

## Research Article

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## Kidney Cancer: 12-years' Experience of Sultan Qaboos University Hospital

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### ABSTRACT

**Purpose:** Kidney cancer is the 10th most common cancer in Omani males. Renal cell carcinoma (RCC) is found in 72% of kidney cancers in Oman. The aim is to study all nephrectomies performed in Sultan Qaboos University Hospital and know the characteristics of RCC.

**Methods:** Clinical, radiological and pathological data of 62 patients who underwent nephrectomy in Sultan Qaboos University Hospital over 12 years (1999-2011), were collected retrospectively. Kaplan-Meier, log-rank and chi-squared tests were used for statistical analysis.

**Results:** A total of 27 patients operated for suspected kidney cancer, 74% were RCC. The mean (SE) tumor size was 8 (1.1) cm. There was a significant correlation between tumor size and mode of presentation, incidental or symptomatic, (Pearson chi-square 6.3,  $P = 0.04$ ). The most common tumor location was upper pole of the kidney. The staging and grading were: T1 (52%), N0 (81.5%), M0 (100%), Fuhrman Grade 2 (59.3%). The most common histological type was conventional RCC (40.7%). Oncocytoma was found in (11%). Surgeries performed were radical nephrectomy (66.7%) and partial nephrectomy (33%). The mean (SE) follow up was 24.4 (5.9) months. The two-year overall and disease-free survivals were 85.7% and 66.7% respectively with a recurrence of 31.8%. The histological type had no significant effect on survival ( $P = 0.299$ ).

**Conclusions:** To improve the outcomes, referral and centralization of kidney cancer surgery care is encouraged. Future long follow up studies in collaboration with ministry of health centers are needed to know the features of RCC in Oman.

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### Introduction

Renal cell carcinoma (RCC) accounts for approximately 2–3% of all adult malignancies and for approximately 90% of all kidney malignancies. More than 50% of all RCCs diagnosed are a localized stage (T1–T2N0M0) [1]. The evidence base suggests localized RCCs are best managed by nephron-sparing surgery where technically feasible [2]. Renal tumors include Primary Lymphoma of the Kidney with 100 cases described in the medical literature [3]. Adult Wilms' tumor is rare. Triglycerides were found to have a statistically significant association with kidney cancer risk. Approximately 31,000 new diagnoses of RCC are made each year in the United States, and 11,900 patients die of disease. Overall, 8.9 new cases are diagnosed per 100,000 population per year, with a male-to-female predominance of 3:2. In Oman, the incidence of kidney and ureter cancer is 1.5 and 0.5 per 100,000 per year for males and females respectively. Kidney cancer is the 10th most common cancer in males. RCC is found in 72% of kidney cancer in Oman [4-7].

### Materials and Methods

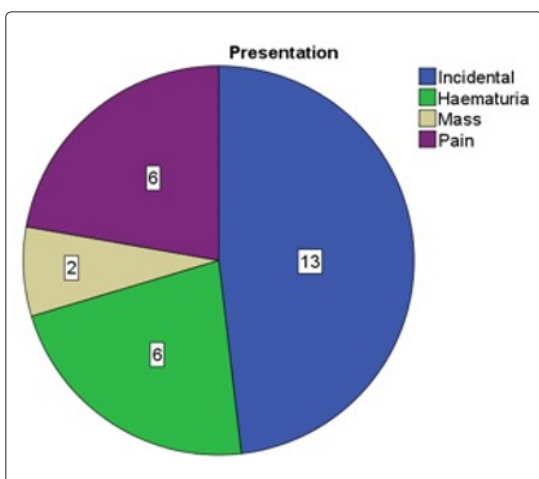
We retrospectively collected data from 62 patients who had renal surgery for kidney cancer in Sultan Qaboos University Hospital over a period of 12 years (1999-2011), with permission from the local ethical committee. Patients were diagnosed with a renal mass lesion during radiological examination because of complaints

unrelated to kidney cancer or they presented with symptoms related to kidney cancer. The radiological investigations used were ultrasonography, excretory urography, CT and MRI. The following data were collected: age, sex, nationality, region, presentation, tumor (side, size in cm, location, stage, grade, histology and recurrence), surgery type, follow up period and condition on the last follow up. Fuhrman's classification and WHO histological classification were used for the stage, grade and histological types of RCC, respectively [8]. The cancer-specific survival was calculated using Kaplan–Meier curves, and the log-rank test was used to compare differences. The chi-squared test was used to test associations between the groups. The statistical significance level was set at  $P < 0.05$ .

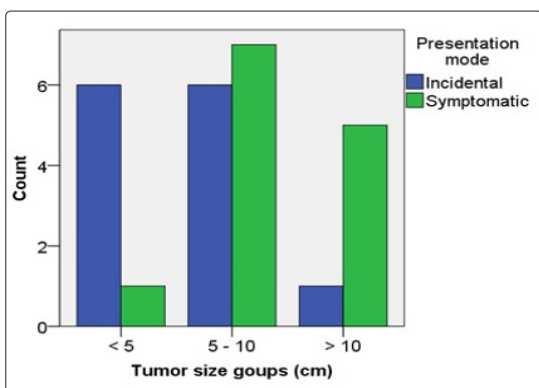
### Results

A total number of 62 nephrectomies were performed (34 right, 28 left). Kidney cancer was found in 27 of them. Renal cell carcinoma (RCC) constituted 74% (20) of the kidney cancer diagnoses. In the 27 kidney cancer cases, there were 24 (89%) Omanis, 17 (63%) males and 10 (37%) females. The mean (SE) age was 50 (2.9), range 19-70 years with 9 (33%) patients were > 60 years old. Half of the patients 13 (48%) were asymptomatic and picked up incidentally, whereas 14 (52%) patients were symptomatic (Figure 1). The mean (SE) size of tumors was 8 (1.1), range 2-25 cm, with the majority 48% (13) measuring 5-10cm. There was a significant

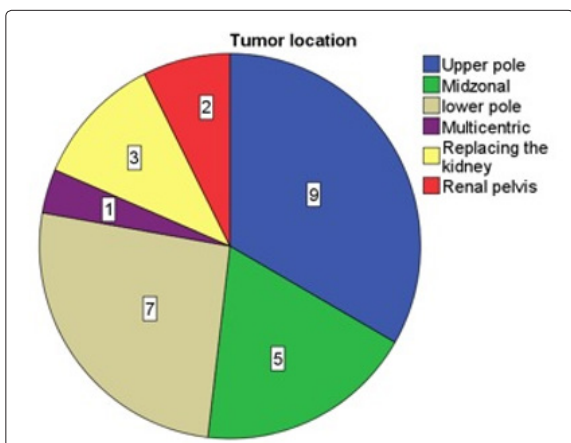
correlation between tumor size and mode of presentation being incidental or symptomatic (Pearson chi-square 6.3,  $P = 0.04$ ), and 85.7% of the incidental tumors were < 5 cm (Figure 2). Side distribution was 14 (52%) on the right and, 13 (48%) on the left. The most common tumor location was upper pole of the kidney (Figure 3). The staging of tumors was T1 52% (14), N0 81.5% (22), M0 100% (27) with Fuhrman Grade 2 constituting 59.3% (16) of the cases. The most common histological type was conventional RCC 40.7% (11) followed by papillary RCC 26% (9) (Figure 4). Oncocytoma was found in 11% (3) of the cases all were males aged 57, 60, and 70 years.



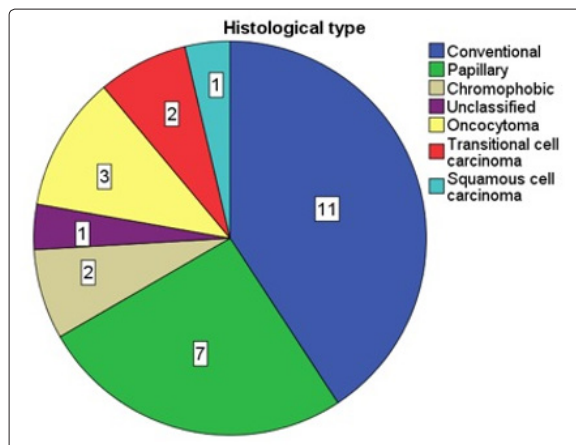
**Figure 1:** Presentation of the 27 patients diagnosed with kidney cancer



**Figure 2:** Bar chart showing incidental tumors present with smaller sizes

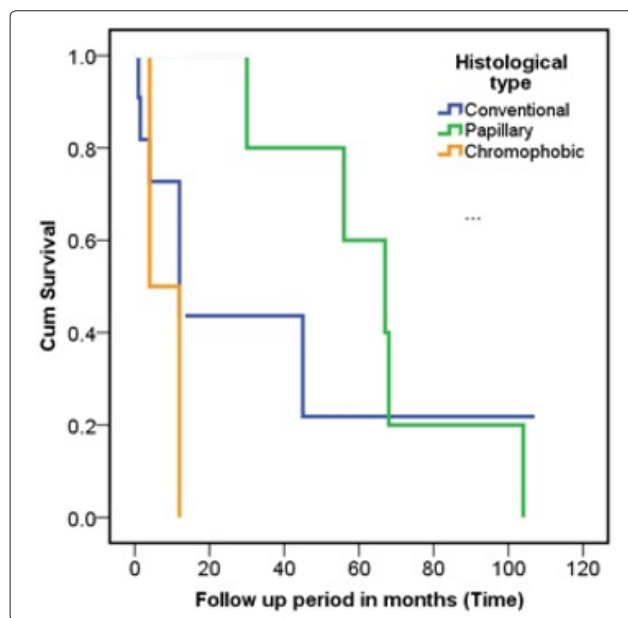


**Figure 3:** Tumor location for the 27 patients diagnosed with kidney cancer



**Figure 4:** Histological type for the 27 patients diagnosed with kidney cancer. Renal cell carcinoma (conventional, papillary, chromophobic) constitutes 74%

Preoperative embolization of the renal tumor was carried out in 14.8% (4). Most of the patient underwent radical nephrectomy 66.7% (18), and partial nephrectomy was performed in 33% (9). In the partial nephrectomy patients: two had positive margins and two were converted to radical nephrectomy due to uncontrolled bleeding. The mean (SE) follow up was 24.4 (5.9), range 1-107 months with 55.5% (15) were followed  $\geq 1$  year. The two-year over all and disease-free survival were 85.7% and 66.7% respectively. A recurrence of 31.8% (7) occurred (1 local, 2 distant, 4 both). The recurrence in first year was 85.7% (6). Kaplan-Meier shows that the histological type has no significant effect on survival ( $P = 0.299$ ) (Figure 5). However, patients with papillary RCC had better survival than the conventional and the chromophobe type.



**Figure 5:** Kaplan-Meier showing disease-free survival for renal cell carcinoma

### Discussion and Conclusions

With the more use of noninvasive imaging for the evaluation of a variety of nonspecific symptom complexes, more than 50% of RCCs are now detected incidentally [9]. Of the symptomatic RCCs diagnosed, 50% of patients present with haematuria, 40% with loin pain, 30% of patients notice a mass, and 25% have symptoms or signs of metastatic disease (night sweats, fever,

fatigue, weight loss, haemoptysis). Less than 10% patients exhibit the classic triad of haematuria, pain, and mass [10]. Less common presenting features include acute varicocele due to obstruction of the testicular vein by tumor within the left renal vein (5%), and lower limb oedema due to venous obstruction. Paraneoplastic syndromes due to ectopic hormone secretion by the tumor occur in 20% of patients with RCC.

In the present study 85.7% of the incidental tumors were < 5 cm. Al-Marhoon et al [11]. in an earlier study done in another center, showed that incidental renal tumors present when smaller and that their diagnosis offers a better prognosis and longer cancer specific survival than for symptomatic patients with RCC. However, due to the small number of patients in the present study the effect of incidental tumors on survival could not be established. The low two-year disease-free survival (66.7%) and high recurrence (31.8%) in the present study could be explained by big tumor sizes (mean 8 cm, range of 2-25 cm); 18.5% of patients were lymph node positive (2 N1, 3 N2); and the low number of cases performed. As per the cancer incidence in Oman (2007, 2008, 2010), there are on average 19 cases of kidney cancer diagnosed in Oman per year. At our hospital we are operating on 11.7% of kidney cancers in Oman. As a university teaching hospital and tertiary center the number of kidney cancers performed are considered low, hence referral is encouraged from secondary hospitals and centralization of kidney cancer care is required to improve the outcomes.

Renal oncocytoma is the most common benign tumor that appears as an enhancing renal mass on cross-sectional imaging and is presumed to be RCC until surgical excision, representing one of the ultimate challenges in preoperative diagnosis. It accounts for 3-7% of kidney tumors [12]. Treatment options for a known oncocytoma range from observation to thermal ablation, partial nephrectomy, and even radical nephrectomy depending on the clinical scenario and uncertainty regarding the diagnosis. In the present study, oncocytoma was found in 11% of the cases operated for as kidney cancer and all of them were elderly males who were diagnosed incidentally. The high percentage of oncocytoma in elderlyour study calls for percutaneous core renal biopsy when indicated. However, continuing uncertainty about the diagnosis is an indication for radical or partial nephrectomy.

RCC is primarily a disease of the elderly patient, with typical presentation in the sixth and seventh decades of life [1]. In the present study, most of the patients (67%) with kidney cancer were diagnosed below the age of 60 years and half (50%) of them were discovered incidentally. This calls for increased health awareness about kidney cancer and the further studies to examine the cost effectiveness of screening by ultrasound abdomen in patients below 60 years in Oman. Currently, the screening of high-risk populations, especially for those undergoing dialysis or with von Hippel-Lindau disease, and for those aged >50 years, is advised [13]. However, other groups reject this approach in the belief that the cost/benefit relationship of such screening is not well defined, although rapid routine examination of the kidneys during ultrasonography of other organs is also defended [14]. The limitations of the present study are: small number of patients, being single center study and not involving all kidney cancer patients in Oman, and short follow up. Further collaborative study with the ministry of health centers is needed to know all the features of RCC in Oman.

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