

ORIGINAL RESEARCH

Histomorphological patterns of various kidney lesions in nephrectomy specimens in a tertiary care hospital

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ABSTRACT

Introduction: Kidneys are one of the major organs of the human body that serve several essential functions. Kidneys are affected by various nonneoplastic and neoplastic pathological processes. Nephrectomy is a surgical procedure done for wide variety of conditions like chronic pyelonephritis, calculi, malignancy, injury etc.

Aim: To study the histomorphological pattern of various kidney lesions in nephrectomy specimens received in the department of pathology in our institute.

Materials and Methods: This was a retrospective study carried out in department of pathology in TSM medical college Lucknow from March 2018 to April 2020. A total of 45 nephrectomy specimens received during the period were included in the study. Paraffin blocks and slides along with case records were retrieved and studied.

Results: Out of 45cases, 34 cases (75.5%) were benign and 11 cases (24.5) were malignant. Age ranged from 3 years to 75 years. Maximum number of cases was seen in 51-60 years of age (22%). Majority of cases were of chronic pyelonephritis (31%). Renal cell carcinoma constituted 8 cases (17.8%). Commonest variant was clear cell carcinoma. Wilms tumour was the commonest renal tumour in children.

Conclusion: Benign lesions of kidney outnumber the malignant lesions. Chronic pyelonephritis was the most common histopathological diagnosis. Renal Cell Carcinoma was the most common malignant lesion in adults. Clear cell variant was the commonest. Wilms tumor was the commonest renal tumor in children.

Keywords: Malignant Lesions, Nephrectomy, Pyelonephritis, Wilms Tumor

INTRODUCTION

Kidneys are one of the major organs of the human body that serve several important functions. Their main function is to regulate the balance of electrolytes in the blood along with maintaining PH homeostasis. Kidneys are affected by various neoplastic and nonneoplastic pathological lesions. Common clinical conditions involving the kidney include the nephritic and nephritic syndromes , renal cysts, acute renal injury, chronic kidney disease, Urinary tract infection, nephrolithiasis , urinary tract obstruction and various cancers of the kidney.¹ Nephrectomy is a surgical procedure done for a wide variety of conditions like chronic pyelonephritis, calculi, malignancy, injury etc.² There are three types of nephrectomies which are performed for different indications which includes simple, partial and radical. Nephrectomy is indicated in patients with an irreversibly damaged kidney due to symptomatic chronic infections, obstruction, calculus disease or severe traumatic injury.³ The

aim of the study was 1) to study histomorphological patterns of various kidney lesions in nephrectomy specimens, 2) to analyze the frequency of nonneoplastic and neoplastic renal lesions.

MATERIALS AND METHODS

This is a retrospective study carried out in department of pathology in TSM Medical College Lucknow (UP) from March 2018 to April 2020. 45 nephrectomy specimens received during this period were included in the study. The indications for nephrectomy and other relevant clinical information were recorded. The weight, size, capsule and other changes recorded in the gross sheet were analyzed. All the specimens were fixed in 10% buffered formalin for 24-48 hours and processed. The histopathological slides were reviewed and the microscopic findings were studied. The result were compiled and analyzed.

RESULTS

In the present study, out of 45 cases, 34 cases were benign and 11 cases were malignant as shown in table 1. Male to female ratio is 1.6:1. Table 2 shows the gender distribution. Age ranged from 3 years to 75 years. Most common age group was sixth decade (50-60 years) as shown in table 3. In adults, flank pain was the most common complaint while flank mass was most common complaint children. Most common diagnosis was chronic pyelonephritis which was also the most common benign renal lesion shown in table 4 and in figure 1 (a & b). Most common malignant tumour was renal cell carcinoma in adults. Clear cell RCC was the most common variant as shown in table 5 and in figure 2 While other variants- papillary and sarcomatoid are shown in figures 3 and 4 respectively. In children the most common renal tumour was Wilms Tumour shown in figure 5a & b. Among benign lesions most common diagnosis was chronic pyelonephritis (14 cases) followed by hydronephroic kidney (8 cases) and then granulomatous and xanthogranulomatous each 4 cases shown in figures 6 & 7, followed by simple renal cyst and End stage kidney disease (ESKD) as shown in table 4.

Table 1: Frequency of benign and malignant renal lesions

	NUMBER	PERCENTAGE
BENIGN	34	75.5
MALIGNANT	11	24.4

Table 2: Sex distribution of renal lesions

GENDER	NUMBER	PERCENTAGE
MALE	28	62.2
FEMALE	17	37.8

Table 3: Age wise distribution of renal lesions

AGE RANGES IN YEAR	NUMBER OF CASES	PERCENTAGE
0-10	05	11
11-20	04	9
21-30	04	9
31-40	06	13.3
41-50	08	17.6
51-60	10	22
61-70	04	9
>70	04	9

Table 4: Histopathological diagnosis of various renal lesions

HISTOPATHOLOGY DIAGNOSIS	NUMBER	PERCENTAGE (%)
BENIGN		
CPN	14	31.1
HDN	08	17.7
TB Pyelonephritis	04	8.8
Xanthogranulomatous pyelonephritis	04	8.8
Simple renal cyst	02	4.4
ESKD	02	4.4
MALIGNANT		
RCC	08	17.7
WILMS TUMOUR	03	6.6

Table 5: Histopathological variants of RCC

VARIANT	NUMBER	PERCENTAGE
Clear cell	04	50%
Papillary	02	25%
Sarcomatoid	02	25%

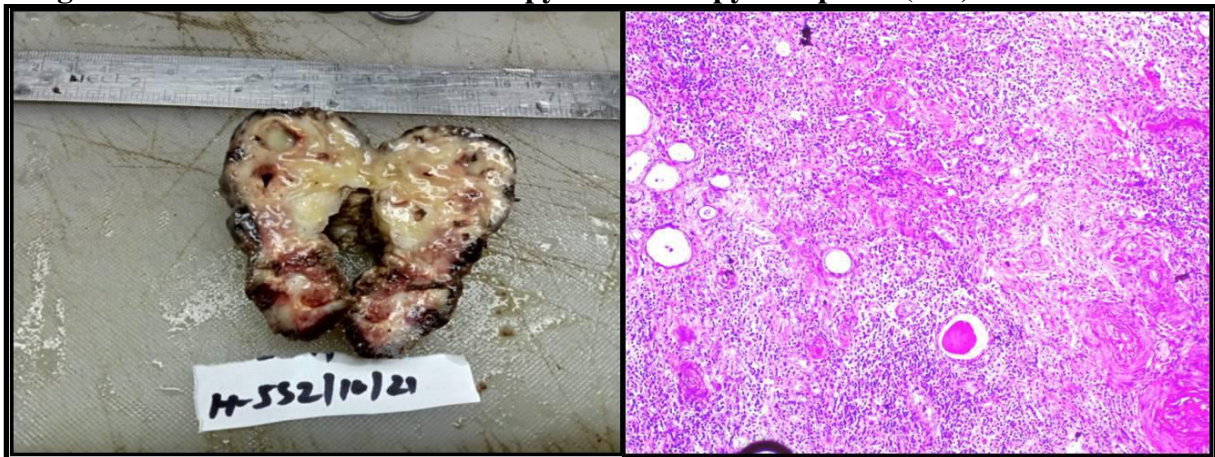
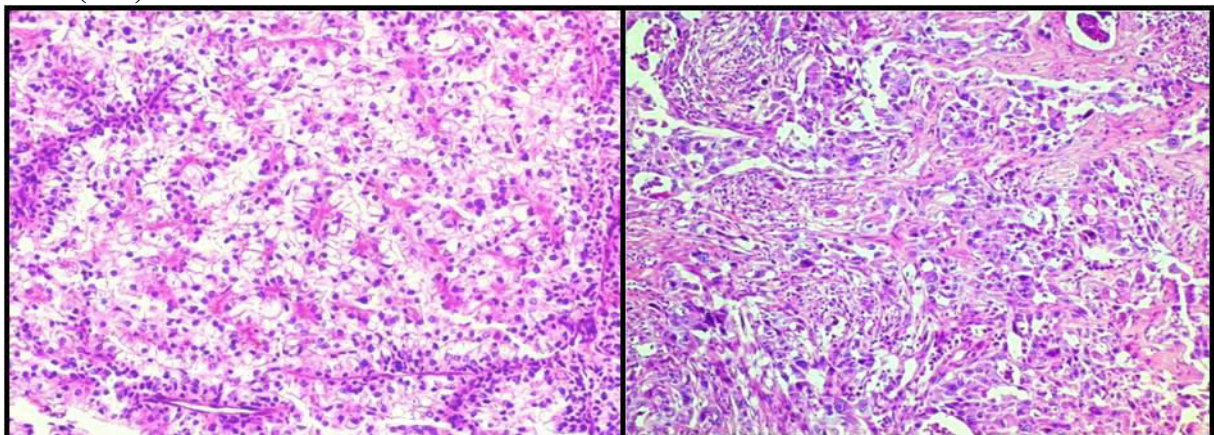
Figure 1a & 1b: Gross and microscopy of chronic pyelonephritis (40x)**Figure 2: Microscopy of clear cell RCC (40x) and Figure 3: Microscopy of Sarcomatoid RCC (40x)**

Figure 4a & 4b: Microscopy of Papillary RCC (10x, 40x)

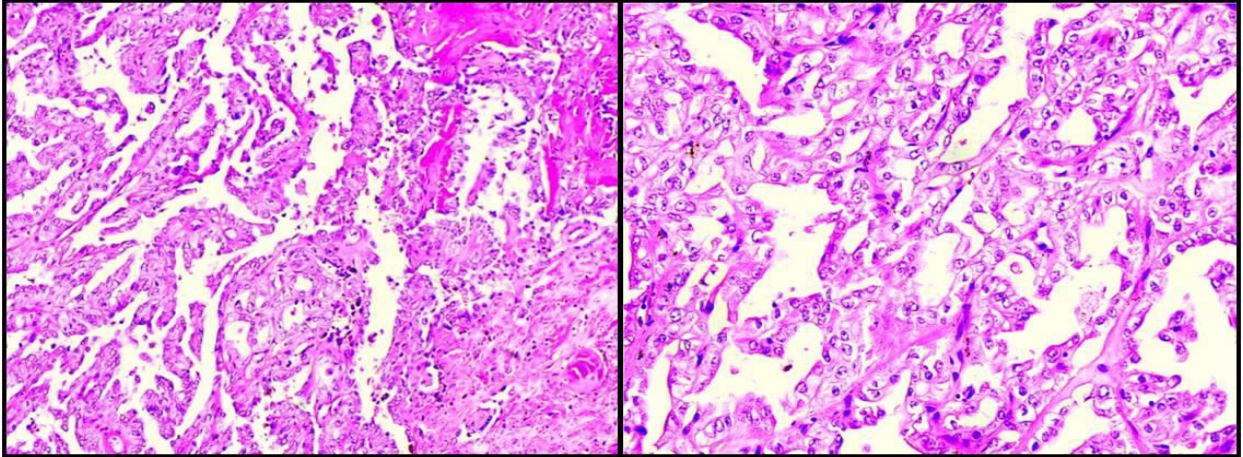


Figure 5a: Gross of Wilms tumour & Figure 5b: Microscopy of Wilms tumour(40x)

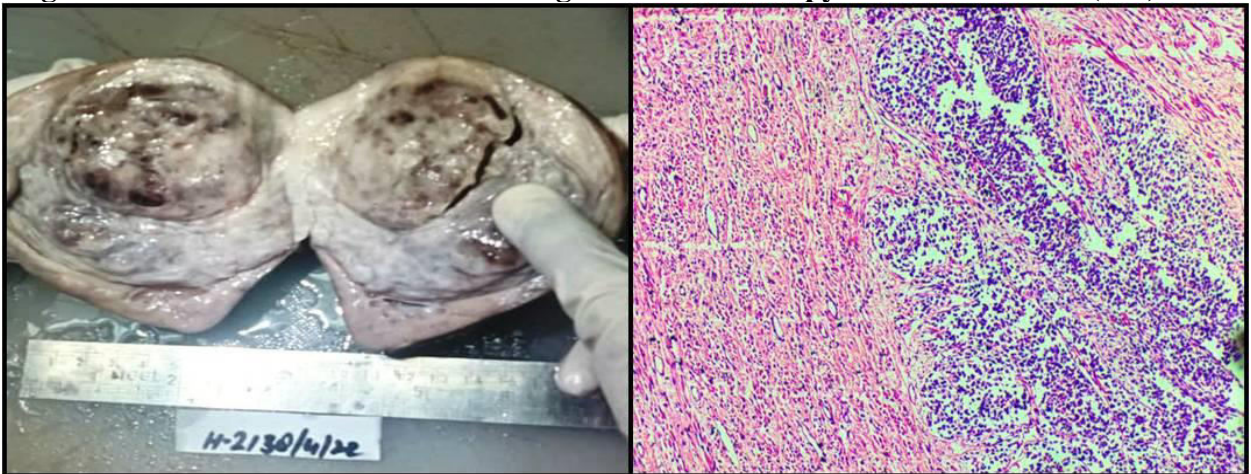
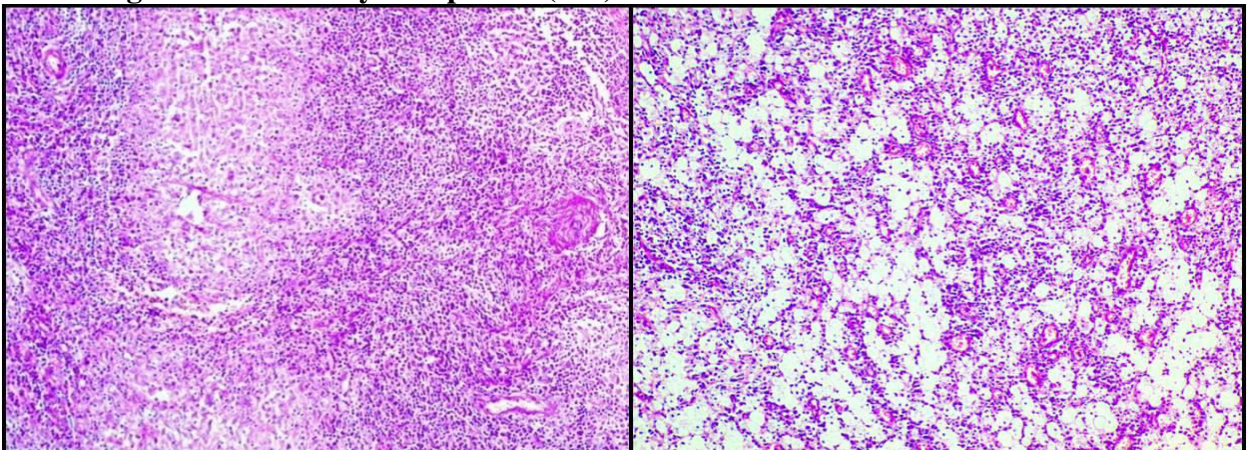


Figure 6: Microscopy of Granulomatous Pyelonephritis (40x) & Figure 7: Microscopy of xanthogranulomatous Pyelonephritis (40x)



DISCUSSION

In the present study out of 45 nephrectomy cases 34 were benign and 11 were malignant. Thus benign lesions outnumber the malignant lesions. Similar to the study done by Anu Gupta et al in 2020.² In our study majority of the patients belonged to age group 51-60 years. This is similar to study done by Gulshan Kumar et al in 2020 who also found ages 51-60 years

commonest.³ Male to female ratio in our study was 1.6:1. Similarly in study done by Kotta Devender Reddy et al in 2016 male to female ratio was 1.3:1. Similar study by Ahima N Amin et al in 2015, male to female ratio was 1.3:1.⁴ In our study most common clinical presentation was flank pain similar to study done by Kotta Devender Reddy. In our study the commonest nonneoplastic condition was chronic pyelonephritis similar to study done by Bhavya P. Mohan et al in 2020 who also found chronic pyelonephritis as the commonest nonneoplastic lesion followed by hydronephrosis.⁵ In the present study, total of 11 malignant lesions were observed commonest was RCC. This was similar to study done by Aiffa Aima et al in 2016.⁶ Out of RCC, clear cell variant was most common subtype observed in 50% cases of RCC followed by papillary and sarcomatoid 25% each. This was very similar finding in study done by Basavaraj et al in 2018 who found clear cell variant in 46.9% cases and papillary RCC 15.6% and chromophobe 3.1% cases.⁷

S.NO	AUTHORS	CLEAR	PAPILLARY	CHROMOPHOBE	SARCOMATOID
1.	Basavaraj et al (7)	46.9	15.6	3.1	-
2.	Madhukumar et al (8)	50	40	10	-
3.	Present	50	25	-	25

Most of the patients of renal tumors presented in the age group 4th to 5th decade of life. Most common presentation was flank pain. This is similar to study done by Nusrat Bashir et al in 2015.⁹ Clear cell carcinoma was the most common adult malignancy while pediatric malignancy was Wilms tumour. Similar study findings by Basnet et al in 2021.¹⁰ Similar were the study findings by Rosy Khandelia and Ashim Bhuyan in 2020.¹¹ Nonneoplastic lesions were most common cause for nephrectomies in our study. Chronic pyelonephritis followed by hydronephrotic changes being the most common cause. This is similar to study done by Vinay KS et al in 2018.¹²

CONCLUSION

Benign lesions of kidney outnumber the malignant lesions. Chronic pyelonephritis was the most common histopathologic diagnosis and Renal Cell Carcinoma was the most common malignant lesion. Clear cell carcinoma was the commonest variant of renal cell carcinoma. Wilms Tumour was the commonest renal tumour in children.

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