

Original Research Article**A Study of Histopathological Spectrum in Non-Neoplastic and Neoplastic Lesions of Kidney****Dakhure Sarita D.^a, Phulgirkar Pragati P.^b, Bindu Rajan S.^c**^{a,b}Assistant Professor ^cProfessor, Department of Pathology, Government Medical College, Aurangabad, Maharashtra 431004, India.**Abstract****Corresponding Author:****Sarita Dakhure,**
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drsarita14june@gmail.com**(Received on 25.01.2018,**
Accepted on 09.02.2018)**Objective:** We conducted three years retrospective study in tertiary care hospital in India catering to both urban as well as rural fraternity to see the various pattern of renal diseases.**Methods:** The present study comprised of studying all the biopsy (core needle as well as nephrectomy) specimens coming to pathology department, GMC Aurangabad.**Results:** A total of 72 cases over a period of three years were studied. Data in this study showed that non-neoplastic lesions comprised of 48 cases (66.7%) & neoplastic lesions were 24 cases (33.3%). Chronic pyelonephritis predominated in the non-neoplastic group & in the neoplastic group renal cell carcinoma was the commonest.**Conclusion:** A wide range of lesions are encountered on histopathology, many of which may be misdiagnosed clinically and radiologically; therefore, it is mandatory that every renal biopsy specimen be subjected to detailed histopathological examination for a clinico-morphological correlation to ensure proper management.**Keywords:** Renal Diseases; Chronic Pyelonephritis; Renal Cell Carcinoma (RCC).**Introduction**

The kidney can be involved in a number of pathological conditions, some of them require nephrectomy. Although Simple Nephrectomy is a common procedure in surgical practice, it is the ultrasound guided renal core biopsy (histopathological examination) which in the field of nephrology remains the gold standard for diagnosing various renal disorders [1]. By this procedure, it is possible to establish an accurate diagnosis, to know the prognosis of disease process and develop the rational approach to treatment of renal disorders. Radical nephrectomy is the treatment of choice for patients with renal cell carcinoma [2].

Objective of this study was to review all cases of renal biopsy (core needle as well as nephrectomy) specimens

received in the department of pathology and to evaluate the different histomorphological lesions, observe variations if any from the conventional pattern, along with clinic-morphological correlation for proper postoperative management.

Aims and Objectives

To study the histopathological spectrum of non-neoplastic and neoplastic lesions in tertiary care hospital.

Material and Methods

The present study was conducted in the Department of Pathology Government Medical College and Hospital,

Aurangabad over a period of three years. (January 2015 to December 2017) All renal biopsy (core needle as well as nephrectomy) specimens submitted to the Department of Pathology were considered in the study. The age, sex, clinical history, IVP, MRI, CT and any other relevant investigation findings were noted from patient's clinical records. Nephrectomy specimens were examined and gross sections from representative areas were taken and processed. Slides were stained by H&E and special stains as and when required.

Results

A total of 75 renal biopsies were examined over a period of three years (from January 2015 to December 2017) out of which 3 biopsies were inadequate so we studied 72 cases in detail. Data in this study showed that non-neoplastic lesions comprised of 48 cases (66.7%) & neoplastic lesions were 24 cases (33.3%) [Table 1]. From 72 cases, there were 47 males (65.3%) and 25 females (34.7%). The male:female ratio was 1.88:1. The highest number of patients belonged to the age group 61-80 years (22 cases) followed by those in the age group 21-40 years (21 cases). The youngest patient was 5 years old and the oldest patient was 95 years old. A majority of cases of chronic pyelonephritis were seen in the age group of 41-60 years. All cases of renal cell carcinomas fell into the age group of 61-80 years. All cases of Wilms tumor were in patients below the age of 15 years. Majority of the cases of hydronephrosis belonged to the age group of 21-40 years [Table 2].

A wide range of lesions were found on histopathological examination. Maximum number of cases were of chronic

pyelonephritis (45.1%), followed by renal cell carcinoma [Figures 1-3] (19.7%). Other renal lesion encountered were Xanthogranulomatous pyelonephritis, Tuberculous pyelonephritis, Pyonephrosis, Hydronephrosis, Wilms tumor, Squamous cell carcinoma, Urothelial carcinoma, Angiomyolipoma and Ganglioneuroma [Table 2].

Out of the 48 cases of non-neoplastic lesions, chronic pyelonephritis was the commonest histopathological condition observed with a total of 32 cases. There were 10 cases of hydronephrosis and three cases of xanthogranulomatous pyelonephritis, and two cases of pyonephrosis and one case of tuberculous pyelonephritis.

Out of the 22 cases of malignant tumours the incidence of renal cell carcinoma was highest with a total of 14 cases, followed by Wilms tumour 4 cases and 2 cases each of urothelial carcinoma and squamous cell carcinoma. There were two benign tumours one of each angiomyolipoma [Figure 4] and ganglioneuroma. From 14 cases of renal cell carcinoma, 9 Cases (64%) were male and 5 Cases (36%) were female. Grossly, growth in size was in the range of 4-12 cm. The growths were solid having variegated appearance with necrosis, hemorrhagic, and yellowish areas. In the maximum number of cases (57%), the upper pole of the kidney was involved grossly. Microscopically, majority of the cases (71%) were of clear cell type of renal cell carcinoma.

All four cases of Wilms tumor were characterized by a grossly enlarged kidney with hemorrhagic and nodular appearance. Microscopically, three of the cases were of biphasic Wilms tumor, one case of triphasic Wilms.

Table 1: Percentage incidence of Non-neoplastic and Neoplastic lesions

Conditions		No of Cases	% Percentage
Non-neoplastic lesions		48	66.7%
Neoplastic lesions	Benign tumours	02	2.7%
	Malignant tumours	22	30.5%

Table 2: Age-wise distribution of various histopathological lesions of kidney

	Histopathological diagnosis	0-20	21-40	41-60	61-80	>80	No. of cases	% of all lesions
		yrs	yrs	yrs	yrs	yrs		
1	Chronic pyelonephritis	04	13	12	03	00	32	44.4
2	Xanthogranulomatous pyelonephritis	00	02	00	01	00	03	4.2
3	Tuberculous pyelonephritis	00	01	00	00	00	01	1.4
4	Hydronephrosis	01	05	02	01	01	10	13.8
5	Pyonephrosis	00	00	00	02	00	02	2.7
6	Renal Cell Carcinoma	00	00	00	14	00	14	19.4
7	Wilms tumour	04	00	00	00	00	04	5.6
8	Urothelial Carcinoma	00	00	01	01	00	02	2.7
9	Squamous cell carcinoma	00	00	02	00	00	02	2.7
10	Angiomyolipoma	00	00	01	00	00	01	1.4
11	Ganglioneuroma	01	00	00	00	00	01	1.4
	Total	10	21	18	22	01	72	100

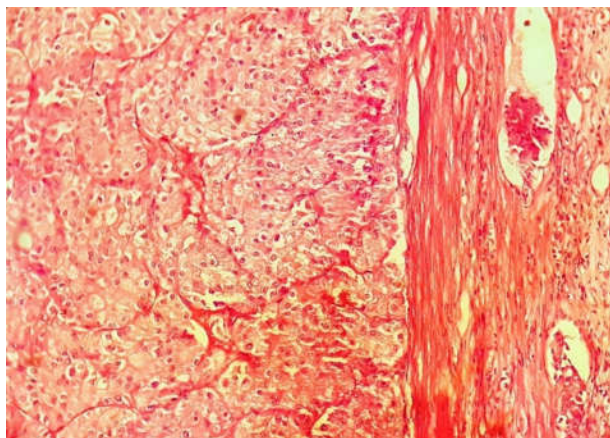


Fig. 1:Chromophobe renal cell carcinoma showing a solid growth pattern and perinuclear cytoplasmic clearing. (H & E: 10x)

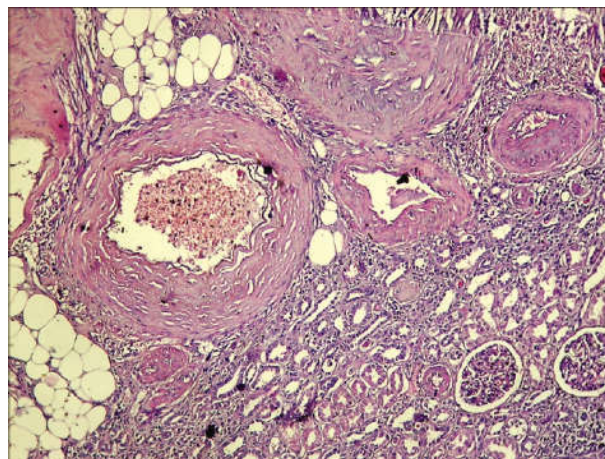


Fig. 4:Angiomyolipoma composed of mature fat cells, irregular thick and thin walled blood vessels, and smooth muscle proliferations. (H & E: 10x)

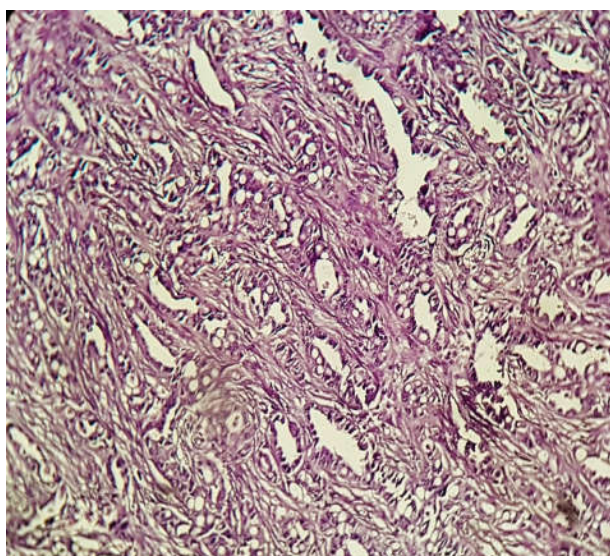


Fig. 2: Collecting duct renal cell carcinoma showing tubular structures are lined by tumour cell. (H & E: 10x)

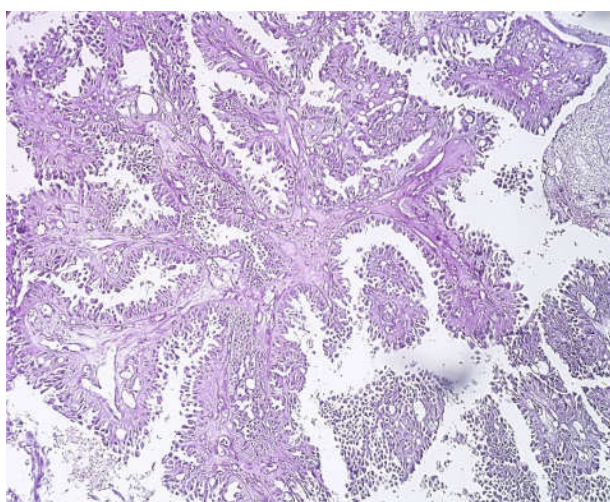


Fig. 3:Papillary renal cell carcinoma showing papillary structure lined by tumour cell with fibrovascular cores. (H & E: 10x)

The most common clinical presentation observed was flank pain, followed by fever and abdominal lump. Least common clinical presentation was burning micturition.

Discussion

Out of the 72 cases of renal biopsies during the study period, 48 cases (66.7%) were non-neoplastic and 24 cases (33.3%) were neoplastic. There were 65.3% males and 34.7% females. The male: female ratio was 1.88:1. This was inconcordance with El malik et al who reported 61% in males and 39% in females with M:F = 1.9:1 [3]. Aiman et al also reported a male preponderance in their study [4].

Among the non-neoplastic conditions, chronic pyelonephritis was the commonest lesion our study. This was similar to the findings by El malik et al [3]. Among 32 cases of chronic pyelonephritis (CPN), grossly majority of cases shows dilatation of pelvi-calyceal system (23 cases) and loss of cortico-medullary junction (09 cases), which is concordance with study conducted by Datta et al.⁵ Out of 32 cases of CPN, microscopically 2 cases were diagnosed to CPN with nephrolithiasis and other associated findings include pyonephrosis, granulomatous reaction.

In the present study, 3 (4.2%) cases of xanthogranulomatous pyelonephritis were seen. Popat et al [6] observed 2 cases (2.5%) and El Malik et al [3].³ 6 cases (1.1%), of xanthogranulomatous pyelonephritis. Genitourinary tuberculosis comprises 20% of all extra pulmonary tuberculosis [7]. In present study we found one case of tuberculous pyelonephritis in 35 year old male presented with flank pain and hematuria.

Renal cell carcinoma is a group of malignancies arising from the epithelium of the renal tubules. Renal cell carcinoma (RCC) is a tumour of adults with an average

age of diagnosis 55 to 60 years. The clear cell renal cell carcinoma is the most common and constitutes 70-80% of all renal cancer. Papillary carcinomas account for 10% to 15% of renal cancers. Chromophobe carcinomas represent 5%, collecting duct (Bellini duct) carcinoma represents 1% or less of renal epithelial neoplasms. Approximately 5% to 10% of primary renal tumours originate from the urothelium of the renal pelvis, which range from apparently benign papillomas to invasive urothelial (transitional cell) carcinomas. Sarcomatoid renal cell carcinoma makes up about 1% of all renal tumours in adults [8].

In this study, among the malignant cases, renal cell carcinoma was the commonest malignancy with an incidence of 63.6%. This was similar to the studies of Popat et al who found in their study that 70% of malignant lesions were renal cell carcinoma [6]. Similar findings were reported by Rafique M [9] who observed that majority of malignant neoplasms of the kidney (97%) were renal cell carcinomas. In our study, out of 14 cases of RCC, clear cell type was the commonest 10 cases (71.4%) followed by 1 case (7.1%) of each that is papillary, sarcomatoid, chromophobe type and collecting duct carcinoma. This was consistent with R.C. Mohanty et al [10]. Study who found 24 cases of RCC, clear cell variant was most frequent i.e 18 cases (75%), two cases (8.33%) of RCC with chromophobe cells, One sarcomatoid RCC (4.16%), One was diagnosed as carcinoma of collecting ducts of Bellini (4.16%).

There were 4 cases of Wilms tumor one was a 5 year old child another was of 8 year old and yet another were of two 12 and 14 years old child confirming it as the commonest childhood tumor.

Primary squamous cell carcinoma is very rare only two cases were reported in our study. The incidence of renal squamous cell carcinoma among malignant renal tumors is in the range of 0.5-0.8%, as reported by Lie et al [11] and Blacher et al [12]. There were 2 cases (8.3%) of urothelial carcinoma observed in our study. In different studies renal pelvis tumors accounted for approximately 10% of all renal tumors.

In benign tumours we found two cases, from that one of angiomyolipoma and other of ganglioneuroma. Renal angiomyolipoma (AML) is an uncommon benign mesenchymal tumour of the kidney. It has a incidence of 0.3-3% among kidney tumors [13]. Here, we report a case of renal AML in a 57-year-old female. Renal ganglioneuroma is a rare form of benign tumour involving neural crest cells and kidney tissues [14]. Renal ganglioneuromas in pediatric patients are even more uncommon with only three other reported cases [15-17]. Our case was forth case of a 4 year-old girl with an incidental finding of a right renal mass after ultrasound

examination due to frequent urinary tract infections. Histopathological examination is required for diagnosis, there are no other diagnostic methods to identify ganglioneuromas.

The histopathological analysis correlated well with the clinical diagnosis; however, few benign lesions like xanthogranulomatous pyelonephritis may be misdiagnosed clinically as malignant. Similarly, cases of angiomyolipoma, ganglioneuroma and renal squamous cell carcinomas were confirmed on histopathological analysis only.

Conclusion

Renal cell carcinoma - Clear cell type is the most common malignant tumor. Chronic pyelonephritis (CPN) is the most common non-neoplastic lesion. In conclusion, a wide range of lesions are encountered on histopathology, many of which may be misdiagnosed clinically and radiologically; therefore, it is mandatory that every renal biopsies specimen be subjected to detailed histopathological examination for a clinico-morphological correlation to ensure proper management.

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