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Nephron Sparing Surgery for Small Renal Mass at a University Teaching Hospital: A Six Years Retrospective Review

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ABSTRACT

Introduction

Nephron-sparing surgery (NSS) is the standard of care for clinical T1 (cT1), renal mass less than 7 cm, whenever intervention is indicated. It has oncological outcome equivalent to radical nephrectomy in small renal masses and it also minimizes the progression to chronic kidney disease. However, there is paucity of data on outcomes of NSS in Nepalese population.

Methods

A six years retrospective review of medical records of patients undergoing partial nephrectomy from Jan 2012 to Dec 2017 in Department of Urology and Kidney Transplant Surgery at Tribhuvan University Teaching Hospital was done to determine its demographics and outcomes.

Results

Twenty eight patients underwent nephron sparing surgery for clinical T1 renal masses in the past six years. Complications occurred in three cases. Five of the lesions were benign and 23 malignant on final histology. Clear cell carcinoma was the commonest variant of renal cell cancer. Margin was positive in two cases and both were kept in close surveillance. There was no local recurrence and renal impairment during five to 60 months follow-up.

Conclusion

Nephron sparing surgery is a safe procedure with good oncological outcome for clinical T1 renal mass. It prevents unnecessary nephrectomy in benign lesions as well as chronic renal impairment at the same time.

Keywords: *Nephron sparing surgery, small renal mass*

INTRODUCTION

Radical nephrectomy with its minimal complications and good oncological outcome has stood the test of time for the treatment for renal masses.¹ However, despite a higher complication rate and increased complexity of surgery, partial nephrectomy (PN) has up surged radical nephrectomy for the treatment of selected small renal masses of less than seven cm.^{2,3} Partial nephrectomy or Nephron sparing surgery (NSS) provides a similar oncological outcome with the advantage of nephron preservation in patients with small renal masses, which is important in patients with diminished renal reserve, solitary kidney or bilateral renal masses.^{3,4}

Though incidental and small renal masses are rising in the developed countries, renal masses requiring radical nephrectomy are still common in Nepal.^{5,6} There is very little published data on long term outcomes of NSS in Nepal. Here, we retrospectively reviewed the medical records evaluating the pathology, complications and outcome of the cases that underwent renal preserving surgery over six year period in our institute.

METHODS

We conducted a retrospective study in the Department of Urology and Kidney Transplant Surgery, Tribhuvan University Teaching Hospital, Kathmandu, Nepal and medical records of all patients undergoing

NSS from January 2012 to December 2017 were reviewed. Demographic data, lesion characteristics, complications and follow-up outcomes of the patients were analyzed. Tumor Node Metastasis (TNM) staging was done applying the 2017 TNM classification system.

RESULTS

A total of 28 patients underwent NSS surgery in our institute over a period of six years. The mean age of the patients was 56 ± 16 years ranging from 20-90 years. The male to female ratio was 2.5: 1.

Most of the patients (57%) were symptomatic, with pain and hematuria in 15 and one patients respectively. Only 12 cases were detected incidentally. Four patients had solitary functioning kidneys and one had renal stone in the ipsilateral pelvis.

Masses were located in the upper or lower pole in 23 patients and remaining five patients had the masses in the interpolar region of the kidneys. The mean size of the lesion was 3.6 ± 1.7 cm and was removed with a mean cold ischemia time of 16.9 ± 7.1 mins. The important operative outcome of the patients who had undergone NSS is presented in table 1.

Complications were seen in three patients. Two patients who developed fistula had lesion in the interpolar region. The patients with pyelo-cutaneous fistula were successfully managed conservatively with insertion of double J stent and prolonged retroperitoneal drainage. The patient with surgical site infection required secondary suturing. Hospital stay was longer in these patients.

Majority of the resected lesions (82.1%) were malignant. Low grade clear cell carcinoma was the most common histopathological finding in the current series. Both patients with positive surgical margin had lesion in the intrahilar region, however as both the lesions were of low grade (Furhman grade I) and hence were kept on close follow-up. On follow-up of these patients (range 5 -60 months), none of the patients have developed recurrence including patients with positive surgical margin. All the patients including those with functionally solitary kidney had not developed renal failure.

DISCUSSION

Small renal masses usually present around sixth and seventh decade of life.⁷ But in our study it was more common in fifth decade which is similar to series reported by Agnihotri et al in an Indian and by Shin et al. in a Korean population.^{7,8} In our series, 57% of the patients were less than 60 years old which is similar to other series reported from Nepal and India.^{5,7} It may be a representation of different trend among the Asian population but may be the result of only a small proportion of patient presenting as small renal masses as compared to Western population. In

Table 1. Operative outcomes

Variable	Number
Mean hemoglobin drop	0.9 (0.5-1.6) gm/dl
Transfusion	0
Median hospital stay (days)	5 (5-14)
Complications	
Pyelocutaneous fistula	2
Surgical site infection	1

the West 60% of the patients present as T1a lesion, whereas only 16% of our patients fall in the category.⁹ Renal masses were more common among males in our series which is similar to the world literatures.¹⁰ In the West 48-66% of small renal masses are detected incidentally.⁶ But in the current series, only one-third of the patients presented with an incidentally detected mass supporting the previously published series from Nepal.¹¹

The advantage of NSS is exemplified by the four patients who had functional solitary kidney remaining dialysis free over the study period. The overall complication rate was 12.3% in our series which is not higher than reported in large series. Although the reported risk of hemorrhage is about 3.1% we did not have any hemorrhagic complications.^{12,13} It may be the reflection of only a small number of partial nephrectomies being done in our institute. The morbidity just prolonged the duration of hospital stay in our series.

Table 2. Pathological characteristics of the patients

Variable	Number
Histopathology	Total=28
Malignant	Sub-total=23
Clear cell RCC	19
Papillary RCC	1
Chromophobe RCC	3
Benign	Sub-total=5
Oncocytoma	1
Cystic nephroma	1
Xanthogranulomatous pyelonephritis	2
Angiomyolipoma	1
Furhman grade (clear cell carcinoma)	Total=19
I	6
II	10
III	3
Stage	Total=23
T1a	16
T1b	7
Margin status (malignant lesions)	Total=23
Free	21
Positive	2
Lymphovascular invasion	0

Our series highlights another benefit of partial nephrectomy where there is possibility of a benign pathology. Five (18%) cases were benign which is similar to those mentioned in literature and hence radical nephrectomy would have been an overtreatment in these cases.¹⁴ Clear cell renal cell carcinoma is the commonest histology found in patients with small renal masses accounting for 82-88% of renal masses.¹⁵ Clear cell renal cell carcinoma was the most common variant comprising of 82.6% of the resected malignant lesion in the current series. Positive surgical margins can occur in 8% of cases undergoing nephron sparing surgery.¹⁶ Two of the patients in our series had a positive surgical margin. There are multiple non surgical and surgical approaches to manage a patient with a positive surgical margin and observation with follow-up is one of the options. It is based on the published reports showing that only patient with high grade tumors have a higher chance of recurrence and there is comparable five year cancer specific and recurrence free survival among margin positive and negative cases.^{17,18} Since our patients with positive surgical margins had low grade (Furhman grade I) disease we kept the patients on follow-up and they have not shown any recurrence for up to three years of follow-up.

CONCLUSION

Though our series is small, the study has shown that NSS is a feasible option with good short term and intermediate term outcome in Nepalese patients with small renal masses.

CONFLICT OF INTEREST

None declared.

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