Partial Nephrectomy in Adults – A Single-Centre Experience

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ABSTRACT

Partial nephrectomy is the preferred procedure in benign renal lesions requiring surgical removal. It has also been accepted procedure for malignant renal conditions of smaller size. The aim of this observational study was to determine the outcome of partial nephrectomy in terms of complications and recurrence rates. Twenty patients with renal mass underwent this procedure from January 2010 till June 2014 at our Department, with mean age of 46.51 ±1.53 years. There were 14 males and 6 females. Renal mass on CT scan had the mean size of 3.80 ±1.15cm. The mean hospital stay in this series was 5.11 ±1.42 days, while mean operative time was 247 ±79.71 minutes. Twelve patients had malignant histology. They were followed using CT scan abdomen and pelvis with contrast at six and 12 months. Out of these, 10 (83.3%) patients were found to have no recurrence after six months.

Key Words: *Partial nephrectomy. Renal tumor. Adults. Malignant mass. Benign mass. Recurrence.*

Kidney cancer has been the 13th most prevalent malignancy internationally.[1] Renal cell carcinoma (RCC), being the most common type, comprises 90% of all the renal malignancies. Despite the incidence of RCC being on the decline in a few European nations in current years, an international rise has been noted in the prevalence of RCC during the last few years.[2]

Cigarette smoking is considered to be the most common causative factor, although many different reasons have additionally been suggested.[3] The most typical age at presentation is in the range from 60-70 years and is more frequent in males than in females.[4]

With the advancement and widespread use of imaging techniques, the fraction of incidental tumors in asymptomatic people has risen consistently.[5] The incidence of incidental tumors was just 10% in mid 1970s, which ascended to 60% in1990s.[6]

Over the last two decades, procedure of partial nephrectomy (PN), which is nephron-sparing surgery, has gained momentum due to increase in detection of small incidental renal masses. For patients having smaller renal tumors, radical nephrectomy (RN) has been an important risk factor for the progression of chronic kidney disease (CKD) as compared to PN.[6,7]

This is a retrospective analysis of 20 patients who had procedure of partial nephrectomy from January 2010 till June 2014 at the Department of Urology & Kidney Transplant, Shifa International Hospital, Islamabad. Adult patients of age more than 18 years, who had a renal tumor size less than 7 cm without any evidence of metastasis, were included in the study. Patients of ASA 1 and 2 were chosen for the procedure. All patients underwent baseline investigations and anesthesia fitness before surgery. Consent regarding open partial nephrectomy was taken from all patients before the procedure. Patients having anatomic anomalies of the kidney (horseshoe kidney/malrotated kidney), positive urine cultures, and bleeding disorders were excluded from the study.

The kidney was approached using a flank incision and then freed from surrounding tissues. Then the renal artery and the vein were controlled by applying rubber slings around them. The gap formed after the removal of tumor area was closed with vicryl 4/0 and hemostasis was secured by placing surgicell in the gap and compression over it for one or two minutes. A tumor-free margin of 1 cm was made sure on frozen section report by the pathologists. Ischemia time was only 5.31 ±0.33 minutes as the sling was pulled to control the blood flow to kidney which resulted in minimal blood loss as well as minimal warm ischemia time.

Data was noted regarding patient gender, age, size of the tumor on CT scan, BMI, histological findings, postoperative complications, creatinine clearance and any recurrence of the tumor on the follow-up CT scan at six months and at 12 months by chart review. SPSS version 16 was used for analysis of the data.

The mean age of patients was 46.51 ±1.53 years, in which 14 (70%) were males and 6 (30%) were females. Their mean BMI was 27.8 ±5.6 Kg/m^2. Thirteen (65%) patients were incidentally found to have a renal mass on radiological exam, four (20%) had presented with flank pain, two (10%) had presented with abdominal pain, and one (5%) with LUTS. Three (15%) were diabetic, 11 (55%) were hypertensive, and six (30%) had no

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comorbid. Patients had mean renal mass size of 3.80 ±1.15 cm on CT scan. The mean nearness of the mass to the pelvicaleceal system was 5.2 ±1.94 mm. Eight (40%) underwent partial nephrectomy with Dj stent and the remaining 12 (60%) underwent partial nephrectomy without Dj stent, out of which only one patient needed Dj stent for persistent urine leak coming from drain. Patients had a hospital stay duration of 5.11 ±1.42 days, while the mean operation time was 247 ±78.71 minutes. Total mean preoperative hemoglobin level was 13.73 ±1.66 g/dl and mean drop in the hemoglobin (Hb) level on first postoperative day was 1.6±1.2 g/dl. Eleven (55%) required no blood transfusion, five (25%) needed one pint packed RBCs and four (20%) needed two pints packed RBCs.

On histopathology, eight (40%) were benign and remaining 12 (60%) were malignant, of which seven (58.3%) were clear cell RCC and remaining five (41.67%) were papillary RCC. Postoperatively, two (10%) had lower respiratory tract infections, four (20%) had developed post-op ileus, two (10%) had prolonged urine leak in drain, out of which one needed DJ stent insertion. None of the patients suffered from sepsis or wound infection. They had mean preoperative value of the creatinine clearance of 103.11 ±3.07 ml/min and the mean drop in the creatinine clearance noted at six months was 14.51 ±1.40 ml/min.

Twelve patients with malignant histology were followed up with CT scan at six and 12 months. Out of these, 10 (83%) patients were found to have no recurrence at six months, while two (16.7%) patients did not continue the follow-up.

Over the past few decades as imagining modalities have improved, it has led to the increased diagnosis of small localized incidental renal tumors, which can now be managed safely by partial nephrectomy without compromising the oncological outcomes.[7] In a study by Chang *et al*., the mean age of the patients was around 60.7 years having mean body mass index of 24.3 ±3.0 (Kg/m^2). In their study, the mean baseline eGFR was approximately 81.5 ±16.7 mL/min/1.73 m^2. Partial nephrectomy was performed in 218 patients. They noted acute kidney injury (AKI) and new-onset type of CKD in 24.3% of the operated patients. New-onset CKD was labelled in case of a decrease in the eGFR of patients to <60 mL/min/1.73m^2 three months after partial nephrectomy in their patients having a preoperative value of eGFR of more than 60 mL/min/ 1.73 m^2.[8] In this series, there was no case of AKI or CKD over the follow-up.

There was comparatively more blood loss as judged by hemoglobin drop and need for transfusion was also high in this series. The mean hospital length of stay in this study was almost similar to previous studies.[7]

One patient (5%) required re-intervention, which is comparatively a higher rate as compared to a report by Stephenson *et al*. in which re-intervention rate was 2.5% due to complications of urinary leak after partial nephrectomy requiring ureteric stents or insertion of a percutaneous drain.[9]

We had no case of incisional hernia on follow-up. Russo *et al*. stated about a modified open technique having better cosmetic results as compared to the traditionally used open techniques. After 18 months of patients follow-up, 5/133 patients (3.6%) had developed a bulge (not a hernia but only muscular atony) at the incision site, and only one patient had developed an incisional hernia.[7]

Chang *et al*. found recurrence was seen in 3.2% of the patients, in which the mean size of tumor was 3.9 ±1.5 cm.[8] There was no recurrence over two years of follow-up in this series, where mean renal lesion size was approximately 3.8 ±1.1 cm, which was comparable to theirs.

Partial nephrectomy procedure is deemed as a safe procedure and can be introduced easily even in new centers without major complications. However, it is necessary that in-house facility of frozen section is available to confirm tumor-free surgical margins peroperatively.

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