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A rare curative case of collecting duct carcinoma

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ABSTRACT

Collecting duct carcinoma (CDC) is a rare form of renal carcinoma that has a poor prognosis. To date, there has been no report that the survival time of a patient with metastatic CDC could be more than six years. We present a case of rapidly advanced recurrence of CDC after nephrectomy that completely responded surgical intervention followed by targeted therapy with sorafenib and nivolumab.

1. Introduction

Collecting duct renal carcinoma (CDC) is a rare subtype of renal cell carcinoma (RCC), accounting for approximately 1–2% of patients with renal cancer.[1] This aggressive malignancy is considered to be arisen from the epithelial layer of distal tubules and has a poor prognosis in the majority of patients with a median survival time of only 30 months following nephrectomy.[2] Surgical treatment is the first option for CDC, but some patients usually suffer from extensive metastasis with extremely poor prognosis at the time of diagnosis, and thus lose their chance of surgery.[3]

Nivolumab is widely used to treat some malignant solid tumors, including renal cell carcinoma and urothelial carcinoma. Only five case reports of CDC treated with nivolumab can be searched on Pubmed. Although some of these patients get a complete response , none of these patients are followed-up for more than six years. In this report, we present a case of a 59-year-old female with metastatic CDC living for more than six years.

2. Case report

This case report was approved by the research ethics committee of Ningbo Medical Treatment Centre Li Huili Hospital. In March 2015, a 59-year-old female was admitted to our hospital with complaint of lower left back pain, and a tumor was found by ultrasonography in her left kidney. Her Eastern Cooperative Oncology Group performance status (PS) was 0. Computed tomography (CT) showed a tumor of 50mm in diameter in the inferior pole of the left kidney (Fig. 1 a/b). Meanwhile, metastasis was found in the hilar lymph node of the kidney, but not in the lung or other places. After radical nephrectomy with lymph node dissection, pathology confirmed that it was CDC, pT1bN1M0 (Fig. 1 c/d). Three months later on follow-up, a lung CT scan was performed and 2 neoplasms were found (Fig. 1 e/f). The patient then was started on target therapy with Sunitinib (37.5mg qd po) but without chemotherapy, because the patient has only 1 kidney and tested positive for proteinuria. Half a year after surgery on follow-up, the kidney CT scan showed massive ascites, and bilateral abdominal wall edema which had progressed compared to the previous film, as well as the left adrenal gland is also larger than the previous film (Fig. 2 a). Also due to the adverse events of sunitinib, the patient was then switched to sorafenib (200mg bid po) for a duration of three months. When the tumor became approximately 10cm in size, a laparoscopic resection of the left adrenal tumor was performed (Fig. 2 b). The adrenal tumor pathology suggests that it was a recurrence of the CDC (Fig. 2 c/d). Two months later, the patient was started on immunotherapy using nivolumab (3mg/kg on day 1, every 14 days), the next six months no recurrence or metastasis was found, and the lung metastases also disappeared. Nivolumab plus sorafenib had been administered to her for two years after the resection of the left adrenal tumor, and the woman is still alive today (Fig. 3. Treatment flow chart).

3. Discussion

Collecting duct carcinoma is a rare and highly aggressive histological subtype of RCC. Usually, CDC is characterized by an extremely aggressive phenotype. Although there are multiple effective agents with different mechanisms of action against clear cell renal cell carcinoma (CCRCC), effective systemic therapy for those with advanced CDC has not yet been established.[4] When pathology confirmed it is CDC, we once recommended our patient to take part a trial to be treated with sorafenib

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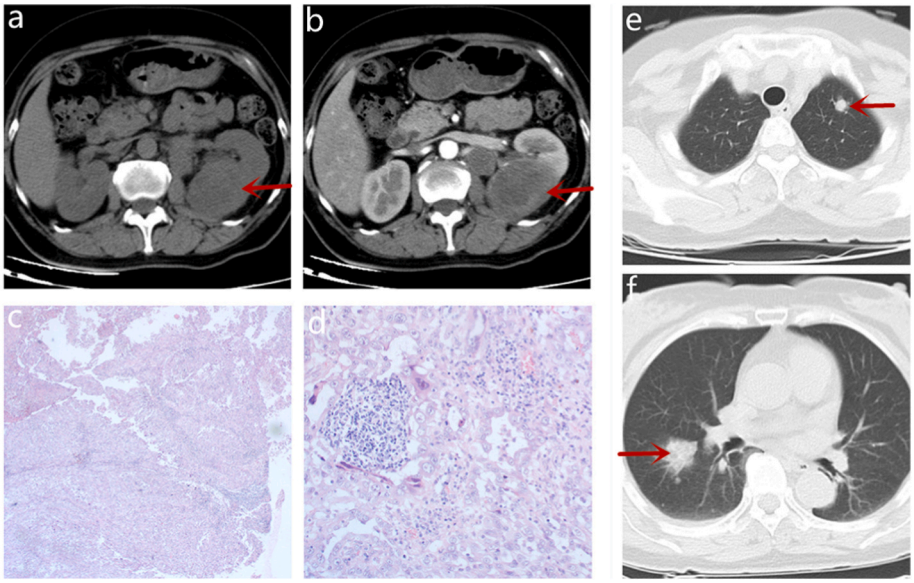

Fig. 1. (a)/(b): Contrast-enhanced abdominal CT revealed a poorly enhanced tumor of 50mm in diameter in the inferior pole of the left kidney, the red arrows indicate the primary tumor lesion. (c): The tumor mainly showed tubular and papillary growth patterns, (d): The tumor cells had eosinophilic cytoplasm and large, vesicular nuclei with prominent nucleoli, (e)/(f): Chest CT shows neoplasms in the lungs, the red arrows indicate the metastatic tumor lesions. CT = computed tomography. (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

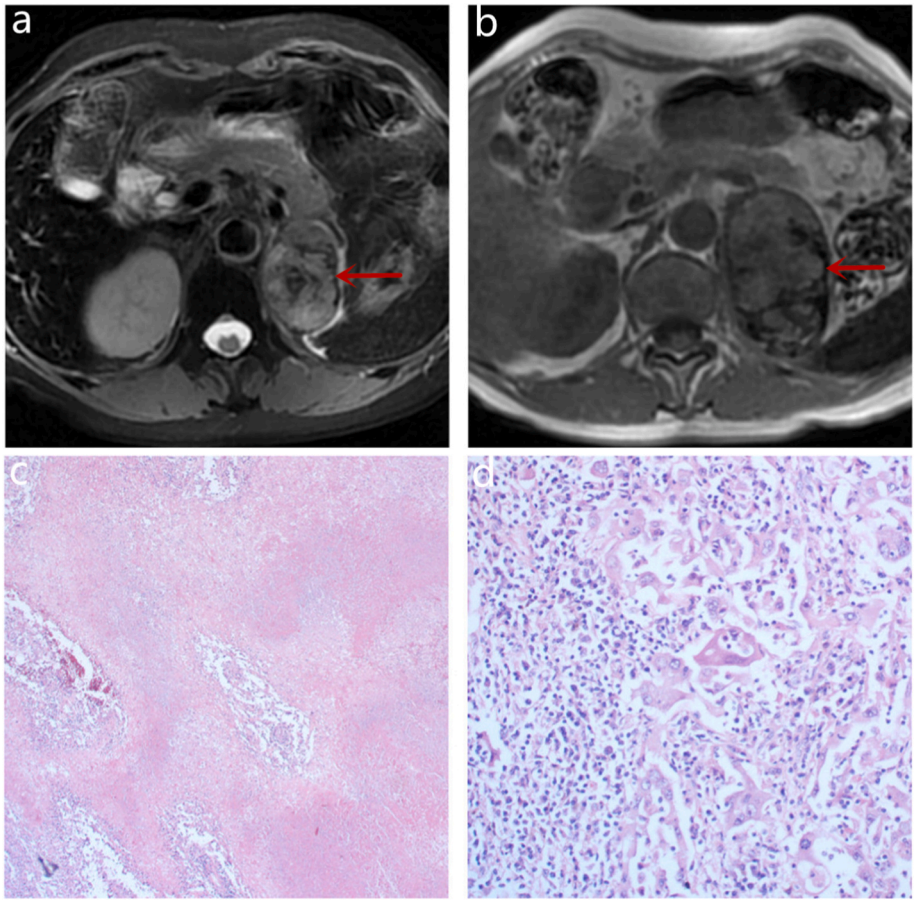

Fig. 2. (a)/(b): MRI shows metastasis to the left adrenal is growing larger and larger, the red arrows indicate the recurrent tumor in the left adrenal area. (c): The tumor demonstrated an infiltrative pattern with desmoplasia, (d): The stroma had extensive infiltration of inflammatory cells. MRI = magnetic resonance imaging. (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

plus gemcitabine and cisplatin, but she was excluded by this study because of the proteinuria. So, this patient then was started on targeted therapy with sunitinib only. However, a recurrence was found a few months after radical nephrectomy and it grew to 10cm in size in a short time. Cytoreductive surgery is considered for tumor burden reduction and relief of symptoms associated with larger masses. However, the metastases in the lung cannot be removed by surgery. We knew we needed to find a novel systemic therapy for this patient. Before we add nivolumab to the patient regimen, Robert.et al. reported that nivolumab demonstrated antitumor activity with a manageable safety in mRCC,[5] so

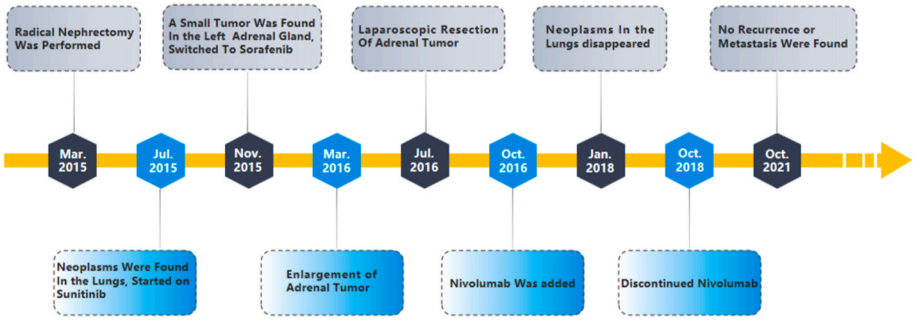

Fig. 3. Treatment flow chart.

we decided to use sorafenib plus nivolumab to control the progression of CDC. Fortunately, after 3 courses of administering nivolumab, the metastatic nodes in the lung had shrunk to 0.5 cm in diameter. The next 6 months, no recurrence or metastasis was found, and the lung metastases also disappeared. Nivolumab had been administrated to her for 2 years after the resection of the left adrenal tumor. It has been 6.5 years since the patient underwent radical nephrectomy with lymph node dissection. Her last visit to our outpatient department was on October 8, 2021, a CT scan of chest and abdomen was performed on which there were no recurrence or metastasis found.

To date, 5 case reports have described patients with metastatic CDC showing a response to nivolumab plus target therapy. All these reports suggest a potential benefit of nivolumab in collecting duct carcinoma.

4. Conclusions

We present a case of metastatic CDC, which is cured by multiple surgical interventions followed by combination therapy with sorafenib and nivolumab. Although Surgical resection of a recurring tumor is technically challenging and associated with added surgical morbidity, cytoreductive surgery may decrease the tumor load and increase the chance of curative treatment. With the addition of systemic therapy of nivolumab plus sorafenib to cytoreductive surgery made it possible to increase the OS of CDC more than 5 years.

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