CASE REPORT

UROLOGICAL ONCOLOGY

Chromophobe renal cell carcinoma with sarcomatoid changes: case report and review of literature

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Chromophobe renal cell carcinoma (RCC), a subtype of RCC, accounts for 4–6% of all RCC and has better prognosis then conventional RCC. Sarcomatoid dedifferentiation is thought to represent the high–grade end of all subtypes. This makes chromophobe RCC with sarcomatoid changes a rare entity associated with poor prognosis in most studies. We present a case of a 40–year old female with this rare histology, with the tumour localised to the renal capsule, managed with nephrectomy and with close follow–up thereafter. The patient is free of disease after one year of treatment.

Key Words: chromophobe RCC ‹› sarcomatoid changes

CASE REPORT

A 40–year old female non–smoker of average build, presented with swelling in the left lumbar region along with dragging pain for 3 months, with no history of dysuria, hematuria, trauma or previous surgery. She was non–hypertensive and non–diabetic and had no family history of malignancy. Ultrasonography (USG) showed a large (17.4 x 13 x 12 cm) predominantly cystic mass with solid components and internal septas which appeared to be arising exophytically from the lower pole of the left kidney. On further evaluation, the CT findings showed a large (19 x 14 x 17 cm) left retroperitoneal mass with solid and cystic components on the inferior aspect of the left kidney (Figure 1) showing effaced fat planes, inseparable from the lower pole of the kidney, with mild–moderate left hydronephrosis due to compression of the left ureter. Soft tissue stranding was observed in the adjacent retroperitoneal fat and thickening of the perinephric fat. The duodenojejunal junction and descending colon were displaced by the tumour. Her liver and renal function tests, along with chest X–ray, did not reveal any abnormalities. The patient underwent a left nephrectomy. A tan to grey coloured growth, measuring 16 x 15 cm, with

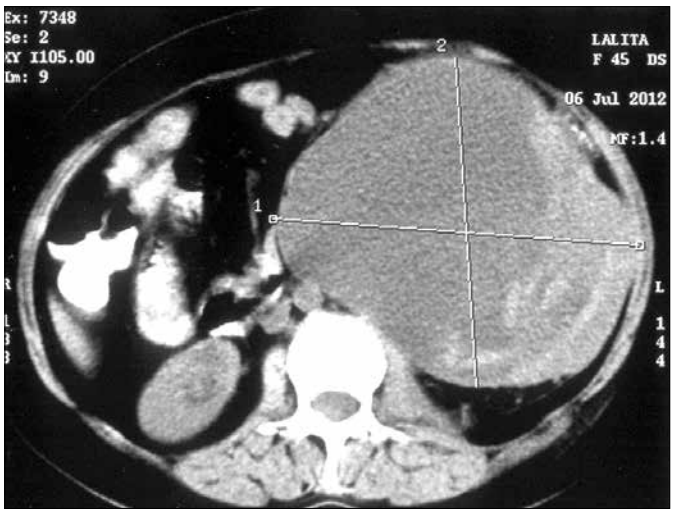

Figure 1. *CT image showing a 19 x 14 x 17 cm left retroperitoneal mass with solid and cystic components in the left kidney.*

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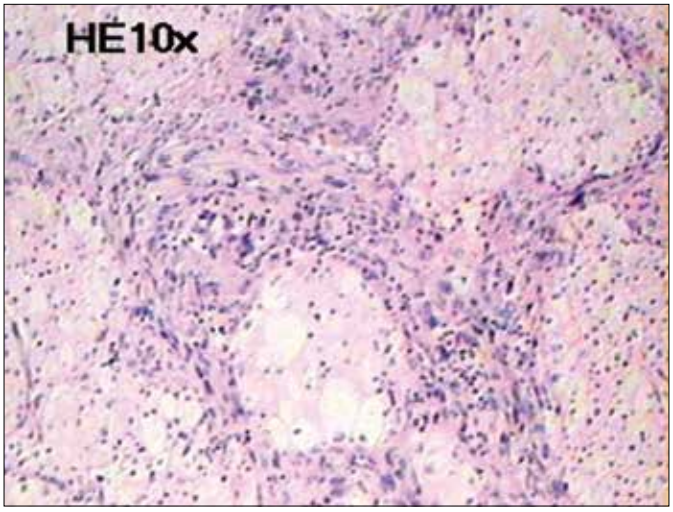

Figure 2. *Hematoxylin–eosin stained section (A: chromophobe renal cell carcinoma cell nests with fascicles of spindle cells in between). The cells had eosinophilic cytoplasm with accentuated cell borders and centrally located nuclei that had wrinkled peripheral borders and varying degrees of hyperchromatism (magnification ×10).*

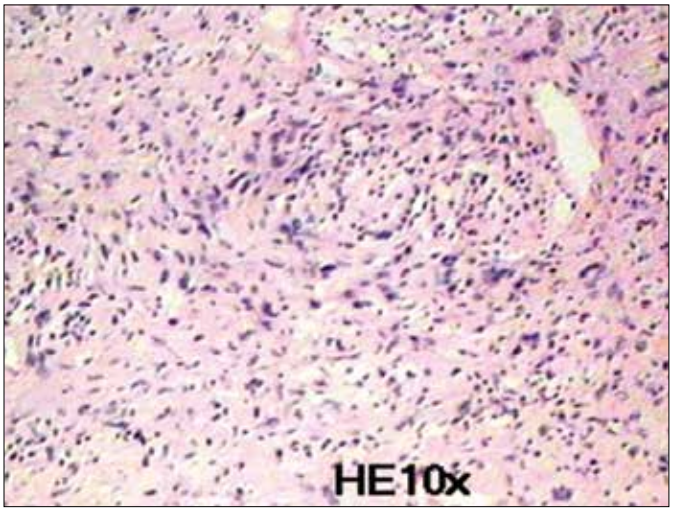

Figure 3. *Hematoxylin–eosin stained section (B: spindle cell component). The spindle cells were arranged in ill–defined fascicles that had a focal storiform pattern, mitoses and some bizarre forms.*

fleshy consistency and golden yellow discoloration, along with areas of necrosis and haemorrhage, was found to be pushing the capsule at the lower pole. The hilar vessels and ureter were not involved. Microscopic sections showed a biphasic, malignant neoplasm with epithelial and sarcomatoid features. Chromophobe RCC, as the carcinomatous element, is comprised of groups of polygonal cells with resinoid nuclei, perinuclear halo and prominent cell membranes (Figure 2). The sarcomatoid component is represented by pleomorphic spindle cells in between forming fascicles at places, fibrosarcoma–like pattern, occasionally tumour gaint cell and bizarre forms noted, Furhman nuclear grade was 3, comprising 40–50% component in tumour (Figure 3). Lymphatic permeation was not observed. The tumour was unifocal, limited to the lower pole, raising the capsule, but not infiltrating it. The tumour had not infiltrated the surrounding, normal–appearing kidney. Large areas of necrosis and haemorrhages were seen in the tumour. Table 1, fig. 4 and 5 show the immunohistochemistry (IHC) study. The morphology and IHC study were suggestive of the chromophobe type of RCC with sarcomatoid differentiation. CT of the thorax was done to search for metastasis, but did not reveal any abnormal findings. Considering the aggressive nature of the tumour, the patient was advised to have adjuvant chemotherapy. Due to the patient's reluctance for chemotherapy, she was given the option to remain under close observation with USG/CT scan. The patient is disease free after one year of treatment and is still under observation.

Table 1. *IHC study of the tumour cells*

Marker	Chromophobe RCC	Sarcomatoid cells
Pan–cytokeratin	+++	+/–
EMA	++	–
Vimentin	–	+++
CD10	–	++

DISCUSSION

Chromophobe RCC is the third most common histologic subtype, accounting for less than 5% of RCCs [1]. Chromophobe RCC shows a mean age of incidence in the 6th decade. Men and women are equally affected. Eighty–six percent of chromophobe RCCs are stage 1 and 2 at presentation [1]. Renal vein invasion is seen in less than 5% of cases. Despite the overall favourable prognosis, large tumours may develop hepatic metastases [2].

Sarcomatoid RCC of the kidney, constituting about 1–5% of all renal malignant neoplasms, are clinically aggressive tumours with rapid spread and poor overall survival. In a study done by de Peralta–Venturina et al, the incidence of sarcomatoid changes in RCC was found to be 10.6% in 952 cases studied. The incidence of sarcomatoid changes was highest (29%) in collecting duct carcinoma (2 of 7 cases), followed by 11% (3 of 27 cases) in unclassified RCC, 9% (5 of 53 cases) in chromophobe RCC and 8% (59 of 720) in

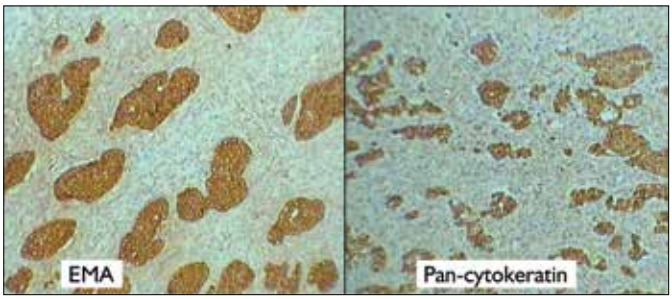

Figure 4. *IHC studies showing epithelial cells positive for pan–cytokeratin and EMA, whereas spindle cells are negative for EMA and few are positive for pan–cytokeratin.*

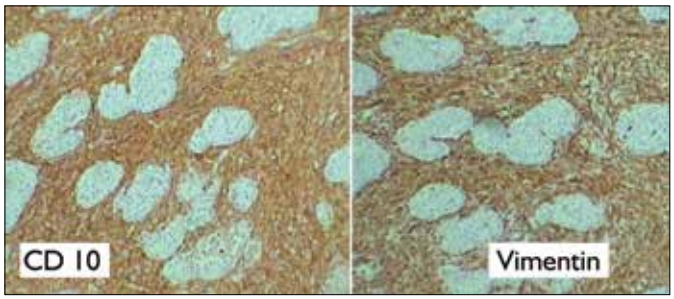

Figure 5. *IHC studies showing spindle cells positive for CD10 and vimentin, whereas epithelial cells are negative.*

clear cell RCC [3]. This process is thought to result from dedifferentiation of the epithelial component, and so the sarcomatoid cells are expected to show the original genomic pattern of the "parent" cells. The sarcomatoid dedifferentiation in any type of RCC carries a poor prognosis for most patients, and most of them present with an advanced stage at initial diagnosis. The disease–specific survival rate was found to be 22% and 13% after 5 and 10 years respectively, as compared with RCC without sarcomatoid changes with a 5 and 10 year disease–specific survival of 79% and 76% respectively [3]. The amount of sarcomatoid component (equal to or more than 50%) and lymphovascular invasion are associated with decreased survival [4]. Patients are 3 times more likely to die of RCC if they have distant metastasis or tumor necrosis at the time of radical nephrectomy. The presence of a sarcomatoid component was significantly associated with poor outcome even after adjusting for TNM stage, tumour size, and histologic tumour necrosis [5].

Detection of sarcomatoid RCC has an important prognostic significance, as reflected by its aggressive behaviour, propensity to metastasize and association with the overall poor survival. Fortunately, the case reported here presented at an early stage, when the disease was localised within the renal capsule, with no detectable metastasis. We have reviewed our case with one of the largest series of chromophobe RCC with sarcomatoid changes, where Lauer et al. found male predominance (64%) with 60.4 years as the mean age of presentation. Akhtar et al. had a female predominance (66%) with 57 years as the mean age of presentation [6, 7]. Our patient is a 40 year female, who is comparatively young as compared to the case series data. Macroscopically, 64% patients were found to have left–sided disease in the series by Lauer et al., whereas Akhtar et al. found an equivalent number on both sides [6, 7]. This suggests a greater predominance of the sarcomatoid tumour on the left side. The tumour size ranged from 9.5–28.0 cm in the study done by Lauer et al. and the mean size reported by Akhtar et al. was found to be 11 cm [6, 7]. In both series, all patients had local spread of the disease and 20–30% had metastasis during the time of presentation [6, 7]. Our patient had a left sided tumour, 19 cm in size, but there was no local spread or distant metastasis at presentation. Compared with classic chromophobe RCC, an analysis of 61 cases by Peryomaure et al. found that the most common pathologic stage tumour was T1 in 65.6% of cases, and T2 in 31.1% patients [8]. It is suggested that sarcomatoid chromophobe RCC is a more aggressive neoplasm compared with classic chromophobe carcinoma. Similar findings were obtained in the study by Cheville et al. [5]. They demonstrated a very poor prognosis in the sarcomatoid chromophobe cell carcinoma compared with classic chromophobe cell carcinoma.

Our case represents a sarcomatoid chromophobe cell carcinoma with no local spread and no metastasis. This unusual renal cancer has the potential to behave aggressively and to metastasize, but, in our case, the patient was under close observation with no adjuvant treatment, and there is no evidence of disease one year after the surgery. Our case gives an option of close observation instead of chemotherapy in cases where there is no disease outside the renal capsule, despite having a sarcomatoid differentiation in chromophobe renal cell carcinoma.

ABBREVIATIONS

RCC – renal cell carcinoma, IHC – immunohistochemistry, EMA – epithelial membrane antigen, CD – cluster of differentiation

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