Type II papillary renal cell carcinoma with heterotrophic ossification: a case report

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ABSTRACT

Heterotrophic ossification in tumours is an uncommon phenomenon. The presence of ossification in renal cell carcinomas is extremely rare. In this report, we present a unique case of type II papillary renal cell carcinoma associated with heterotrophic ossification.

KEYWORDS

Kidney – Renal cell carcinoma – Bone

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Introduction

Renal cell carcinoma may be associated with calcification but the presence of ossification is extremely rare.¹ We report a unique case of type II papillary renal cell carcinoma associated with heterotrophic ossification.

Case history

A 60-year-old man presented with history of pain in the left flank for five months. There were episodes of gross haematuria, together with passage of clots. On examination, there was a hard mass palpable in the left subcostal area. His renal and liver function tests were within normal limits and the haemoglobin was 7 g/dl. An ultrasound examination revealed a calcified mass of approximately 6 cm x 6 cm arising from the upper pole of the left kidney. A contrast-enhanced computed tomography scan revealed a densely calcified exophytic lesion of 6.7 cm x 5.3 cm x 9 cm with a soft tissue component. The entire kidney was filled with a hypodense, mildly enhancing soft tissue mass with a thin rim of surrounding normal renal parenchyma. The mass was in close relation to the transverse colon, descending colon and the tail of the pancreas but the planes were maintained. The left adrenal gland was free of tumour. There was no evidence of renal vein thrombus. The bladder was filled with clots. The clinical diagnosis of transitional cell carcinoma was considered. A cystoscopy and clot evacuation was done. There were no lesions in the bladder but clots were seen coming out from the left ureteric orifice. A left diagnostic ureteroscopy had to be abandoned due to poor visibility. The bladder wash and left ureteric wash were negative for

malignant cells. The patient had a fine needle aspiration cytology performed elsewhere, which suggested the possibility of renal cell carcinoma. He underwent a left radical nephrectomy by an open approach. On gross examination, there was a very hard exophytic lesion in the upper aspect of the kidney while the rest of the kidney was tense to touch. The sectioning of the calcified lesion had to be performed with a power saw. The rest of the kidney was filled with a homogeneous soft tissue. The histopathological examination of the soft tissue component was suggestive of papillary renal cell carcinoma type II while the calcified lesion was found to be made up of mature bone. There was no evidence of sacromatoid element. The patient made an uneventful recovery and is doing well at three months follow up.

Discussion

Renal cell carcinomas are often associated with calcification.² This calcification can be stippled or coarse and is thought to be an indicator of a well-differentiated disease.³ Heterotopic ossification is an extremely rare phenomenon in renal cell carcinomas. There have been a handful of reports and the major histological subtype most often associated with it was clear cell variant.¹ There has been just one previous report of a type I papillary variant of renal cell carcinoma associated with heterotrophic ossification.³ To the best of our knowledge, ours is the first case in which heterotopic ossification was found in association with a type II papillary renal cell carcinoma.

The exact mechanism of ossification in renal cell carcinoma is poorly understood. It has been proposed that the mesenchymal cells differentiate into osteoblasts and

Figure 1 (a) Computed tomography showing a calcified mass (arrow) in the left kidney, together with a homogenous mass filling the entire left kidney. (b) The excised left kidney. (c) The histopathological picture (haematoxylin and eosin, 10x magnification) showing mature osseous elements on the left side and tumour cells arranged in papillary pattern with eosinophilic cytoplasm suggestive of type II papillary renal cell carcinoma

produce excessive collagen, which is subsequently mineralised, leading to the formation of bone.¹ The role of bone

morphogenic protein has also been suggested in the process of ossification.⁴

Surgical excision remains the modality of choice. It has been observed that ossification decreases the tumour vascularity and may improve the outcome.⁵ The presence of bone morphogenic protein may also contribute to this effect by its virtue of inhibiting the growth of the tumour cells of renal cell carcinoma.⁴

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