

# Spectrum of Histopathological lesions in Nephrectomy specimens – A two year study in a tertiary care hospital

Mahesh Kumar U., Yelikar BR\*, Girija Patil, Mahesh H Karigoudar, Pankaj Pande and Patil SB.

Shri B.M.Patil Medical College Hospital & Research Centre, Bijapur, Karnataka, India.

## ABSTRACT

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. Objective is to study the histopathological features of various lesions in nephrectomy specimens, to study the frequency of different pathological lesions, particularly Renal Cell Carcinoma (RCC) in nephrectomy specimens. Twenty two cases of nephrectomies were received in the department of histopathology. Out of 22 patients, 14 were males and 8 were females. The spectrum of pathological lesions included inflammatory lesions, benign and malignant tumours. Renal cell carcinoma (RCC) was the most common malignant tumour seen in this study. A case of oncocytoma and epithelioid angiomyolipoma were also diagnosed. Our study has revealed that the renal tumours are the commonest lesions in nephrectomy specimens and RCC was the predominant malignant tumour.

**Keywords:** Nephrectomy, Renal cell carcinoma, Oncocytoma.

## 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.<sup>1</sup>

Renal diseases are responsible for a great deal of morbidity but, fortunately, are not equally major causes of mortality. Twenty percent of all women suffer from infections of the urinary tract or kidney at sometime in their lives.<sup>2</sup>

## OBJECTIVES

1. To study the histopathological features of various lesions in nephrectomy specimens.
2. To study the frequency of different pathological lesions, particularly Renal Cell Carcinoma (RCC) in nephrectomy specimens.

## METHODOLOGY

### Source & Method of collection of data

This was a two year study conducted in histopathology section of Department of Pathology, from January 2010 to Dec 2011.

All patients who visited the Surgery/Urology outpatient department and presenting with haematuria, dysuria etc., were included in the study. Nephrectomies were performed as and when indicated. The specimens were sent to

histopathology section in 10% formalin. Gross examination was done and representative sections were taken and later were embedded in paraffin. Light microscopy technique was used for diagnosis. Special stains and immunohistochemistry were applied, where ever required.

### Sample size

All the nephrectomies which were done in our hospital from Jan 2010 to December 2011 were included in the study.

## RESULTS

Out of 22 patients, 14 (63.6%) were males and 08 (36.4 %) were females. The peak age of incidence was between 61-70 years (Table -1). The spectrum of pathological lesions included inflammatory lesions, benign and malignant tumours (Table -2). Benign tumours accounted for 2 cases (9%) and malignant tumours accounted for 10 cases (45.4%) (Table -3) and Renal cell carcinoma (RCC) was the most common malignant tumour seen in this study accounting for 7 cases. In this study, one case of primary squamous cell carcinoma, primary transitional cell carcinoma and Wilm's tumour were diagnosed. A case of oncocytoma and epithelioid angiomyolipoma (positive for HMB 45) were also diagnosed (Fig- 3 to 7).

**Table 1: Age and Sex distribution**

Age (Yrs)	Male	Female	Total	Percentage (%)
01-10	01	00	01	4.5%
11-20	01	00	01	4.5%
21-30	00	02	02	9.0%
31-40	03	01	04	18.1%
41-50	02	02	04	18.1%
51-60	02	02	04	18.1%
61-70	05	01	06	27.2%
Total	14	08	22	100%

**Table 2: Histopathological diagnosis**

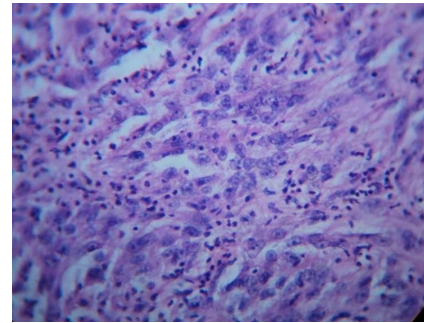
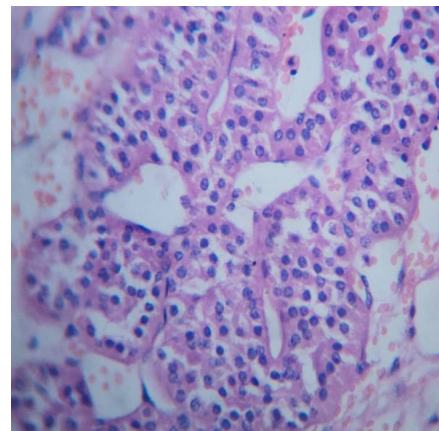
Diagnosis	No. of patients	Percentage (%)
<b>a) Inflammatory</b>	10	45.4%
<b>b) Benign Tumours</b>	02	9.0%
Angiomyolipoma	01	
Oncocytoma	01	
<b>c) Malignant tumours</b>	10	45.4%
Renal cell carcinoma	07	
Nephroblastoma	01	
Squamous cell carcinoma	01	
Transitional cell carcinoma	01	
Total	22	100%

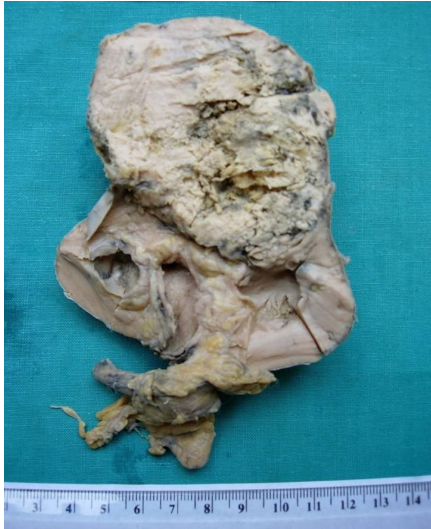
**Table 3: Histological Types of Renal Cell Carcinoma (RCC)**

RCC Types	Observations	Percentage (%)
Clear cell RCC	04	57.1%
Papillary RCC	01	14.2%
Chromophobe RCC	01	14.2%
Sarcomatoid RCC	01	14.2%
Total	07	100%

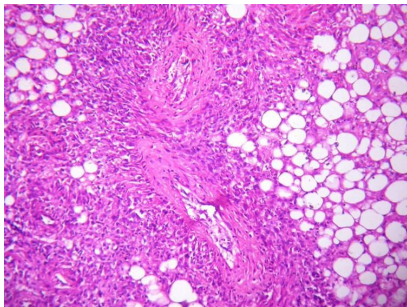
**Table 4: Incidence of Renal cell carcinoma (RCC)**

Various Studies	Incidence of RCC (%)
Elbe et al <sup>3</sup>	90%
McLaughlin JK et al <sup>4</sup>	85%
Fletcher et al <sup>5</sup>	88%
Present Study	70%

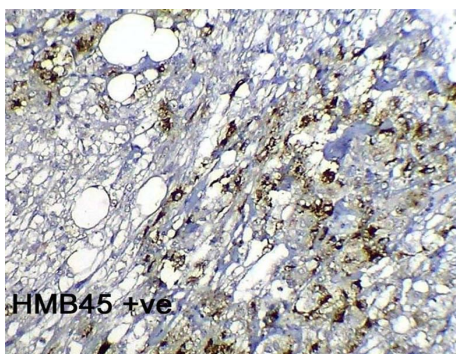
**Fig. 2: Photomicrograph showing malignant spindle cells (400X) (RCC- Sarcomatoid variant)****Fig. 3: Cut surface- Tumour tissue is tan to mahogany brown, homogenous & central scar. (Renal Oncocytoma)****Fig. 4: Photomicrograph showing oncocytes (400X) (Renal Oncocytoma)****Fig. 1: Cut surface – Dark brown tumour tissue with large areas of necrosis and hemorrhage. Invasion in to the renal vein is noted. (RCC- Sarcomatoid variant)**



**Fig. 5: Cut surface- Tumour tissue is at one pole which is grey white, friable. (Angiomyolipoma) {Courtesy Dr.Mahesh H Karigoudar}**



**Fig. 6: Photomicrograph showing features of epithelioid angiomyolipoma (200X). {Courtesy Dr.Mahesh H Karigoudar}**



**Fig. 7: IHC – Positive for HMB 45 (Epithelioid angiomyolipoma) {Courtesy Dr.Mahesh H Karigoudar}**

## DISCUSSION

Both benign and malignant tumours occur in the kidney. Most common malignant tumour in adults is renal cell carcinoma (RCC) and Wilms tumour in childhood. Rare are urothelial tumours of calyces and pelves.<sup>2</sup>

Renal cell carcinoma (RCC) accounts for 1 to 3% of all visceral cancers and 85% of renal cancers. Affect older individuals usually in the 6<sup>th</sup> and 7<sup>th</sup> decades and show male preponderance (2 to 3:1). Risk factors include tobacco intake, obesity, hypertension, unopposed estrogen therapy, exposure to asbestos, chronic renal failure, acquired cystic disease and tuberous sclerosis complex patients.<sup>2</sup>

Most renal carcinomas are sporadic. Familial variants (4%) consisting of Von Hippel-Lindau (VHL) Syndrome, Hereditary (familial) clear cell carcinoma and Hereditary papillary carcinoma.<sup>2</sup>

RCC is a great mimicker and has features of Paraneoplastic syndrome. Has a tendency to metastasize widely before giving rise to any local signs and symptoms.<sup>2</sup>

Patients included in this study were mostly representing population of Bijapur district of Karnataka state of India. In our study, tumours make up highest percentage (54.5%) among these lesions, followed by non-specific inflammations (45.4%). The Renal cell carcinoma (RCC) accounted for 70% of all tumours while the primary squamous cell carcinoma, primary transitional cell carcinoma and Wilm's tumour accounted for 10% respectively.

The incidence of renal cell carcinoma according to Elbe et al<sup>3</sup> is at about 90%, McLaughlin JK et al<sup>4</sup> about 85% and in our study it was 70%.

Prognosis depends upon extent of tumour involvement at the time of diagnosis. Presence of metastasis, renal vein invasion and high nuclear grade are predictors of poor prognosis. In our study left sided kidney was more commonly involved, upper pole being the commonest area involved. Three cases showing high nuclear grade showed metastasis (one was sarcomatoid variant of RCC and the other two were clear cell type of RCC). These patients are under follow up and bed ridden. Chromophobe RCC had an excellent prognosis compared to clear cell type and papillary type of RCC.

Limitations of the study was that this was a hospital based study not community based and the follow up of the cases was challenging in our setup due to this we missed few cases for follow up.

## CONCLUSION

Our study has revealed that the renal tumours are the commonest lesions in nephrectomy specimens and renal cell carcinoma was the predominant malignant tumour of kidney.

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