Case Report

Cystic renal oncocytoma mimicking renal cell carcinoma

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Abstract

Cystic renal lesions are one of the commonly encountered urological conditions. They can be either benign or malignant. The Bosniak classification is employed to differentiate benign cysts from the malignant ones and to recommend treatment options. Bosniak type 4 cysts are mostly malignant. Rarely, benign tumors can be encountered in Bosniak type 4 cysts. We present a 59-year-old female who presented with a hilar Bosniak type 4 cyst in the right kidney. She underwent open exploration of the right renal tumor. The tumor was infiltrating into the renal vessels and could not be separated from the renal vein. In view of preoperative and intraoperative suspicion of malignancy, radical nephrectomy was done. Postoperative histopathological examination revealed the tumor to be an oncocytoma. The benign nature of the cyst could not be conclusively determined by preoperative investigations and intraoperative findings. Postoperative histological examination uncovered the rare cystic presentation of this benign tumor.

Keywords: Benign renal tumor, cystic renal tumors, hale colloidal iron, oncocytoma, vascular infiltration

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INTRODUCTION

Renal cysts are a major diagnostic challenge to the urologist. Both benign and malignant tumors can present as renal cysts. Complex renal cysts have enhancing solid components within them and are considered malignant tumors unless proved otherwise. They are usually diagnosed as renal cell carcinoma with cystic changes. Rarely, benign tumors of the kidney can present as complex cyst. Oncocytoma is a benign epithelial tumor of the kidney, which usually presents as a solid tumor with a central stellate scar. But rarely, it can have central cystic degeneration or can present as a multilocular cyst.[1-3] Only few cases of cystic oncocytomas have been reported in literature. It has been reported to mimic a hemorrhagic cyst of the kidney.[4] It can be associated with coexisting papillary renal cell carcinoma and can even have small cell components on histological examination.[4,5] We report a renal oncocytoma which presented as a complex renal cyst. Radiological investigations were suggestive of malignancy. Only a thorough histopathological examination revealed the final diagnosis.

CASE REPORT

A 59-year-old female presented with complaints of noncolicky and nonradiating right loin pain for 6 months. There was no history of fever, hematuria, loss of weight or appetite, or previous renal calculi. Abdominal examination was unremarkable. Her renal function tests, serum electrolytes, and hemoglobin and blood counts were within normal limits. X-ray kidney–ureter–bladder was normal. Ultrasonogram of the abdomen revealed a 5-cm-sized cystic lesion with solid components in the

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upper pole of the right kidney closely abutting the renal vessels. Color Doppler revealed normal flow in the renal vessels. Contralateral kidney, bilateral ureters, and urinary bladder were normal. Other solid organs were normal. A contrast-enhanced computerized tomogram with delayed images (computed tomography urogram) was performed, which confirmed the presence of a 5-cm-sized Bosniak type 4 cyst involving the right renal hilum and upper medial renal border. There was no central scar. The enhancement noted in the solid component of the cyst was 30 Hounsfield Units. The tumor was closely related to the renal vein and artery. The opposite kidney showed prompt uptake, excretion, and drainage of contrast [Figure 1].

In view of the Bosniak type 4 cyst, an open partial nephrectomy was planned after obtaining written informed consent from the patient for partial nephrectomy as well as radical nephrectomy. The right kidney was approached through the right flank eleventh transcostal extrapleural and extraperitoneal approach. There was a 5-cm-sized gray-colored cystic tumor occupying the hilum and medial border of the kidney. The cyst was dissected all around from the parenchyma, except the hilar region where it was firmly adherent to the main renal vein and artery [Figure 2]. The tumor was seen ramifying between the major divisions of the renal vessels. The rest of the renal parenchyma was normal. Intraoperative frozen section could not rule out a malignant tumor. In view of the preoperative and intraoperative suspicion of malignancy, radical nephrectomy was done. Cut-section of the tumor showed a grayish cyst wall containing soft, friable, grayish solid components. Postoperative period was uneventful.

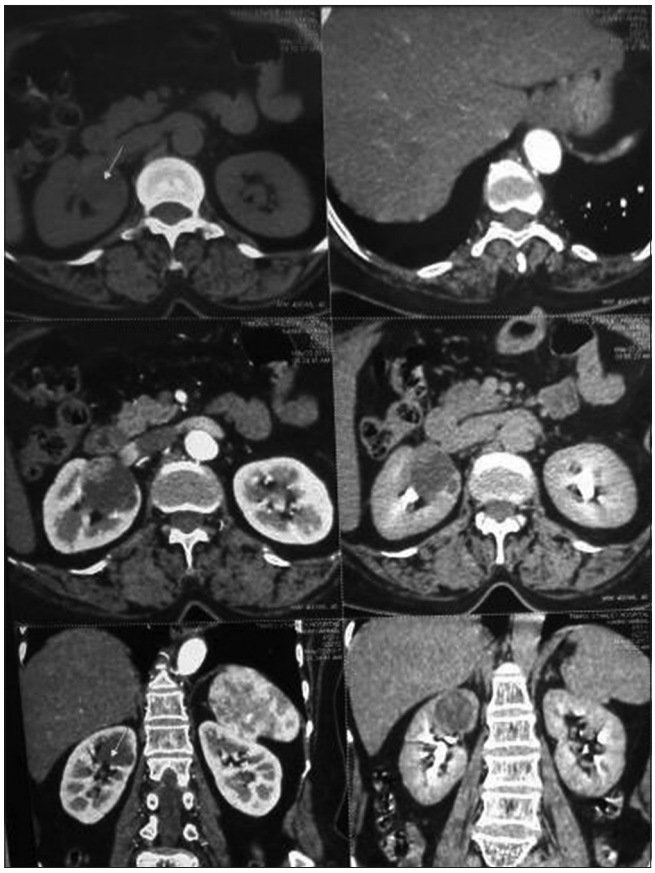

Figure 1: Plain and contrast-enhanced computerized tomography showing the hilar Bosniak type 4 cyst with enhancing soft-tissue component (arrow)

Histological examination of the tumor using hematoxylin and eosin stains showed nests of eosinophilic oncocytic cells (round or polygonal cells with moderate or abundant granular, eosinophilic cytoplasm, and small nuclei with granular chromatin) in a hypocellular stroma [Figure 3]. There was no evidence of infiltration or invasion into surrounding renal parenchyma. The tumor cells did not take up Hale's colloidal iron stain [Figure 4]. Immunohistochemical staining for cytokeratin-7 and vimentin was negative, confirming the diagnosis of an oncocytoma.

DISCUSSION

Oncocytoma is a benign epithelial tumor arising from the intercalated cells of the renal tubule. Oncocytomas make up 5%–7% of the renal tumors. There is growing evidence that oncocytoma is the benign end of a spectrum of renal tumors, malignant counterpart of which is chromophobe renal cell carcinoma.[6] Both arise from the intercalated cells and have similar histological features.

Oncocytoma mimics renal cell carcinoma, making it a diagnostic challenge to the radiologist. The degree of enhancement in contrast imaging and the timing of

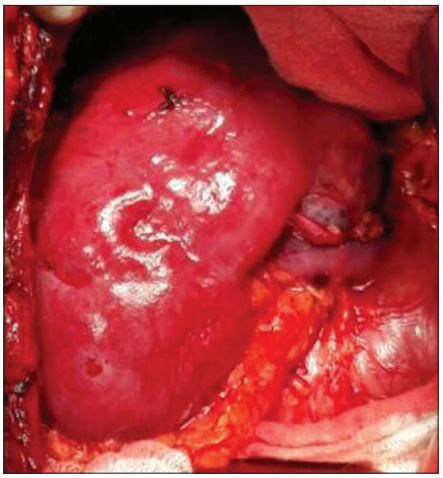

Figure 2: Intraoperative picture showing the grayish tumor closely adherent to renal vessels

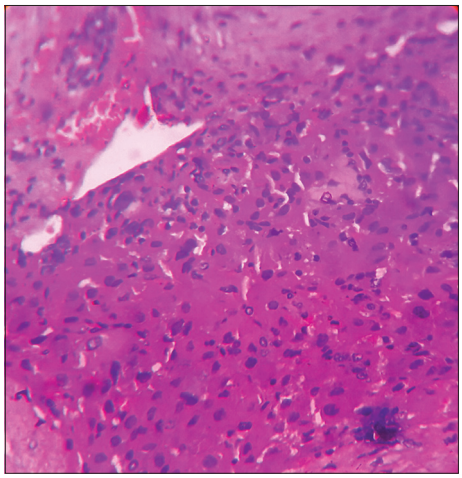

Figure 3: Histopathological picture depicting the tumor composed of sheets of eosinophilic oncocytic cells (H and E, ×10)

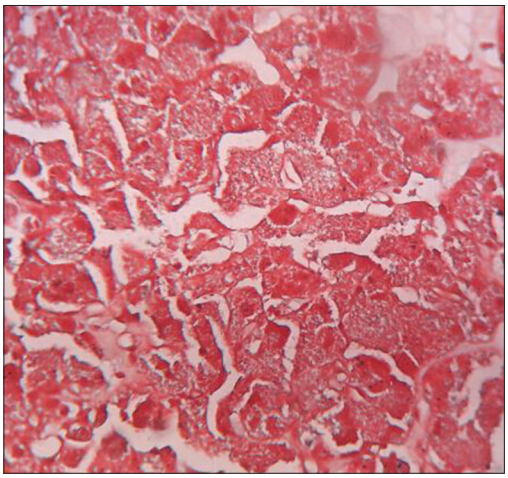

Figure 4: Tumor cells staining negatively for Hale's colloidal iron stain (×40)

peak enhancement is variable in oncocytoma.[7] When the tumor is heterogeneously enhancing, it mimics clear cell type of renal cell carcinoma. When it presents as a hypovascular homogenous mass, it mimics chromophobe or papillary types of renal cell carcinoma. In our case, the tumor presented as a hypovascular cystic lesion with solid components, exhibiting significant contrast enhancement.[7] Cystic oncocytomas can coexist with papillary or tubulocystic renal cell carcinoma adding to the diagnostic dilemma.[4,8]

The usual presentation of oncocytoma is a solid mahogany–tan tumor with central stellate scar without evidence of central necrosis or hemorrhage. The presented tumor neither had a central scar nor the mahogany–tan typical of an oncocytoma. A myriad of atypical presentations of oncocytoma have been reported. Ogden *et al*. reported a cystic oncocytoma.[2] While microscopic cystic degeneration can occur in oncocytoma, macrocystic appearance in an oncocytoma is rare. Multilocular cystic oncocytomas have rarely been reported and are very difficult to differentiate from multicystic renal cell carcinoma preoperatively.[9]

The role of intraoperative frozen section is debated since frozen section cannot reliably differentiate oncocytoma from renal cell carcinoma. Hence, radical nephrectomy is justified in such cases. Kodama *et al*. reported a case of a small 1.5-cm-sized cystic oncocytoma treated by radical nephrectomy. Intraoperative frozen section could not rule out malignancy and hence radical nephrectomy was proceeded with. Postoperative diagnosis was renal oncocytoma with cystic degeneration.[1]

In a clinicopathological study of renal oncocytomas done by Perez-Ordonez *et al*., 70 cases of renal oncocytomas were included. 64% of those tumors had a brown color on cut-section and only one-third were found to have central scar. Cystic changes were noted in 20% of cases in the study.[10]

Histologically, these tumors exhibit different architectural patterns such as cellular nests in hypocellular stroma, tubular, small papillae, pseudopapillae, and intratubular epithelial tufts. Cytologically, the most common cell type is the oncocyte. Other cells such as clear cells and oncoblasts can be seen occasionally. Mitotic activity is albeit low. The presence of atypical features does not alter the very good prognosis associated with these tumors.[10]

Hale's colloidal iron staining has been useful to differentiate oncocytoma from chromophobe type of renal cell carcinoma. The differentiating feature is the variation in the pattern of staining between these two differing entities. Chromophobe renal cell carcinoma stains in a diffuse and strong, reticular pattern, while oncocytomas either exhibit focal and weak, fine dust-like positivity or do not take up the stain, as in the present case.[11] Further differentiation can be done by immunohistochemical staining methods. Oncocytoma stains focally or negatively for cytokeratin-7 and negatively for vimentin and Cytokeratin 20, 15.[9] In the present case, staining for cytokeratin-7 and vimentin was negative, confirming the diagnosis of an oncocytoma.

CONCLUSION

This case has been presented for its rarity and to emphasize the fact that renal complex cysts of Bosniak 4 category can rarely be benign, as in our case. Such benign lesions cannot be diagnosed by radiological investigations alone. Tissue diagnosis with special stains and immunohistochemistry is mandatory to rule out malignancy in such situations.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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