

Renal Cell Carcinoma With Massive Osteoid Metaplasia

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Citation

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Abstract

Renal cell carcinoma (RCC) is frequently associated with calcification. Osteoid metaplasia is a rare event. We report one such case of RCC with massive osteoid metaplasia in a 62 year old lady. The differential diagnosis and review of literature are discussed.

INTRODUCTION

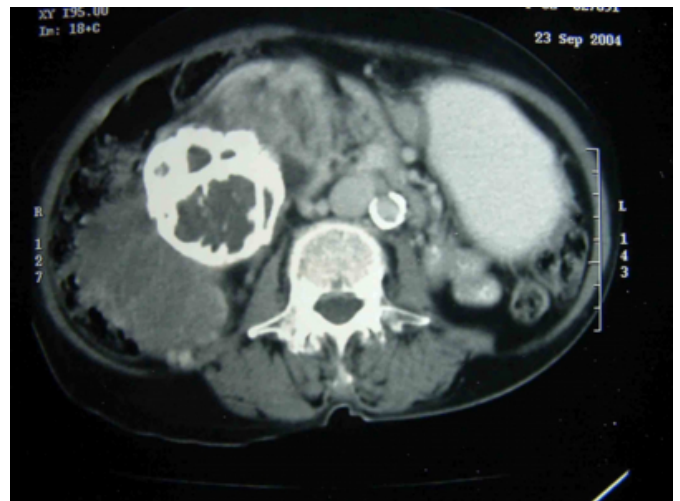
Renal cell carcinoma is associated with calcification in a significant percentage of patients.¹ Ossification of the tumor has been distinctly rare. Bone formation has been specially reported in sarcomatoid variant of RCC.² Although ossification is considered to be a favourable marker for RCC, its exact significance is not clear.³

CASE REPORT

This 62 year old lady presented with right sided abdominal pain of 5 month duration and a single episode of hematuria. Examination showed a large right renal mass which was hard on palpation. Routine laboratory investigations were within normal limits. Computerized tomography scan showed a large heterodense mass of size 16x15x12 cm with extensive calcification and degenerative areas (FIG.1)

Figure 1

Figure 1: The CT scan of the right renal tumour with extensive calcification. (400 X) showing the mature bony trabeculae.



Radical nephrectomy with hilar lymph node dissection was performed. Bisecting the tumor was very difficult and a saw had to be used for this. Cut surface showed the entire renal parenchyma replaced by the tumor and extensive bony areas (FIG.2). Histopathological examination revealed clear cell RCC (Fuhrman Grade II) with mature bony tissue showing classical trabecular pattern (FIG.3). The pathological staging was T₂NM. Five months later she presented with extensive lung metastasis, ascites and expired shortly thereafter.

Figure 2

Figure 2: Gross specimen after radical nephrectomy showing the entire parenchyma replaced by the tumor and bony trabeculae.

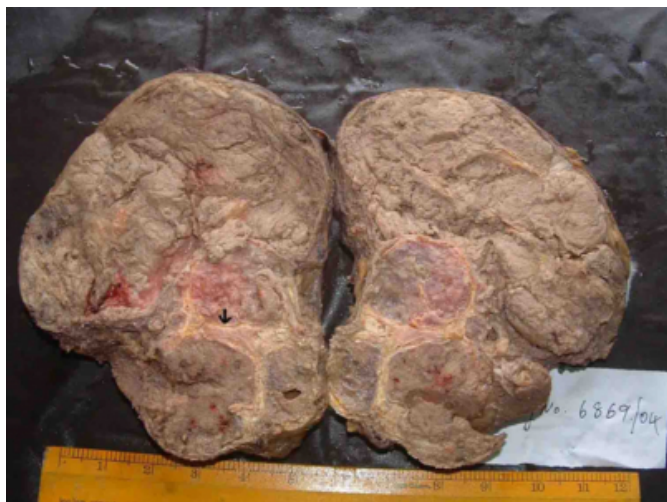
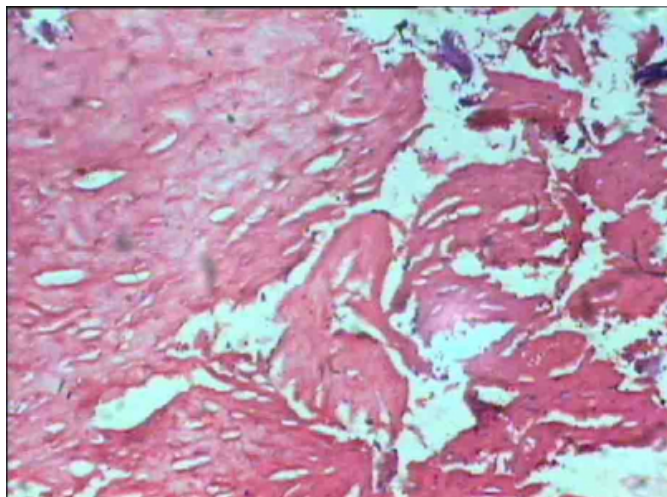


Figure 3

Figure 3: Microphotograph



DISCUSSION

Calcification can be seen in many renal tumors like RCC, Wilms' tumor, cystic renal disease etc.¹ Approximately 20% of all calcified renal masses are malignant⁴ and 10-20% of RCC's may contain focal calcification.⁵ Metaplastic bone formation, however, is a relatively rare event in these tumors.⁶ There are about eighteen cases reported previously in the literature. Differential diagnosis of this type of mass includes mature cystic teratoma, adrenal neoplasm, soft tissue sarcoma, metastatic carcinoma. The pathological diagnosis which should be considered include metastatic carcinoma, adrenal myelolipoma, extraskeletal osteosarcoma and angiomyelolipoma. Osseous metaplasia have also been

reported in other tumors most commonly in colon.⁷ The mechanism of ossification in tumors is unclear. Several hypothesis have been proposed including a metaplastic or reparative response in these tumors or surrounding tissues, the production of bone by tumor cells or the ossification of preexisting mucin or calcification.³ Osseous metaplasia may occur secondary to ischemia, necrosis or inflammation in the tumor or surrounding tissues.⁸ It has been suggested that RCC with calcification or bone tend to be hypovascular and that this may predispose the tumor to ischemia and subsequent metaplasia.⁸ Recently Yamasaki et al reported involvement of bone morphogenic protein 2 (BMP2) in ossification of RCC.⁹ BMP 2 has been reported to be an inducer of osteoblastic differentiation of pluripotent cells. Osteoid metaplasia has been suggested to be a marker for favourable prognosis because there are typically no tumour invasion beyond the gross margin of ossified RCC.¹⁰ However some reports suggests that it may also be associated with high grade tumors and poor prognosis, as in our case.¹¹

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Bone metaplasia in a case of bilateral renal cell carcinoma

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