Chromophobe Renal Cell Carcinoma with Sarcomatoid Differentiation

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Abstract

We report chromophobe renal cell carcinoma (CRCC) with sarcomatoid dedifferentiation in a sixty-five year old male. CRCC is a prognostically better, distinctive subtype of renal cell carcinoma (RCC), histologically characterized by cells containing translucent and reticulated cytoplasm with distinct cell borders. Sarcomatoid component accompanies 9% of CRCC which alters its prognostic implications.

Introduction

Theones et al in 1985 first described this entity.1 According to updated UICC and AJCC classification proposed in 1997,2,3 RCC is categorized as clear cell, papillary, chromophobe and collecting duct subtype. RCC not fulfilling above categories is subtyped as NOS.2,3 CRCC is an uncommon neoplasm with reported incidence in the literature of 5.9%.1-8 It has distinctive histologic characteristics with diffuse cytoplasmic reactivity to Hale’s colloidal iron due to ultrastructural presence of microvesicles.1,2 Theones along with his colleagues Rumpell and Stout1 described eosinophilic variant of CRCC which closely mimics oncocytoma and granular variant of conventional RCC.1

Sarcomatoid dedifferentiation previously termed as sarcomatoid RCC was first described by Farrow et al.4 It is currently thought to represent transformation to a malignancy of a higher grade.3 Its presence is associated with poor prognosis with a reported incidence of median survival of less than a year following its diagnosis.3,4 It is characterized histologically by pleomorphic spindle cells with ultrastructural/immunohistochemical evidence of epithelial and mesenchymal differentiation.5

Case Report

A 65 year old male was admitted for pain in right hypochondrium along with vomiting since past seven months. Pain was off and on, not relieved by analgesics. His work-up revealed anaemia and USG and CT abdomen showed a huge left sided mass suggestive of renal neoplasm. We received left sided nephrectomy specimen (Fig. 1).

Gross: Left sided nephrectomy specimen measuring 17 x 11 x 5 cm was distorted by huge, expansile, bosselated tumour. Capsule could be stripped off easily. Cut section showed a well-defined tumour almost replacing the whole of medullary portion, pale grey-tan in appearance with focal yellow areas and extensive areas of haemorrhage and necrosis with a firm central area (Fig. 2). However no central scar was noted. Calyceal system was compressed into slits by the tumour. Ureretic surgical margin was unremarkable. Vascular margin could not be identified grossly.

Microscopy: Histological examination showed kidney with a well demarcated tumour composed of lobules separated by fibrous septae (Fig. 3). Lobules were composed of solidly packed, round to polygonal cells with well-defined cell borders and eosinophilic cytoplasm. Some of the cells were larger with clear or reticulated cytoplasm. Nuclei were round with irregular nuclear membrane and inconspicuous nucleoli (Furhman grade I-II). Perinuclear halo was clearly evident, imparting the cells a “plant cell”

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appearance (Fig. 4). Binucleation and nuclear grooving was seen in some cells. At places trabecular pattern was seen. Extensive hyalinization and areas of geographic necrosis were noted. Areas of sarcomatoid dedifferentiation with spindle cells having hyperchromatic, bizarre nuclei were seen lying in apposition to tumour lobules (Fig. 5). Surgical margins appeared free of tumour. A diagnosis of CRCC with sarcomatoid dedifferentiation was rendered.

Discussion

Clinically patients may present with classic triad similar to other renal neoplasm. In a large series studied by Akhtar et al, age range is 30-83 years with a mean of 53 years which correlated with study of Theones et al.4 Our case presented at age of sixty-five with loin pain. Morphologically gross findings vary considerably. They are usually light brown to beige coloured; some are grey-tan to light pink. Yellow colour often seen with conventional RCC is not seen with CRCC. [Maximum diameter ranges from 2.5 - 15 cm
(mean 7 cm), tumour may involve cortex as well as medulla. Histologically they are characterized by typical presence of cells containing translucent, reticulated cytoplasm and distinct cell borders imparting the cells a "plant-cell" appearance which are arranged in trabeculae and sheets. Similar morphological findings were seen in our case. Theones et al have described three types of cells. Type I cells show round, centrally located nuclei with solid, slightly granular cytoplasm. Type II cells are slightly larger than type I but with translucent granules within cytoplasm. Type III cells are larger than former with more abundant reticulated, translucent cytoplasm. Some type III are extremely large with reticulated balloon cells.

According to Theones et al, translucency is related to presence of microvesicles. By IHC tumours are variably positive for cytokeratins and EMA but vimentin negative. Hale's colloidal iron is strongly and diffusely positive. Close differential diagnosis is oncocytoma which is weakly and focally positive. Other points differentiating the two are tabulated in Table 1. Electron microscopy is the gold-standard for diagnosis of CRCC. KIT, a sensitive marker is positive with both CRCC (80%) and oncocytoma (40%) but negative for granular RCC and hence can be used to differentiate the two from granular RCC. CRCC carry best prognosis. Five year survival is 78-98%.

Sarcomatoid change can involve 1-99% of tumour mass. It may be intimately admixed with epithelial element or show clear demarcation between the two components. Spindle component may show a fibrosarcomatous pattern or undifferentiated stroma with wispy bundles of collagen or sclerotic stroma. Its presence indicates aggressive behaviour. Median survival following diagnosis is less than 1 year.

**Conclusion**

Due to overlapping features of eosinophilic subtype of CRCC and oncocytoma- a benign renal neoplasm, it is important to diagnose CRCC correctly. Prognosis worsens with
presence of sarcomatoid component. Hence, every renal tumour should be thoroughly screened for sarcomatoid component and whenever present should be mentioned in the report. Conclusion: Due to overlapping features of eosinophilic subtype of CRCC and oncocytoma—a benign renal neoplasm, it is important to diagnose CRCC correctly. Prognosis worsens with presence of sarcomatoid component. Hence, every renal tumour should be thoroughly screened for sarcomatoid component and whenever present should be mentioned in the report.

References

THE YIN AND YANG OF PARACETAMOL AND PAEDIATRIC IMMUNISATIONS
In practice, the administration of paracetamol to all children receiving whole-cell pertussis vaccine became widespread. In Canada, the National Advisory Committee on Immunization advised “because of the lower incidence of fever associated with (acellular pertussis) vaccines, there may be less justification for routine use of prophylactic acetaminophen, as had seen recommended with the whole-cell pertussis vaccines”.

Roman Prymula and colleagues are the first to examine this issue carefully with a current paediatric vaccine regimen. Unexpectedly, they found reduced immunogenicity of common paediatric vaccines with use of paracetamol in open-label randomized trials for both primary and booster doses.