

Case Report

Renal oncocytomas: “A pathologist perspective”

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Abstract

Renal oncocytomas are uncommon benign epithelial renal tumors with good prognosis. The presentation is no different from renal carcinomas and so preoperative diagnosis is less commonly made. We present a case of renal oncocytoma in a 54 year old female diagnosed on morphology and immunohistochemical studies.

Key words: Oncocytoma, Renal carcinomas, Immunohistochemistry

1. Introduction

Renal oncocytomas (RO) are benign epithelial neoplasms of the kidney arising from intercalated cells. These account for approximately 5% of all neoplasms of renal tubular epithelium. The entity was first described by Zippel in 1942.¹ These uncommon tumors, though benign in nature pose diagnostic difficulties, since they have morphological similarity to some of the variants of renal cell carcinomas (RCC). The present case was confirmed with immunohistochemistry as renal oncocytoma.

2. Case report

A 54 year old female presented with right sided intermittent radiating abdominal pain of 3 weeks duration. USG showed a 29x28mm hyperechoic lesion in the upper pole of right kidney suggesting angiomyolipoma. Routine blood investigations and renal function tests were within normal limits. With the clinical diagnosis of renal cell carcinoma, patient underwent right open nephrectomy.

Grossly, the kidney measured 9.5x7x6.5cms. On outer surface, a single nodular projection measuring 3.5x2.5cm was seen at the upper pole; with capsule over the nodule being intact. Cut surface showed a well circumscribed pale brown to yellow nodular mass measuring 2.5x2cm. The mass was about 0.5cm from the nearest cortical margin. (Fig 1)

Histopathological examination of the nodular mass revealed a tumour composed of polygonal cells arranged in solid compact nests and occasional tubular pattern. The cells had dense eosinophilic granular cytoplasm with regular nuclei. Areas of loose edematous stroma and good number of psammoma bodies were observed. (Fig 2 & 3) Hale's colloidal iron stain showed negative staining. The immunohistochemistry done showed vimentin negativity, Pancytokeratin (AE1/ AE3) showed focal positivity and CD117 showed diffuse cytoplasmic positivity. (Fig 4) The morphological and immunohistochemical features confirmed the diagnosis of renal oncocytoma.

Figure 1: Oncocytoma: A well circumscribed nonencapsulated pale yellow nodule. Note the absence of central scar.



Figure 2: Oncocytoma: Solid compact nests of tumour cells with hypocellular loose edematous areas (H & E; 40X)

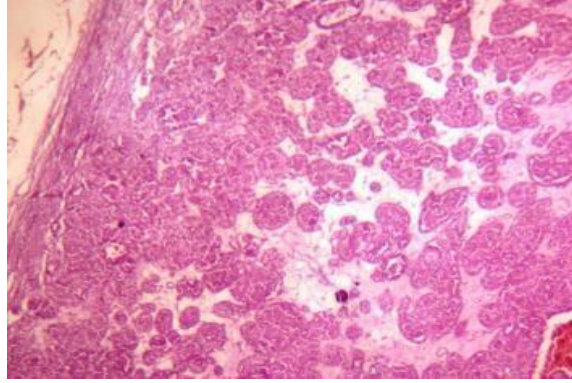


Figure 3 Oncocytoma: Rounded aggregates of eosinophilic granular cytoplasm with psammoma bodies (H & E; 100X)

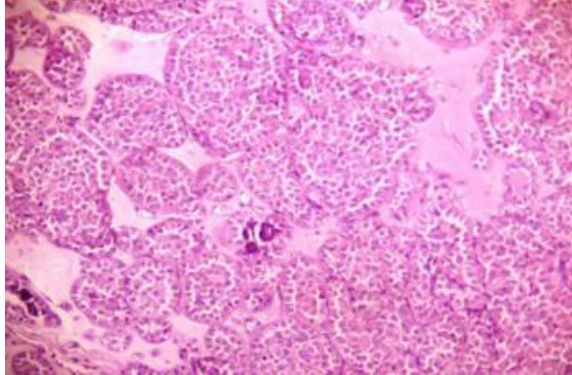
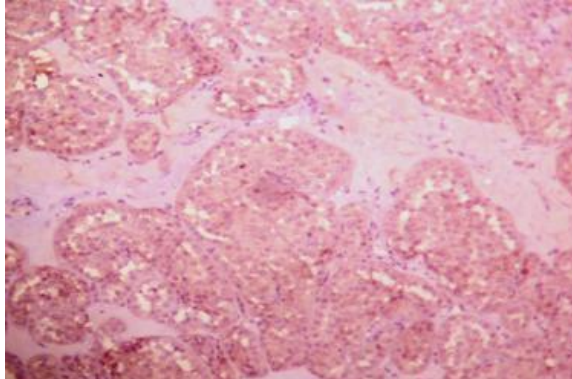


Figure 4: Cytoplasmic immunoreactivity of tumour cells for CD 117 in oncocytoma (Immunoperoxidase; 100X)



3. Discussion

The most common renal epithelial tumor is renal cell carcinoma. ROs, though uncommon, are the second most common solid tumors of kidney². These are benign tumors with good prognosis. Very often, ROs are provisionally diagnosed as RCC due to overlapping clinical and imaging features; hence morphology and use of ancillary methods may be needed to make a definite diagnosis since the two entities have different prognosis.³

Most of the oncocytomas are asymptomatic at presentation and are discovered incidentally during evaluation of non-urolological causes. Hematuria and pain might be present in minority of cases.⁴ These occur in wide age range; peak age being seventh decade and are more common in males.¹ Bilateral and multifocal presentations, and possible associations with other benign and malignant renal neoplasms have been described.⁵

Diagnosis of renal oncocytomas has been a radiological pitfall as most of the times findings are nonspecific for oncocytoma and overlap with those of RCCs. Thus these are less commonly made on imaging studies and clinical suspicion of renal cell carcinoma often exists preoperatively. A percutaneous core biopsy and fine needle aspiration cytology play a very limited role in the diagnosis and differentiating especially renal neoplasms with oncocytic cell features.⁶ In our case, patient had presented with a short duration of symptoms. USG had reported angiomyolipoma, but RCC was the working clinical diagnosis, hence nephrectomy was done.

Macroscopically, most of the oncocytomas are well circumscribed often nonencapsulated neoplasms that are classically mahogany brown and less often tan to pale yellow with a central scar in 33% of cases.^{3,6} Foci of hemorrhage may be seen but grossly visible necrosis is very rare.¹ No central scar was seen in our case. Tumor size has been found to be variable. In a study by Mahul *et al*⁷ the oncocytomas ranged in size from 0.6cm-15 cm with 4.4 cm being the average size. Few oncocytomas of giant sizes have also been reported.²

Histologically they are composed of oncocytic cells having mitochondria rich dense eosinophilic granular cytoplasm, round to oval nuclei and prominent nucleoli. Oncocytoma cells are arranged in solid compact organoid nests and some are also arranged as acini, tubules, microcysts and even as papillary fronds. Focal clear cells, foamy cells, small cells and bizarre cells with enlarged nuclei may rarely be seen. Often there is a hypocellular myxoid areas or presence of hyalinized stroma intervening between the nests of cells.^{1,5,7} The presence of psammoma bodies in ROs has been rarely described at an incidence rate of 7.5% by Mahul AB *et al*.⁷ These bodies are commonly seen in papillary RCC.⁸ RO lacks areas of clear cell carcinoma, significant lesional

necrosis or conspicuous papillary formations. Acceptable minimal atypical features in RO include extension of the tumor into perinephric adipose tissue, hemorrhage, minimal necrosis, microvascular invasion and occasional mitosis.⁷

Tumor cells with eosinophilic granular cytoplasm (oncocytic cells) include carcinomas in differential diagnosis. The eosinophilic granular cell variant of conventional clear cell RCC, chromophobe RCC and oncocytic papillary RCC are the important ones.⁶ Morphological differentiation is possible in most cases but can be difficult at times. The granular cell variant of conventional RCC nearly always has clear cell areas with prominent surrounding capillary network. The chromophobe RCC cells are arranged in diffuse sheet like pattern and the cells have characteristic perinuclear halo. The Hale's colloidal iron stain is diffusely positive in these but there is focal positivity or absent in ROs.³ The oncocytic type of papillary RCC have prominent papillary pattern with foamy macrophages in core.

Many immunohistochemical studies have been done to contribute for a suitable panel of markers to differentiate the tumors with oncocytic cellular features.⁶ Different expression patterns of cytokeratin, vimentin and CD117 have been found to be useful in differentiating oncocytic renal neoplasms. Vimentin is reported to be positive in 64-88% of conventional RCCs, 0-21% of chromophobe RCCs and 0-10% of oncocytomas. Recently, CD 117, a transmembrane growth factor receptor encoded by c-kit, has been reported as a useful marker for renal neoplasms. Previous studies have showed that CD 117 is positive in 83-100% cases of chromophobe RCC and 71-100% cases of oncocytomas and negative in conventional RCCs.⁹ Rekha *et al*⁴ has described the pattern of CD117 positivity in Chromophobe RCCs is strong and diffuse reticular positivity where as oncocytomas show a strong luminal staining pattern or diffuse fine dust like cytoplasmic granules. Our case had a diffuse cytoplasmic fine dust like granules staining pattern.

4. Conclusion

Pre-operative diagnosis of renal oncocytoma is still a diagnostic challenge, if made then nephron-sparing surgery is treatment of choice. However, the clinical approach for a solid renal mass in any elderly with history of flank pain and hematuria would be a nephrectomy as chances of the lesion being RCC are high. The morphological diagnosis may be difficult at times with carcinomas in the differential diagnosis. This case report enlightens about the presence of some rare histological findings such as psammoma bodies in oncocytomas which add on to the diagnostic challenge. The immunohistochemistry has a definite role to play in such cases.

References

1. Reuter VE, Davis CJ, Moch H. Oncocytoma. In: World Health Organization Classification of Tumors. Pathology and genetics of tumors of the Urinary System and Male Genital Organs. Eble JN, Sauter G, Epstein JI, Sesterhenn IA eds. IARC Press: Lyon 2004. p. 42-3.
2. Anastasiadis A, Dimitriadis G, Radopoulos D. Incidental giant renal oncocytoma: A case report. *J Med Case Rep* 2010; 4:358.
3. Geramizadeh B, Ravanshad M, Rahsaz M. Useful markers for differential diagnosis of oncocytoma, chromophobe renal cell carcinoma and conventional renal cell carcinoma. *Indian J Pathol Microbiol* 2008; 51:167-71.
4. Rekha PR, Rajendiran S, Rao S, Shroff S, Joseph LD, Prathiba D. Histological reclassification, histochemical characterization and c-kit immunorexpression in renal cell carcinoma. *Indian J Urol* 2008; 24:343-7.
5. Argüelles-Salido E, Marcilla-Plaza D, Medina-López R, Congregado-Ruiz B, Campoy-Martínez P, Cayuela-Domínguez. A. Renal oncocytoma: Review of our series of 22 patients. *Actas Urol Esp* 2006; 30:583-590.
6. Benatiya MA, Rais G, Tahri M, Barki A, El sayegh H, Iken A *et al*. Renal oncocytoma: experience of Clinical Urology A, Urology Department, CHU Ibn Sina, Rabat, Morocco and literature review. *Pan Afr Med J* 2012;12:84
7. Amin MB, Crotty TB, Tickoo SK, Farrow GM. Renal Oncocytoma: a reappraisal of Morphologic Features with clinicopathologic Findings in 80 Cases. *The American Journal of Surgical Pathology* 1997;21; 1-12.
8. Pradhan D, Kakkar N, Bal A, Singh SK, Joshi K. Sub-typing of renal cell tumors; contribution of ancillary techniques. *Diagnostic Pathology* 2009;4:21
9. Liu L, Qian J, Singh H, Meiers I, Zhou X, Bostwick DG. Immunohistochemical analysis of Chromophobe Renal cell carcinoma, Renal Oncocytoma, and clear cell carcinoma an optimal and practical panel for differential diagnosis. *Arch Pathol Lab Med* 2007;131:1290-7