Renal cell carcinoma: Are we attacking a different tumor over the past 10 years?

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Abstract:

Objective: There is a noticeable increase in the presentation of different types of urological malignancies at a younger age of presentation, in our institution. The objective of our study was to investigate cases presented with renal cell carcinoma, managed in the past 10 years for any possible epidemiological and cancer characteristics changes.

Methodology: Retrospective data collection for cases managed by our institution in the time period (2002- 2012) was done. We included patients with complete data and pathologically proven renal cell carcinoma at final diagnosis.

Results: Complete data could be retrieved for 334 patients. The mean age of cases was 43.5 years, with 279 (83%), 200 (60%) and 128 (38%) of patients younger than 60, 50 and 40 years respectively. Males and females involvement were 191 (57%) and 143 (43%) respectively. By histopathology, 200 (60%) of patients had clear cell (CC) RCC and 134 (40%) patients had non-clear cell type (papillary or chromophobe). The mean tumor size was 10.9 cm and partial nephrectomy was applied for 16% of all the cases, including 65% for cases with tumor size less than 4 cm.

Conclusion: There is a marked increase in the prevalence of renal cell carcinoma in the past 10 years, among younger age group, with higher rate for involvement of female gender. RCC is tending to present with large tumor size and more prevalence of non-clear cell histopathology. The use of partial nephrectomy is accepted for patients presented with renal mass and can safely challenge larger sized tumors.

Key words: Renal cell carcinoma, partial nephrectomy, Radical nephrectomy

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Introduction

Renal cell carcinoma (RCC) is the ninth most common type of cancer all over the world [1] and the major type of kidney cancer. [2] Clear cell type is considered the commonest type of RCC, representing about 70-80 %.[2]

The aim of our study was look for any possible epidemiologic changes for RCC over the past 10 years, including age and sex distribution, pathological types of RCC, and also for the mode of surgical intervention.

Methods

Retrospective data collection, for all cases operated upon in our tertiary center within the past 10 years, for a pathologically documented RCC. The main parameters we were looking for were age and sex of the patients, pathological type of RCC and type of surgery performed.

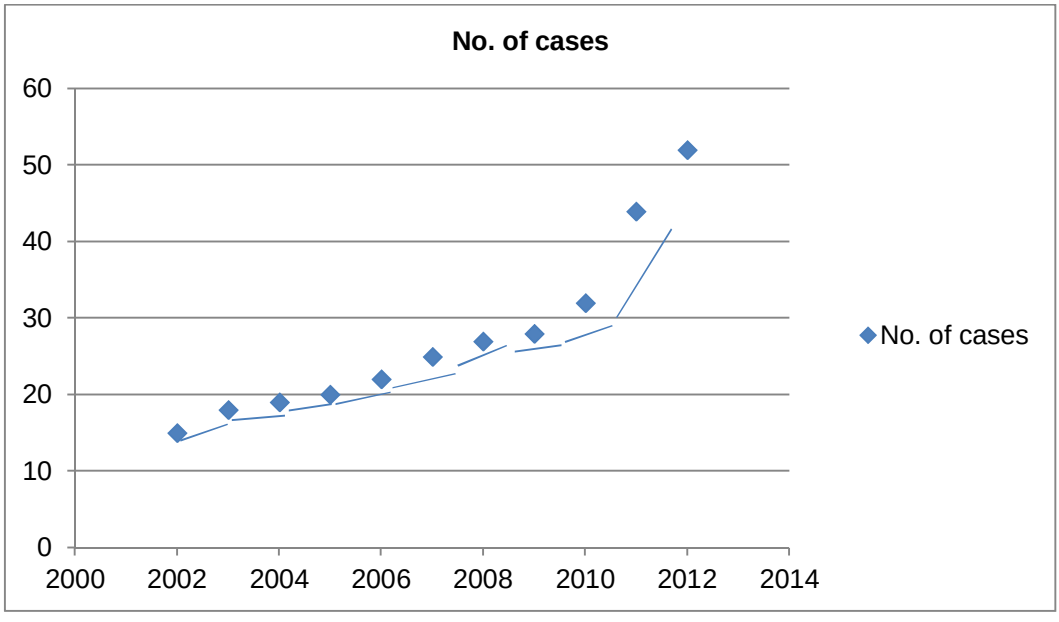
Informed consent is routinely obtained for every case at time of presentation to our department, in order to include their data in the department's database to be used for internal audit and international research. No specific consent was needed to be obtained for this particular research and patients' personal data were not shown in the study.

Ethics committee approval was obtained before the start of data collection and confidentiality was assured.

Results

Complete data could be retrieved for 334 patients. The mean age of cases was 43.5 years, with 279 (83%), 200 (60%) and 128 (38%) of patients younger than 60, 50 and 40 years respectively. Correlating with tumor size, the mean age was 34, 39, 40 and 48 year for tumors less than 4, 4- 7, 7- 10 and more than 10 cm respectively. Males and females involvement were 191 (57%) and 143 (43%) respectively. The incidence of RCC was increased in the past 3 years. Figure (1) shows the incidence of RCC in our institution over the past 10 years.

Figure (1): Incidence of RCC diagnosis over the past 10 years.



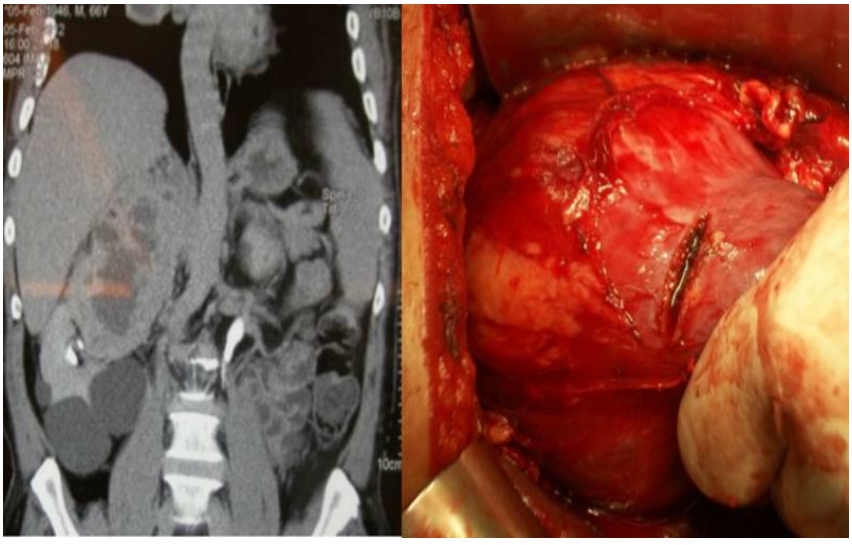
By histopathology, 200 (60%) of patients had clear cell (CC) RCC and 134 (40%) patients had non-clear cell type (papillary or chromophobe). The prevalence of non CC RCC was higher than expected and was very close to the prevalence of CC type for tumors less than 4 cm and more than 10 cm respectively. The mean tumor size was 10.9 cm ranging from (2-26 cm). Radical nephrectomy was performed in 281 cases (84%), while partial nephrectomy was applied for 53 cases (16%). Table (1) illustrates the cases, regarding the tumor size correlated with age, sex and the surgical approach.

Table (1): Data on tumor size correlated with age, sex, histopathology and surgical approach.

Tumor size (cm)	Mean age (Years)	Number of patients			Pathology		Surgical approach	
		Total	Males	Females	CC	Non CC	Radical	Partial
<4	34	29 (9%)	18	11	15	14	10 (34.5%)	19 (65.5%)
4.1- 7	39	61 (18%)	35	26	43	18	35 (57%)	26 (43%)
7.1- 10	40	68 (20%)	37	31	42	26	61 (89.7%)	7 (10.3%)
>10	48	176 (53%)	101	75	101	75	175 (99.4%)	1 (0.6%)

There was a trend in the past few years to challenge every case for partial nephrectomy, regardless of the tumor size, as long as sufficient renal parenchyma could be preserved following the surgery. Figure (2) shows radiological and intra-operative image for a large upper polar tumor that could be managed by nephron sparing surgery.

Figure (2): CT and intra-operative image for a case of large upper polar tumor managed by partial nephrectomy.



Regarding postoperative complications; this could be retrieved for the last 100 cases. Using Clavien Dindo grading, we could find that 30% of cases had grade I complication, mostly was in the form of ileus requiring delayed feeding for an extra day. Grade II complication was noticed in 25% of cases in the form of blood transfusion or prolonged antibiotics intake due to wound infection. None of studied cases had grade III or grade IV complications. Grade V complication (death) was recorded for a single patient.

Discussion

It was reported that RCC occurs predominantly in the sixth to eighth decade of life, and it is less common in patients under 40 years of age. [3] Our series was very much different as we had only 16% of our cases older than 60 year of age, with 38% of cases younger than 40 year of age. We do not believe that can be only attributed to increased use of radiology and the diagnosis of asymptomatic cases. We believe that there may be an environmental pollution and unknown new risk factor that resulted in the development of such large sized tumors earlier in age.

Previously, RCC was reported to be at least twice as frequent in men as women. However, more recent data analysis of SEER

(Surveillance, Epidemiology and End Results) suggests that this gap is narrowing. Raising incidence has been more rapid in females than males. [4, 5] Our results go with confirming the increased incidence of female affection with RCC, as we had 57% and 43% of patients being males and females respectively, with nearly equal mean age of presentation and with same tumor size at presentation.

Although the increased diagnosis of RCC worldwide was attributed to the increased detection of incidental small renal masses, due to wide use of radiological investigations, it was of interest in our study that only 27% of cases presented with stage 1 disease (tumor less than 7 cm), while three quarters of cases presented initially with a larger tumor size, including 176 patients (53%) presenting with tumor size exceeding 10 cm.

In our series, clear cell RCC represented the major histopathological subtype (60%), but with a lower incidence that was expected (80%). We could identify 40% of our cases as having either papillary or chromophobe RCC. This may be attributed to the young age of our patients. Gillett et al [6] could identify that 13% of their patients younger than 40 year old, to have chromophobe RCC, in comparison to 3% of older patients. Rodriguez et al [7] also showed that percentage of clear cell RCC in patients younger than 40 years to be 70% in comparison to 90% of their older patients. Another possible explanation is the large tumor size for patients in our series. Rothman et al [8] made an analysis on SEER database and could show those large sized tumors are more associated with non-clear cell histopathology. Tabibi et al [9] studied the same correlation between tumor size and histopathological type. They detected that small tumors are associated with more diagnosis of non-clear cell type. In our series, although non-clear cell histology was prevalent in different tumor sizes, the prevalence was specifically the highest for tumors less than 4 cm and for those larger than 10 cm in diameter.

Currently; partial nephrectomy represents the standard of care for patients with T1a RCC (< 4 cm) and an optional modality, whenever possible for larger tumor size. Thompson et al [10] reported the use of partial nephrectomy, at their institution, as 90% and 60% for tumor size <4 cm and 4- 7 cm respectively. Kim et al [11] and Patel et al [12] identified a sample of patients from 1755 hospitals in USA and could demonstrate an increased use of partial nephrectomy across the country, reaching 25% of cases with small renal masses, in 2008, with higher performance in academic and high nephrectomy volume urban hospitals. Bjurlin et al [13] more recently (2013) analyzed a nationwide inpatient sample across USA and could show that the use for partial nephrectomy has increased to 32% for small renal masses. In our series, partial nephrectomy was applied for 16% of cases. Stratifying by tumor size, it was applied for 65.5%, 43%, 10.3% and 0.6% for cases smaller than 4 cm, 4- 7 cm, 7- 10 cm and more than 10 cm respectively. The high use of nephron sparing surgery in our institution is correlating with the above date for being an academic institution and a referral tertiary care center for managing urological malignancies.

In our study; we had a high rate of grade I complication that can be attributed to our preferred chevron transperitoneal incision that was sometimes associated with ileus and delayed start of enteral feeding.

Conclusion

There is a marked increase in the prevalence of renal cell carcinoma in the past 10 years, among younger age group, with higher rate for involvement of female gender. RCC is tending to present with large tumor size and more prevalence of non-clear cell histopathology. The use of partial nephrectomy is accepted for patients presented with renal mass and can safely challenge larger sized tumors.

Conflict of interest

No conflict of interest to declare.

Financial disclosure

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