

Study of Pattern of Histopathological Lesions in Nephrectomy Specimens in a Tertiary Care Hospital

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Abstract: Introduction: Nephrectomy, either partial, complete or radical, is a surgical procedure where kidney is removed in patients with an advanced kidney damage due to different renal diseases, injuries or congenital conditions. These diseases include serious kidney infections and inflammations like chronic pyelonephritis and glomerulonephritis, benign and malignant kidney tumours and above all from a donor for renal transplantation where even a healthy kidney is removed. Though with the advanced imaging technologies like CT, MRI and ultrasound near accurate preoperative diagnosis can be made but histopathological study remains the gold standard. This study has been taken up to analyse the nephrectomy specimens received in the last two years and find out the various histology types, their relative frequency, this being a tertiary care hospital. Results: A total of 24 nephrectomy specimens were studied, received over a period of 2 years at this laboratory. Clear cell Renal cell carcinoma (RCC) was the most frequent constituting 6 cases, whereas 2 cases were Papillary RCC, 1 case was chromophobe variant, and 1 case was sarcomatoid variant, 8 cases were Chronic pyelonephritis, followed by 6 cases of hydronephrosis. Conclusion: It is concluded that both non - neoplastic pathologies and malignant renal tumours were the indication for nephrectomies at this tertiary care centre and incidence of malignant renal tumours has been found to be relatively more common in comparison to non - neoplastic pathologies ostensibly due to the fact that this centre being a cancer referral centre

Keywords: Renal cell carcinoma (RCC), Nephrectomy, neoplastic, non - neoplastic

1. Introduction

Kidney can be involved in various pathological processes, some of which may require its surgical removal [1] The most common lesions encountered in kidney today are certain inflammatory and neoplastic lesions. Renal diseases are responsible for a great deal of morbidity, rather than mortality. Nephrectomy brings in relief to patients from various chronic and life - threatening diseases. Renal cell carcinoma accounts for approximately 2 percent of adult malignancies and 80 - 85 percent of malignant kidney tumours. [1] The pathologic evaluation of tumour nephrectomy specimens focuses on the diagnosis, grading and staging of the neoplasm. The presence of non - neoplastic diseases in these specimens may have significant implications for patient outcomes [2] The present study was undertaken to become familiar with the morphological features and to explore, elucidate and document the kidney lesions at nephrectomy. Grossly mass occupying nature of the lesion in xanthogranulomatous pyelonephritis often mimics renal cell carcinoma [4]

Objective

To study the clinicopathological spectrum of lesions in nephrectomy specimens in a tertiary care hospital.

2. Materials and Methods

The present study was done on 24 nephrectomy specimens received at the Department of Pathology, in a tertiary care hospital during a period of 2 years (January 2020 - August 2022) Patient particulars were recorded in detail on proformas, which included age, sex, and clinical findings; investigations such as CT scan, USG, and other relevant investigations were also noted. Nephrectomy specimens were examined in detail grossly and a minimum of 3

sections were taken from the tumours including adjacent kidney each of 3 – 5 mm thickness, pelvis, uninvolved kidney, renal artery, renal vein, ureter (cut end) and lymph nodes. After routine paraffin processing, serial sections of 4 - micron thickness were cut and routinely stained with haematoxylin and eosin stain. Special stains were used as and when required. Immunohistochemistry was used only

3. Results

A total of 24 cases over a period of 2 years were studied out of which 10 (67.3%) were neoplastic and remaining 14 (32.7%) cases were non - neoplastic. In the present study Renal cell carcinoma was the commonest imaging diagnosis examined in 09 (37.5%) patients followed by 8 (33.33%) chronic pyelonephritis. Of the total 24 cases, all are radical nephrectomies accounted for 100%.

Neoplastic lesions: Out of 10 cases of neoplastic lesions, Clear cell RCC were predominantly seen in 6/24 cases (25%), 2 (8.3%) cases of Papillary RCC and 1 case of chromophobe and sarcomatoid variant each. The highest percentage of patients belonged to the age group of 40 - 50 years for neoplastic lesions with a male: female ratio of 1.2: 1 and the most common clinical presentation was lump abdomen. 2 cases were of Papillary RCC were found in the 3rd decade and 6th decade. There was male predominance in the study 16 (66.66%) cases. Papillary RCC was seen in both genders equally. All the cases were concordant with the radiological diagnosis. Grossly, the size of the tumours ranged from 0 - 4 cm with a predilection towards the left seen in 16/24 cases and to the middle zone in 8/24 cases. Both cases of papillary RCC was found in the mid cortex. 6/24 cases of clear cell carcinoma showed well circumscribed borders with variegated appearance and both cases of Papillary carcinoma had variegated appearance and

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capsular breach. While Chromophobe RCC was tan brown in colour with solid areas. Most of the cases demonstrated a predominant compact alveolar architecture (44.11%). The majority (55.2%) of renal cell carcinomas were of Fuhrman nuclear grade II nuclear features.

Non - neoplastic lesions: Out of 14 non - neoplastic lesions, 8 (33.33%) cases were chronic pyelonephritis. 6 (25%) cases

each of hydronephrosis. The peak age incidence ranged between 31 - 40 years (35.3%) cases with male preponderance (66.7%) cases.

Lump abdomen was the leading presenting feature observed in 16/24 cases (66.66%) followed by haematuria in 8/24 cases (33.33%)

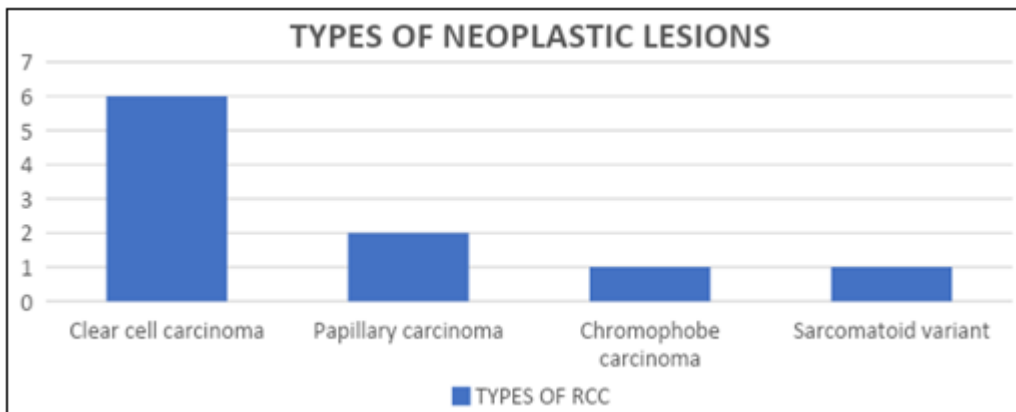


Figure 1: Frequency of neoplastic lesions of the kidney

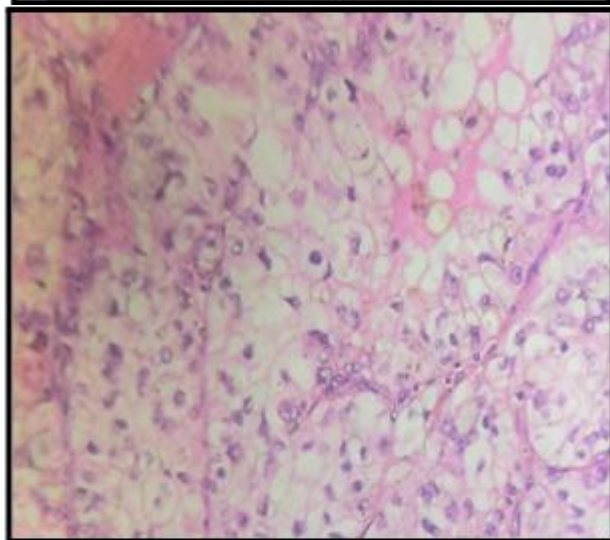


Figure 2: Gross picture of RCC showing tumour in lower pole. Microscopy showing Clear cell type of RCC

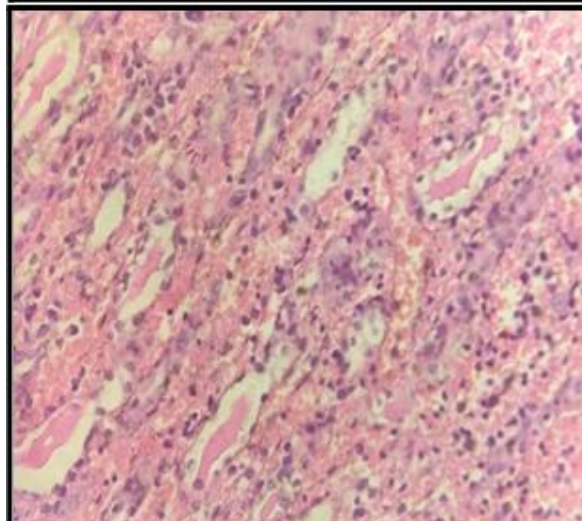


Figure 3: Gross picture of Chronic Pyelonephritis showing multiple cysts with necrosis. Microscopy showing thyroidization of tubules

4. Discussion

Indications for nephrectomy:

The socioeconomic condition and availability of health care facility is the main factor behind the geographic variation regarding the indications for nephrectomy. In our institution, neoplastic lesions of the kidney is the more frequent cause for nephrectomy with a similar predominance observed in other studies. Philips et al in a series of 121 cases has reported, 52 (75.3%) cases of laparoscopic nephrectomy done for malignant and 69 (24.7%) cases for benign causes which was invariance with our study [3]

In present study, among non - neoplastic causes chronic pyelonephritis was commonest cause seen in 8/24 cases (33.33%) similar to El Malik et al [9], Popat et al [5] and Adamson et al studies Among neoplastic lesions of the kidney, Clear cell renal cell carcinoma were 6 cases, Papillary renal cell carcinoma were 2 cases and Chromophobe variant and sarcomatoid variant was one each. This was also similar to the observation made by Patard et al [7], Rafique et al [6] and Popat et al [5].

The incidence of renal cell carcinoma increases with advancing age [8] and thus majority of the patients in the present study were between 51 - 60 years of age. However studies from WHO reveals that the incidence is two or three times more common in men than in women, in both high risk and low and high risk countries [8] which was similar to the our study. Among 24 cases, 10 were malignant and 14 were benign. In the present study most common clinical presentation was lump abdomen observed in 16/24 cases (66.6%) followed by burning micturition seen in 8/24 cases (16%). The present study was discordant with the studies conducted by El Malik et al [9] and Popat et al [5] Bashir et al [10] in which flank pain was recorded as main presentation.

Table 1: Comparative analysis of neoplastic lesions with other studies

S. No	Studies	Neoplastic Lesions
1	Rafique et al [6] (2007)	23%
2	Malik et al [9] (1997)	23.5%
3	Datta et al (2012)	40.9%
4	Amin et al (2015)	45.7%
5	Present study	41.66%

Table 2: Comparative analysis of prevalence of chronic pyelonephritis with other studies

S. No	Studies	Chronic Pyelonephritis
1	Malik et al [9] (1997)	55.3%
2	Rafique et al [6] (2007)	20%
3	Amin et al (2015)	44.3%
4	Present study	33.33%

5. Conclusion

The spectrum of adult renal tumours in the present study were consistent with that of previously reported literature. Average age of clinical presentation of patient underwent nephrectomy was 40 years, youngest case was recorded at 32 yrs. The present study of the nephrectomy specimens showed male predilection with 66.6%, M: F ratio 2: 1.

Grossly most cases are involving left kidney (66.6%), lower pole of the kidney (66.6%). Average size of the tumour was 10cm grossly. Most common histopathological finding among nephrectomy specimens was Renal cell carcinoma followed by chronic pyelonephritis in present study. Adequate examination of non - neoplastic renal parenchyma in kidneys removed for tumours is an important tool in recognising patients at risk for possible progressive renal disease in the contralateral kidney and helps in taking remedial measures to save the kidney.

A detailed histological study of benign nephrectomies could be clinical predictor for further clinical course, and management of slowing down progression or decline of renal function.

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