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HISTOMORPHOLOGICAL SPECTRUM OF RENAL TUMORS IN RESECTED NEPHRECTOMY SPECIMENS AT A TERTIARY CARE HOSPITAL

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ABSTRACT

Introduction: Renal tumour is 14th most common malignancy in the world of which mostly are of epithelial in origin (58%). It most commonly presents with a mass in abdomen or hematuria. Radical or partial nephrectomy is the treatment of choice and gold standard for a great proportion of patients with renal tumors. **Aim and Objective**: In this study our aim is to see the histomorphological spectrum of renal tumors in resected nephrectomy specimens at a tertiary care hospital and analyse the age distribution and various characteristics of renal tumors. **Material and Methods**: The study was carried out in Department of Pathology, B.P.S. Govt. Medical College, Khanpur Kalan. The resected nephrectomy specimens presented over a 6-year period from Jan 2012 to Oct 2017 were analysed retrospectively. All the patients with renal tumours managed surgically, were included. **Results**: A total of 20 cases were studied, 90% were malignant and 10% were benign. Male: female ratio was 1:1. 10 cases (50%) were attributed to renal cell carcinoma, while 4 cases (20%) Wilms tumour and 3 cases (15%) squamous cell carcinoma were reported. **Conclusion**: RCC is the most common histological type of renal neoplasm. Wilm's tumour is the most common malignant renal tumour of childhood.

KEYWORDS: Renal cell Carcinoma, Wilm's Tumour, Nephrectomy.

INTRODUCTION

Kidney can be involved in various pathological processes and some may require its surgical removal. Nephrectomy is a common procedure in surgical practice. Simple nephrectomy is indicated in patients whose kidney has been irreversibly damaged due to chronic infections, obstruction, calculus disease, or severe traumatic injury. Whereas, radical nephrectomy is indicated in cases of renal tumour.

Renal tumour is the 14th most common malignancy in the world.[1] Most of them are epithelial tumours (58%). 99% of renal neoplasms are malignant, most common being Renal cell carcinoma and Wilms' tumor. [2] Renal cell carcinoma accounts for approximately 2% of adult malignancies and 80-85% of malignant kidney tumors.[3] Renal cell carcinoma is a disease of elderly patients, presenting in the fifth to seventh decades of life. It is twice as common in men than in women.[4]

Wilm's tumour is the most common childhood abdominal malignancy. It is seen primarily in infants, 50% of the cases before the age of 3 years and 90% before the age of 6 years.[5] Primary squamous cell carcinoma of the kidney is a very rare entity (0.5-0.8 %).[6] Benign neoplasms of kidney are adenoma, oncocytoma and angiomyolipoma.

The greatest risk factors for renal malignancies are smoking, obesity, hypertension, occupational exposure of some chemicals & long term use of NSAIDS. [7] Common clinical presentations include pain, palpable mass and haematuria. Other constitutional symptoms are fever, weakness, weight loss & malaise.

Radical or partial nephrectomy is the treatment of choice and gold standard for a great proportion of patients with renal tumors.[8]

In this study, our aim is to see the histomorphological spectrum of renal tumors in resected nephrectomy specimens at a tertiary care hospital and analyse the age distribution and various characteristics of renal tumors.

MATERIALS AND METHODS

The present study was conducted in the Department of Pathology, BPS, Government Medical College for Women, Khanpur Kalan. The data was collected from 2012 to 2017 for 6 years. Twenty tumour nephrectomy specimens (both adult and pediatric group) were included

in the study. Inclusion criteria were nephrectomies either total, radical or partial, done for tumours, both benign and malignant. Nephrectomies and needle biopsies performed for non-neoplastic conditions, were excluded. Patient's clinical details were recorded in detail, including age, sex, and clinical findings; investigations such as CT scan, USG, and other relevant investigations were also noted. Nephrectomy specimens were received fixed in 10% buffered formalin. Gross handling of nephrectomy specimens was done very meticulously, according to the standard protocol for examining nephrectomy specimens. Gross features of the specimens received, were recorded. The tissue was processed as per standard procedure; representative tissue blocks were taken and processed for paraffin embedding, 4- to 5-µm-thick sections were cut on a rotary microtome. Haematoxylin and eosin (H&E) stained sections were examined under the microscope. Special stains and immunohistochemistry was also done wherever needed. The WHO classification 2016 and Fuhrman's nuclear grading for renal tumors were used to classify renal tumours.

RESULTS

A total of 20 neoplastic nephrectomy specimens were received in Pathology department of our institute during the study period. Out of these, 10(50%) were men and 10 (50%) were women.(Figure 1). Most of the benign tumors occurred between 20-40 years of age, while malignant tumors presented commonly after 40 years of age.(Figure 2) Among 20 cases, 18 (90%) were malignant and 2 (10%) were benign (Table 1).

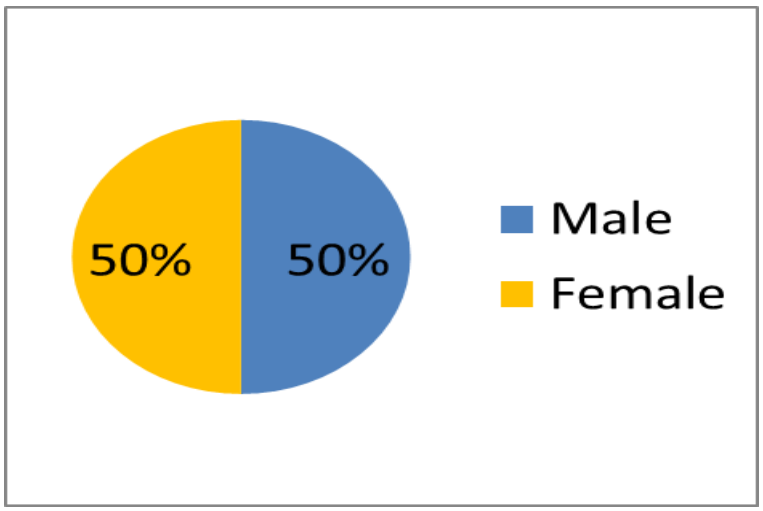

Figure 1: Pie chart showing sex distribution of renal tumours.

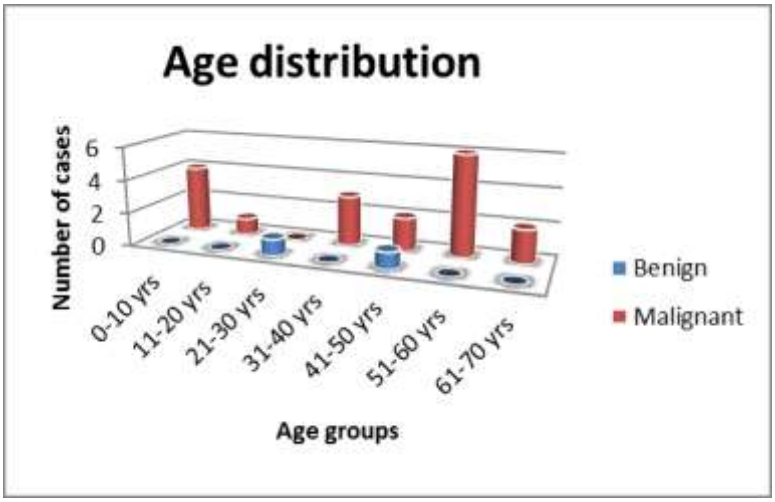

Figure 2: Bar diagram showing age distribution of renal tumours.

This study provides a fair insight into the histological patterns of tumours in nephrectomy specimens in our institution. 50% of the cases were of renal cell carcinoma, 20% of wilms tumour, 15% of squamous cell carcinoma and 5% cases each of renal cell sarcoma, oncocytoma and angiomyolipoma.(Table 1).

A total of 10 cases of renal cell carcinoma were seen, of which 70% were male and 30% were female. The age of patients was in the range of 30-80 years. In maximum number of cases (60%), the lower pole of the kidney was involved grossly. Microscopically, majority of the cases (80%) were of clear cell type of renal cell carcinoma.

According to Fuhrman's nuclear grading of Renal cell carcinoma, 70% of the tumours in our study fall into Grade 2, whereas 30% of them fall into Grade 3.(Table 1).

Amongst the malignant tumours 20% of them showed capsular invasion and 15% showed features of distant metastasis.

Amongst the 4 cases of Wilm's tumour, 3 of them fall under the age group of 0-10 years while 1 of the case, was a 57 year old male patient. Microscopically, two of the cases were of biphasic Wilms' tumor, two were of triphasic Wilm's tumour.

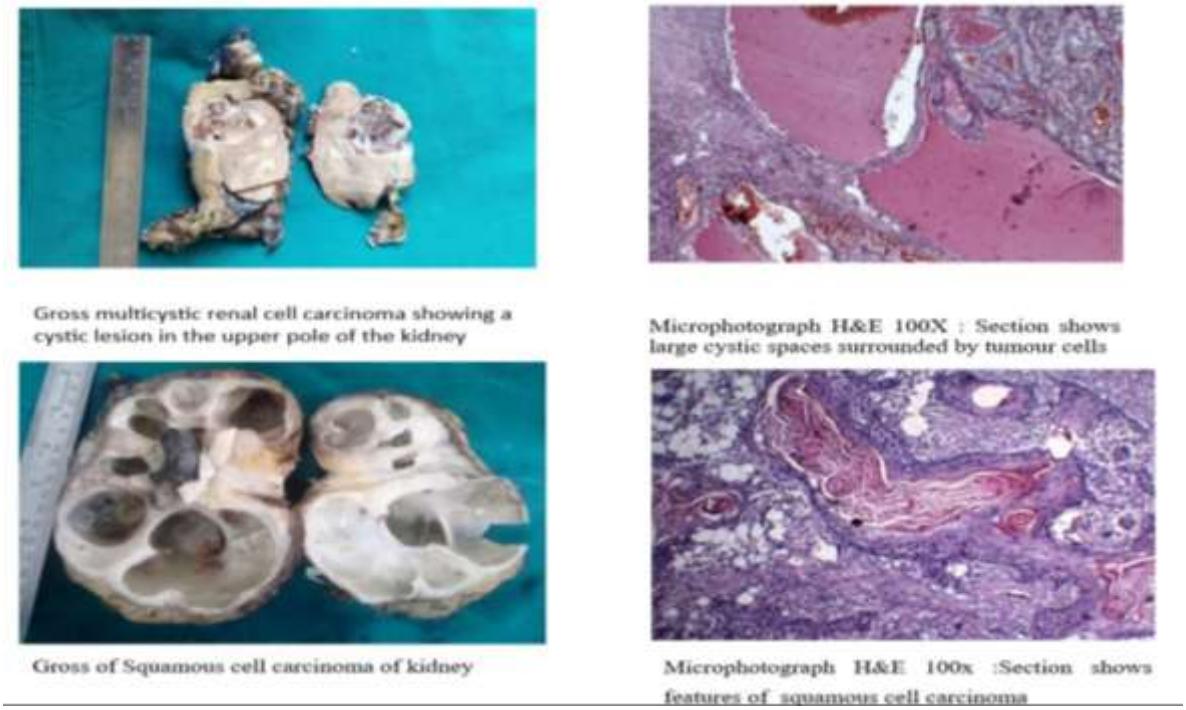

Figure 3: Showing gross and microphotograph of Multicystic Renal cell carcinoma and Squamous cell carcinoma.

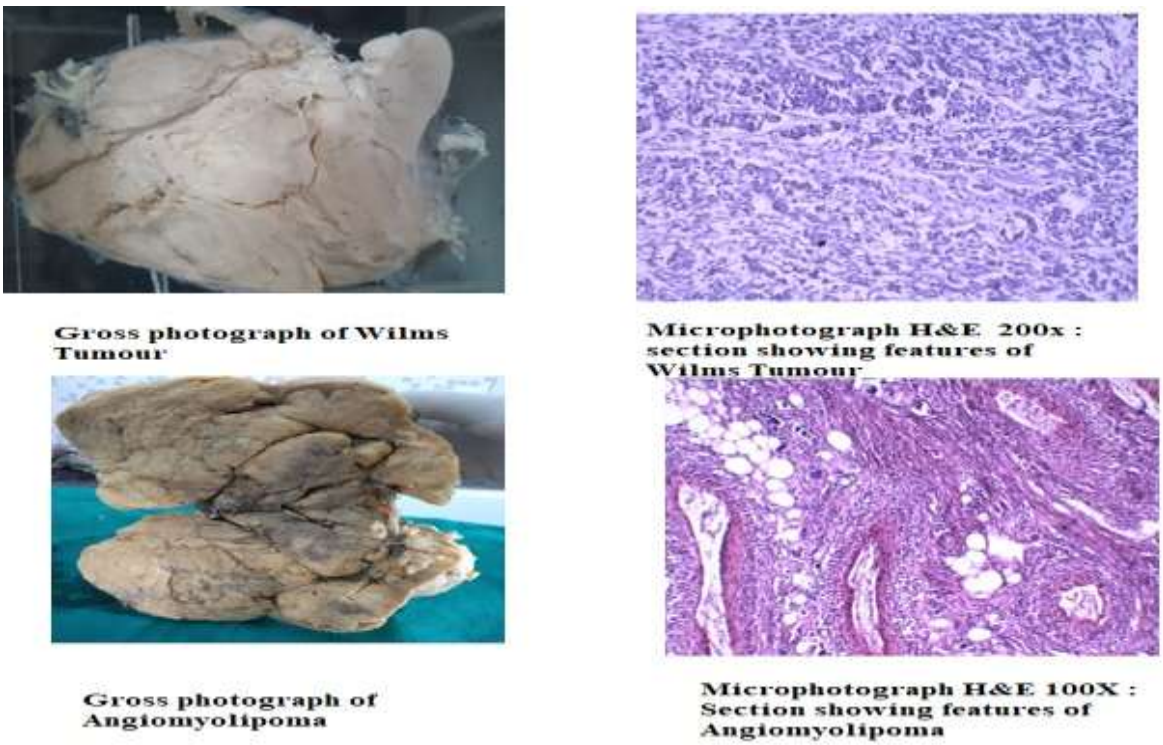

Figure 4: Showing gross and microphotographs of Wilm's Tumour and Angiomyolipoma

Table 1: Categorisation of various Renal tumours on the basis of histopathologic features.

Histopathologic features	N=20(100%)
Benign	02(10%)
Malignant	18(90%)
Histologic type	
Benign • Oncocytoma • Angiomyolipoma of kidney Malignant • Renal Cell Carcinoma • Squamous Cell carcinoma • Wilm's tumour • Renal cell sarcoma	 1(5%) 1(5%) 10(50%) 3(15%) 4(20%) 1(5%)
Fuhrman's nuclear grade of RCC Grade 1 Grade 2 Grade 3	(10 cases) 0(0%) 7(70%) 3(30%)

DISCUSSION

Renal tumours in adults are increasing in incidence throughout the world, partly as a result of widespread use of cross sectional imaging modalities and ultrasonography. Renal carcinomas accounts for approximately 3% of adult malignancies. They affect the older age group mostly.

The classification of renal cell neoplasms has been extensively studied recently and is based on histological, genetic and immunohistochemical features. A meticulous and detailed histopathologic examination of tumour nephrectomy specimens is essential for the accurate diagnosis, classification, prognostication and management of these tumours.

Renal Cell Carcinoma is the most common primary malignant tumour of the kidney (85%) worldwide and constitutes 2-3% of all visceral malignancies in adults.[3]

The mean age of presentation in our study was 55.6 years. Singam et al [9] and Hashmi et al[10] found that the mean age of adult renal tumour in their study was 64 and 57.1 years respectively. Renal tumours are known to have a male predominance as shown in study by Hashmi et al but in our study, males are affected equally as compared to females.

A wide range of lesions are encountered when nephrectomy specimens were subjected to histopathological examination. In our study, the malignant tumours vastly outnumbered the benign tumours. There is low frequency of benign tumours in our study as all our cases presented with symptoms attributable to renal neoplasms and no incidental tumour was found. In contrast, incidental detection of renal masses has been markedly increased in developed countries. In our study malignant tumours constituted 90% percent of all the cases, which is comparable to other studies by Latif et al[11], Reddy et al[12] and Hashmi et al[10] which had malignant tumours comprising of 94%, 93.8% and 98.4% respectively.

In the present study, a total of 18 (90%) malignant lesions were observed; of these, a vast majority comprises of renal cell carcinomas, i.e., 10 cases (50%). This was similar to the findings of Mohammad Rafique [13] who observed that the majority of malignant neoplasms (97%) of the kidney were renal cell carcinomas. Popat et al [14], in their study, found that 70% of malignant lesions were accounted by renal cell carcinomas. Among renal cell carcinomas, a majority of cases (70%) were seen in males and 30% in females. Grossly, majority of tumors (60%) involved the lower pole, followed by 40% tumors that involved the whole of the kidney. Whereas, Popat et al., found majority of the tumors (57%) involving the upper pole of the kidney. In our study, microscopically, the clear cell type of renal cell carcinomas was the predominant type of tumor observed, involving 8 (80%) cases. Fuhrman's nuclear grade 2 was observed in 70% of the cases.(Table 1) This was in concordance with a study by Hashmi et al and Latif et al, where the most common renal tumour was clear cell carcinoma with nuclear grade 2.

Wilms' tumor, is the most common childhood abdominal malignancy; however, less than 1% of Wilms' tumor occurs in adults. We have found 1 case of wilm's tumour in adults, which had triphasic morphology, in our study. 75 % of the cases of Wilm's tumour in our study fall in the age group of 0- 10 years.

Primary squamous cell carcinoma of the kidney is a very rare entity. In the present study, three cases of squamous

cell carcinoma were seen, all in the age group of 50-60 years.

In our study, amongst the benign tumours, 1 case (5%) of oncocytoma and 1 case (5%) of angiomyolipoma were also reported.

The present study tells about the histological patterns of lesions in nephrectomy specimens in our institution and its correlation with studies conducted across the world. All nephrectomy specimens should be subjected to a detailed histopathological examination for a clinico-morphological correlation to ensure proper management as many lesions can be misdiagnosed clinically as well as radiologically. The results can be considered as a reflection of the disease pattern in this part of the country.

CONCLUSION

Majority of the renal tumours in our setting are malignant. Benign neoplasms are rare. RCC is the most common histological type of renal neoplasm and has shown a sustained increase in its prevalence. Clear cell RCC and nuclear grade 2 being the commonest histologic type. Wilm's tumour is the most common malignant renal tumour of childhood.

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