



CHANGING TRENDS IN THE PRESENTATION AND MANAGEMENT OF RENAL TUMORS

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ABSTRACT

Introduction: We have analyzed the changing trends in surgical treatment of renal tumors over the last decade with regard to age incidence, presentation, incidental detection, and histopathology.

Methods: Records of renal tumors were analyzed to see change in surgical pattern in last decade. The data was split into 2 parts (cohort) based on five year time period. Cohort 1 from 2006-2010 and cohort 2 from 2011 to 2015. For cohort 2 a comparative study was also performed with regard to age incidence, presentation, incidentalomas, histopathology, and management with statistical analysis.

Results: Total 445 nephrectomies were done. In cohort1 175 (87%) were radical and 22(13%) were partial nephrectomy. In Cohort2 178(71.7%) underwent radical and 70(28.2%) partial nephrectomy. In cohort1 robotic approach was used in 21(12%) in comparison to 7(3.9%) radical nephrectomy in cohort2. 5(22%) partial nephrectomies were done by robotic approach in cohort1 which increased to 24(34.3%) in cohort2. Common histopathology was clear cell carcinoma and papillary RCC. 8 % were benign, oncocytoma being the commonest. There was no difference in gender ratio, histopathology and age with regard to type of surgery. 30% of tumors were incidentally detected which in partial nephrectomy group were 60% in comparison to 20% in radical nephrectomy group ($p=0.001$). Tumors resected by partial nephrectomy were smaller (Mean size, 4.4cm) than those resected by radical nephrectomy (Mean size, 8.3cm).

Conclusion: Due to detection of early stage incidental tumors and gain in experience in minimally invasive surgery there is increasing trend towards NSS for renal tumors.

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INTRODUCTION

Among urological malignancy Renal cancer is the third most common with a slightly higher male prevalence.¹The common clinical presentation for renal cancer is the triad of flank pain, abdominal mass and hematuria.²Earlier most renal tumors were detected at an advanced stage and were managed by radical nephrectomy. With increasing use of radiological investigation, most renal cancers are detected incidentally and at an early stage.^{1,3} With increasing detection of tumors at an early stage and the insight gained into the risk of chronic kidney disease and cardiovascular mortality following radical nephrectomy (RN), partial nephrectomy (PN) is now more commonly used as the treatment option for renal cancer. We evaluated the management of kidney tumors at our institution over a 10-year period to assess the change in presentation and outcomes.

MATERIAL AND METHOD

Data of all the patients who were operated for renal tumors at our institute between 2006 and 2015 were retrospectively retrieved from our data base. The data was split into 2 parts based on a five year time period; cohort 1 from 2006 to 2010 and cohort 2 from 2011 to 2015. Data was analyzed for clinical presentation, types and approach of management and

histological types. Histopathological examinations of the resected specimens were performed at our institute. Tumor histology was based on the Heidelberg classification of renal cell tumors.^{4,5} Statistical analysis was done using Fischer exact test, Chi square test and T test.

RESULTS

Table Changing Trends between the two cohorts

	2006-2010	2011-2015
Total number of cases operated	197	248
Incidentally detected	59 (29.9%)	78 (31.4%)
Mean Age (range)	50 (19-84)	51 (14-88)
Sex(M:F)	2.5: 1	2.5:1
Mean (range) tumor size in cm	7.0 (2-14)	7.2 (1.8-20)
Surgical Approach		
a)Partial Nephrectomy	22 (13%)	70 (28.2%)
Mean (range) tumor size in cm	4.6 (2-8)	4.4 (1.8-10)
Open	14 (63%)	34 (48%)
Laparoscopic	3 (13%)	12 (17%)
Robotic	5 (22%)	24 (34.2%)
b)Radical Nephrectomy	175	178
Mean (range) tumor size in cm	7.3 (3-14)	8.1 (2.5-20)
Open	93 (53%)	106 (59.5%)
Laparoscopic	61 (34.8%)	65 (36.5%)
Robotic	21 (12%)	7 (3.9%)
Common histopathology		
Clear cell	163 (82%)	186 (75%)
Papillary	16 (8%)	24 (9.6%)
Oncocytoma	6 (3%)	9 (3.6%)

From 2006 to 2015 August, 445 nephrectomies were performed at our institute. Of these, 353 (79.3%) were radical nephrectomies and 92(20.6%) underwent partial nephrectomy. 197 nephrectomies were done in the first five years (cohort 1) and 248 nephrectomies were done in next five years (cohort 2). In cohort 1, 175 (87%) were radical nephrectomies and 22 (13%) were partial nephrectomy. In cohort 2, 178 (71.7%) underwent radical nephrectomy and 70 (28.2%) underwent partial nephrectomy. There was no significant difference in the number of radical nephrectomies done in the two time periods. However, in cohort 1, robotic approach was used in 21(12%) of radical nephrectomy in comparison to 7 (3.9%) in cohort 2.(Figure 1)

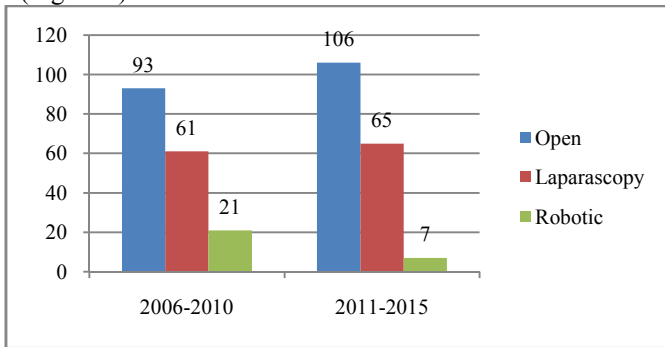


Figure 1 Approach for Radical Nephrectomy in the two cohort

There was a change in the approach of surgery over time for smaller renal masses. In cohort 1, out of all partial nephrectomy procedures, robot was used in 22% cases where as in cohort 2, robot was used in 34.3% cases for performing the procedure(Figure 2).

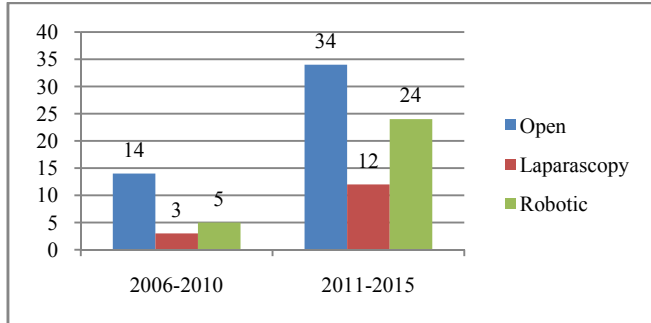


Figure 2 Approach for Partial Nephrectomy in the two cohort

Nearly 30% of the tumors presented incidentally. In cohort 1, incidental detection of renal tumors was 29.9% in comparison to 31.4% in cohort2. This was not statistically significant. There was significant difference in the presentation of lesions resected by partial and radical nephrectomy ($p=0.001$). In patients who underwent partial nephrectomy, around 60% of these were detected incidentally in comparison to 20% in radical nephrectomy group (Figure 3).

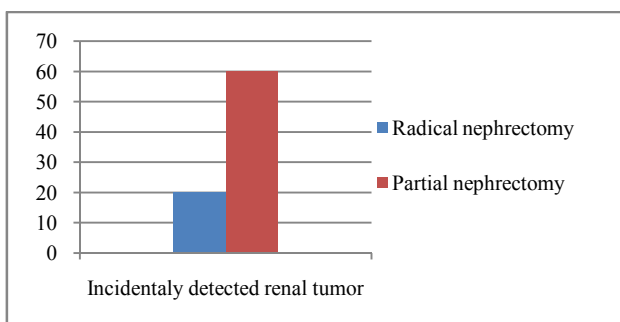


Figure 3 Approach for Incidentally detected tumor

Tumors resected by partial nephrectomy were significantly smaller (4.4cm) than those resected by radical nephrectomy (8.3cm). There was no significant difference in the type of histology between the two cohorts.

DISCUSSION

Despite the increasing use of radiological imaging, only 30% of tumors operated in our series were incidentally detected. This number was consistent over the two time periods studied. This data is similar to previously published reports from the Indian subcontinent but lower than the 50% or higher reported in other series.^{6,7,8} The mean tumor size in our patients was 7.1 cm overall and 4.5 cm for PN. In comparison, large current series from the west found the mean tumor size to be 7cm for RN and 3.1 cm for PN.^{9,10} Literature from European health centers, show an increase in PN from 11.2% between 1987 and 1991 to 37.4% from 2000 to 2003. Between 2004 and 2007, the PN rate surpassed that of RN, reaching 50.1 %.¹¹ SEER data from 1999 to 2006, suggest, that with each 1-cm increase in tumor size there is a 47% lower odds of PN.¹² The lower rate of PN in our center could be explained by the fact that only 30 % of our patients are incidentally detected. The mean tumor size for PN in our series was 4.5 cm in comparison to 3.1 cm of western series further explains the larger tumor size at presentation in our series and hence the decreased in rates of PN.

After initial use of robotic approach for radical nephrectomy, its use for radical nephrectomy has lost favor. This is due to the ablative nature of the surgery where robot does not offer any added advantage over laparoscopy. In this present study, we observed greater use of the robot for performing radical nephrectomy in cohort 1 than in cohort 2 (12% vs 3.9%). The time frame for cohort 1 coincides with the period when robotic system was introduced at our institute and may be explained by the initial enthusiasm for using the robot which subsequently declined when no specific advantage could be found.

Consistent with published literature, partial nephrectomy was the preferred modality of treatment in incidentally detected tumors in our study^{13, 14}. In cohort 1 among 59 incidentally detected tumors, 12 (20 %) underwent a PN and in cohort 2 among 78 incidentally detected tumor 43 (55%) underwent PN. The use of PN increased in the latter half of our series (cohort 2) (28% vs 11%) with an associated increase in the use of minimally invasive approach (Laparoscopic/Robotic) in the second half (51% cohort 2 vs 35% cohort 1). Although the incidence of incidentally detected tumor is same in the two cohorts, significant majority of these tumors were managed by PN in cohort 2. The time frame of the first cohort coincides with the period of introduction of robot to our center. Hence, the increased rate of PN and use of minimally invasive approach (Laparoscopic/Robotic) in the later cohort could be explained by the increased experience with PN and use of robot to perform the procedure.

Because of difficulties in laparoscopic suturing, increased warm ischemia time associated with it most partial nephrectomy was done initially with open approach. With increasing laparoscopic skills and better hemostatic agents, laparoscopic approach is now being used more commonly. Robotic partial nephrectomy has gained wider acceptance in centers where it is available because of ease of suturing and decrease in warm ischemia time.^{15,16}

Clear cell RCC accounts for approximately 70% to 80% of all RCC.⁴In our study there was no difference in the histology of renal tumor between the two cohorts. 75% of RCC were clear cell. Next common histopathology was papillary RCC. 8% of the resected tumors were benign in nature, oncocytoma being the commonest pathology.

Limitations: Ours being an academic institute with the faculties at different level of experience, could have affected the approach of surgery.

CONCLUSION

Due to increase in incidental detected renal tumors at an early stage PN is now the standard treatment for small renal tumors. With increased experience in MIS techniques and skills, laparoscopic and robotic approach is more frequently used for PN. There has been a gradual change in trends towards minimally invasive nephron sparing surgery whenever feasible.

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