

Unusual Variants of Renal Cell Carcinoma-An Institutional Study

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Abstract

Background: Renal cell carcinoma is the most common form of kidney cancer. About 90% of all kidney cancer is attributed to Renal cell carcinoma (RCC). Till near past, RCC was considered as single malignant tumor without any distinguishable morphological characters. But now many variants of RCC have been identified according to cellular characters and arrangement of cancer cells when viewed under microscope. They are different in histomorphologic cytogenetics and molecular features and also in clinical course. The most common type of RCC is clear cell or conventional type which attributes to 72% to 80% of all RCC.

Methods and Results: The present study was carried over a period of 2 years i.e. from 01.09.2014 to 30.08.2016 in Hitech Medical College and Hospital, Bhubaneswar. Unusual variants of RCC which was histomorphologically diagnosed in our Pathology Department was confirmed by Immunohistochemistry. Out of 24 total cases of RCC studied during the above period, the most frequent type is clearcell variant i.e. 18(75%). There were 2(8.3%) cases of RCC mixed with chromophobe cells and 1(4.16%) case each of collecting duct RCC, Highgrade urothelial RCC and Sarcomatoid RCC.

Conclusion: Recognition of variants of RCC is important for patient management in clinical course, prognosis and also in treatment protocol.

Keywords: Renal cell carcinoma, Sarcomatoid, collecting duct, urothelial, chromophobe, papillary

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I. Introduction

Cancer of the kidney amounts to 2% of the total human cancer burden, with approximately 190,000 cases diagnosed each year¹. Renal cell carcinoma is a group of malignancies arising from the epithelium of the renal tubules¹. Renal cell carcinoma (RCC) is a tumour of adults with an average age of diagnoses 55 to 60 years². The male to female ratio of adult renal cell carcinoma is about 2:1 and the incidence of bilaterality is 1%². The classic triad of presenting symptoms are hematuria, pain and flank mass, but nearly 40% of patients lack all of these and present with systemic symptoms, including weight loss, abdominal pain, anorexia and fever¹.

There are several known histologic subtypes of this heterogenous tumour entity with associated distinct molecular alterations and different clinical outcomes³. The clear cell renal cell carcinoma is the most common and constitutes 70-80% of all renal cancers⁴. Papillary carcinomas account for 10% to 15% of renal cancers⁵. Chromophobe carcinomas represent 5% , collecting duct (Bellini duct) carcinoma represents 1% or less of renal epithelial neoplasms⁵. 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) carcinomas⁵. Sarcomatoid renal cell carcinoma makes up about 1% of all renal tumours in adults⁶. Renal cell carcinoma with rhabdoid features is rarely being reported⁷. It is estimated that more than 30% of patients with RCC have metastatic disease at the time of diagnosis and 30% of organ-confined RCCs will develop metastatic disease after local treatment⁸. Thus, RCC remains a very major challenge. The aim of this study was to present our data of renal cell carcinoma variants and highlight the importance of correct diagnosis as each types carries its individual prognostic value.

II. Methods

The present study was carried out in the Post Graduate Department of Pathology, Hi-Tech Medical College and Hospital, Bhubaneswar, for a period of 2 years from September 2014 to August 2016. All nephrectomy specimens received in histopathology section were grossed after proper measurement. Four sections were taken from the tumour proper, one section of renal capsule and Gerota's fascia and one each from renal vein and ureteric resection margin. Sections from renal parenchyma and from pelvis were also submitted. Each specimen was thoroughly searched for lymphnode or associated abnormality. After processing, blocks were made and 3 to 4 sections of 3-5 micron thickness were cut from each block. All sections were stained with H&E stain and were examined under microscope for detailed histomorphological features. Prognostic parameters like tumor size, furhman nuclear grade, vascular or lymphatic involvement, tumor extension to capsule or surrounding fatty tissue or ureteric resection margin were correlated and tumor stage was recorded. Special stains like PAS stain were done when required. Immunohistochemistry(IHC) for the unusual variants were done for confirmation of the renal cell carcinoma variant.

III. Observation

During the study period, 24 cases of RCC were diagnosed. It ranged from 25 years to 68 years (mean 46 years). Out of 24 cases, 23(95.9%) were male patients and one female patient (4.1%). Out of 24 cases of RCC diagnosed, clear cell variant was most frequent ie 18(75%). There were two cases (8.33%) of RCC mixed with chromophobe cells. One sarcomatoid RCC (4.16%) grade IV was diagnosed on H&E which was later confirmed by IHC- cytokeratin and vimentin. One case was showing rhabdoid features(4.16%). One was diagnosed as carcinoma of collecting ducts of Bellini(4.16%) associated with nephrolithiasis and diagnosis was confirmed by PAS positivity and positive reaction for PAX 8. There was one case of high-grade urothelial carcinoma of renal pelvis(4.16%). Ureteric resection margin, renal vien, gerota's fascial margins were free from tumor extensions in 19 cases (79%). In collecting duct carcinoma, tumor extended to capsule and in sarcomatoid variant, tumor extended to surrounding fatty tissue. Thorough examination of H&E and PAS stain were diagnostic in most of the cases, but in collecting duct carcinoma cytokeratin and PAX8 were employed showing CK19 negativity and PAX8 positivity confirming the variant. In sarcomatoid variant, both vimentin and cytokeratin cocktail positivity were obtained.

IV. Discussion

The incidence of clear cell RCC is 75% in the present study i.e. the most common variant Renal cell carcinoma which correlated with all other previous studies on RCC^{8,9}. The chromophobe variant is 8.3% in our study which is slightly higher when compared with other authors. But as other variant like Carcinoma of collecting duct, Urothelial RCC and Sarcomatoid variants are considered, the incidence is much higher when correlated with the incidence mentioned in WHO classification 2004 and with other studies. This may be due to the small sample size in the present study.

V. Conclusion

Years ago, our knowledge about RCC was limited and it was considered as a single disease. Now we know the variants of RCC according to their morphological, immunohistochemical and molecular characters and clinical properties. Different sub types have different clinical outcomes and show different response to therapy. So recognition of these rare variants is essential. In the present study, the case size is small and so the results have limited value. Follow up was not possible in most cases. Study in large scale with proper follow up data will show more light on clinical properties and biological behaviour so that different therapeutic protocol will be made in future as different variants respond differently to therapy.

Declarations

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Conflict of interest: none

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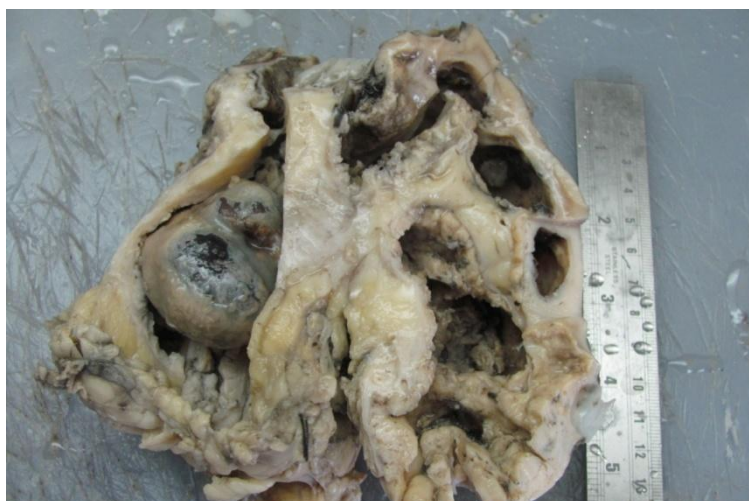


Fig.1 showing nephrectomy specimen with an impacted stone(arrow) in collecting duct carcinoma

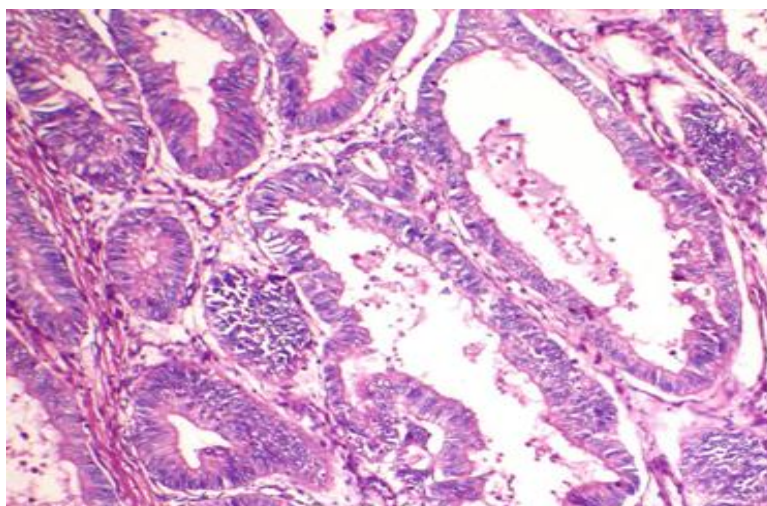


Fig.2 showing glands lined with pleomorphic epithelial cells. (H&E, HP) in collecting duct

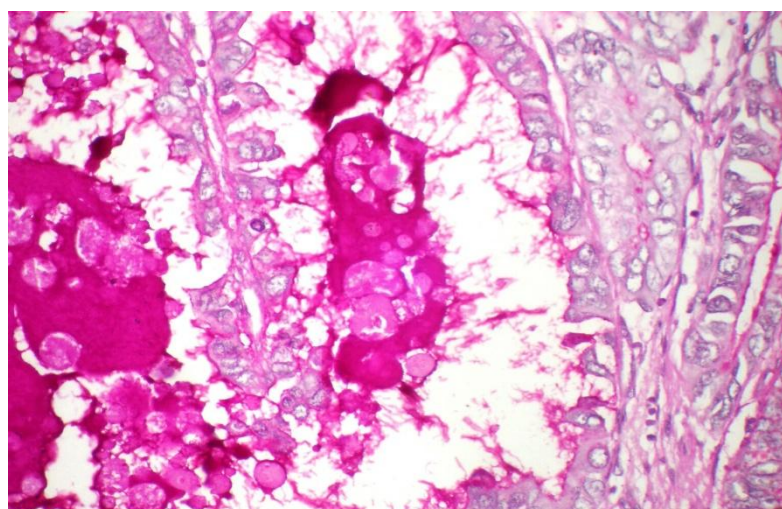


Fig 3 collecting duct carcinoma showing PAS stain positivity

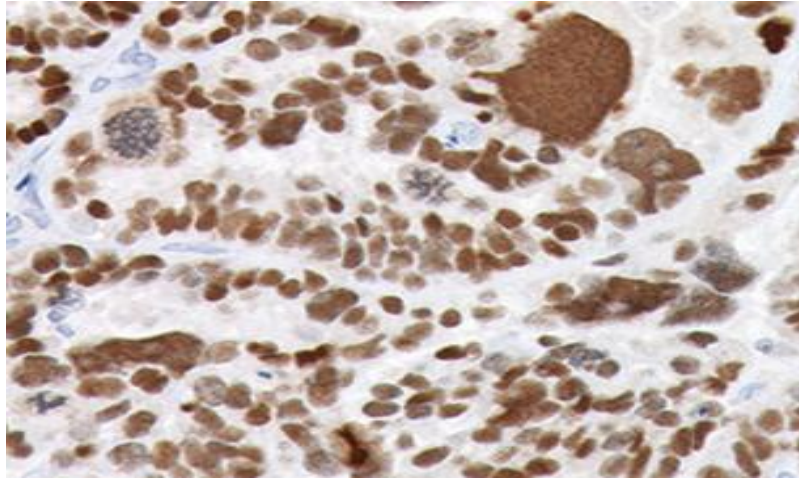


Fig 5 collecting duct carcinoma showing positive reaction for PAX8.

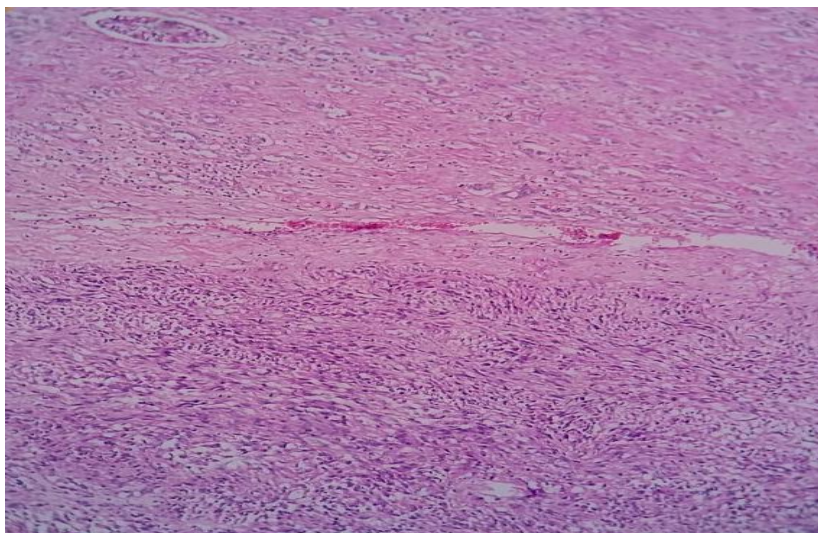


Fig 6 sarcomatoid variant RCC (H&E, LP)

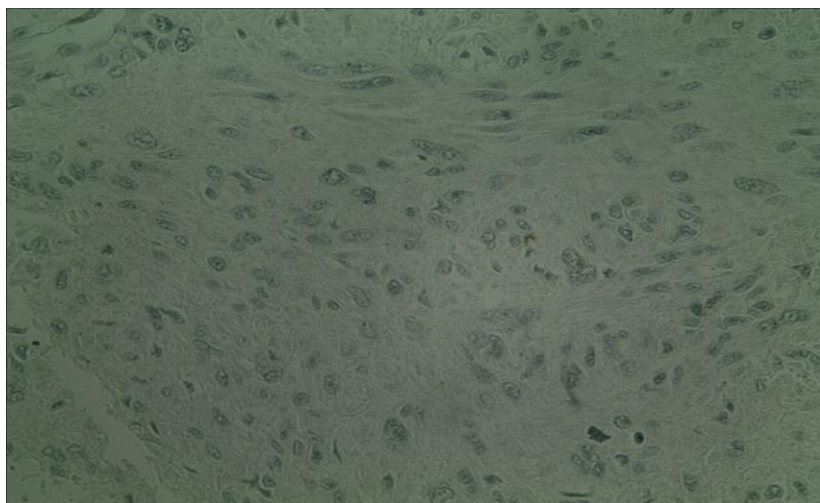


Fig 7 vimentin positivity in sarcomatoid variant RCC

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