1 years (± 13.98), and the mean BMI was 29.13 kg/m² (± 3.98), with 50% of patients being smokers. Statistically significant differences were observed between genders in mean age ($P = 0.023$) and smoking status ($P < 0.001$), but not in BMI ($P = 0.592$). As detailed in table 1.

Table 1: Comparison between males and females regarding their mean of ages, body mass indexes and smoking state (number =20).

Variable	Male = 12	Female = 8	P value
Age, mean ± standard deviation	63.58 ± 11.01	49.87 ± 13.94	**0.023**
BMI, mean ± standard deviation	29.23 ± 5.21	30.34 ± 5.77	0.592
Active smoking, number (%)	9 (75%)	1 (12.5%)	<0.001

Table 2 shows comorbidities of the study patients. It's evident that hypertension is more prevalent among the study patients, followed by diabetes and duodenal ulcer respectively. Of note, two patients had hypertension with diabetes and one patient had hypertension with duodenal ulcer.

Table 2: Patients' comorbidities (number =20).

Past medical history	Number = 20	Percent
Hypertension:	7	35%
Diabetes:	3	15%
Duodenal ulcer:	1	5%

Table 3 shows CT-scan findings of the study patients. The median of RENAL nephrometry score was 6. The majority of patients (70%) had tumor stage of T1a, node stage of N0 (100%). The mean of tumor size was 3.53 cm.

Table 3: CT-scan findings of the study patients (number =20).

CT-scan findings	Number = 20
RENAL nephrometry score, median ± interquartile range:	6 (5-7)
Tumor stage, number (%): T1a T1b	 14 (70%) 6 (30%)
Node stage: -Nx -N0 -N1	 0 (0%) 20 (100%) 0 (0%)
Tumor size (cm), mean ± standard deviation:	3.53 ± 1.06

Table 4 shows histopathological findings of the study patients. The majority of patients (75%) had T1a tumor stage, negative surgical margin (100%), grade 1 nuclear grade (60%), clear cell carcinoma (70%). Moreover, the mean of tumor size was 3.89 cm.

Table 4: Histopathological findings of the study patients (number =20).

Histopathological findings	Number = 20
Tumor stage, number (%): T1a T1b	 15 (75%) 5 (25%)
Surgical margin: -Positive -Negative	 0 (0%) 20 (100%)
Nuclear grade: - One -Two	 12 (60%) 8 (40%)
Histopathological type: -Clear cell RCC - Papillary RCC - RCC with sarcomatoid feature	 14 (70%) 5 (25%) 1 (5%)
Tumor size:	3.89 ± 1.62

Table 5 shows PET-scan findings of the study patients. Negative findings were evident in the majority (90%) of patients. Only one patient (5%) had positive para-aortic nodes and another one patient (5%) had a positive thyroid activity, both patients referred to oncologist to do further management.

Table 5: PET-scan findings of the study patients (number =20).

Variables	Number = 20
PET scan findings, number (%): Positive Negative Thyroid activity	 1 (5%) 18 (90%) 1 (5%)

Table 6 details the operative and postoperative outcomes of the studied patients. The median operation time was 2.75 hours, with 40% experiencing warm ischemia lasting 20-30 minutes. Patients had a median hospital stay of 1 day, and complications were noted in 5% of cases, specifically a ureteric injury. This injury required a double J stent and was treated with absorbable sutures. Postoperatively, one patient experienced drainage issues, but the drain output decreased significantly by the fifth postoperative day. According to the Clavien-Dindo classification, 25% of patients faced complications, including nausea, vomiting, and fever managed with IV Ondansetron and Paracetamol, and one patient received Solifenacin for ureteric injury side effects.

Table 6: Operative and postoperative details of study patients (number =20).

Variables	Findings
Operation time (hour), median ± interquartile range:	2.75 (2.5-3)
Prescence of warm ischemia during operation, number (%):	8 (40%)
Median ± interquartile range of warm ischemia (minutes):	25 (20-30)
Need for blood transfusion, number (%)	0 (0%)
Hospital stays, median ± interquartile range:	1 (1-2)
Operative complication, number (%)	1 (5%)
Clavien-Dindo grade for hospital stay time, number (%): Grade I Grade II Grade III a Grade IIIb Grade IVa Grade IVb Grade V	 4 (20%) 1 (5%) 0 (0%) 0 (0%) 0 (0%) 0 (0%) 0 (0%)

Table 7 shows patients' findings at frequent time intervals. Of note, the means serum creatinine gradually increases, while the means of estimated glomerular filtration rate (eGFR) seem to be slightly decreased over the study time interval but with no statistically difference for both parameters (P value >0.05). On the other hand, one patient was diagnosed with local metastasis at the 6th month visit and another one diagnosed with distal metastasis at the 12th month of follow up visit. All of the patients stay alive but 2 of them alive with the tumor at the 12th month.

Table 7: Follow up findings of study patients (number =20).

Variable	Before operation	Before discharge	1 month after operation	3 months after operation	6 months after operation	12 months after operation
Serum creatinine (mg/ dL), mean ± standard deviation*	0.96 ± 0.18	1.05 ± 0.19	1.07 ± 0.22	1.10 ± 0.25	1.12 ± 0.27	1.17 ± 0.31
Estimated glomerular filtration rate mL/min/1.73m^2, mean ± standard deviation**	116.65 ± 23.81	114.95 ± 23.52	114.55 ± 23.70	114.05 ± 23.71	113.5 ± 24.06	112.45 ± 24.79
CT- scan positive findings, number (%):	20 (100%)	---	---	---	1 (5%) ***	1 (5%) ****
Patient status: Alive healthy Alive with tumor Died	 x0 (0%) 20 (100%) 0 (0%)	 20 (100%) 0 (0%) 0 (0%)	 20 (100%) 0 (0%) 0 (0%)	 20 (100%) 0 (0%) 0 (0%)	 19 (95%) 1 (5%) 0 (0%)	 18 (90%) 2 (10%) 0 (0%)

* P value for serum creatinine mean difference was 0.391.
** P value for estimated glomerular filtration rate was 0.590.
***Local recurrence. The patient was male, aged 63 years, BMI 31.32, smoker, have hypertension, Clavien-Dindo score was I, RANAL nephrometry score was 6, tumor stage T1b, nuclear grade 2, tumor size 4.5 cm, surgical margin was negative, histological type RCC with sarcomatoid feature.
****Distal metastasis. The patient was female, aged 71 years, BMI 34.56, smoker, have hypertension, Clavien-Dindo score was I, RANAL nephrometry score was 6, tumor stage T1b, nuclear grade 2, tumor size 4.7 cm, surgical margin was negative, histological type Papillary RCC.

DISCUSSION

Clinical findings of the study patients

Regarding CT-scan findings of the study patients, the study found that the median of RENAL nephrometry score was 6, most of patients (70%) had tumor stage of T1a, node stage of N0 (100%) and the mean of tumor size was approximately 3.5 cm. Ergün et al found among patients underwent partial nephrectomy, (70%) had T1a, node stage N0 (100%), the mean tumor size was 3.4 cm and the mean of RENAL nephrometry score was 6.2.[13] On the other hand, histopathological examination confirms the diagnosis of renal cell carcinoma in 95% of patients and another 5% found to have renal cell carcinoma with sarcomatoid feature, universal negative surgical margins, and a mean tumor size of 3.89 cm. In the same way of Ślusarczyk et al study findings.[14] These findings would depend entirely on the success of the surgical resections within that specific study's patient group. Additionally, sarcomatoid renal cell carcinoma often presents at an advanced stage, making negative margins more challenging to achieve in all cases, though not impossible, especially if cases were localized.

On the other hand, positron emission tomography (PET) scans findings were negative in the majority of patients. Only one patient (5%) had positive para-aortic nodes and another one patient (5%) report positive thyroid activity. Which consistent with Liu et al study findings who report that PET scan had unfavorable accuracy results for detection and characterization of primary RCC.[15] Anyhow, PET-scans typically show variable Fluorodeoxyglucose (FDG) uptake that correlates with the tumor's histological grade and subtype, rather than a uniform finding.[15]

Only quarter of patients had postoperative complication during hospital stay, indicating good overall result of the laparoscopic partial nephrectomy operation. Eryılmaz et al showed that among 34 patient did laparoscopic partial nephrectomy 11 (32.35%) had postoperative complications most of them were from grade I and II and only one of them had grade V (died).[16] Anyhow, different inclusion criteria and surgical techniques lead to this disparity.

Operative details of the study patients

The study found that laparoscopic partial nephrectomy last for a median of 2.75 hours (165 minutes). These findings are close to Gill et al study finding (3 hours).[15] Furthermore, the study found the median of warm ischemia time was 25 minutes, which also goes with Gill et al study findings (23 minutes).[17] Moreover, the study found (40%) of patient needed warm ischemia to allow for precise tumor excision and reconstruction, which is less than what was reported by Obrecht et al in his Robot-Assisted Partial Nephrectomy (58%).[18] While warm ischemia is a frequent component of laparoscopic partial nephrectomy, the exact percentage depends on the specific surgical approach, the surgeon's expertise and tumor complexity.[19] Additionally, the median hospital stays of the study patient was 1 day, which is shorter than other study findings.[20,21] highlighting a potentially fast recovery of the study patients. Lastly, one patient had an operative complication of ureteric injury. However, this patient experienced an expected postoperative urine leak through the drain site for several days, which gradually resolved by the fifth postoperative day, allowing for drain removal. Campero et al found 6% of patients underwent laparoscopic partial nephrectomy had ureteric injury.[22] Small sample size and different inclusion criteria might cause these mild differences.

One-year outcomes of the study patients

The clinical scenario of the study patients, where mean serum creatinine gradually insignificantly increases while the mean estimated glomerular filtration rate insignificantly decreased through the study time of follow up, consistent with the goal of nephron-sparing surgery, which agrees with Fadahunsi et al study findings.[20] Muscle mass, diet (e.g., high cooked meat intake, creatine supplements), and certain medications can influence serum creatinine levels independently of actual glomerular filtration rate changes.[23] These findings could suggest the compensatory mechanisms are sufficient to maintain the overall estimated glomerular filtration rate at a stable level, but some other non-GFR factor is causing the creatinine level to slowly rise.

Additionally, the study found one patient had recurrent local tumor at the sixth month after operation and another one had recurrent distal tumor at one year after operation. However, the first patient presented with several factors that contribute to a higher risk of early recurrence, like sarcomatoid Features, T1b Stage and tumor size of more than 4 cm.[24] Additionally, he was 63 years, smoker and had hypertension.[25] While the second patients with distal metastasis had papillary cell carcinoma, which is generally less aggressive than clear cell RCC, but it can metastasize.[26] In addition to the patient other risk factors as her age (71 years), smoker, T1b stage and tumor size of more than 4 cm and the reported grade 2 nuclear grade.[25] Furthermore, all of the patients are survived at last follow up visit (after one year). which runs with results obtained from Kreshover et al study.[28]

Limitations of the Study

The study main limitations are; it has small sample size; it was depended on single surgical centre and short follow up time interval. Moreover, lack of adjustment of contralateral healthy kidney function is another limitation, which had a significant clinical role. However, functional assessment of the contralateral kidney is not routine though, and even when it is done, it may result in higher expenses and longer waiting lists for radiological imaging.

CONCLUSIONS

Based on the study's findings, patients who underwent partial nephrectomy experienced fewer complications

and a high survival rate after one year, though some may face reduced estimated glomerular filtration rates and increased serum creatinine levels. Mandatory follow-ups at 1, 3, 6, and 12 months are essential for early detection of tumor recurrence and prevention of metastasis. Renal cancer is more prevalent among elderly males, and preexisting conditions like hypertension, diabetes, and duodenal ulcers may increase risk. Most cases are clear renal cell carcinoma tumors below 4 cm in diameter, and laparoscopic partial nephrectomy typically lasts under 3 hours with a low complication rate.

REFERENCES

1. Bhatt JR, Finelli A. Landmarks in the diagnosis and treatment of renal cell carcinoma. Nat Rev Urol, 2014; 11: 517.
2. Xu C, Liu D, Xing C, Du J, Zheng G, Yu N, et al. Recent Advances and New Perspectives in Surgery of Renal Cell Carcinoma. Ren Cell Carcinoma-Recent Adv New Perspect Appl, 2023.
3. Ianiotescu S, Gingu C, Iordache A, Preda A, Salloum O, Balescu I, et al. Optimizing outcomes of partial nephrectomy in patients with tumors in solitary kidneys: a non-systematic review. J Med Life, 2025; 18: 270.
4. Ljungberg B, Albiges L, Abu-Ghanem Y, Bedke J, Capitanio U, Dabestani S, et al. European Association of Urology guidelines on renal cell carcinoma: the 2022 update. Eur Urol, 2022; 82: 399–410.
5. Kriegmair MC, Mandel P, Moses A, Lenk J, Rothamel M, Budjan J, et al. Defining renal masses: comprehensive comparison of RENAL, PADUA, NePhRO, and C-Index Score. Clin Genitourin Cancer, 2017; 15: 248–55.
6. Capitanio U, Terrone C, Antonelli A, Minervini A, Volpe A, Furlan M, et al. Nephron-sparing techniques independently decrease the risk of cardiovascular events relative to radical nephrectomy in patients with a T1a–T1b renal mass and normal preoperative renal function. Eur Urol, 2015; 67: 683–9.
7. Ochoa-Arvizo M, Garcia-Campa M, Santos-Santillana KM, Klatte T, Garcia-Chairez LR, Gonzalez-Colmenero AD, et al. Renal functional and cardiovascular outcomes of partial nephrectomy versus radical nephrectomy for renal tumors: a systematic review and meta-analysis. In: Urologic Oncology: Seminars and Original Investigations. Elsevier; 2023; 113–24.
8. Hakam N, Abou Heidar N, El-Asmar J, Khauli M, Degheili J, Al-Moussawy M, et al. Comparative analysis of partial versus radical nephrectomy for renal cell carcinoma: Is oncologic safety compromised during nephron sparing in higher stage disease? Urol Ann, 2023; 15: 226–31.
9. Wood EL, Adibi M, Qiao W, Brandt J, Zhang M, Tamboli P, et al. Local tumor bed recurrence following partial nephrectomy in patients with small renal masses. J Urol, 2018; 199: 393–400.
10. Huang WC, Levey AS, Serio AM, Snyder M, Vickers AJ, Raj G V, et al. Chronic kidney disease after nephrectomy in patients with renal cortical tumours: a retrospective cohort study. Lancet Oncol, 2006; 7: 735–40.
11. Touma NJ, Matsumoto ED, Kapoor A. Laparoscopic partial nephrectomy: the McMaster University experience. Can Urol Assoc J, 2012; 6: 233.
12. Li L, Dai J, Liu Y, Zeng S, Yang J, Li X, et al. Incidence and Risk Factors for Progression of Acute Kidney Injury to Chronic Kidney Disease After Liver Transplantation: A Retrospective Cohort Study. FASEB J, 2025; 39: e70903.
13. Ergün M, Akyüz O, Tefekli AH. The Predictive Role of Nephrometry Scores in Evaluating The Effect of Partial Nephrectomy on Postoperative Kidney Functions in T1 Renal Cell Tumors, 2022;
14. Ślusarczyk A, Sharma S, Garbas K, Piekarczyk H, Zapała P, Shi J, et al. Prediction of glomerular filtration rate following partial nephrectomy for localized renal cell carcinoma with different machine learning techniques. Cancers (Basel), 2025; 17: 1647.
15. Liu Y. The place of FDG PET/CT in renal cell carcinoma: value and limitations. Front Oncol, 2016; 6: 201.
16. Eryılmaz R, Aslan R, Taken K, Güneş M. Comparison of Complicatıons Following Laparoscopic Radical and Simple Nephreoctomy Using the Clavien-dindo Clasification. Med Bull Haseki, 2019.
17. Gill IS, Desai MM, Kaouk JH, Meraney AM, Murphy DP, Sung GT, et al. Laparoscopic partial nephrectomy for renal tumor: duplicating open surgical techniques. J Urol, 2002; 167: 466–9.
18. Obrecht F, Padevit C, Froelicher G, Rauch S, Randazzo M, Shariat SF, et al. The Association of Ischemia Type and Duration with Acute Kidney Injury after Robot-Assisted Partial Nephrectomy. Curr Oncol, 2023; 30: 9634–46.
19. Parra I, Rivas J, Serrano Á, Vives R, Hidalgo B, Hermida J, et al. Ischemia time in partial nephrectomy: to rush really matters? Mini-invasive Surg, 2024.
20. Fadahunsi AT, Sanford T, Linehan WM, Pinto PA, Bratslavsky G. Feasibility and outcomes of partial nephrectomy for resection of at least 20 tumors in a single renal unit. J Urol, 2011; 185: 49–53.
21. Tse A, Knaus R, Tse E. Laparoscopic partial nephrectomy: the University of Saskatchewan (Regina division) experience. Can Urol Assoc J = J l'Association des Urol du Canada, 2009; 3: 111–8.
22. Campero JM, Ramos CG, Valdevenito R, Mercado A, Fullá J. Laparoscopic partial nephrectomy: A series of one hundred cases performed by the same surgeon. Urol Ann, 2012; 4: 162–5.
23. De Rosa S, Greco M, Rauseo M, Annetta MG. The Good, the Bad, and the Serum Creatinine: Exploring the Effect of Muscle Mass and Nutrition. Blood Purif, 2023; 52: 775–85.

24. Blum KA, Gupta S, Tickoo SK, Chan TA, Russo P, Motzer RJ, et al. Sarcomatoid renal cell carcinoma: biology, natural history and management. Nat Rev Urol, 2020; 17: 659–78.
25. Chapman D, Moore R, Klarenbach S, Braam B. Residual renal function after partial or radical nephrectomy for renal cell carcinoma. Can Urol Assoc J = J l'Association des Urol du Canada, 2010; 4: 337–43.
26. Al Ashour BH, Azam F, Ibnshamsah F, Alrowais F, Al-Garni A, Al-Shamsi HO, et al. Metastatic Type II Papillary Renal Cell Carcinoma With Recurrent Complete Responses to Sunitinib: A Case Report With a Literature Review. Cureus, 2022; 14: e25541.
27. Ullah A, Yasinzai AQK, Daino N, Tareen B, Jogezai ZH, Sadia H, et al. Papillary renal cell carcinoma: demographics, survival analysis, racial disparities, and genomic landscape. J Kidney Cancer VHL, 2023; 10: 33.
28. Kreshover JE, Richstone L, Kavoussi LR. Renal cell recurrence for T1 tumors after laparoscopic partial nephrectomy. J Endourol, 2013; 27: 1468–70.