ORIGINAL ARTICLE

HISTOPATHOLOGICAL STUDY OF RENAL TUMORS IN RESECTED NEPHRECTOMY SPECIMENS - AN EXPERIENCE FROM TERITARY CARE CENTRE

Nusrat Bashir[1], Yasir Bashir[2], Parveen Shah[3], Nazia Bhat[4], Othman Salim[5], Nuzhat Samoon[5], Humaira Bashir[4], Saleem Hussain[5], Dekyong Angmo[6], Tazeen Geelani[7], Danish Khan[7]

Author's Affiliations: [1]Senior Resident, Department of Hematology; [2]Senior Resident, Department of Critical care medicine; [3]Professor and head; [5]Post graduate; [7]Senior Resident, Department of Pathology; [6]Post graduate, Department of Microbiology, Sheri Kashmir Institute of Medical Sciences, Soura, Srinagar; [4]Senior Resident, Department of Pathology, Government medical college , Srinagar, J&K
Correspondence: Dr. Nusrat Bashir, E mail : bashirnusrat@ymail.com

ABSTRACT

Objectives: To study the histopathological spectrum of renal tumors in resected nephrectomy specimens at a tertiary care hospital and to analyze the age distribution of renal tumors .

Materials and Methods: 184 patients from department of Pathology, Sheri-kashmir institute of medical sciences, Srinagar Kashmir were included in this study. Renal tumors in resected nephrectomy specimens over a period of 10 years from June 2002 to May 2012 were studied. Relevant clinical details were collected from record section of the department.

Results: Of the total of 184 renal tumors studied (89.13%) were found to be malignant and (10.86%) were benign tumors .Most of of patients presented in 4th to 5th decade of life with male to female ratio of 1.70:1. Most common presentation in our patients was flank pain. Histopathologically RCC-clear cell type was the most common subtype in adults and Wilms tumor was the most common childhood tumor

Conclusion: RCC is the commonest malignant tumor and conventional/clear cell RCC is the most common subtype in adults. Wilms tumor was the most common childhood tumor.

Keywords: Renal tumors, clear cell, Wilms, Nephrectomy.

INTRODUCTION

Renal tumours comprise a diverse spectrum of neoplastic lesions with patterns that are relatively distinct for children and adults.[1-4] A wide variety of both benign and Malignant tumours arise from different components of the renal parenchyma, notably tubular epithelium.[1-4]Accurate diagnosis of most renal tumours is not possible before surgery and histopathologic evaluation. Nephrectomy remains the standard of cure for patients with a suspected renal mass, despite studies that have established nephrectomy as an independent risk factor for developing chronic renal insufficiency .Both benign and malignant tumours occur in the kidney. A detailed and meticulous histopathologic examination of tumour nephrectomy specimens is essential to establish histologic type and to record accepted histopathological prognostic determinants i.e. tumour size, histologic subtype, nuclear grade, and stage in cases of malignant renal neoplasms.[5-7]

MATERIALS AND METHODS

The study was conducted in the department of pathology Sher-I-Kashmir Institute of Medical Sciences, Srinagar from June 2002 to May2012. For this study, the cases of renal tumors were searched from records maintained in the department of Pathology at SKIMS. The histopathological reports of all such cases diagnosed during the above mentioned period, were collected. The required clinical details were sought from the medical records department. Name, age, parentage, address, and MRD number and Lab number of pa-

tients was checked in the record section of the Department. Corresponding slides were collected and re-evaluated for the confirmation of diagnosis. The nephrectomy specimens for renal tumors received by the department of pathology were properly labeled, numbered and then subjected to gross and detailed histopathological examination. The specimens were fixed in 10% buffered formalin. After fixation the specimen were measured, weighed and then cut sagitally. The capsule was stripped and pelvis, calyces and ureter were carefully opened. Gross photographs of the specimen were taken to represent various tumor types. A detailed gross examination of the nephrectomy specimens was carried with respect to the following features: Weight and dimensions of the specimen, Capsule, external surface, Cortex, Medulla, Pelvis, Ureter, Renal artery and vein, presence, number, size and appearance of perirenal lymph nodes. After the gross examination of the specimens a minimum of four sections were taken from the tumor. Sections were taken from Pelvis, ureter , renal vessels, capsule and lymph nodes if present. The tissue was processed as per standard procedure.4-5 micron sections were cut on microtome and stained by Haematoxylin and eosin stain(appendix 3) and special stain like PAS was done were required. All the cases of renal tumors were included. The findings were analyzed. Microphotographs of tumors were taken to represent various histological variants of renal tumors.

RESULTS

The present study includes 184 cases of renal tumors reported in the Department of pathology at Sheri-Kashmir Institute Of Medical Sciences (SKIMS) Srinagar Kashmir. Of the total 184 renal tumors studied 164 (89.13%) were found to be malignant and 20(10.86%) were benign tumors. Mean age for renal cell carcinoma in our study was 54years. For Wilms tumor it was 2years. Table 1 shows the age wise distribution of renal tumors in our study. Overall higher numbers of renal tumors were seen in males than females with male to female ratio of 1.70:1.

The most clinical presentation of our patients was flank pain in 66 cases, followed by abdominal swelling, Haematuria, pain abdomen, weight loss, recurrent UTI. Fever and LBA were the least common symptoms. Renal tumors were more common on left side with upper pole of kidney involved in majority of cases. Grossly 168 cases (91.3%) of renal tumors showed variegated appearance (Fig1).

Table 1: Age wise distribution of renal tumors

Age group	Cases (%)(n=184)
0 – 10 years	31 (16.8)
11 – 20 years	2 (1.0)
21 – 30 years	4 (2.1)
31 – 40 years	17 (9.2)
41 – 50 years	39 (21.1)
51 – 60 years	57 (30.9)
61 – 70 years	31 (16.8)
> 70 years	3 (1.6)

Table 2: Distribution of renal tumors according to histopathological diagnosis (n= 184)

Tumor	Cases (%)
RCC-clear cell type	112 (60.8)
Wims tumor	27 (14.7)
RCC-papillary type	15 (8.2)
Angiomyolipoma	11 (5.9)
Congenital mesoblastic nephroma	5 (2.7)
Renal sarcoma	4 (2.2)
Squamous cell carcinoma	2 (1.1)
RCC-chromophobe type	2 (1.1)
Oncocytoma	2 (1.1)
RCC-unclassified	2 (1.1)
Leiomyoma	1 (0.5)
Juxtaglomerular Cell Tumor	1 (0.5)

Figure 1: Gross photograph of RCC showing variegated appearance

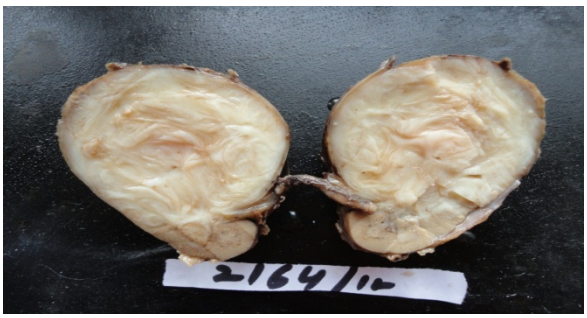

Figure 2: Gross photograph of congenital mesoblastic nephroma showing grey white well circumscribed cut section

Cut section was grey white incase of congenital mesoblastic nephroma (Figure2) Leiomyoma and Renal sarcoma. Oncocytoma was grey brown on cut section. Necrotic growth was seen in case of squamous cell carcinoma .Majority of the renal tumors were 5-7 cm in size.

Table 2 depicts histopathological spectrum of renal tumors observed in our study. Wilms tumor was the most common childhood tumor and most common tumor in adults was renal cell carcinoma. Fuhrmans nuclear grading revealed that maximum number of renal cell carcinomas i.e. 51.4% showed Grade 2 nuclear features. Renal vein invasion was seen in 9.2% of cases.

DISCUSSION

Renal tumors constitute a heterogeneous group of neoplasm's distinguishable histologically and cytogenetically. Classification of renal cell carcinoma is important from the treatment and prognosis point of view as well as for understanding of histogenesis. The kidneys are affected by various types of malignant tumours, 99 percent of renal neoplasms are malignant; Renal Cell Carcinoma and Wilms tumour being the most common.[8] Renal cell carcinoma accounts for approximately 2 percent of adult malignancies and 80 to 85 percent of malignant kidney tumours.[9] Mean age at diagnosis was generally around 60yr, and the male to female ratio was 3:1.[10] It is generally believed that about 5% of all kidney cancers occur in patients younger than 40 yr[11],whereas there is limited information about the management of RCC in elderly people. It would be expected that renal tumours arising in young adults likely are more symptomatic and potentially aggressive, therefore requiring aggressive radical treatment. On the other hand, because of the widespread use of imaging in elderly people, an increasing number of tumours are being discovered with potentially indolent behaviour. Our study was both retrospective and prospective in nature and the study highlights the histopathological spectrum of renal tumors, their age distribution and the pathological prognostic grading for renal cell carcinoma in our setup. In the present study, out of the 184 cases of Renal tumors studied (89.2%) were malignant and 10.8% benign .Thus, malignant tumors comprised the vast majority of the cases this may be due to lower rate of detection of incidental masses as compared to developed countries. However the results were consistent with most studies from developing countries. Mean age and gender distribution in our study was same as observed in previous studies. The commonest clinical symptom that the patients presented with in the present study was flank pain followed by abdominal swelling and hematuria. Similar observations were made by V.Popat etal (2010)[12], El Fadil El Malik et al. (1997)[13] Majority of patients with hematuria had malignant lesions which were compensable to the current study.

Histopathological diagnosis

Grossly in our study majority of the cases involved left kidney (53.8%) and right kidney was involved in (46.1%).This was similar to observation made by TA Badmus et al (2008)[14] who found majority of cases involving left kidney. In our study upper pole was involved by 93 cases (50.5%), 54 cases (29.3%) involved lower pole, 37 cases (20.1) involved whole kidney .This was similar to the observations made by V Popat et al (2010). In our study majority of cases tumor size was in the range of 4-7cm similar to observations made by other studies.

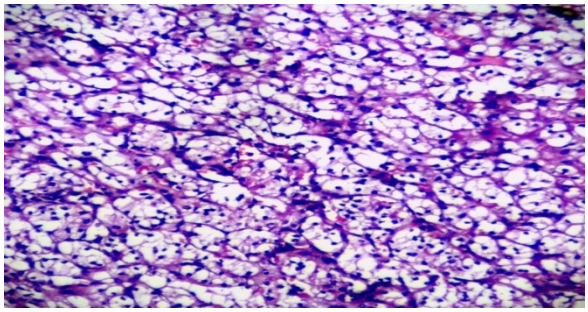

Figure 3: RCC- clear cell type Photomicrograph showing clear cells with prominent delicate vasculature (H&E, *400)

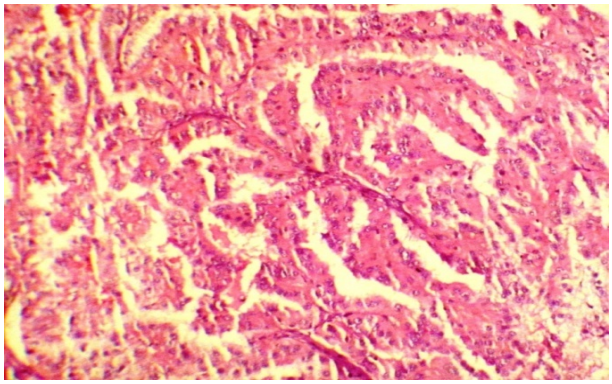

Figure 4: RCC- Papillary type. Photomicrograph showing tumor cells arranged in pappilae lined by cells with abundant eosinophilic cytoplasm

Microscopically: In the present study out of 184 cases a total of 164 (89.2%) were malignant tumors and benign tumors comprise 20 (10.8%) cases.

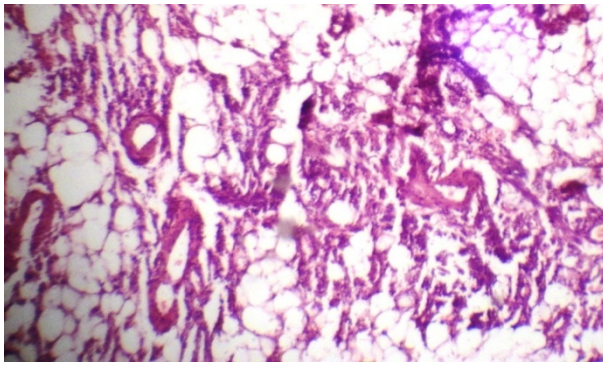

Figure 5: Angiomyolipoma. Photomicrograph showing mature adipose tissue, thick walled blood vessels and smooth muscle (H&E, * 400)

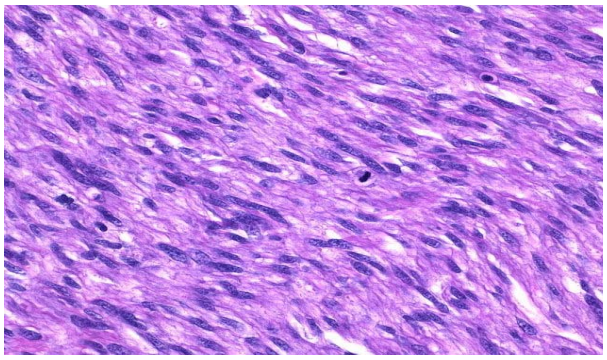

Figure 6: Congenital mesoblastic nephroma. Photomicrograph showing proliferation of spindle cells with acidophilic fibrillary cytoplasm

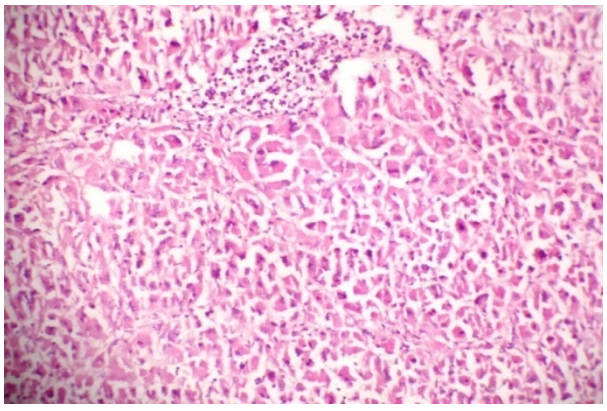

Figure 7: Renal oncocytoma. Photomicrograph showing cels arranged in sheets with abundant eosinophilic cytoplasm, round nuclei. A foci of inflammatory infiltrate also seen

Vast majority comprised of renal cell carcinoma (79.8%). Histologically, Renal cell carcinoma (RCC)- clear cell type was most common 112 cases(60.8%) (Figure 3) followed by Wilms tumor 27 cases (14.7%) followed by RCC- Papillary type 15 cases (8.2%) (Figure 4), angiomyolipoma 11(5.9%) (Figure 5) followed by Congenital mesoblastic nephroma 5 (2.7%) (Figure 6), Renal sarcoma 4 cases (2.2%). Squamous cell carcinoma, RCC-Chromophobe type, Oncocytoma (Figure 7), and RCC- Unclassified comprise 2 cases each (1.5%) (1.5%). 1 case each of leomyoma (0.5%) & Juxtaglomerular cell tumor (0.5%) were also observed in our study. This was similar to the observation made by Mohammad Rafique (2007)[15] who also observed that majority of malignant neoplasms (97%) of the kidney were renal cell carcinoma. Also V Popat et al (2010)[12] in their study found that (70%) malignant lesions were accounted for by renal cell carcinoma. Similar predominance of renal cell carcinoma among malignant tumors was observed by Sun 2 Kim et al (2008). Fuhrmans nuclear grading revealed that maximum number of renal cell carcinomas i.e. 51.4% show Grade 2 nuclear features.

CONCLUSION

Thus majority of the renal tumors in our setup comprised of malignant lesions. Wilms tumor was the most common childhood tumor and most common tumor in adults was renal cell carcinoma. The relative incidence of sub-types of renal cell carcinoma is relatively consistent the world over. Fuhrmans nuclear grading revealed most cases of renal cell carcinomas i.e. 51.4% showing Grade 2 nuclear features. Renal vein invasion was seen in 9.2% of cases.

REFERENCES

1. Alpers CE. The Kidney. In: Kumar V, Abbas AK, Fausto N, Aster JC, editors. Robbins and Cotran pathologic basis of disease. 8th ed. Philadelphia: WBSaunders, 2010;pp 905-70.
2. Gudbjartsson T, Hardarson S, Petursdottir V, Thoroddsen A, Magnusson J,Einarsson GV. Histological subtyping and nuclear grading of renal cell carcinoma and their implications for survival: a retrospective nation-wide study of 629 patients. Eur Urol 2005; 48: 593-600.
3. Renshaw AA. Sub classification of renal cell neoplasm's: an update for the practicing pathologist. Histopathology 2002; 41: 283-300.
4. Eble JN, Sauter G, Epstein JI, Sesterhenn IA, eds. Pathology and genetics of tumours of the urinary system and male genital organs. Lyon, France: IARCPress; 2004.

5. Algaba F, Trias I, Scarpelli M, Boccon-Gibod L, Kirkali Z, Poppel HV.Handling and pathology reporting of renal tumor specimens. Eur Urol 2004;45: 437-43.

6. Fleming S, Griffiths DFR. Best practice No 180. Nephrectomy for renal tumour:dissection guide and dataset. J Clin Pathol 2005; 58: 7-14.

7. Rosai J. Guidelines for handling of most common and important surgical specimens. In: Rosai J, ed. Rosai and Ackerman's Surgical Pathology. 9thed. St Louis: Mosby 2004; pp 2911-77.

8. Ozen H, Colowick A, Freiha FS. Incidentally discovered solid renal masses: what are they? Br J Urol. 1993 Sep; 72(3):274-276.

9. Motzer RJ, Bancer NH, Nanus DM. Renal cell carcinoma. N Engl J Med 1996; 355: 865-875.

10. J. Patard, H. Tazi, K. Bensalah, et al.. The changing evolution of renal tumours: a single center experience over a two-decade period. Eur Urol 45 (2004) (490 - 493).

11. S.E. Eggener, J.R. Rubenstein, N.D. Smith, et al.. Renal tumors in young adults. J Urol 171 (2004) (106 - 110).

12. Popat VC, Kumar MP, Udani D etal:A Study On Culprit Factors Ultimately Demanding Nephrectomy. The Internet Journal of Urology 2010; 7(1).

13. El Malik EM, Memon SR, Ibrahim AL, Al Gizawi A, Ghali AM: Nephrectomy in Adults : Asir Hospital Experience. Saudi J Kidney Dis Transpl 1997; 8: 423-427.

14. TA Badmus, AB Salako, FA Arogundade etal: Malignant Renal Tumors in Adults: A Ten-Year Review in a Nigerian Hospital. Saudi j kidney dis transplant 2008;19(1):120-126.

15. Rafique M: Nephrectomy: indications, complications and mortality in 154 consecutive patients. J Pak Med Assoc 2007; 57(6):308-311.