A Histopathological Study of Non-Neoplastic and Neoplastic Lesions in Nephrectomy Specimens

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Abstract

Background: The kidneys are affected by various disease processes some resulting in permanent damage which may need surgical removal of the organ by partial or total nephrectomy1. Indications for nephrectomy are varied with common indication being obstructive nephropathy, hydronephrosis and chronic pyelonephritis according to studies1.

Aims and Objective: This study was conducted to evaluate the neoplastic and non neoplastic conditions encountered in nephrectomy specimens that were received in our department over a one and half year period. To analyze the frequency of non neoplastic and neoplastic renal lesions, assess age and sex wise distribution of various renal lesions and compare it with other studies.

Materials and Method: The present study was done for a period of 1.5 year from January 2018 to June 2019.A total of 55 nephrectomy specimens were received in the Department of Pathology, B.J.M.C Medical college & Civil Hospital, Ahmedabad India. The clinical details and gross morphology along with microscopic details were recorded. Immunohistochemistry was not done. The results were tabulated.

Findings : In our study, out of 55 nephrectomy specimens , 41 were non-neoplastic and 14 were neoplastic. Males constituted 20 cases(36.36%), females 35 cases(63.63%). The M:F ratio being 0.57 .The highest percentage of patients in both non-neoplastic and neoplastic categories belonged to 2th and 3th decade. A majority of cases were that of chronic pyelonephritis were seen maximum in the age group 21-30 years. Maximum number of Renal cell carcinoma fell into the age group of 51-60 years.

Conclusion: Most common affected age group was 2nd and 3rd decade. Non-neoplastic lesions were most common cause for nephrectomies. Chronic pyelonephritis with hydronephrotic changes being the most common cause. Clear cell renal cell carcinoma being the common among malignant tumors.

Keywords: *Nephrectomy ;Chronic Pyelonephritis; Hydronephrosis; Clear Cell Renal Cell Carcinoma.*

Introduction

The kidney is a very resilient organ[1]. The renal parenchyma though subjected to repeated trauma/insults of the noxious environment[1].

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Kidney can be involved in various pathological processes, both neoplastic and non neoplastic conditions, some of which may require its surgical removal, nephrectomy[1]. A wide variety of both benign and malignant tumors arise from different components of the renal parenchyma, notably tubular epithelium. Nonneoplastic changes are often identified in nephrectomy specimens removed for renal neoplasms. Although they may be of prognostic or therapeutic importance, they are often overlooked. Nephrectomy is also performed for nonneoplastic lesions [1].Chronic pyelonephritis with pyonephrosis and hydronephrosis

are the most common cause for nephrectomy specimen in non-neoplastic conditions[1]. In the neoplastic group, renal cell carcinoma is the most common in adults and Wilms tumor in childhood[1].

Aims and Objective of the Study

• This study was conducted to evaluate the neoplastic and non neoplastic conditions encountered in nephrectomy specimens that were received in our department over a one and half year period.

• To analyze the frequency of non neoplastic and neoplastic renal lesions, assess age and sex wise distribution of various renal lesions and compare it with other studies.

Materials and Method

• The present study was done for a period of 1.5 year from January 2018 to June 2019.A total of 55 nephrectomy specimens were received in the Department of Pathology, B.J.M.C Medical college & Civil Hospital, Ahmedabad India. The clinical details(including age, sex, clinical diagnosis along with radiological details) and gross morphology along with microscopic details were recorded. Sections were cut at 3-4 microns and processed according to standard operating protocols. The tissue was subjected to routine paraffin embedding tissue processing and stained with hematoxylin and eosin. PAS(Periodic acid Schiff) stain to look for fungal elements and ZN (Zeil Nielson) stain for acid fast bacilli was done wherever needed. Immunohistochemistry was not done. The results were tabulated.

Findings

• In our study, 55 nephrectomy specimens were analysed. Out of these 41 were non-neoplastic and 14 were neoplastic.(Table-1).

• Males constituted 20 cases(36.36%), females 35 cases(63.63%).

• The M:F ratio being 0.57 (Table-1).

• The highest percentage of patients in both non-neoplastic and neoplastic categories belonged to 2th and 3th decade. The youngest patient was 2 years old, the oldest patient was 78 years old.

• A majority of cases were that of chronic pyelonephritis which were seen maximum in the age group 21-30 years.

• Maximum number of Renal cell carcinoma fell into the age group of 51-60 years.

• In our study, out of 13 renal cell carcinomas, five were clear cell RCCs, two cases of clear cell carcinoma with sarcomatoid differentiation and one case with both sarcomatoid and rhabdoid differentiation, two cases were of papillary RCC, one case of clear cell papillary RCC, one case of chromophobe RCC and one case of RCC-NOS(Table 6).

• One case of Wilms tumor was reported.

• Four cases of Tuberculous pyelonephritis were encountered.

• Two Xanthogranulomatous pyelonephritis cases were seen one in 3 years male and other in a 19 year female.

Table-1 : Gender wise distribution of non-neoplastic and neoplastic lesions

Lesions	Males	Females
Non-neoplastic	14	28
Neoplastic	7	7
Total	20	35

Table-2 : Prevalence of various non-neoplastic and neoplastic lesions of kidney

Lesions	Number of cases	Percentage
Chronic pyelonephritis	32	78.04
Xanthogranulomatous pyelonephritis	2	4.87
Tuberculous pyelonephritis	4	9.75

Cont... **Table-2 : Prevalence of various non-neoplastic and neoplastic lesions of kidney**

Tubulo-interstitial nephritis	1	2.43
Chronic glomerulonephritis	2	4.87
Renal cell carcinoma -Clear cell type	5	38.46
Renal cell carcinoma -Papillary type	2	15.39
Renal cell carcinoma -Clear cell-papillary	1	7.69
Renal cell carcinoma -Chromophobe type	1	7.69
RCC-NOS	1	7.69
Renal cell carcinoma -Clear cell type with sarcomatoid differentiation	2	15.39
Clear cell type with sarcomatoid and rhabdoid differentiation	1	7.69
Wilm's Tumor	1	7.69

Table-3 : Age wise distribution of Non-neoplastic lesions

Lesions	**0-10**	**11-20**	**21-30**	**31-40**	**41-50**	**51-60**	61-70	71-80
Chronic pyelonephritis	1	0	8	6	7	4	4	3
Xanthogranulomatous pyelonephritis	1	1	0	0	0	0	0	0
Tuberculous pyelonephritis	1	0	1	0	1	1	0	0
Tubulo-interstitial nephritis	0	0	0	0	0	1	0	0
Chronic glomerulonephritis	0	1	1	0	0	0	0	0

Table- 4 : Age wise distribution of Neoplastic lesions

Lesions	**0-10**	**11-20**	**21-30**	**31-40**	**41-50**	**51-60**	**61-70**	**71-80**
Renal cell carcinoma	0	0	1	2	2	6	2	0
Wilms tumor	1	0	0	0	0	0	0	0

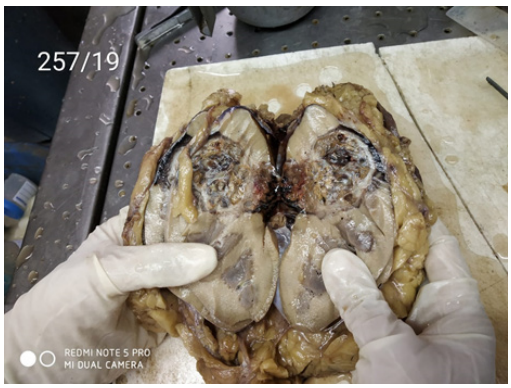

Figure 1 : Gross image of Renal cell carcinoma

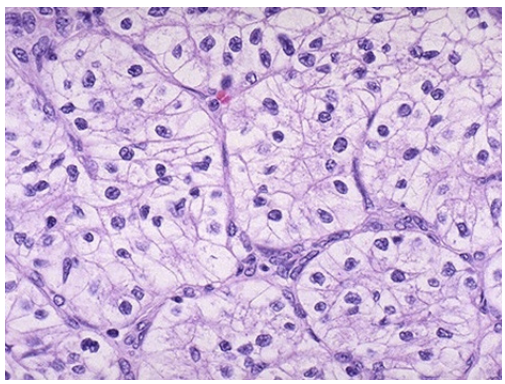

Figure 2 : Microscopic features of Renal cell carcinoma – Clear cell variant

Discussion

The present study consist of 55 nephrectomy cases were analysed. Majority of the patients belonged to 2th and 3th decade.This is in concordance with the study done by Aimen et al. [2] . This is variable with the study conducted by Dr.Swarnlatha Ajmera et al. and Dr. Shanmugasamy K et al. , in where the most common cases were in 4th and 5th decade [3 , 4] .Youngest patient in our study was a 2 year old and the oldest was 78 year old. In our study there was a female preponderance with M:F ratio of 0.57:1. this finding is in correlation with study conducted by Dr. Vinay KS and Dr. Sujatha [1]. Ashima N et al., Swarnlatha Ajmera et al., Dr Bharti et al., Which have showed male predilection [5,6,7,8]. In a study done by Shanmugaswamy K et al., There was equal male and female preponderance [4].

In our study, non-neoplastic lesions were most common with 41 cases (74.54%) than neoplastic lesions which were 14 cases (24.45 %). Similar findings was seen with studies of Dr. Vinay KS and Dr. Sujatha, Kotta Devender Reddy et al. and Dr. Ajay Kumar , where non-neoplastic lesions were most common indications for nephrectomy [1, 5 , 8]. In our study, chronic pyelonephritis with pyonephrosis was the most common lesion followed by chronic pyelonephritis with hydronephrosis. In our study renal cell carcinoma was common in neoplastic lesion , which was seen in age group 51 to 60 years age [9]. General Features RCC is generally a tumor of adults (average age at diagnosis: 55–60 Years) [9].The male to female ratio of adult RCC is about 2 : 1%. Cigarette smoking and high blood pressure are said to increase the risk for development of the disease [9].

Conclusion

Nephrectomy is an accepted surgical procedure for non functioning kidneys due to various pathological disease processes. Most common affected age group was 2nd and 3rd decade.Non-neoplastic lesions were most common cause for nephrectomies. Chronic pyelonephritis with hydronephrotic changes being the most common cause. Clear cell renal cell carcinoma being the common among malignant tumors. Other benign and malignant lesions being rare. A greater number of non-neoplastic lesions were observed in females. Malignant lesions were observed in males and females equally.

Ethical Consideration : All procedures performed were in accordance with the ethical standards of institution.

Source of Funding : Self

Conflicts of Interest : Nil

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