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HISTOPATHOLOGICAL SPECTRUM OF NEPHRECTOMY SPECIMENS: A TERTIARY HEALTH CENTER BASED STUDY

Pathology

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ABSTRACT

Aims and Objectives: The kidneys are affected by various disease processes some resulting in permanent damage leading to surgical removal of the organ i.e. nephrectomy. Indications for nephrectomy are varied including irreversible damage by chronic infections, obstructive causes including strictures & calculus disease, vesicouretric reflex, congenital dysplasia, nephrosclerosis, cystic diseases, traumatic injury and various renal tumors; malignant or benign.

Material and methods: The retrospective study was done in the Department of Pathology, Geetanjali Medical College & Hospital, Udaipur, Rajasthan for the period of 2 years from April 2016 to April 2018. A total of 42 nephrectomy specimens were included in the study and were analyzed with regard to age, sex and histopathological variety.

Results: A total of 42 specimens of nephrectomy were included in the study. There were 22 (52.38%) male patients and 20 (47.62%) female patients. Most commonly affected age group was 41-50 years with 13 patients (30.95%) followed by 31-40 years of age group with 9 patients (21.42%). Out of 42 cases, 35 (83.33%) were non-neoplastic and 7 (16.66%) were neoplastic. Neoplastic cases further included 6 malignant cases and only one benign case.

Conclusion: In this single center based study, we have come across many of the common renal tumors described in adults and children and obtained results were almost comparable with worldwide data. Nephrectomy is an accepted surgical procedure for non-functioning kidneys due to various pathological disease processes.

KEYWORDS

Nephrectomy, RCC (Renal cell carcinoma), Pyelonephritis

INTRODUCTION

The kidneys are affected by various disease processes some resulting in permanent damage leading to surgical removal of the organ i.e. nephrectomy. Indications for nephrectomy are varied including irreversible damage by chronic infections, obstructive causes including strictures & calculus disease, vesicouretric reflex, congenital dysplasia, nephrosclerosis, cystic diseases, traumatic injury and various renal tumors; malignant or benign.

There is a wide spectrum of benign and malignant renal tumors based on their origin from different components of renal tissue with different patterns in adults and children.

RCC is the seventh most common malignant disease in men, and the ninth in women (1). Renal cancer is the 16th most common cause of death from cancer worldwide (2).

The incidence of renal cell carcinoma is high in developed countries and low in Africa and Asia. Major etiological factors include cigarette smoking, obesity and hypertension. Considering that a marked difference exists in prognosis and biological behavior associated to the different RCC histologic subtypes, an accurate diagnosis is essential (3). The most common histologic types are the clear cell and the papillary RCC, accounting for 70%-75% and 15%-20% of the cases, respectively. The former presents a more aggressive behavior and is the responsible for the largest number of deaths (4). Benign tumors like oncocytoma, papillary adenoma, mixed epithelial and stromal tumor and angiomyolipoma are also encountered in the kidney.

Accurate diagnosis is not possible before surgery and detailed histopathological examination. Nowadays, due to advances in image diagnosis, 50% of the diagnosed RCC are detected accidentally (5). Even so, RCC incidence and mortality have been increasing in recent times. This is probably explained by the fact that almost 30% of RCC present disseminated disease at diagnosis, and around 50% of them will result in death by metastasis within five years after diagnosis.

Pediatric renal tumors are uncommon and include both benign and malignant tumors, the diagnosis and treatment of which also depend upon histopathology. Wilms tumor (nephroblastoma) is the most common renal malignancy in children and the fourth most common childhood cancer. Other renal tumors in children are clear cell sarcoma, rhabdoid tumor, renal cell carcinoma, ossifying renal tumor, mesoblastic nephroma, angiomyolipoma, multilocular cystic renal tumor, metanephric adenoma, lymphoma etc. (6)

MATERIAL AND METHODS:

The retrospective study was done in the Department of Pathology, Geetanjali Medical College & Hospital, Udaipur, Rajasthan for the period of 2 years from April 2016 to April 2018. A total of 42 nephrectomy cases were included in the study period. Patient particulars including age, sex, clinical diagnosis along with radiological details like USG and CT findings along with gross morphology and microscopic details were noted form the data available with our department. Representative bits taken were processed according to standard operating protocols. Sections were cut at 3-4 microns and stained with Hematoxylin and Eosin.

RESULTS:

A total of 42 specimens of nephrectomy were received in the histopathology department in 2 years duration. There were 22 (52.38%) male patients and 20 (47.62%) female patients. Most commonly affected age group was 41-50 years with 13 patients (30.95%) followed by 31-40 years of age group with 9 patients (21.42%) Table no (1). Out of 42 cases, 35 (83.33%) were non-neoplastic and 7 (16.66%) were neoplastic. Neoplastic cases further included 6 malignant cases and only one benign case. Histopathological spectrum of lesions is shown in table no. 2.

TABLE NO. 1 Age Wise Distribution Of Nephrectomy Cases

S.No.	Age Group	Number	Percentage
1	11-20	2	04.76
2	21-30	5	11.90
3	31-40	9	21.42
4	41-50	13	30.95
5	51-60	8	19.04
6	61-70	3	07.14
7	71-80	2	04.76

TABLE NO. 2 Histopathological Spectrum Of Nephrectomy Cases

S. No.	Histopathological finding	Number	Percentage
	Non- Neoplastic	35	83.33
1	CPN with hydronephrosis	12	28.57
2	CPN	8	19.04
3	Xanthogranulomatous Pyelonephritis	7	16.66

4	Granulomatuos pyelonephritis- TB	3	07.14
5	Interstitial nephritis with Pyelolithiasis	2	04.76
6	End stage renal disease	2	04.76
7	Pyonephrosis	1	02.38
	Neoplastic	7	16.66
	I. Malignant	6	14.28
1	Clear cell RCC	2	04.76
2	Papillary RCC	1	02.38
3	Chromophobe RCC	1	02.38
4	Wilms Tumour	2	04.76
	II. Benign		
1	Oncocytoma	1	02.38

CPN: chronic pyelonephritis, TB: tuberculosis, RCC: Renal cell carcinoma

DISCUSSION:

The present study consists of 42 nephrectomy cases. Majority of patients belonged to the age group of 4th to 5th decade. Youngest patient in our study was 12 years old and the oldest patient was 77 years old. This is in concordance with the study done by Kotta Devender Reddy et al. and Dr Ajay Kumar where the maximum number of patients was in 4th decade (7, 8).

In our study there was male preponderance with M:F ratio of 1.1:1. This finding was in correlation with studies done by Kotta Devender Reddy etal., Ashima N et al., Swarnlatha Ajmera et al., Dr Bharti et al., Which have showed male predilection(7,9-11).

In our study, non-neoplastic lesions were most common with 35 cases (83.33%) than neoplastic lesions 7 cases(16.66%).Similar findings was seen with studies of Kotta Devender Reddy et al., Ashima N Amin et al.,Shanmugaswamy K et al., Dr Ajay Kumar where non-neoplastic lesions were most common indications for nephrectomy (7,8,12,13).In present study, chronic pyelonephritis with hydronephrosis was the most common lesion followed by chronic pyelonehritis only and then Xanthogranulomatous pyelonephritis.

This was in concordance with study by Ashima N Amin where chronic pyelonephritis with hydronephrosis was the most common lesion followed by multicystic renal dysplasia (13). Chronic pyelonephritis was also the most common lesion in other studies like Kotta Devender Reddy et al.Aiman et al., Dr Bharti Devi et al., Shanmugaswamy et al.& Dr Ajay Kumar (7-13).

In our series, among neoplastic cases, malignant renal tumors were more common (14.28%) than the benign tumor (2.38%). This is again supporting the different study reports from the developed countries (14-18).

Among the cases of malignant renal tumors, RCC was the commonest type in our series (4 cases) followed by Wilms tumor (2 cases). RCC is obviously the most common malignant renal tumor diagnosed throughout the world. RCC is a heterogeneous group of tumors with different histopathological and genetic features. Prognosis of the disease also depends upon the different subtypes of the RCC. In our series, conventional clear cell RCC was the most common histopathological variant (2 cases) followed by papillary RCC and chromophobe RCC (1 case of each). The result of our series in this regard is generally comparable with the previous reports by different authors (14, 19-20). No genetic study was done in any case of RCC in our patients.

Among the benign renal tumor, only one case of oncocytoma was found in present study.

CONCLUSION:

In this single center based study, we have come across many of the common renal tumors described in adults and children and obtained results were almost comparable with worldwide data. Nephrectomy is an accepted surgical procedure for non-functioning kidneys due to various pathological disease processes. Most common affected age group was 4th to 5th decade.Non-neoplastic lesions were most common cause for nephrectomies. Chronic pyelonephritis with hydronephrosis was the most common cause. Clear cell renal cell carcinoma was the most common malignant renal tumor. Other benign and malignant lesions were rare.

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