

# Histopathological Spectrum of Nephrectomy Cases: A Hospital Based Study

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**Abstract:** *Nephrectomy is a common procedure in surgical practice. It can be partial nephrectomy or radical nephrectomy, indicated in patients with neoplastic and nonneoplastic conditions ranging from chronic infections, obstruction, calculous disease, renal cell carcinomas. Objective: This study aimed to assess the histopathological spectrum, neoplastic or non-neoplastic conditions in nephrectomies received in our department. Methods: A hospital based retrospective study over a period of 8 years from January 2011 to January 2019 of all nephrectomy specimens received in our department. Results: A total 30 cases over a period of eight years from January 2011 to January 2019 were studied. There was male predominance (63.34%) and 30% of the cases were in the age group of 31-40 year, 73.34% of the nephrectomies were performed for non neoplastic indications. A wide range of lesions were found on histopathological examination. Chronic pyelonephritis was the most common histopathological diagnosis (30%). Conclusion: Inflammatory causes more commonly required a nephrectomy in the study population. Chronic calculous pyelonephritis was the most common underlying pathophysiology leading to a non-functioning kidney.*

**Keywords:** Nephrectomy, Chronic pyelonephritis, RCC

## 1. Introduction

Kidney can be involved in various pathological processes, some of which may require its surgical removal. Nephrectomy is a common procedure in surgical practice. Nephrectomy can be either partial, total or radical depending upon the indication and other patient parameters. Both benign and malignant tumours occur in the kidney. The kidneys are affected by different malignant tumours. 99 percent of renal neoplasms are malignant with renal cell carcinoma being most common. [1] Radical or partial nephrectomy is the treatment of choice for a great proportion of patients with renal tumours. [2] Renal cell carcinomas account for approximately 2 percent of adult malignancies and 80 to 85 percent of malignant kidney tumour. [3] Renal cell carcinomas occur twice as commonly in men than women, it is primarily a disease of elderly patients. Renal cell carcinomas typically present in the 5<sup>th</sup> to 7<sup>th</sup> decade of life, however it has been reported in much younger patients as well. [4] Nephrectomy done for non neoplastic conditions like obstructive nephropathy, Hydronephrosis, Chronic pyelonephritis, Xanthogranulomatous pyelonephritis have been reported in both adults and children. [5] Grossly, mass occupying nature of this lesion often mimics renal cell carcinoma. [6] Angiomyolipoma kidney demands nephrectomy. [6]

Renal cystic diseases are classified into autosomal recessive kidney disease, glomerular cystic diseases, medullary cystic diseases, etc. Autosomal dominant polycystic kidney disease (ADPKD) is the most common inherited condition leading to end stage kidney disease with an incidence of 1 in 400 to 1 in 1000. [7]

## 2. Methods and Materials

This is a retrospective study conducted in the Department of Pathology on 30 consecutive nephrectomies performed at K.J. Somaiya Medical College and Research Centre, Mumbai during January 2011 to January 2019. All nephrectomy specimens, both simple and radical were included in this study. Core needle biopsies from renal masses were excluded. Tumours of ureter and pelvis were excluded from statistical analysis. Age, sex and clinical findings were retrieved from the records. Nephrectomy specimens received in the department were thoroughly grossed as per standard protocol for grossing of individual renal specimens and processed. Paraffin embedded, H and E stained sections were initially observed under light microscopy. A final diagnosis was made on histopathology. Malignant tumours renal cell carcinomas were graded using Furham's nuclear grading.

## 3. Results

A total of 30 nephrectomy specimens were received out of which 10 were neoplastic and 13 were non neoplastic lesions. (Table 1) Among 30 cases 19 (63.34%) were male patients and 11 (36.66%) were female patients (Table 1) with male to female ratio of 1.72:1. The age range varied widely according to the type of the disease. The youngest patient being a 5 year old male while oldest patient being 77 year old male. The highest percentage of patients belong to the age group of 31 to 40 years (Table 2). Maximum number of cases were chronic pyelonephritis, 5 cases were associated with hydronephrosis (46.68 %) followed by renal cell carcinoma (26.68%). Neoplastic cases were 10 in number among which 8 were malignant and 2 were benign. Malignant cases were renal cell carcinomas and benign were angiomyolipoma in our study. The greater percentage of both benign (43.33%) and malignant lesions (20%) were

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observed in males. Among the malignant tumours 5 were clear cell carcinomas, 2 cases were papillary carcinomas, and 1 was chromophobe with focal sarcomatoid change. Nuclear grading of clear cell renal cell carcinoma was grade 1 in 2 cases, grade 2 in 2 cases and grade 4 in 1 case. Other pathologies encountered were Xanthogranulomatous pyelonephritis, cystic diseases, angiomyolipoma, chronic glomerulonephritis, hydronephrosis. (Table 3) 5 cases were hydronephrosis with chronic pyelonephritis.

**Table 1:** Gender-wise distribution of Neoplastic and Non neoplastic lesions

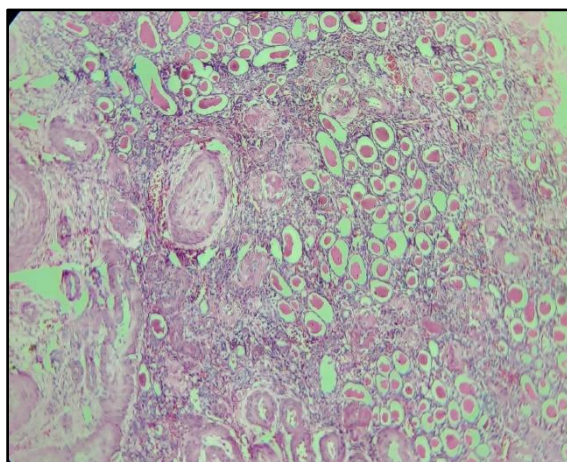
Lesions	Males	Females
Neoplastic	06	04
Non neoplastic	13	07
Total	19	11

**Table 2:** Age-wise distribution of nephrectomy specimens

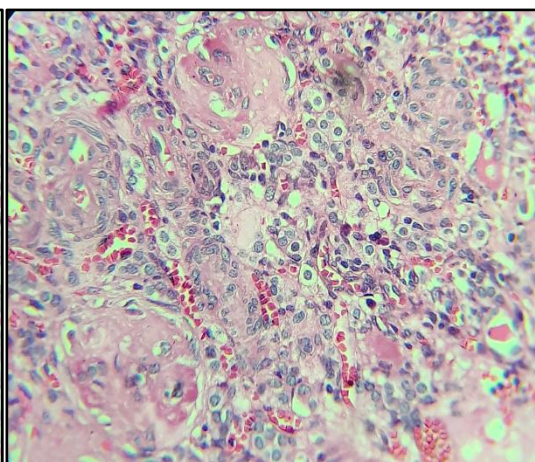
Age group	No of cases (n=30)	% age
0-10 years	1	3.33
11-20 years	2	6.66
21-30 years	2	6.66
31-40 years	9	30.00
41-50 years	5	16.67
51-60 years	3	10.00
61-70 years	5	16.67
71-80 years	3	10.00

**Table 3:** Distribution of nephrectomy specimens according to histopathological lesions

S. NO	Lesion	No. of cases (n=30)	Percentage
1	Chronic pyelonephritis	14	46.68
2	Renal cell	8	26.68
3	Xanthogranulomatous pyelonephritis	2	6.66
4	Cystic renal disease	2	6.66
5	Angiomyolipoma	2	6.66
6	Chronic glomerulonephritis	1	3.33
7	Hydronephrosis	1	3.33

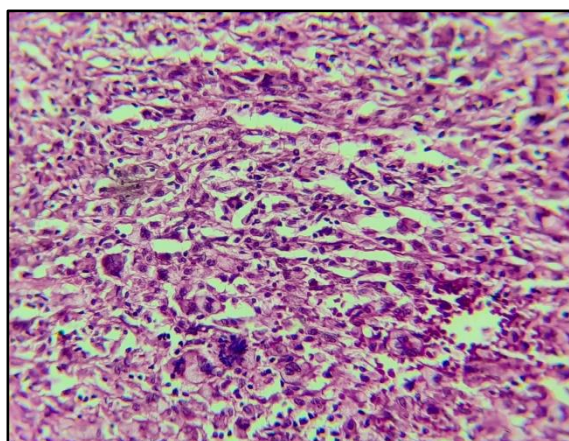


1(A)

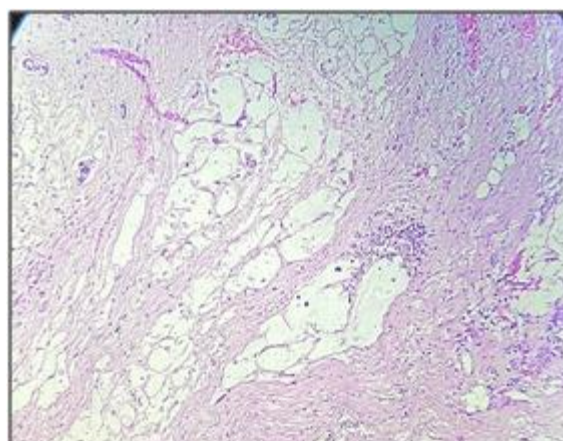


1 (1B)

**Figure 1A. and 1B:** Photomicrograph of chronic pyelonephritis showing patchy dense mononuclear cell infiltrate, periglomerular fibrosis and thyroidisation. (H & E 1A- 100X and 1B- 400X)

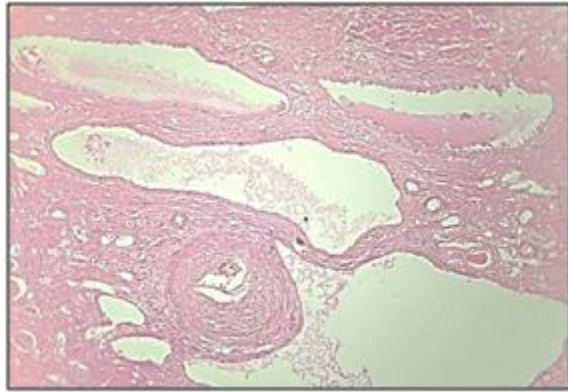


**Figure 2:** Photomicrograph of Xanthogranulomatous pyelonephritis showing collection of foamy macrophages and diffuse mononuclear cell infiltrate. (H&E -100X)

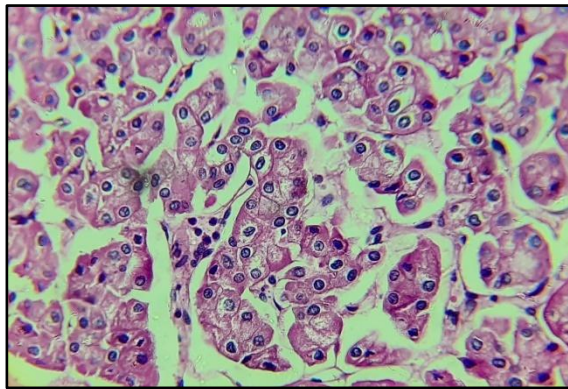


**Figure 3:** Photomicrograph of Angiomyolipoma showing mature adipose tissue and fascicles of spindle cells. (H&E - 100X)





**Figure 4:** Photomicrograph of renal cystic disease showing cysts of varying sizes lined by flattened epithelium. (H&E – 100X)



**Figure 5:** Photomicrograph of chromophobe RCC showing tumour cells arranged in trabeculae and sheets having abundant eosinophilic cytoplasm. (H&E – 400X)

#### 4. Discussion

The kidney like other organs is liable to different diseases varying from congenital diseases, inflammatory and neoplastic lesions requiring nephrectomy. The results of this study enable us to pathologically classify the indications for nephrectomy. In this study total 30 nephrectomy specimens were received. Male constituted 19 cases (63.33%) and female 11 cases (36.67%) with male to female ratio 1.7:1 similar to studies done by Suryawanshi et al,[8] Rafique et al [9] and El Malik et al. [10]

In the present study the most common indication for nephrectomy was chronic pyelonephritis 14 cases(46.68%) followed by RCC 8 cases (26.68%) which is similar to studies done by Aiman et al,[11]Popat et al,[12]Suryawanshi et al[8] and Shaila et al.[13]

In our study 66.67% were non neoplastic and rest 33.33% were neoplastic conditions. Thus non neoplastic conditions comprised majority of cases requiring nephrectomy similar to studies done by Chaitra B et al [14] and Dr Bharati Devi Thaker et al. [15]

#### 5. Conclusions

The present study provides fair insight into the histological patterns of lesions in nephrectomy specimens in our institution and its correlation with studies conducted across

the world. Non neoplastic lesions were more common than neoplastic lesion. Chronic pyelonephritis was the most common histopathological diagnosis. Renal cell carcinoma was most common among the malignant tumours.

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