

Original Research Article**Non- Neoplastic Lesions in Nephrectomy Specimens: A Histopathological Study****Harshanand S.¹, Chandrakanth V.R.², Jayashree K.³, Bharath C.⁴**

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Abstract

Introduction: Nephrectomy is a common procedure in urological practice. Simple nephrectomy is indicated in patients with an irreversible damaged kidney resulting from symptomatic chronic infections, obstruction, calculus, severe traumatic injury and renal dysplasia. The present study was aimed at studying of wide spectrum of renal diseases, to study the frequency of non neoplastic conditions and correlation with respect to age and sex of the patients.

Methodology: The study was prospective and included 40 nephrectomy specimens over a period of 2 years. The gross morphology and the microscopic features were studied.

Results: In the present study, a total of 40 cases of nephrectomy specimens were studied. Of the 40 cases, 25 were non-neoplastic lesions (62.5%).

Conclusion: It is mandatory for every nephrectomy specimen to be subjected, to a detailed Histopathological examination, for a clinico-pathological correlation to ensure proper management. The clinical outcomes of various histologic subtypes are different, validating for accurate subtyping of renal lesions in clinical practice.

Chronic Pyelonephritis was the commonest non-neoplastic lesion in females, which is a consistent finding in the present study. No significant difference was noted in the frequency of males and females in case of other non-neoplastic lesions of kidney.

Keywords: Nephrectomy; Chronic Pyelonephritis; Renal Cell Carcinoma.

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Introduction

Like any other human body organ, kidney can be involved in various pathological processes, some of which may require its surgical removal. Nephrectomy brings in relief to patient from various chronic and life threatening disease and in some cases make way for renal transplant. Renal cell carcinoma comprise for 3% of all cancer deaths. Staging and grading remain the most useful indicators for prognosis in renal Neoplasia amidst the increasingly sophisticated techniques such as cytophotometry and molecular biological assessment [1].

Simple nephrectomy is indicated in patients with an irreversibly damaged kidney resulting from symptomatic chronic infections, obstruction, calculus disease or severe traumatic injury. It may also be indicated to treat renovascular hypertension from non-correctable renal artery disease, or for severe unilateral parenchymal damage resulting from nephrosclerosis, pyelonephritis, reflux dysplasia or congenital dysplasia [2].

In the last few years, there has been growing interest in nephron sparing surgery or partial nephrectomy [3] is being used for selected patients, resulting in fewer complications and shorter hospital stay.

The present study was aimed at studying of wide spectrum of renal diseases, to study the frequency of non neoplastic conditions and correlation with respect to age and sex of the patients.

Methodology

The present study was done on the nephrectomy specimens sent for Histopathological evaluation to the Department of Pathology, VIMS, Ballari, during a period of 2 years (July 2014-july 2016). This is a 1 year retrospective and 2 year prospective study.

In the retrospective analysis of cases, the description of the gross findings was taken from the records maintained in the department.

The nephrectomy specimens were studied in detail for gross findings sent in 10% formalin, a detailed gross examination of the specimens was recorded. Required number of representative sections was taken for Histopathological study. After routine paraffin processing, serial sections of 5-micron thickness were cut and routinely stained with haematoxylin and eosin stain. Detailed

microscopic features were studied and recorded. Special stains were used as and when required. The final diagnosis was arrived at after correlating the clinical findings, gross and microscopic features.

Required relevant clinical and imaging details were obtained from patients case sheets whenever required. In the present study 40 nephrectomy specimen's morphology was analyzed as per the proforma protocol.

Result

The present study was carried out on a total of 40 nephrectomy specimens. Out of which 25 cases (62.5%) were non-neoplastic

Out of 40 cases, Chronic Pyelonephritis was observed in 18 cases comprising of 45% of the non- neoplastic lesion, followed by 6 cases of hydronephrosis (15%).

Maximum numbers of cases were seen between 3rd to 6th decades (23 cases- 57.5%).

Sex: Majority of the patients were females, accounting for 23 (57.5%) out of 40 cases, forming a male to female ratio of 1.35:1 (Table 3, Graph 4).

Table 1: Distribution of Non-Neoplastic in the present study

S1. No	Lesions	No. of cases	%of cases
1.	Non neoplastic	25	62.5

Table 2: Distribution of Various Lesions in the Present Study

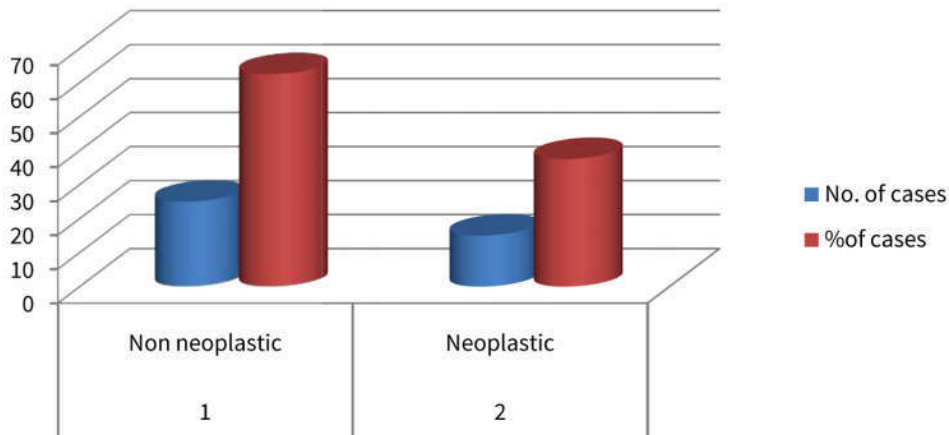
S1. No	Non-neoplastic Lesions	No. of cases	% of cases
1.	Chronic Pyelonephritis	14	45
2.	Hydronephrosis	6	15
3.	Chronic Pyelonephritis with hydronephrosis	4	10
4.	Xanthogranulomatous Pyelonephritis	1	2.5

Table 3: Age and Sex Distribution of the cases studied

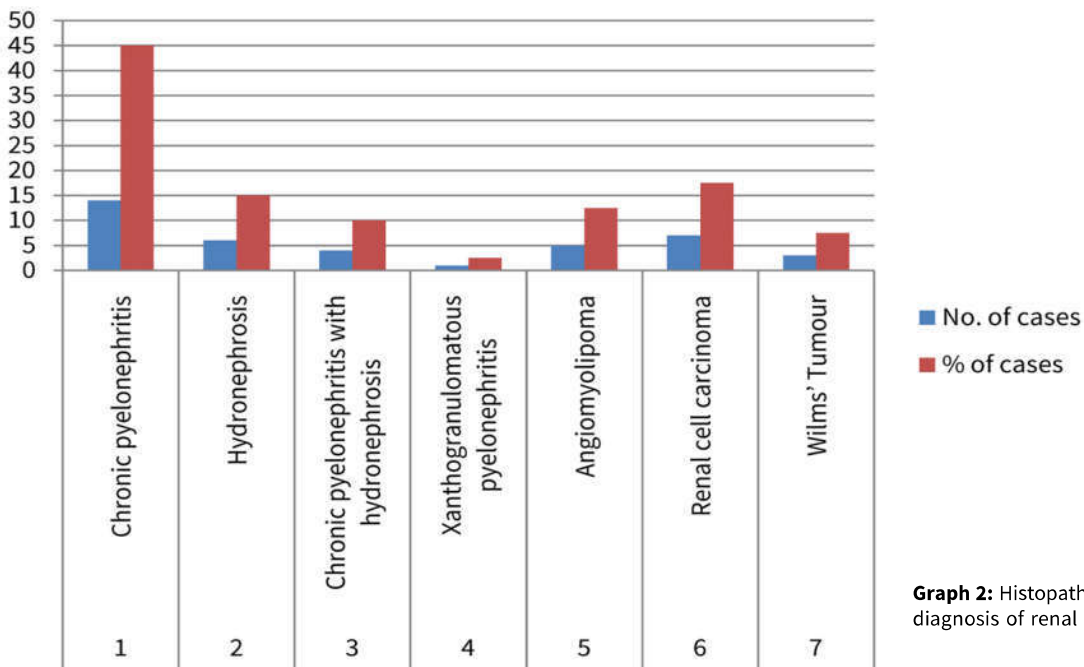
Age group (years)	Male	Female	Total
0-10	2	1	03
11-20	1	2	03
21-30	2	4	06
31-40	4	6	10
41-50	4	2	06
51-60	2	6	08
61-70	1	1	02
71-80	1	1	02
Total	17	23	40

Table 4: Clinical Presentation of Non-neoplastic lesions of the kidney

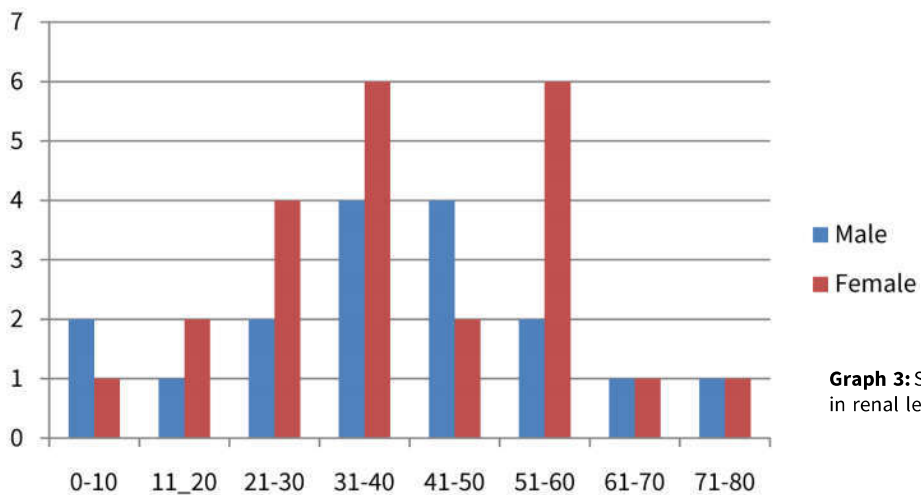
Clinical Symptoms	Non-neoplastic lesions
Pain abdomen	18
Mass per abdomen	03
Hematuria	0
Fever	13
Burning micturation	12



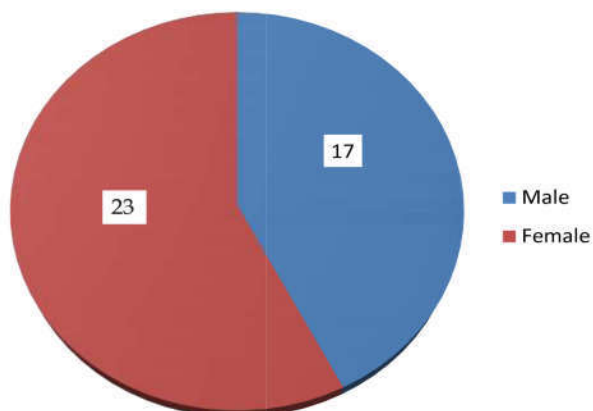
Graph 1: Showing distribution of Non-Neoplastic



Graph 2: Histopathological diagnosis of renal lesions



Graph 3: Showing age distribution in renal lesions



Graph 4: Showing sex distribution in various renal lesions

Among non- neoplastic lesions, pain abdomen (18 cases-45%) was the commonest presenting symptom.

Majority of the non-neoplastic lesions were seen between age 31-40 years, which comprised of 9 cases (22.5%).

Chronic Pyelonephritis was the commonest non-neoplastic lesion in females. No significant difference was noted in the frequency of males and females in case of the other non-neoplastic lesions of kidney. There was no significant difference observed in the frequency of left or right side of kidney involved by non-neoplastic lesions. Overall right kidney was involved more commonly.

Gross Morphology

External Surface

In the present study out of 25 cases, of non neoplastic lesions, enlargement of kidney was seen in 6 cases, while 11 were normal in shape and 5 were shrunken. 3 were normal in size and rest 2 cases were distorted. 9 cases showed thickened and adherent capsule. As many as 8 nephrectomy specimen showed rough external surface followed by smooth surface in 5 cases. Scarring was noted in 7 cases.

Cut surface

Majority of the cases showed dilatation of pelvi-calyceal system (14 cases), followed by thinning of cortex in (10 cases), localized yellow nodular areas (4 cases), necrosis (3 cases). In the present study stones were present in 2 nephrectomy specimens; they were single to multiple stones, measuring between 3x2x2cms to 2x2x1cms, black in color. Both the cases were seen in hydronephrosis and chronic pyelonephritis respectively.

Out of 18 cases of chronic pyelonephritis, hydronephrotic changes were noted in 4 cases and Xanthogranulomatous change in 1 case.

Table 5: Age distribution of the non-neoplastic lesions

Non-neoplastic lesions	0-10	11-20	21-30	31-40	41-50	51-60	61-70	Total
CPN	1	2	4	3	1	3	-	14
CPN with HN	-	-	1	2	1	-	-	4
HN	-	1	1	3	1	-	-	6
XGP	-	-	-	1	-	-	-	1
TOTAL	1	3	6	9	3	3	-	25

Table 6: Sex Distribution of non-neoplastic lesions

Non-neoplastic lesions	Male	Female
CPN	5	9
HN	2	4
CPN with HN	3	1
XGP	-	1
Total	10	15

Table 7: Frequency of involvement of the right and left sided kidney in non-neoplastic lesions

Non-neoplastic lesions	Right kidney	Left kidney
Chronic Pyelonephritis (CPN)	11	3
Hydronephrosis (HN)	2	4
CPN with HN	2	2
XGP	-	1
Total	15	10

Table 8: Gross features of Non Neoplastic Kidney Lesions

Gross Findings	CPN	HN with CPN	HN	XGPN	No. of Cases
External Surface					
Normal size	1	1	1	-	3
Enlarged kidney	3	1	2	-	6
Shrunk kidney	3	1	1	-	5
Normal shape	6	2	3	-	11
Distorted	1	1	-	-	2
Adherent renal capsule	5	2	2	-	9
Smooth	1	2	2	-	5
Rough	5	2	1	-	8
Scarred	5	2	-	-	7
Cut Section:					
PCD	3	3	2	-	8
Loss of CMD	3	2	-	-	5
Thinned out cortex	4	3	3	-	10
Yellow nodular areas	3	-	-	1	4
Calculi	2	-	-	1	3
Necrosis	2	-	1	-	3

Table 9: Microscopic findings in 25 cases of non-neoplastic kidney lesions

Microscopic Findings:	No. of cases
Periglomerular fibrosis	13
Sclerosis of glomeruli	8
Atrophy of tubules	10
Interstitial inflammation:	
Chronic	15
Foamy macrophages	2
Interstitial fibrosis	14
Hyaline arteriosclerosis	4



Fig. 1: Cut section of CPN showing loss of corticomedullary junction with necrosis



Fig. 3: Cut section showing destruction of renal tissue with greywhite grey yellow areas

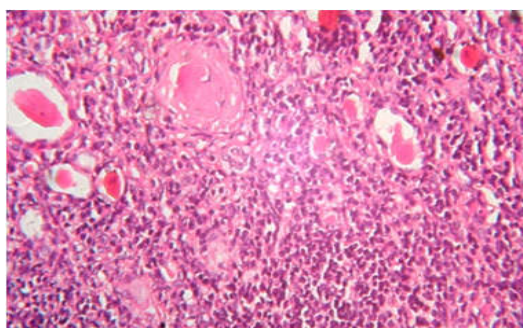


Fig. 2: Microphotograph of chronic pyelonephritis showing periglomerular fibrosis, thyroidization of tubules, interstitial lymphocytic infiltrates. H&E(10X)

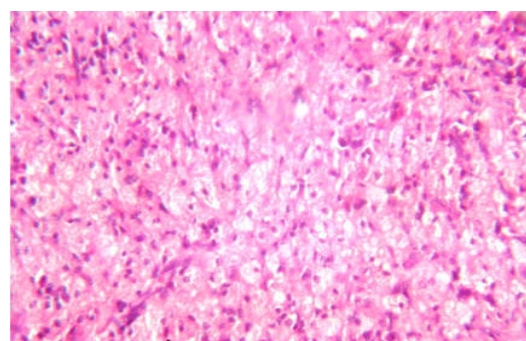


Fig. 4: Microphotograph of Xanthogranulomatous pyelonephritis showing foamy histiocytes and lymphocytes. H&E(10X)



Fig. 5: Cut section of hydronephrosis showing dilated pelvi-calyceal system with thinned out renal cortex

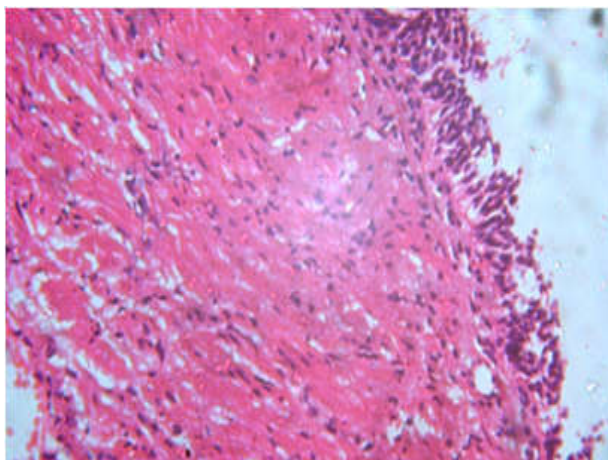


Fig. 6: Microphotograph of hydronephrosis showing thinned out transitional epithelium with underlying fibrosis and sparse inflammatory cells. H&E (5X)

Discussion

Nephrectomy is a standard treatment offered to patients who present with benign as well as malignant mass lesions in the kidney. In the present study, 40 nephrectomy cases were analyzed. There were 25 (62.5%) Non-neoplastic. In the present study, there were 23 females and 17 males, with a ratio of 46:34. Most of the cases were between 20-40 years, followed by 50-70 years.

Non-Neoplastic Lesions

In the present study, 25 non-neoplastic lesions were encountered, among them CPN consisting of 40%, hydronephrosis in 24%, Xanthogranulomatous pyelonephritis in 4%. Majority of the cases of CPN with or without hydronephrosis were observed between 2nd and 5th decades.

Chronic Pyelonephritis

In the present study, 14 cases of CPN were seen. In a study of 95 nephrectomy specimen obtained from transplant recipients by Schwartz and Cotran, 11 cases (11.5%) had CPN [4]. A study of autopsy specimens at Boston city hospital in 1965 and 1971 revealed the incidence of CPN in 1.85% [4].

In the present study, the majority of the patients had pain abdomen and burning micturation. Pyelonephritis is seen in all age group with peak incidence in infancy and childhood, women of child bearing age and both men and women older than 60 years. In the present study, majority of pyelonephritis were seen between 3rd to 6th decade.

All the CPN cases had coarse corticomedullary scars with underlying dilated/deformed calyces. Hudson noticed radiologically in CPN cases, coarse scars with underlying dilated/deformed calyces.

Xanthogranulomatous Pyelonephritis (XGP)-XGP is a rare and aggressive form of chronic bacterial infection of the renal parenchyma.

In the present study, one case of XGP was seen. Popat et al observed two cases (2.5%). El malik et al 6 cases (1.1%) and D Costa et al found 10% cases of XGP in 188 nephrectomy specimens [5,6,7].

In the present study, the patient presented with flank pain, followed by burning micturation and hypertension. Similar observations were made by Parson et al in a study of 8 cases, renal mass in (60%), renal pain in 80% and hypertension in 4%.

Hydronephrosis

In the present study, 6 cases of Hydronephrosis and 4 cases of Hydronephrosis with Chronic Pyelonephritis were seen. 5 cases were seen in females and 2 cases in males. The left side was more commonly involved in the present study 4/6 (66.6%). The peak incidence, 70% cases were seen in age group of 30-50 years in the present study.

In the present study, hydronephrotic changes was mainly due to calculi (7 cases) followed by pelvi ureteric junction obstruction. In a study by S.Sujatha et al, of the 192 nephrectomy cases, HN was seen in 77 cases and the commonest cause was pelvi ureteric junction obstruction which is in contrast to our study [8].

Conclusion

It is mandatory for every nephrectomy specimen to be subjected, to a detailed Histopathological examination, for a clinico-pathological correlation to ensure proper management. The clinical outcomes of various histologic subtypes are different, validating for accurate subtyping of renal lesions in clinical practice.

Chronic Pyelonephritis was the commonest non-neoplastic lesion in females, which is a consistent finding in the present study. No significant difference was noted in the frequency of males and females in case of other non-neoplastic lesions of kidney.

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