(International Print/Online Journal)

SJIF IMPACT FACTOR: 4.617
PUBMED-National Library of Medicine ID-101739732

ISSN (Print): 2209-2870
ISSN (Online): 2209-2862

International Journal of Medical Science and Current Research (IJMSCR)
Available online at: www.ijmscr.com
Volume2, Issue 6, Page No: 306-309
November-December 2019

Histopathological study of non neoplastic lesions of Nephrectomy Specimens

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Type of Publication: Original Research Paper
Conflicts of Interest: Nil

ABSTRACT

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Keywords: NIL

INTRODUCTION

Kidneys are a pair of vital organs of body with many functions and comprise of a diverse spectrum of benign and malignant lesions with patterns that are relatively distinct for children and adults, some of which require its surgical removal.

Nephrectomy is a common surgical procedure done for a variety of neoplastic and non neoplastic diseases. . It is useful in conditions like renovascular hypertension from non-correctable renal artery disease, or for severe unilateral parenchymal damage as a result of pyelonephritis, nephrosclerosis, vesicoureteric reflux, congenital dysplasia[1]. The non neoplastic diseases includes severe hydronephrosis, non functioning kidney due to chronic pyelonephritis, polycystic kidney, obstructive nephropathy etc.

Chronic pyelonephritis with hydronephrosis is the commonest indication for nephrectomy. Chronic pyelonephritis is a chronic tubulointerstitial renal disorder and an important cause of End Stage Kidney Disease. The appearance of proteinurea and focal segmental glomerulosclerosis are poor prognostic signs.

Susceptibility to infections and stone formation increases with urinary obstruction and if remain unrelieved it can lead to obstructive uropathy and permanent renal atrophy[2].

Cystic diseases of kidney can be hereditary and acquired. These disorders are common and often confused with malignant neoplasms and some forms like polycystic kidney are major causes of renal failure.

Xanthogranulomatous pyelonephritis usually presents in females in 5th to 7th decades. Urinary obstruction, fever, chills and flank pain are the commonly present. Grossly, lesion mimics Renal Cell Carcinoma. Histologically, there is diffuse granulomatous inflammation with many foamy histiocytes and multinucleated cells[3].

Cystic renal Dysplasia is a sporadic disorder due to abnormality in metanephric differentiation and can be unilateral or bilateral. Histologically, there is persistence of abnormal structures like cartilage, undifferentiated mesenchyme and immature collecting ductules and by abnormal lobar organisation[4].

A multilocular renal cyst mostly presents in 5th to 7th decade of life as an abdominal mass and are mostly unilateral. Literature mentions multilocular renal cysts as a potentially premalignant condition. Multilocular renal cysts should be treated surgically as tumorous and not as a cystic disease[5].

Non neoplastic kidney diseases are commonly encountered in the tumor nephrectomy specimens

and therefore it is important to correctly classify the underlying renal or urothelial neoplasm and the concomitant non neoplastic kidney disease that is likely to be present in the specimens [6].

AIM

To study the histopathological spectrum of non neoplastic lesions in nephrectomy specimen

MATERIAL AND METHODS

The study was conducted in the post graduate department of pathology in collaboration with the department of Surgery (Urology), Acharaya Chander College of Medical Sciences, Sidhra (ASCOMS). The study consisted of:-

Retrospective analysis of three years w.e.f 1st November 2014 – 31th october 2017. All the histopathological reports maintained in the histopathology section of department of pathology and H&E stained slides of each case were reviewed. All the clinical information provided in the requisition forms were taken into consideration and recorded in a prestructured proforma.

The prospective study conducted in the post graduate department of pathology, ASCOMS and Hospital, Sidhra, Jammu comprising of fresh cases presented in the course of one year w.e.f 1st November 2017 – 31st October 2018. The clinical information of patients was obtained from the requisition forms and any further relevant information were procured from the clinical case sheets.

After the gross examination of specimens, sections were taken for histology from the kidney, pelvis, ureter, tumor (if any), renal artery, vein and lymph nodes if present. After grossing, tissue processing was done in an automatic tissue processor.

The tissues fixed in 10% buffered formalin were then dehydrated with ascending grades of alcohol, cleared in Xylene and embedded in paraffin. Tissue blocks were prepared using leukhart's pieces. 5mm thick paraffin sections were cut on rotary microtome, dewaxed and stained with Haematoxylin and Eosin method; and then studied under light microscope.

RESULTS

A total of 100 nephrectomy cases, non-neoplastic lesions were studied. Following observations were made during the study period.

Out of 100 nephrectomy specimens studied, 20 were found to be neoplastic lesions and 80 non-neoplastic lesions.

Maximum number of nephrectomy specimens were of patients in the age group of 40-49 years (22%), followed by 30-39 years (20%), 60-69 years (19%), 50-59 years (18%) and 20-29 years (11%). Least number of specimens were from the age group of ≥70 years (5%), <10 years (4%) and 10-19 years (1%).

Mean age of the study group was 44.64 with a range of 1 to 80 years.

Out of 80 non-neoplastic lesions, chronic pyelonephritis was the most common lesion diagnosed in 74 (92.50%) specimens, followed by Xanthogranulomatous pyelonephritis in 5 (6.25%) and trauma kidney in 1 (1.25%) specimens.

Out of 74 cases of chronic pyelonephritis, 28 were associated with hydronephrosis and 1 with pyonephrosis.

Non-neoplastic lesions were also observed more in nephrectomy specimens of females 42 (52.50%) than in males 38 (47.50%). Chronic pyelonephritis was observed in 34 (42.50%) males and 40 (50%) females, while Xanthogranulomatous pyelonephritis was observed in 3 (3.75%) specimens of male and 2 (2.50%) specimens of female gender and trauma kidney was observed in 1 (1.25%) specimen of male gender.

Table 1: Age wise distribution of non-neoplastic lesions (n=80)

Non-neoplastic lesions	Age group (in years)			
	<20 No. (%)	20 – 39 No. (%)	40 – 59 No. (%)	≥60 No. (%)
Chronic pyelonephritis	0	27 (33.75)	26 (32.50)	21 (26.25)

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Xanthogranulomatous pyelonephritis	0	2 (2.50)	3 (3.75)	0
Trauma kidney	1 (1.25)	0	0	0
Total	1 (1.25)	29 (36.25)	29 (36.25)	21 (26.25)

Maximum non-neoplastic lesions were observed in the age groups of 20-39 and 40-59 years 29 (36.25%) each respectively, followed by ≥60 years age group 21 (26.25%). Chronic pyelonephritis was observed more in 20-39 years age group 27 (33.75%), followed by 40-59 26 (32.50%) and ≥60 years 21 (26.25%) age groups. Xanthogranulomatous pyelonephritis was observed in 40-59 years 3 (3.75%) and 20-39 years 2 (2.50%) age groups.

Comparison of the incidence of Benign and Malignant Lesions

In the present study, out of 100 nephrectomy specimens studied, benign lesions were seen in 80% cases and malignant lesions were seen in 20% cases, thus benign lesions comprised the vast majority of the cases in our study.

A similar predominance of benign lesions was observed in the following studies.

Study	Percentage (%) of benign lesions	Percentage (%) of malignant lesions
Aiman (2013)	77.2	22.8
Shaila (2015)	81.13	18.87
Chaitra (2018)	63.8	36.2
Present study	80	20

The study conducted by Shaila et al (2015) was the closest to the current study. From the review of literature it appears that there is geographical variation in indications for nephrectomy

Comparison of lesions observed in the Nephrectomy Specimens

Chronic Pylonephritis

Chronic pyelonephritis is a chronic tubulointerstitial renal disorder in which chronic tubulointerstitial inflammation and renal scarring are associated with pathological involvement of the calyces and pelvis. Alpers (2004). In this study

Chronic pyelonephritis was the most common lesion diagnosed in 74 (92.50%) specimens. Out of 74 cases of chronic pyelonephritis, 28 were associated with hydronephrosis and 1 with pyonephrosis.

Chronic Pylonephritis being the commonest lesion in nephrectomy specimens, this finding is also seen in Nggada et al (2006), Popat et al (2010), Aiman et al (2013), Shaila et al (2015), Narang et al (2016) and Chaitra et al (2018).

Pyonephritis

Pyonephritis is a complication of acute pyelonephritis. It occurs when there is total or almost complete obstruction to the flow of urine, particularly high in urinary tract. The suppurative exudate is unable to drain and thus fills the renal pelvis, calyces and ureter producing pyonephrosis. Alpers (2004).

In this study one case of pyonephritis was seen.

Xanthogranulomatous Pyelonephritis

Xanthogranulomatous pyelonephritis is an uncommon and distinct type of chronic infectious pyelonephritis in which yellow, lobulated masses diffusely replace the renal architecture. Grossly the mass occupying nature of this lesion greatly mimics renal cell carcinoma. Microscopically there is a diffuse granulomatous infiltrate comprising of foamy histocytes and some multinucleated giant cells, plasma cells and neutrophils. Ordonez et al (2004).

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In the present study five cases of Xanthogranulomatous pyelonephritis were seen. Three cases were those of males and two of females. Grossly, the kidneys in all the cases were enlarged. On cut-section, multiple small cystic areas filled with necrotic material were seen in two cases. All cases showed yellowish lobulated areas.

D'Costa et al (1990) found 10% cases of xanthogranulomatous pyelonephritis among 188 nephrectomy specimens and there was male predominance. However, there was male predominance seen in Ghalayini (2006) and Aiman et al (2013).

Trauma Kidney

One case of traumatic damage of kidney was seen in 13 year old male. Laceration was identified grossly on the outer surface extending into the cortex and the medulla.

CONCLUSION

Out of 80 non-neoplastic lesions, chronic pyelonephritis was the most common lesion diagnosed in 74 (92.50%) specimens, followed by Xanthogranulomatous pyelonephritis in 5 (6.25%) and trauma kidney in 1 (1.25%) specimens. Non-neoplastic lesions were also observed more in nephrectomy specimens of females 42 (52.50%) than in males 38 (47.50%).

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