

Extensive Osseous Metaplasia In Renal Cell Carcinoma: A Case Report

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Citation

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Abstract

Calcification is frequently observed in renal cell carcinoma but ossification is extremely rare. Ossification has been suggested to be a marker for favorable prognosis. We report a unique case of a large calcified renal cell carcinoma with marked desmoplasia and massive osseous metaplasia.

INTRODUCTION

Renal cell carcinoma of any architectural pattern may exhibit varying degrees of necrosis and haemorrhage. Other degenerative changes including oedema, fibrosis, hemosiderin, cholesterol clefts, and calcification are also seen. Metaplastic bone formation, on the other hand, is a rare event.¹ Bone morphogenetic protein (BMP) is known to be primary inducer of new bone formation and is suggested to be involved in ossification of several cancers.²

CASE REPORT

A 66 year old woman was admitted in January 2005 with left lumbar pain. Physical examination did not reveal any significant finding and laboratory studies were within normal limits. Computed tomography showed heterogeneous lesion arising from left kidney with foci of calcific, fluid, and fat density. Clinical possibility of angiomyolipoma was given. Partial nephrectomy was done.

Grossly, the resected portion of kidney measured 6.5 x 4 x 3 cms and a solid encapsulated tumor measuring 3x2x1cms was seen located in the upper renal pole. Cut surface of tumour was grayish yellow to grayish white and was stony hard which could not be cut with a scalpel or scissors (Fig.1).

Figure 1

Figure 1: Gross photograph showing solid encapsulated tumor located in the upper renal pole; cut surface of tumour was grayish yellow to grayish white and was stony hard



Histologically, the tumor was composed of cells arranged in acinar as well as papillary configurations. There was stromal overgrowth due to marked desmoplasia and extensive foci of osseous metaplasia enclosing fatty marrow were identified (Fig.2 and 3). Tumour cells were positive for PAS, cytokeratin and vimentin.

Figure 2

Figure 2: Photomicrograph showing tumor composed of cells arranged in acinar as well as papillary configurations along with stromal overgrowth causing marked desmoplasia. (Hematoxylin & eosin, x 200).

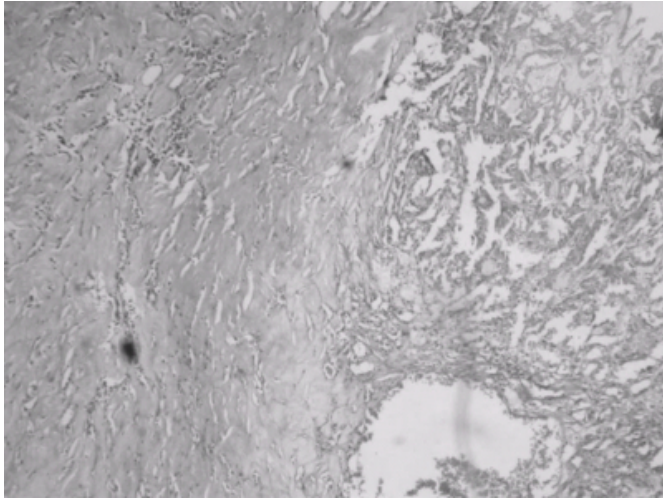
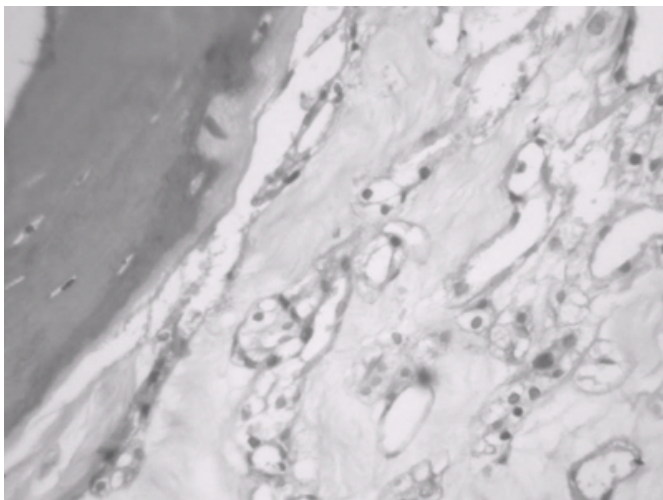


Figure 3

Figure 3: Photomicrograph showing foci of osseous metaplasia enclosing fatty marrow in the tumor area (Hematoxylin & eosin, x 400).



DISCUSSION

Focal fibrosis or hyalinization due to degenerative changes is seen in more than 75% of cases of conventional renal cell carcinoma but true desmoplasia is absent or minimal.

Calcification and osseous metaplasia are rare findings, seen in less than 10% and 4% of cases respectively.¹

In renal cell carcinoma, bone can originate through two different processes: neoplastic cells can dedifferentiate into an osteosarcomatous component (osseous differentiation), or, alternatively mesenchymal cells in stromal tissue can produce a dense collagenous matrix, with subsequent mineralization and organization into bone.³

The present case belongs to the second category of epithelial tumors. The ossified focus in the present case was found within fibrotic area of the tumor apart from cancer cell nests, stromal osseous metaplasia could be the best explanation for the histogenesis.

Prognostic significance of osseous metaplasia in renal cell carcinoma is controversial. However, studies have considered ossification as a significant tumor marker for patients with RCC.^{4,5} Patients with ossified RCC usually have an early stage of tumour without invasion beyond the gross margins of the tumor. Therefore, as a tumor marker, ossification of RCC implies a less extensive surgical resection and a much more favorable prognosis.

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