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Case Report

Pathology Section

Collision Tumour of the Kidney: A Case Report

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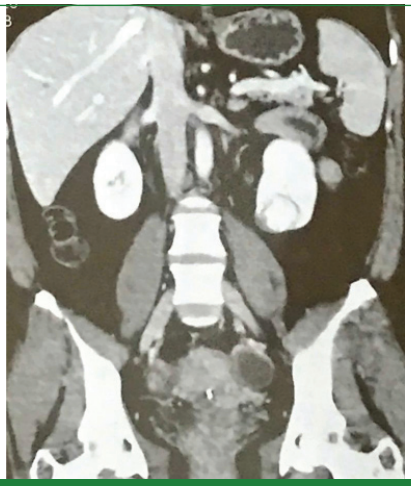
ABSTRACT

A collision tumour is characterised by the co-existence of two adjacent but different tumour types, with no histological admixture, forming a single lesion. This case report presents a case of a 46-year-old female with a solitary tumour in the lower pole of the left kidney. A left lower polar partial nephrectomy was done. Histologically, the tumour had two distinct but closely associated tumour components, the first one was a conventional clear cell Renal Cell Carcinoma (RCC) and the second component a papillary RCC. The final diagnosis was a collision tumour consisting of clear cell RCC and papillary RCC. A collision tumour of two different RCC subtypes is exceedingly rare and only a few cases have been published until now. Hence, this article presents the case report due to the rarity of its occurrence.

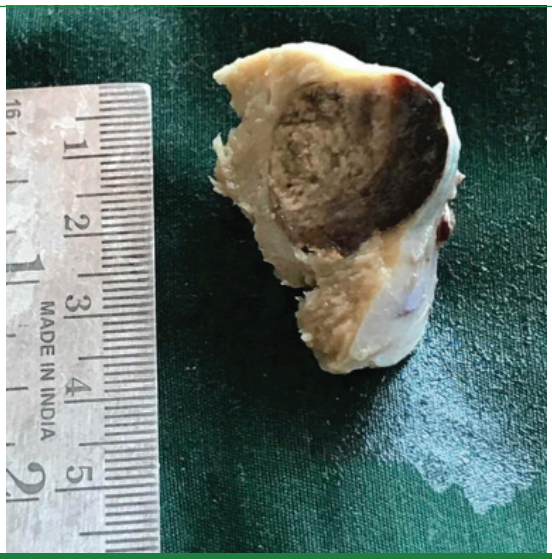
Keywords: Carcinoma, Clear Cell, Papillary, Renal

CASE REPORT

A 46-year-old female patient presented to the Urology Department with chief complaints of occasional episodes of painless haematuria and unexplained weight loss since a period of six months. There was no history of fever or flank pain. There was no past medical history of chronic renal disease/hypertension/diabetes mellitus/Ischeamic Heart Disease (IHD)/asthma. On physical examination, patient was afebrile; Bp: 130/80 mmHg; pulse 74 beats/min. Systemic examination revealed clear RS; CVS: S1 and S2 present; Per abdomen: soft, bowel sounds present, no palpable abdominal mass; CNS: conscious and oriented. Investigations: Urine: RBCs 20/hpf, Renal Function Tests, Liver Function Tests, Fasting Blood Sugar Level and lipid profile were within normal limits. A Computed Tomography (CT) scan of abdomen was advised which revealed a cystic left renal mass with solid enhancing areas within the lower polar parenchyma of the left kidney measuring 29 × 23 × 27 mm-suggestive of Bosnlak category IV renal cystic lesion/cystic RCC [Table/Fig-1]. Based on the above investigations, a provisional diagnosis of cystic renal neoplasm was made. Patient was subjected to a left lower polar partial nephrectomy and the tissue was sent to the Department of Pathology, for histopathological examination. Left partial nephrectomy specimen, measuring 3.5 x 2 x 1.5 cm was received. Cut section showed a well-circumscribed tumoural mass



[Table/Fig-1]: CT scan of abdomen showed a cystic left renal mass with solid enhancing areas in the lower pole of the left kidney.



[Table/Fig-2]: Gross image of cut section of left lower polar partial nephrectomy specimen showing a well-circumscribed tumoural mass.

measuring 2.5 × 2 × 2 cm, yellowish in color with brownish area at periphery. Capsule appeared intact [Table/Fig-2].

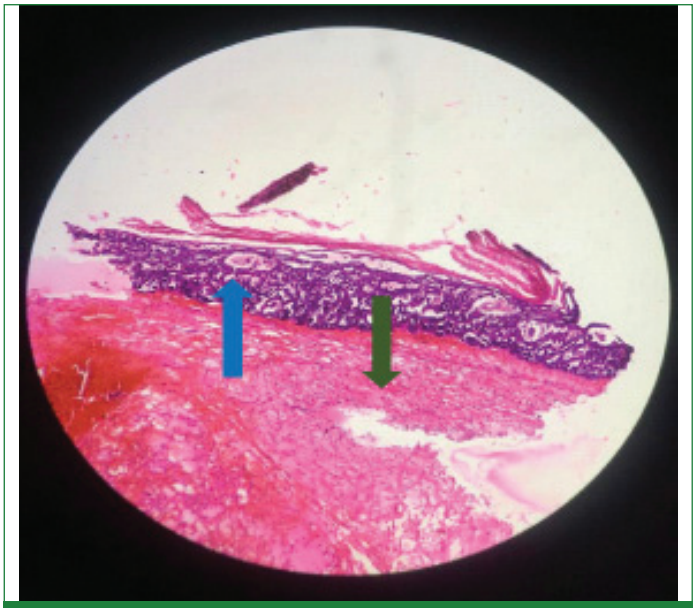
On microscopic examination, multiple sections studied revealed a circumscribed tumoral mass comprising of clear cell component with cells arranged in predominantly solid, but focally alveolar and acinar pattern, separated by stroma with a prominent network of small thin-walled blood vessels, the individual cells being large with clear to granular cytoplasm. The papillary component showed papillae lined by a single layer of cells, with scanty pale cytoplasm. Capsule was intact. Surrounding kidney showed congestion [Table/Fig-3-6].

A histopathological diagnosis of collision tumour consisting of clear cell RCC (90%) and low grade papillary RCC (10%) was made.

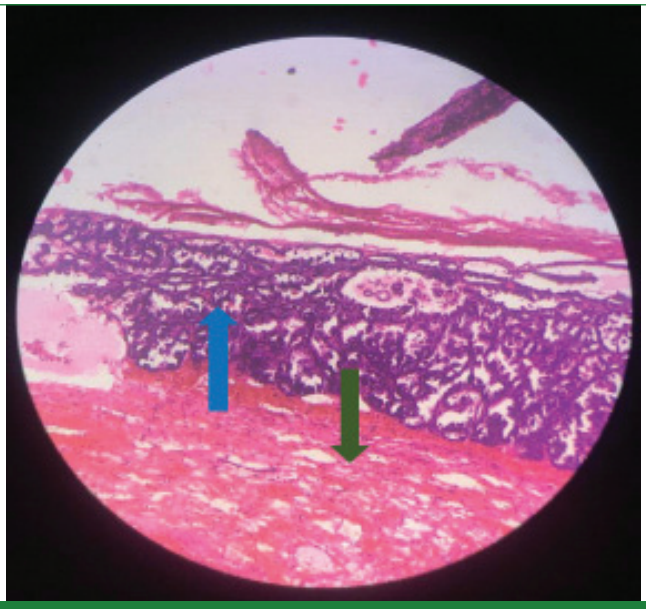
Patient is being followed-up with routine blood investigations and imaging studies to see for recurrence/metastasis.

DISCUSSION

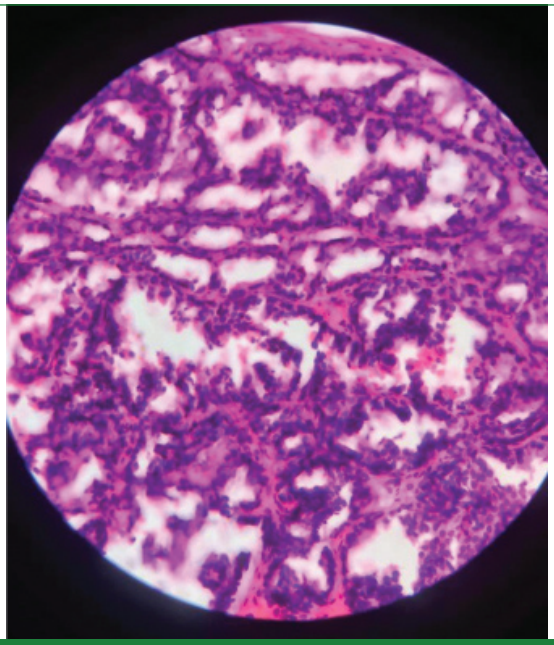
Collision tumour refers to the phenomenon where two apparently different and unrelated tumour types are present within the same location in an organ forming a single discrete lesion [1]. They are well-



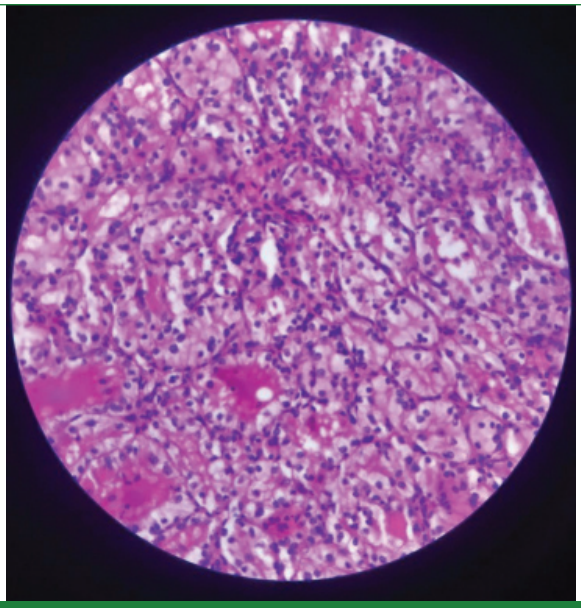
[Table/Fig-3]: Microphotograph H&E (X40) showing papillary RCC (blue arrow) at the periphery and clear cell RCC (green arrow) in the centre.



[Table/Fig-4]: Microphotograph H&E (X100) showing papillary RCC (blue arrow) at the periphery and clear cell RCC (green arrow) in the centre.



[Table/Fig-5]: Microphotograph H&E (X400) showing papillary RCC with papillae lined by a single layer of cells with pale, scanty cytoplasm.



[Table/Fig-6]: Microphotograph H&E(X400) showing clear cell RCC comprising large cells with clear to granular cytoplasm with solid, alveolar and acinar pattern.

demarcated and lack tissue admixture [2]. Although the phenomenon has been well-documented in other organ systems like gastro-intestinal tract and lungs, there is limited knowledge of this phenomenon within the kidney [1]. On the other hand, composite tumours are made up of two tumours which are morphologically and immunohistochemically distinct, occurring in the same lesion, with intermingling of the two tumour types and absence of sharp borders. Various mechanisms have been proposed to explain the 'collision phenomenon' [2]. The first hypothesis is the coincidental occurrence of two distinct neoplasms within the same tumour. The second theory suggests that the cellular microenvironment is altered by a common carcinogenic stimulus giving rise to two different primary neoplasms within a common location. The last theory proposes that the first tumour changes the microenvironment within the organ, leading to an increased chance of developing another primary tumour [3].

RCC is a very heterogeneous neoplasia that comprises different histological subtypes, the most common include clear cell RCC and papillary RCC [4]. The tumour cells in clear cell RCC are relatively large; with optically clear to deeply granular cytoplasm, due to accumulation of glycogen and lipids. The pattern of growth is predominantly solid, with alveolar and acinar pattern of tumour cells, separated by a prominent network of small thin-walled blood vessels [5].

Papillary RCC can be further subdivided into two subtypes:

Type I: Composed of papillae lined by a single layer of cells, the cells exhibiting scanty pale cytoplasm.

Type II: Papillae are lined by pseudostratified epithelium. The lining cells have abundant eosinophilic cytoplasm and exhibit higher nuclear grade [5].

While papillary RCC is typically strongly positive for cytokeratin 7 and alphamethylacyl-CoA racemase, they are usually negative in clear cell RCC, although it may sometimes show focal reactivity for both markers [6].

In the present case report, authors have presented case of collision tumour in a 46-year-old female comprising of clear cell RCC and low grade papillary RCC. Both tumour components, were sharply demarcated from one another within the single lesion.

Collision tumour comprising of two different RCC subtypes is exceedingly rare [2]. Fewer than ten cases of collision or synchronous renal tumours have been reported in literature [1]. Collision tumours comprising of combinations of different histological types of kidney tumours have been previously reported in literature, such as papillary RCC with oncocytoma, papillary RCC with medullary carcinoma, squamous cell carcinoma and osteogenic sarcoma

of the kidney, squamous RCC with chromophobe RCC and clear cell RCC with squamous cell carcinoma of the kidney [7]. In 2017, Bartos V reported a case of collision tumour of kidney comprising of clear cell RCC and papillary RCC in a 70-year-old man who underwent periodic clinical exams, several times a year and even three years after surgery there was no regional tumour recurrence or distant metastasis [2]. This is probably the only known case of such a collision tumour reported in literature besides the present case report. The patient in the present case report underwent no further medical or surgical treatment but was followed-up after one month with routine blood investigations and imaging studies. There was no evidence of recurrence/metastasis. The patient has been asked to follow-up every three months.

CONCLUSION(S)

A collision tumour of the kidney represents an infrequent and usually unexpected biopsy finding. During gross examination of the renal mass, it is very important that areas which look grossly different are sampled adequately. This is required to rule out the possibility of more than one tumour type existing in the same specimen. Different RCC subtypes exhibit different biological behaviour and the prognosis is determined by the higher grade tumour component.

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