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STUDY OF HISTOMORPHOLOGICAL SPECTRUM OF RENAL TUMORS- A RETROSPECTIVE STUDY

Pathology

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ABSTRACT

Background: The kidneys remove waste product from the body, maintain blood pressure and regulate electrolyte balance. Renal tumors show a wide spectrum which is distinct in adults and children. **Aim:** To study the histomorphological spectrum of renal tumors. **Materials and Methods:** It was a retrospective study of renal tumors in a tertiary care centre of Department of Pathology, AMCH from the from January 2018 to January 2022. A total 10 cases of renal tumors were seen. **Result:** Out of total of 10 cases (M: F-four: six, age range: 1 to 70 yrs.) clear cell renal cell carcinoma was seen in 6/10 cases (60%), 1 (10%) papillary renal cell carcinoma, 1 case of chromophobe (10%) and 2 nephroblastoma (20%). Thus, this study showed that renal tumors occurs both in children and adults. There was preponderance of female cases.

KEYWORDS

Histomorphological, Renal cell carcinoma, Nephroblastoma

INTRODUCTION

The kidneys are one of the most important organs. The kidneys serve many homeostatic functions including excretion of metabolic waste products, regulation of water and electrolyte balances, regulation of arterial pressure, and acid- base balance[1]. Both benign and malignant tumors occur in the kidney. Malignant tumors are great importance clinically. By far the most common malignant tumor is renal cell carcinoma, followed by nephroblastoma (Wilms tumor) which is found in children[2]. Renal tumors are responsible for a great deal of morbidity and mortality. The pathologic evaluation of tumor nephrectomy specimens focuses on the diagnosis, grading, and staging of the neoplasm[3]. Renal tumors results in total removal of the organ. New techniques, such as cryoablation and radiofrequency ablation which are minimally invasive, have shown good results and the follow-up is still short[4]. Renal tumors shows a wide spectrum of tumors, distinct in adults and children. The present study evaluated the histopathological spectrum in renal tumor.

AIMS AND OBJECTIVES:

To study the histomorphological spectrum of renal tumors in a tertiary care center

MATERIALS AND METHODS

This is a retrospective study of renal tumors in the Pathology department of Assam Medical College & Hospital, Dibrugarh from January 2018 to January 2022. 10 cases of renal tumors were seen. The medical records as well as the paraffin blocks of all the diagnosed cases were retrieved. Formalin fixed paraffin embedded tissue sections were stained by Hematoxylin and Eosin stain. All histopathological slides were examined. After detailed study of the sections under light microscopy, final diagnosis was given along with disease stage (ISUP Grading) and statistical analysis was done. Immunohistochemical evaluation was also done for few cases.

RESULT:

The study is done in Assam Medical College and Hospital, where total 10 cases of renal tumor were studied. Out of 10 nephrectomy specimen 4 were right kidney specimen while 6 were left kidney. The 4 (40%) were male and 6 (60%) were female. The highest percentage of patients belong to the age group of 45 to 60 years considering the age of the patient ranges from 1 to 70 years with male to female ratio 4:6 showing female were most commonly involved.

The important clinical features in patient were localized flank pain, fever, burning micturition, abdominal lump and hematuria. Nephrectomy was done in all patients based on clinico radiological analysis. Histomorphological features were studied in details and the final diagnosis was based on clinical findings, radiological finding and histomorphological features.

- Out of 10 cases of neoplastic lesions clear cell RCC was predominantly seen in 6/10 cases (60%), 2 cases of nephroblastoma (20%), 1 (10%) case of papillary RCC, 1 cases of chromophobe (10%) were noted.
- Grossly the size of the tumor ranges from 0 -10 cm with greatest involvement of left kidney and upper pole.

The 4 Cases of clear cell RCC showed WHO/ ISUP grade 3 and 2 cases of clear cell RCC showed WHO/ISUP grade 1. The 1 case of chromophobe RCC showed well defined cell border and amphophilic to pale basophilic cytoplasm admixed with smaller population of polygonal cells with eosinophilic cytoplasm. Among the 2 cases of nephroblastoma one is 1.5 years female and other is 1 year male both showing triphasic components. The case of papillary RCC also showed sarcomatoid changes with ISUP grade 4. Most of the tumor showed presence of necrosis and one case of clear cell RCC showed thyroidisation of the renal tubules. There was no lymph node metastasis in any of the cases of RCC.

Pathological stages of 2 clear cell RCC was T2aN0MO, one other case having PT1b. Tumor staging is not assessed in other 3 clear cell RCC. The papillary RCC case showed staging of T2aN0M0.

Table 1 shows the frequency of neoplastic lesions in relation to sex showing female preponderance along with various histological variants.

Table 2 shows clinical presentation of neoplastic lesions.

Table 3 illustrate the macroscopic features of kidney in renal cell carcinoma. kidney was enlarged in all cases. The most frequent finding was the presence of hemorrhagic and necrotic areas. Cystic degeneration was present in 33% cases.

Table 1: Frequency of neoplastic lesion of kidney in relation to sex and various histological variants

Neoplastic lesions	Male	Female	Number of cases
Clear cell RCC	2	4	6 (60%)
Papillary RCC	0	1	1 (10%)
Chromophobe RCC	1	0	1(10%)
Nephroblastoma	1	1	2(20%)

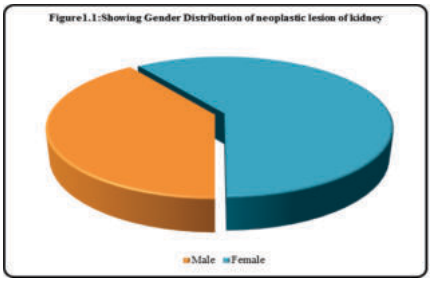
Table 2: Clinical features of neoplastic lesions

Clinical features	Clear cell RCC	Papillary RCC	Chromophobe RCC	Nephroblastoma
Abdominal/ flank pain	4	1	1	0
Mass per abdomen	6	1	1	2

Pain abdomen + mass per abdomen	4	1	1	0
Hematuria	3	1	0	0

Table 3: Gross features of kidney in renal cell carcinoma

Gross finding	Number of cases
Enlargement	10
Capsular infiltration	0
Areas of hemorrhage	9
Areas of necrosis	9
Areas of cystic degeneration	2
Evidence of adrenal involvement	0



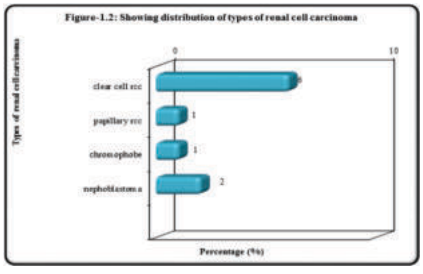


Fig 2.1: Gross specimen of clear cell renal cell carcinoma

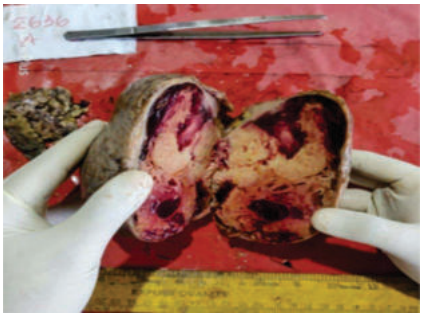


Fig 3: Gross specimen of papillary renal cell carcinoma

Fig2.2: Cut section of clear cell renal cell carcinoma

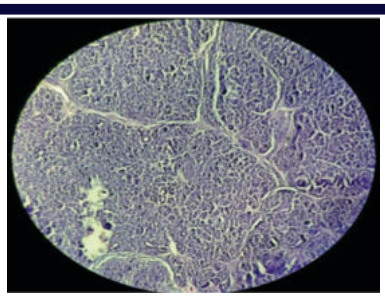


Fig4a: Papillary renal cell carcinoma (H&E,10X)

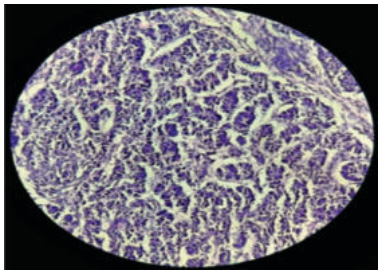


Fig4b: Papillary renal cell carcinoma(H&E,40X)

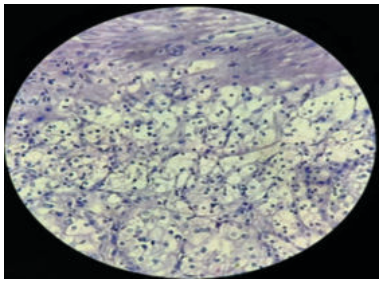


Fig5a

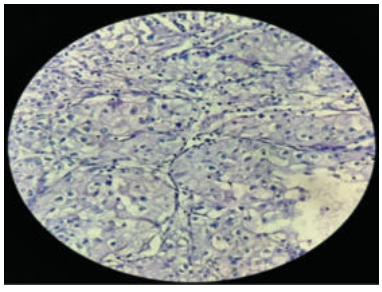


Fig 5b

Fig 5a & 5b: Clear cell renal cell carcinoma (H&E,40X).

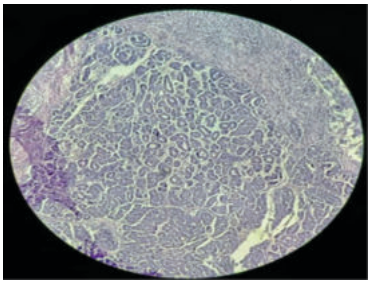


Fig 6a: Nephroblastoma (H&E,10X)

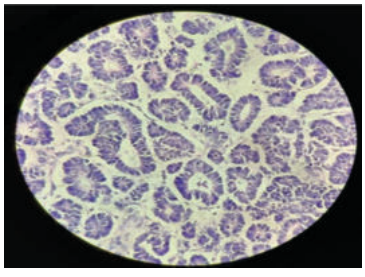


Fig 6b: Nephroblastoma (H&E, 40X)

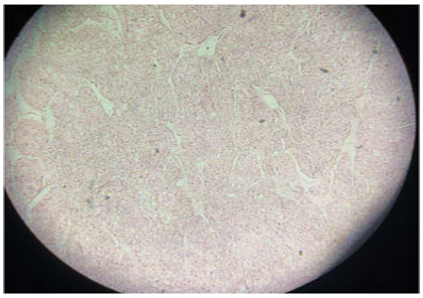


Fig7a : Chromophobe renal cell carcinoma (H&E, 4X)

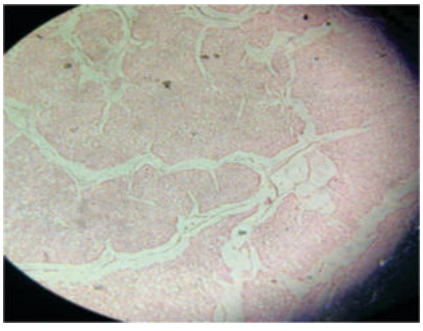


Fig7b: Chromophobe renal cell carcinoma (H&E,10X)

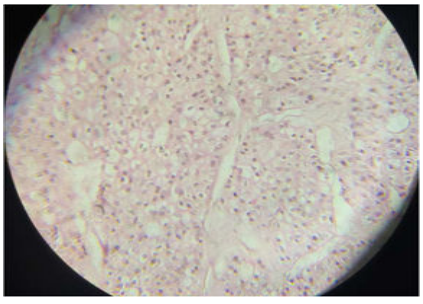


Fig7c: Chromophobe renal cell carcinoma (H&E, 40X)

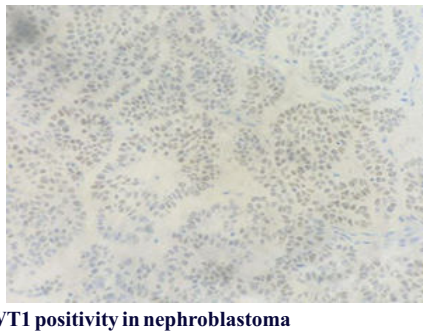


Fig 8 : WT1 positivity in nephroblastoma

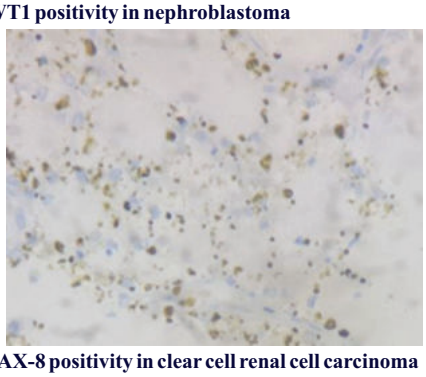


Fig 9 : PAX-8 positivity in clear cell renal cell carcinoma

DISCUSSION:

In the present study highest percentage of patients belong to the age group of 45 to 60 years considering the age of the patient ranges from 1 to 70 years with male to female ratio 4:6 showing female preponderance which is similar with the study of Madhu Kumar R et al[4] study.

On histomorphological study out of 10 cases clear cell RCC was seen in 6 cases (60%), 2 cases of nephroblastoma (20%), 1 (10%) case of papillary RCC, 1 cases of chromophobe (10%) were noted which is comparable with Lal L, Reba Philipose T et al[3] study.

CONCLUSION:

A wide spectrum of renal tumors occurs in both children and adults. The percentage of malignant tumor increased with age and there was female preponderance. Clear cell renal cell carcinoma was the commonest renal tumor encountered in our retrospective study and the most common presenting feature were pain abdomen and mass per abdomen followed by hematuria. Most commonly affected female were in the age group of 4th decade.

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