



## Histopathological spectrum of lesions in nephrectomy specimens: Five years' experience.

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**ABSTRACT... Objective:** The aim of this study was to evaluate the histopathological changes in the nephrectomy specimens. **Study Design:** Retrospective study. **Setting:** Private Lab, Located in Faisalabad. **Period:** January 2015 to December 2019. **Material & Methods:** A total of 113 cases were included in the study. In this study paraffin blocks and previous slides along with clinical data were analyzed according to standard protocols. Patient age, sex and histological diagnosis were noted and compared. **Results:** In this study we analyzed 113 cases, received during a five year time period. Out of which 60 (53%) were males and 53 (47%) were females. Most common age group ranges from 51 to 60 years and the least common affected group was 71 to 80 years. The neoplastic cases were 66 (58%) and nonneoplastic cases were 47(42%). Neoplastic were further sub- divided in to 3(5%) benign cases and 63(95%) malignant cases. Most common neoplastic lesion was clear cell renal cell carcinoma, 49 (74%) cases and most common non- neoplastic condition was chronic pyelonephritis, 37 (78%) cases. **Conclusion:** Nephrectomy is the ultimate surgical procedure for the treatment of renal diseases. The 5th to 6<sup>th</sup> decade is the most common age group of patients affected by non- neoplastic conditions leading to non-functioning kidney. Malignant tumor like clear cell carcinoma is the most common malignant tumor in our society. Early clinical, radiological and histopathological diagnosis of renal diseases will help out patients for proper management. Thus every nephrectomy specimen should be evaluated through clinico –pathological correlation.

**Key words:** Chronic Pyelonephritis, Clear Cell Renal Cell Carcinoma, Nephrectomy.

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## INTRODUCTION

The kidneys perform various important functions including maintainance of acid base balance, regulation of electrolytes and blood pressure with production of various hormones. Kidneys are affected by various neoplastic and non- neoplastic conditions that lead to end stage kidney disease and ultimately need surgical removal of kidney.

The non-neoplastic renal diseases include chronic pyelonephritis, hydronephrosis, nephrolithiasis, vesicoureteric reflux, Granulomatous pyelonephritis due to tuberculosis and xanthogranulomatous pyelonephritis. Xanthogranulomatous pyelonephritis presents as a mass and mimics grossly and microscopically Renal cell carcinoma. In various conditions like renal dysplasia nephrectomy is the treatment of

choice.<sup>1</sup>

The neoplastic conditions involving kidneys comprised wide spectrum of patterns which are distinct for children and adults. This includes both benign and malignant tumours while almost 99% renal neoplasms are malignant. Among the malignant tumours Renal cell carcinoma and Wilms tumour are the most common tumours. The treatment of choice for these neoplasms is Radical and partial nephrectomy.

Renal cell carcinoma comprises 2% of adult malignancies and almost 85 % of malignant kidney tumours. This tumor is more common in 5th to 6<sup>th</sup> decades. It can also be seen in children.

Wilms tumor is the most commom childhood

tumor that is 5th in ranking. However it is very rare in adults that is less than 1%.<sup>2</sup>

The histopathological evaluation is mandatory for exact typing of tumour and its biological behavior according to stage and grade of tumour. This has the prognostic and therapeutic implications. The objective of this study is to evaluate the morphological spectrum of histopathological lesions in the nephrectomy specimens with clinicopathological correlation and their implication on the patient management.

## MATERIAL & METHODS

This Retrospective study was conducted In a private pathology lab, Faisalabad, from Jan 2015 to Dec 2019 after approval by ethical committee. A total of 113 cases were studied for the last 5 years from January 2015 to December 2019. All nephrectomy specimen paraffin blocks were taken out from the record and slides were reviewed.

### Inclusion Criteria

It includes all benign and malignant nephrectomy cases of any age and sex.

### Exclusion Criteria

The patients with prior needle core biopsies and nephrectomy due to traumatic injury were excluded from the study.

Patient's particulars were recorded including age, sex, pathological diagnosis, clinical presentation and investigations such as CT scan and ultrasound. This is a retrospective study so paraffin blocks and slides along with case records were studied and wherever needed further sections were taken. Sections were cut at 3 to 4 microns and stained with Haematoxylin and Eosin. Immunohistochemistry was not done. PAS (Periodic acid Schiff) stain for fungus and ZN (Ziel Nielson) stain for Acid fast bacilli were done wherever needed.

## RESULTS

In this study out of 113 patients 60 (53%) were males while 53 (46%) were females. Most of the patients belong to the age group 51 to 60,

including 26 cases (23%) while least affected group was 71 to 80 years including only 2 cases. The youngest patient was 6 months old male and the oldest one was 80 year male.

Age Distribution	Total Number (%)
0 to 10	11 (10 %)
11 to 20	06 (05 %)
21 to 30	13 (11 %)
31 to 40	21 (19 %)
41 to 50	24 (21 %)
51 to 60	26 (23 %)
61 to 70	10 (09 %)
71 to 80	02 (02 %)
Total	113 (100%)

**Table-I. Age and sex wise distribution of nephrectomy cases.**

Sex	Total Number (%)
Male	60 (53 %)
Female	53 (47 %)
Total	113 (100%)

The neoplastic cases were 66 (58%) and number of non-neoplastic cases were 47(42%). Neoplastic cases were further classified in to malignant cases 63 (95%) and benign cases 3 (5%). Among the Non – neoplastic cases, most common inflammatory condition was chronic pyelonephritis 37(78%) shown in Figure-3. Majority of pyelonephritis cases were in 31 to 40 years age group. It was followed by 3 cases of granulomatous pyelonephritis, 1 case of xanthopyelonephritis and 1 case of polycystic kidney disease. There were two cases of multicystic renal dysplasia.

Neoplastic cases were more , among which clear Renal cell carcinoma was the most common malignant tumour in adults comprising of 49 cases, while there were 3 cases of chromophobe Renal cell carcinoma. Most common age group affected by renal cell carcinoma was 51 to 60 years. The youngest case of the Renal cell carcinoma was of 26 years old male as shown in Figure-1. Wilms tumour was the most common malignant tumour in children. It comprised of 5 cases and the age group affected was below 10 years. The youngest case was of 7 months female

while oldest was of 5 years old male as shown in Figure 2. Rhabdoid tumour was seen in 6 months old male.

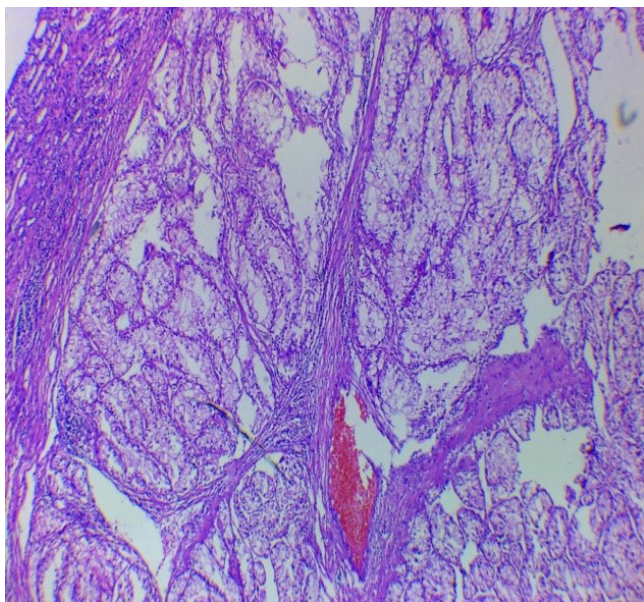


Figure-1. Renal cell carcinoma.

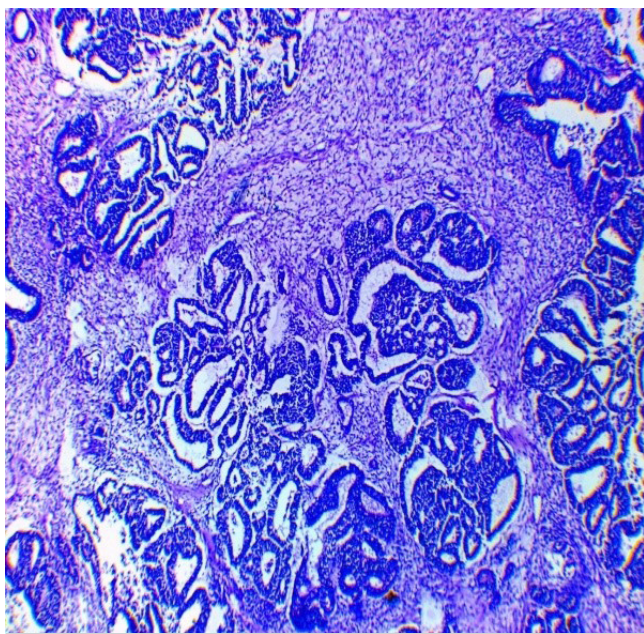


Figure-2. Wilms tumour.

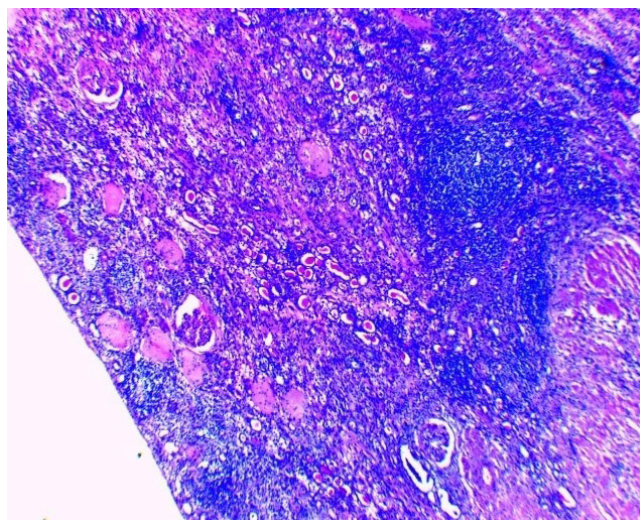


Figure-3. Chronic pyelonephritis.

Histopathological Finding	Number	Percentage
<b>Non – neoplastic</b>	47	42%
Chronic pyelonephritis	37	78%
Granulomatous pyelonephritis	03	06%
Multicystic renal dysplasia	02	04%
Hydronephrosis	01	02%
Xanthogranulomatous	01	02%
Plycystic kidney diseases	01	02%
<b>Neoplastic</b>	66	58%
<b>Benign</b>	03	05%
Oncocytoma	01	01%
Pheochromocytoma	01	01%
Multicystic Nephroma	01	01%
<b>Malignant</b>	63	95%
Renal cell carcinoma	49	74%
Chromophobe RCC	03	04%
Wilms tumor	05	07%
Squamous cell carcinoma	02	03%
Transitional cell carcinoma	03	04%
Rabdoid tumour	01	01%

Table-IV. Histopathological spectrum of lesions in nephrectomy cases.

Lesion	No of Cases (n= 54)	Percentage (%)
Non-neoplastic	47	42 %
Neoplastic	66	58 %
Total	113	100%

Table-II. Distribution of neoplastic and non-neoplastic lesions in nephrectomy cases.

**DISCUSSION**

In this study a total of 113 cases were analyzed, including 66 neoplastic cases and 47 non – neoplastic cases. Most of the cases were in 51 to 60 years age group. This is inconcordance with the studies done by Vinay KS et al., Shanmugaswamy et al and Swarnalath a Ajmera et al in which the

most common affected age group was 5<sup>th</sup> to 6<sup>th</sup> decade.<sup>3,4,5</sup> While in the study done by Vinay KS et al the majority of the patients were in 4th decades.<sup>3</sup> In our study 60( 53%) male cases outnumbered the 53 ( 46%) female cases. The similar findings were seen in the study done by Thakur A.S et al, Vinay KS et al, and Swarnalatha Ajmera et al.<sup>1,3,5</sup> In the present study neoplastic cases were more 66 (58%) than non- neoplastic cases 47 (42%). Similar results were seen in the study of Thakur A.S et al which showed 38 (70%) cases of neoplastic lesions than 16 (29.6%) cases of non- neoplastic lesions.<sup>1</sup> While in the study done by Vinay KS et al non- neoplastic lesions were 63 (88%) and neoplastic cases were only 8 (11%).<sup>3</sup> The chronic pyelonephritis cases 47 (42%) were the most common non- neoplastic lesion in this study, followed by granulomatous pyelonephritis 3 (6%) cases. The similar results were seen in the study done by Vinay KS et al, in which chronic pyelonephritis cases were 23 (32%) followed by Xanthogranulomatous pyelonephritis 10(14%) cases.<sup>3</sup> Similar number of cases of Xanthogranulomatous pyelonephritis were seen in the study done by Aiffa Aiman et al, showed 8 (5.7%) cases with female predilection 5 (62%) cases.<sup>2</sup>

In our study there was only one case of Xanthogranulomatous pyelonephritis in 45 years female. The incidence of Xanthogranulomatous pyelonephritis worldwide is 1%.<sup>1</sup> This was comparable with the results of the study done by Thakur A.S et al, Swarnalatha Ajmera et al and Savita D et al.<sup>1,5,6</sup> The study done by Thakur A.S et al also reported one case of Xanthogranulomatous pyelonephritis in a 33 years female.<sup>1</sup> In the present study there were 3(6%) cases of Tuberculous pyelonephritis which are comparable with the results shown by Vinay KS et al 3(4%) cases while Swarnalath Ajmera and Shanmugaswamy et al documented no cases of Tuberculous pyelonephritis.<sup>3,4,5</sup> This might be due to increased prevalence ratio of Tuberculosis in our region. In the present study most of the cases of neoplastic lesions were malignant 63(95%) while only 3 (5%) were benign cases.

The malignant cases included majority cases of

Clear cell Renal cell carcinoma 49 (74%) in adults followed by Chromophobe Renal cell carcinoma 3 (4%) cases. These results are comparable with the studies done by Vinay KS et al and Thakur KS et al. Vinay KS et al documented 75% malignant cases and 25% benign cases and most common malignant tumour was clear cell RCC, similarly Thakur KS showed 52% cases of Renal cell carcinoma.<sup>1,3</sup> In our study malignant cases outnumbered the benign ones almost to 95%. However Affia Aiman et al showed 77% benign cases and only 22% malignant lesion while among the malignant cases 32 (22%) Renal cell carcinoma was the most common one comprising of 25(53%) cases.<sup>2</sup> The study done by Shaila et al, Chitra et al, Popat et al also documented Renal cell carcinoma as the most common entity.<sup>7,8,9</sup> In this study majority cases of RCC were of Clear cell type 49 (74%) followed by Chromophobe type 3 (4%). This is in concordance with studies of Affia Aiman et al showing 20 (80%) cases of clear cell type of RCC.<sup>2</sup> Similar results are observed by Thakur AS et al, Vinay KS et al, Popat et al and Vikram Narang et al.<sup>1,3,9,10</sup> Primary Squamous cell carcinoma of kidney is very rare only 0.5% to 0.8%. We documented 2 (3%) cases of Squamous cell carcinoma of renal pelvis in 36 years male and 44 years male. Which is a slightly higher ratio. Aiffa Aiman et al also reported one case of Squamous cell carcinoma in a 33 year old female<sup>2</sup> Similar results were observed by Thakur AS et al, Vinay KS et al, Li et al, observing only one case of Squamous cell carcinoma.<sup>1,3,11</sup> In our study there were 3 (4%) cases of transitional cell carcinoma of renal pelvis while 1 (1%) case was reported by Vinay KS et al<sup>3</sup> In this study 5 (7%) Cases of Wilms tumour were observed in age group from 0- 10 years. The youngest was 7 months old female and oldest was 5 years old male. Similar results were seen by Thakur A.S and Aiman et al. In the study done by Thakur AS the youngest patient was 6 months old and oldest was 27 years old while the commonest age group was below 10 years.<sup>1,2</sup>

## CONCLUSION

This study analyzed various non- neoplastic and neoplastic conditions involving the kidneys. Most common age group affected was 5<sup>th</sup> to 6<sup>th</sup>

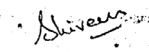



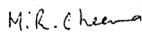
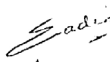
decades. The most common malignant tumour in adults was Renal cell carcinoma and in children was Wilms tumour. The most common non-neoplastic condition was chronic pyelonephritis. Thus every nephrectomy specimen should be evaluated through clinico-pathological correlation in order to ensure early and proper management of patients.

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2	Shazia Aslam	Pictures contribution, Critical review.	
3	Hafiza Azka Iqbal	Data collection and analysis.	
4	Hafsa Tariq	Medical expert.	
5	Rafique Cheema	Medical expert.	
6	Sadia Hameed	Supervise research work.	
7	Tariq Mehmood	Editing, Proof reading, Data analysis.	