



HISTOMORPHOLOGICAL SPECTRUM OF LESIONS IN NEPHRECTOMY SPECIMENS IN TERTIARY CARE HOSPITAL

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ABSTRACT

Introduction: The kidneys are essential bodily parts that perform a variety of tasks, including excretory function, acid-base balance maintenance, salt and water metabolism regulation, and blood pressure regulation through renin. This study aims to study the histomorphological features of lesions in nephrectomy specimens in a tertiary care hospital, according to age, gender and site. Histomorphological study helps in determining diagnosis and treatment. The aim of the study is to analyse the histomorphological spectrum of lesions in nephrectomy specimens. **Aim:** We aimed at determining the histomorphological spectrum of lesions in nephrectomy specimens with its incidence according to age and sex distributions. **Material and Methods:** It is a retrospective study conducted in a tertiary health care centre of Mumbai over a period over two years with 38 nephrectomy specimens including right and left, simple and radical nephrectomies, along with uretero-nephrectomies. The lesions were classified based on their histomorphological findings. **Results:** Out of the 38 specimens studied 70.7% (29 cases) were non-neoplastic. Most common lesions among non-neoplastic cases were chronic inflammatory pathology which included chronic pyelonephritis, granulomatous pyelonephritis, others included non-functioning kidney, end-stage renal disease, Neoplastic lesions were 29.2% (12 cases) out of which 8.3% (1 case) were benign. Benign lesion included Angiomyolipoma of kidney. Malignant lesions included renal cell carcinoma in 11 cases. **Conclusions:** Non-neoplastic chronic inflammatory lesion are the commonest lesions based on histomorphology. Cases studied belong to varied age group. Mean age of malignant lesions was 3rd to 6th decade with male preponderance. This study gives a fair insight into the incidence and spectrum of renal neoplastic and non-neoplastic lesions.

KEYWORDS : Histomorphology, Neoplastic, Nephrectomy, Non-neoplastic

INTRODUCTION

Kidneys are considered as one of the most vital organs of the body. They can be involved with various pathological processes that can result in morbidity and mortality throughout the life. Nephrectomy is a common procedure in urological practice done for various neoplastic and non-neoplastic conditions like congenital abnormality, calculi, chronic pyelonephritis, malignancy, obstruction or injury; which alter its function and has wide range of morbidity and mortality, as the functions performed by it contribute to homeostasis.

The kidneys which are impacted in an irreversible way needs to be surgically removed, and the procedure is known as nephrectomy. A wide spectrum of lesions can be seen affecting the kidney in the patients from early childhood to elderly. The non-neoplastic lesions can be of inflammatory, developmental, pre-malignant aetiology and the neoplastic lesions can be either benign or malignant.

Simple nephrectomy is a procedure done for removing non-functioning kidneys which are irreversibly damaged by non-neoplastic lesions whereas radical nephrectomy is done for different malignant lesions of the kidney.⁽¹⁾ Nowadays there are newer surgical modalities like nephron sparing surgeries which are being used in selected cases of renal cell carcinomas. But such surgeries are yet to replace the conventional nephrectomies that are being done in India.^(2,3)

The clinical presentation in patients with renal lesions can be flank pain, burning micturition, haematuria, fever, lump per abdomen. The patients may also show radiological evidence of decreased renal function of the kidney via procedures like IVP and/or USG. Flank pain is the most common presentation for which nephrectomy is indicated.⁽⁴⁾

Histopathological examination is the gold standard method for diagnosis of kidney lesions. The gross and microscopic picture of different lesions may vary according to the type and level of the lesion. Here, the histomorphological examination is required for establishing diagnosis of lesions as well as for determining its histological type.

Also, it helps in assessment of histomorphological prognostic markers like tumour size, histological subtype, nuclear grade and stage in malignant cases.⁽⁵⁾

AIM

We aimed at determining the histomorphological spectrum of lesions in nephrectomy specimens with its incidence according to age and sex distributions.

MATERIAL AND METHODS

It is a retrospective study conducted in a tertiary health care centre of Mumbai over a period over one year with 38 nephrectomy specimens including right and left, simple and radical nephrectomies, along with uretero-nephrectomies. The lesions were classified based on their histomorphological findings.

RESULT

The most common clinical presentation of patients who underwent nephrectomy was flank pain seen in 92.1% patients followed by burning maturation 76.3%, fever 65.8%, haematuria 44.7% and lump in abdomen in 26.3% of cases. The present study included 38 nephrectomy cases received during the study period. [Table/Fig1].

[Table/Fig1] Age wise and symptom wise distribution of nephrectomy specimens.

Age	Flank pain	Burning micturition	Fever	Haematuria	Abdominal lump
1-10	1	2	1	1	-
11-20	3	2	2	1	1
21-30	2	1	1	1	-
31-40	7	6	5	4	2
41-50	8	8	9	5	4
51-60	9	6	5	3	2
61-70	3	2	1	1	1
>70	2	2	1	1	-
Total	35	29	25	17	10

There were 26 non-neoplastic lesions and 12 neoplastic lesions. In our study, males constituted 24 cases (63.4 %) and females 14 cases (36.6 %) with a M:F ratio of 2.1:1. Age ranged from 1 year to 76 years. In patients with non-neoplastic lesions, in all the age groups, most of the patients had chronic pyelonephritis. Majority of cases of chronic pyelonephritis 34.9% belonged to age group of 41-50 years.

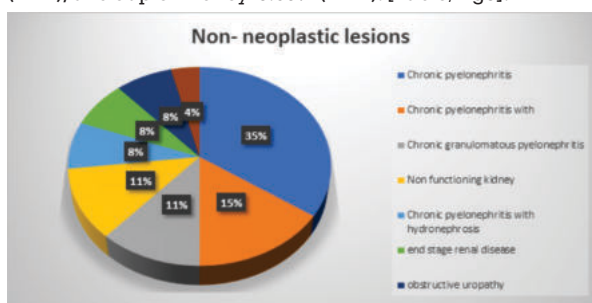
Out of 26 cases of non-neoplastic lesions, 16 were from male and 10 from female patients. In non-neoplastic lesions, majority of the patients were in age groups 41-50 years (26.9 %). Most of the cases in males were from age group 41-50 years. Majority of the cases in females were from age group 41-50 years. Majority of cases in neoplastic lesions belonged to age group 51-60 years 41.6% (n= 5).

In neoplastic lesions, most of the cases were malignant 91.6% (n=11) and benign were 8.4% (n=1); majority of the patients were in age groups 51-60 years (41.6 %). Most of the males (37.5 %) belonged to age groups 51-60 years and most of the females 50 % were in 51-60 years. [Table/Fig2]

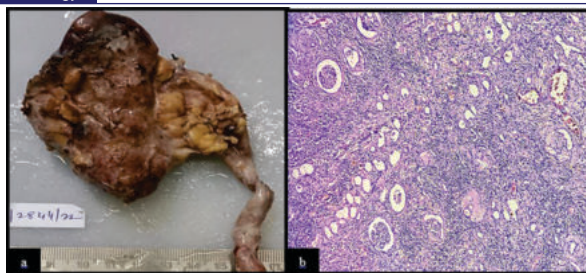
[Table/Fig2]: Age and Sex-wise distribution of non-neoplastic and neoplastic lesions.

Age	Non-Neoplastic lesions		Benign and Malignant lesions	
	Male	Female	Male	Female
1-10	1	1	-	-
11-20	2	1	-	-
21-30	1	-	1	-
31-40	3	2	1	1
41-50	4	3	1	1
51-60	3	2	3	2
61-70	1	1	1	-
>70	1	-	1	-
	16	10	8	4
	26		12	

Most common non-neoplastic lesion was chronic pyelonephritis 34.68% (n=9), followed by chronic pyelonephritis with ureteritis 15.38% (n=4), chronic granulomatous pyelonephritis 11.54% (n=3), Non-functioning kidney 11.54% (n=3), chronic pyelonephritis with hydronephrosis 7.67% (n=2), End-stage renal disease with Hydronephrosis 7.67% (n=2), Obstructive uropathy 7.67% (n=2), and duplex kidney 3.85% (n=1). [Table/Fig3].

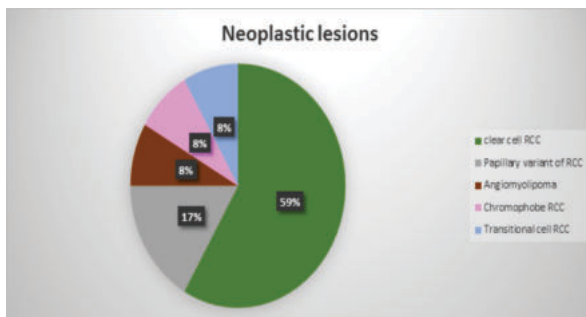


[Table/Fig3] Distribution of nephrectomy specimen according to non-neoplastic lesions

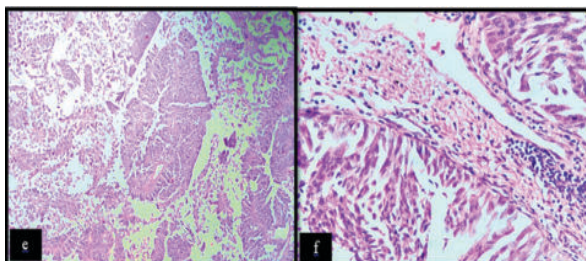
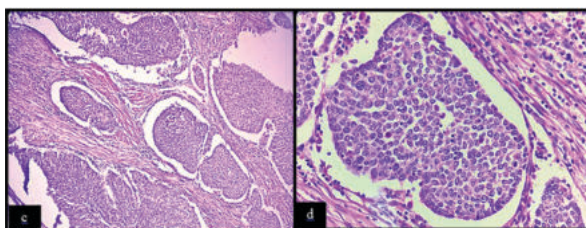
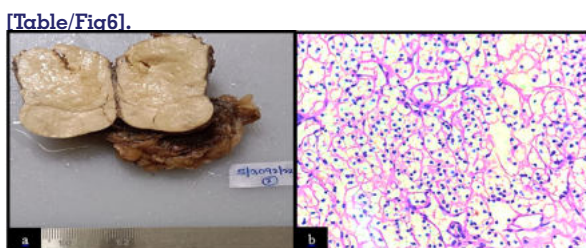


[Table/Fig4] (a) Gross picture of contracted kidney (b) Chronic pyelonephritis with few glomeruli showing glomerulosclerosis with interstitium showing dense inflammatory infiltrates (10x).

Most common neoplastic lesion was malignant clear cell renal cell carcinoma comprising of 58.4% (n=7), followed by papillary variant of renal cell carcinoma 16.6% (n=2), Chromophobe renal cell carcinoma 8.33% (n= 1) and transitional cell carcinoma 8.33% (n= 1) and angiomyolipoma 8.33%(n= 1). [Table/Fig5].



[Table/Fig5]. Distribution of neoplastic lesions in nephrectomy specimens



(a) Gross picture of Papillary Renal Cell Carcinoma (b) Microscopic picture of Clear cell Renal Cell Carcinoma with absent or inconspicuous nucleoli (c) Microscopic picture of Papillary Renal Cell Carcinoma

- having papillary architecture with fibrovascular core(10x)
- (d) Microscopic picture of Papillary Renal Cell Carcinoma having papillary architecture showing small round to oval tumor cells (40x)
- (e) Microscopic picture of Transitional cell carcinoma of Renal Pelvis (10x)
- (f) Microscopic picture of Transitional cell carcinoma of Renal Pelvis (40x)

Total number of right and left nephrectomy specimens were 20 (52.6%) and 18 (47.3%), respectively. [Table/Fig7]



[Table/Fig7] Distribution of nephrectomy specimen according to laterality

DISCUSSION

In the present study of 38 nephrectomy specimens, male predominance was seen with overall Male: Female ratio 1.7:1. This is in concordance with other studies like K Shanmugasamy et al (2:1), El Malik et al, Fauzia et al (1.9:1)^[6,7,8]

In this study, most of the patients who underwent nephrectomy were belonging to 41-50 years age group (29.26%). This finding was consistent with other previous studies done by Shaila et al, Vinay et al, Suryavanshi et al.^[9,10,11]

Our study showed right side predominance (52.6%) amongst 41 nephrectomy specimens. This is correlating with other studies by Ashima N Amin (51.6%) and Madhu Kumar et al, (58.33%)^[12,13]

The most common clinical presentation in patients undergoing nephrectomy was found to be flank pain (92.1%) which is consistent with other studies like Shanmugasamy et al, Shaila et al.^[6,9]

In the present study, 26 cases (68.4%) had non neoplastic lesions and 12 cases (31.5%) cases had neoplastic lesions. Hence non-neoplastic conditions were a more common indication for nephrectomy in this study. This is in concordance with studies done by Meena et al, Ghalayani et al, Divyashree et al.^[4,15,16]

The Present study found Chronic Pyelonephritis as the most common non-neoplastic indication of nephrectomy (34.6%). This is consistent with other studies done by Shaila et al, and Ajay et al.^[6,17]

Renal Cell Carcinoma (58.4% of neoplastic lesions) was the most common neoplastic lesion in the present study. This is consistent with studies done by Meena et al, Bashir et al.^[14,19] Clear Cell carcinoma is the most common type of renal cell carcinoma in the present study. This is in concordance with studies done by Bashir et al, Meena et al, Shaila et al, Ashima et al, and Sujata et al.^[14,18,19]

A rare 1 case (8.3%) of Angiomyolipoma was reported at our centre which is similar to the study done by bajaj et al.^[20]

CONCLUSIONS

The present prospective study provides a fair understanding

of the histomorphological patterns of lesions in nephrectomy specimens in our institution. The nephrectomy specimens received represented a wide variety of histological spectrum. Frequency in distribution of various non-neoplastic and neoplastic lesions were similar to the reports in literature. Number of clinical parameters such as age, sex, presenting complaints, laterality was correlated with renal tumours and non-neoplastic lesions demanding surgical removal. Overall, most common affected age group was 41- 50 years and the most common indication for nephrectomy was chronic pyelonephritis. The most common presenting complaint was flank pain and nephrectomy was more frequently performed on right kidney. Clear cell carcinoma was the most common adult malignancy. All the above clinical and histomorphological parameters can help in early diagnosis and to plan the line of treatment and also have a prognostic significance.

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