

Histopathological Spectrum of Nephrectomy Specimens in a Tertiary Care Centre: Observations in Seventy Cases

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Abstract

Original Research Article

Background: Kidneys are one of the major organs of the human body that serve several essential functions. Nephrectomy is a common surgical procedure and is performed in patients with a wide range of clinical conditions ranging from symptomatic chronic infections, obstruction, calculi disease, severe traumatic injury and malignant pathologies like renal cell carcinomas and transitional cell carcinoma. Kidneys with end stage renal disease may give rise to major complications such as massive bleeding for which nephrectomy may be indicated. Radical or partial nephrectomy is the treatment of choice for a significant proportion of patients with renal tumours. **Aim/Objectives:** To assess the patterns and morphology of lesions in nephrectomy specimens in the hospital. **Material and Methods:** This retrospective study carried out in the Department of Pathology in Government Medical College, Jammu. A total of seventy nephrectomy specimens received during the period were included in the study. Paraffin blocks and slides along with case records were retrieved and studied. **Results:** Majority of cases were seen in 5th decade of life with a male predominance (M:F 1.7:1). Out of 70 cases, 14 were neoplastic and 56 were non-neoplastic. Out of the 14 neoplastic cases, Renal cell carcinoma was commonest (7 cases) followed by wilms tumour (4 cases) and angiomyolipoma (2 cases). Of the non-neoplastic cases, chronic pyelonephritis with hydronephrosis was seen in 42 cases, chronic pyelonephritis in 7 cases, xanthogranulomatous pyelonephritis in 5 cases and tuberculosis and traumatic kidney (1 case each). **Conclusions:** The study provides a fair insight into the histological patterns of lesions in nephrectomy specimens at our institution. A wide range of lesions are encountered on histopathology of nephrectomy specimens, many of which may be misdiagnosed clinically and radiologically. Detailed histopathological examination is necessary for diagnosis and the prognostication of the lesions to ensure proper management.

Keywords: Histopathology; Nephrectomy; Renal Cell Carcinoma; Chronic Pyelonephritis.

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INTRODUCTION

Kidneys are one of the major organs of the human body and perform essential functions. The main function of kidney is to regulate the balance of electrolytes in the blood, along with maintaining pH homeostasis [1]. Kidneys are affected by various non-neoplastic and neoplastic pathological processes [1]. Widespread use of imaging has led to increased number of renal lesions to be detected which may be managed medically or surgically.

Nephrectomy is a common surgical procedure and is performed in a variety of neoplastic and non-neoplastic conditions [2]. Nephrectomy is of various types; partial, simple and radical nephrectomy. Partial nephrectomy involves removing a small portion of the kidney. A simple nephrectomy requires removal of the

kidney and a section of the attached ureter while Radical nephrectomy involves removing the entire kidney and ureter including adrenal gland and the fatty tissue surrounding the kidney [3]. The common non-neoplastic diseases, for which nephrectomy is usually performed are non-functioning kidney due to severe hydronephrosis, pyonephrosis, polycystic kidneys etc [2]. Nephrectomy remains the standard of care for patients with a suspected renal mass and accurate pathological evaluation of renal neoplasms is essential for subtyping and proper staging and thus, assisting in establishing further treatment protocols. Indications for nephrectomy may show geographic variations with different urologic causes. The major objective of our study is to observe the spectrum of histopathological lesions in nephrectomy cases received in our department and then to know the indications for the same in our community practice.

MATERIAL AND METHODS

This retrospective study was conducted for a period of 3 years in histopathology section of Post Graduate Department of Pathology, GMC Jammu. 70 nephrectomy specimens received in the department were included in the study. All the data, pertaining to nephrectomy specimen maintained in the department were retrieved. Histopathological examination of all the slides was done and the specimens were categorized into benign and malignant. Staining was done by Haematoxylin and Eosin and each case was analysed with respect to age, clinical presentation and microscopic diagnosis. Histological typing of renal neoplasms was done according to WHO classification and their histological prognostic factors i.e. nuclear grade, capsular invasion, infiltration into the peri-renal fat and vascular invasion were evaluated.

RESULTS

70 nephrectomy specimens were included in our study. Of these males constituted 44 cases and females 26 cases with Male to female ratio of 1.7:1 and

age range of 3-72 years. Non-neoplastic Pathologies were seen in 56 cases (80%). Chronic Pyelonephritis (CPN) with hydronephrosis was the commonest non-neoplastic pathology observed in our study, accounting for approximately 60.0% cases. It was followed by CPN (10.0% cases) and Xanthogranulomatous pyelonephritis (7.1% cases). Solitary case each of tubercular pyelonephritis, and traumatic kidney were also seen.

Neoplastic Lesions were seen in 14 cases (20%). Of these malignant lesions were seen in 12 cases while two cases were benign. Malignant lesions included renal cell carcinoma (RCC) (7 cases; 10.0%), wilms tumour (4 cases; 5.7%) and Transitional cell carcinoma (TCC) of pelvis (1 case; 1.4%). Of 7 cases of RCC, five were of clear cell type while two were of papillary type. The clear cell RCC was graded from 1 to 4 according to Fuhrman’s nuclear grade. Nuclear Grade 2 was the commonest pattern (3 cases) followed by Nuclear Grade 3 (2 cases). TCC of pelvis was observed in one case. The tumour was located in renal pelvis and was high grade neoplasm. Both the benign lesions were angiomyolipoma.

Table-1: Histopathological Spectrum of Nephrectomy Specimens

Histopathology		Number	Percentage
Non-Neoplastic (56)	1. CPN with hydronephrosis	42	58.6
	2. CPN	7	10.0
	3. Xanthogranulomatous Pyelonephritis	5	7.1
	4. Tubercular Pyelonephritis	1	1.4
	5. Traumatic Kidney	1	1.4
Neoplastic (14)	1. Clear Cell RCC	5	7.1
	2. Papillary RCC	2	2.9
	3. Wilms Tumour	4	5.7
	4. Angiomyolipoma	2	2.9
	5. TCC of Pelvis	1	1.4

DISCUSSION

The kidney is vulnerable to many pathological processes varying from congenital diseases, inflammatory and neoplastic lesions. Nephrectomy is a standard treatment in patients presenting with benign as well as malignant lesions in the kidney [2]. The present study was a retrospective analysis of 70 nephrectomy specimens in a tertiary care centre. Males accounted for 44 cases and females 26 cases with male to female ratio of 1.7:1. The results were similar to study done by Latif F *et al.* [4] and Badmus TA *et al.* [5] who found male to female ratio of 1.9:1 and 2:1 in their studies respectively. Majority of cases were seen in 5th decade of life similar to results of Vinay KS *et al.* [6].

Non-Neoplastic Pathologies were seen in majority of cases (80%) while neoplastic lesions were seen in 20% cases. The results were similar to previous studies [7-11]. CPN with hydronephrosis was the commonest non-neoplastic condition in our study followed by CPN. Results were similar to previous studies [1, 10]. All cases of CPN with hydronephrosis

had enlarged kidneys with majority having coarse depressed scars. On microscopy varying degrees of glomerular atrophy and hyalinization, periglomerular fibroses, tubular atrophy and hyalinization along with interstitial inflammation, fibrosis and thickened blood vessels was seen [2]. Five cases of Xanthogranuloamtous Pyelonephritis and Solitary case each of tubercular pyelonephritis and traumatic kidney were also seen in our study similar to previous studies [1,10].

Renal cell carcinoma was the commonest neoplasm in our study and seen in 7 cases (10.0%). The results were similar to studies by Narang V *et al.* [2] and Jha MS *et al.* [11]. Among RCC, Clear cell RCC was seen in majority of cases (7.1%) followed by papillary RCC (2.8%). Similarly higher incidence of clear cell RCC was reported in studies done by Narang V *et al.* [2], Aiman A *et al.* [10], Rafique M *et al.* [12], Lopez JI *et al.* [13]. RCC is the commonest malignant renal neoplasm in adults. RCC affects older individuals usually in the 6th and 7th decades and show male

preponderance. Risk factors include tobacco intake, obesity, hypertension, unopposed estrogen therapy, exposure to asbestos, chronic renal failure, acquired cystic disease and tuberous sclerosis complex patients [14]. Most renal carcinomas are sporadic while Familial variants are seen in Von Hippel-Lindau (VHL) Syndrome, Hereditary (familial) clear cell carcinoma and hereditary papillary carcinoma [2].

Four cases of wilms tumour were seen in our study and all the cases were seen in children <5 years of age. Also single case of TCC of pelvis was seen in our study. Among Benign tumours, two cases of angiomyolipoma were seen.

CONCLUSIONS

The current study provides a fair insight into the histological patterns of lesions in nephrectomy specimens in our institution. A wide histopathological range of lesions comprising of neoplastic and non-neoplastic lesions were found. Wilms tumor was the most common childhood tumor and in adults renal cell carcinoma was most common malignancy whereas chronic pyelonephritis with hydronephrosis was most common non-neoplastic lesion. So it is mandatory that nephrectomy specimen be subjected to a detailed histopathological examination for a clinico-morphological correlation to ensure proper management.

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