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Case report

A huge renal cell carcinoma: Case report and literature review

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ABSTRACT

In the current era, because of the prevalence of sonography, renal cell carcinoma usually can be detected in the early stages and a huge tumor is rarely encountered. Recently, we found a huge clear cell-type renal cell carcinoma that weighed approximately 2.7 kg, which is very rare.

1. Introduction

Renal cell carcinomas account for approximately 80–85% of primary renal tumors and are the most common form of malignant renal tumor. Because of the prevalence of sonography, renal tumors usually can be detected at an early stage. A renal tumor with a diameter >20 cm is extremely rare. Herein, we report a huge renal cell carcinoma with a diameter of approximately 22 cm and weighing 2.7 kg.

2. Case report

A 48-year-old male with no underlying disease experienced progressive abdominal uplift for 8 months. He also mentioned body weight loss of approximately 20 kg over the past 2 years and gross hematuria several times. However, no flank pain, abdominal pain, nausea, vomiting, or bowel habit changes were reported by the patient. A physical examination found a significantly palpable and mild tender mass in the left upper quadrant of the abdomen. There was no superficial lymphadenopathy. Results of a laboratory examination showed the following levels of measurements: hemoglobin, 5.0 g/dL; platelets, 608,000/μL; and alkaline phosphate, 252 IU/L. Other laboratory data were within normal limits. An enhanced computed tomography (CT) scan (Fig. 1) revealed a huge tumor lesion (approximately 21.6 × 16.9 × 13.5 cm) with heterogeneous enhancement and some calcified contents in the left abdomen. No normal renal parenchyma was observed in the left kidney, and the left renal vein was extremely engorged with thrombi internally. There were lots of engorged, tortuous veins around the tumor. Multiple hepatic and pulmonary metastatic lesions with central necrosis were also noted.

Under general anesthesia, he received a successful left radical nephrectomy. During the operation, we found an engorged renal vein of almost 4 cm in diameter internally filled with thrombi (Fig. 2). In addition, there were extremely engorged vessels around the tumor (Fig. 3). The entire tumor with the left kidney was removed *en bloc*, and there was profound bleeding while we attempted to dissect it. Multiple lymphadenopathies were found during the operation, which were unresectable because of severe adhesion to the aorta. The total blood loss was approximately 8000 mL. The postoperative tumor size was 22 × 17 × 14 cm, and it weighed 2695 g (Fig. 4). Grossly, the cut surface revealed an ill-defined, yellowish, solid mass with multifocal necrosis and hemorrhaging. The tumor extended into the perirenal fat and renal vein, and the pathological stage was pT3a. The histopathological diagnosis was clear cell-type renal cell carcinoma with Grade 2 Fuhrman nuclear grading. Laboratory data revealed that the lactate dehydrogenase level was 1410 IU/L and that of calcium ions was 4.2 mg/dL. After the operation, he began targeted therapy with sunitinib. However, the follow-up abdominal CT scan showed rapid growth of metastatic cancer. The patient died 6 months after the operation.

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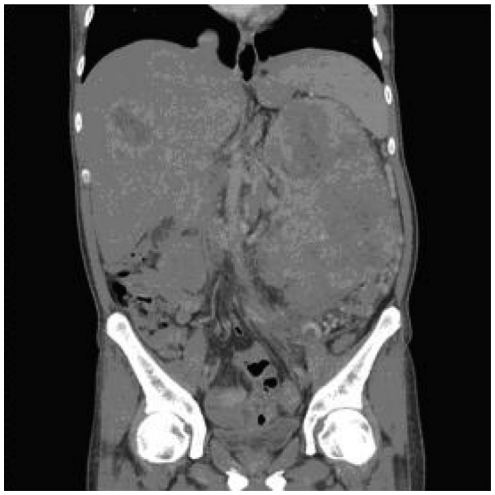

Fig. 1. A huge heterogeneous enhanced tumor lesion in the left abdomen. Liver and lung metastases were also noted.

3. Discussion

Renal cell carcinoma arises from the renal parenchyma. It accounts for approximately 2–3% of all adult malignant neoplasms. The main symptoms are flank pain, gross hematuria, and a palpable abdominal mass—the "classic triad." However, these symptoms usually indicate advanced renal cell carcinoma. Recently, because of the use of ultrasonography and CT, asymptomatic renal cell carcinoma can be detected much earlier than before. Volpe et al indicated an incidental detection rate of approximately 48–66%, which was only approximately 7–13% in the 1970s.[1] In addition, the size of detected renal cell carcinomas is smaller, and the stage is lower. More renal tumors are incidentally diagnosed and remain asymptomatic.[2–5]

Many reports found that renal cell carcinomas grow slowly at about 0.06–0.39 cm annually.[1,6,7] Because of the slow growth rate, metastasis may occur during the long period over which a tumor becomes huge. Some reports indicated that tumor size plays an important role in the prognosis. Kunkle et al stated that the metastatic disease increased by 22% with every 1-cm increase in tumor size.[8] The relationship between tumor size and prognosis in patients with renal cell carcinoma is also confirmed by the tumor node metastasis staging system, with the 5-year survival rate decreasing from approximately 80–100% in T1 cases to approximately 50–80% in T2 cases.[9]

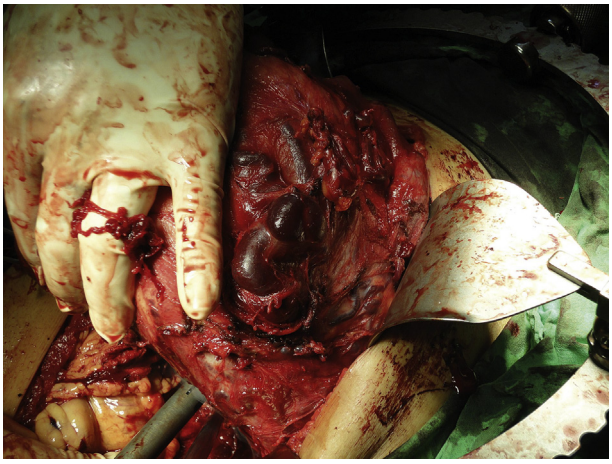

Fig. 3. Engorged vessels around the huge tumor.

A large study concluded there were five important prognostic factors to predict the survival rate. One of them is the absence of a prior nephrectomy.[10] In addition, the National Comprehensive Cancer Network guidelines suggest surgical resection as the primary treatment.[11] Surgical resection is an important key procedure to achieve long-term survival. There are various surgical approaches when performing a nephrectomy. In this case, we used a transperitoneal approach because it was easier to control the pedicle and perform a thrombectomy than with a flank approach.[12,13]

To treat metastatic renal cell carcinomas, targeted therapy instead of immunotherapy is the first-line therapy followed by surgical resection.[14] Targeting agents are also superior to immunotherapy in prolonging survival.[14–18] Several targeting agents, such as sunitinib, temsirolimus, and sorafenib, have been used to treat patients with metastatic renal cancer. In clear cell-type renal cell carcinomas, sunitinib is the first choice.[19] However, the response rate to sunitinib is approximately 47%.[15] In our case, the response to sunitinib was not obvious, and this patient had a poor outcome. Further immunotherapy may have been worth using.

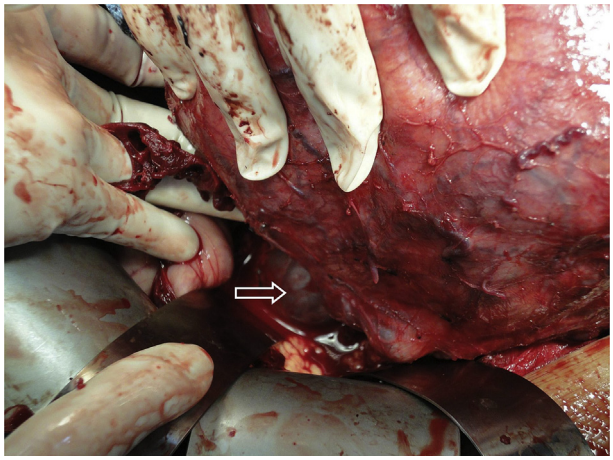

Fig. 2. Engorged renal vein filled internally with thrombi.

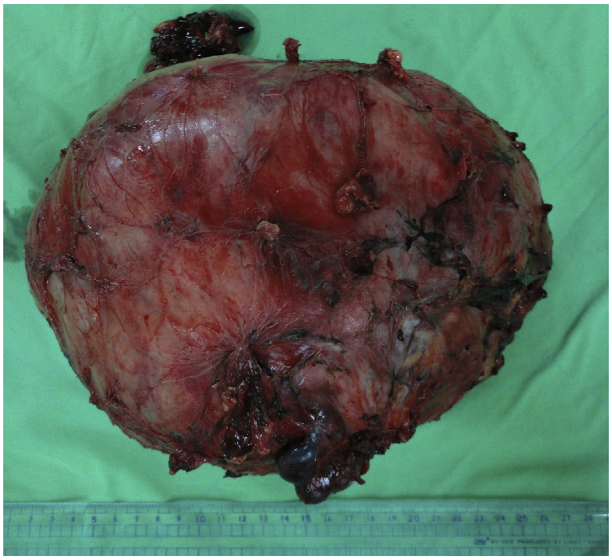

Fig. 4. The huge tumor after excision.

However, because of multiple metastases and cachexia, this patient died 6 months after the operation.

A huge renal cell carcinoma is unusual because of the low growth rate and the development of imaging techniques. In a literature review, there were several huge renal cell carcinomas. Ballesteros et al presented a huge renal adenocarcinoma of 5150 g.[20] A huge renal tumor was also reported by Wu et al who found a sarcomatoid renal cell carcinoma, which measured 28 cm.[21] Furthermore, one study reported a case of an enormous chromophobe renal cell carcinoma (with a tumor weight of 11.5 kg).[22] The largest reported clear cell renal cell carcinoma was $31 \times 31 \times 10$ cm.[23]

Most of the reported giant renal cancers were of the chromophobe or sarcomatoid type. There were only two case reports of giant clear cell-type renal cell carcinoma exceeding 20 cm in diameter.[23,24] In this case, we found a huge renal cell carcinoma, which is very rare. In our experience, with a huge renal cell carcinoma, the prognosis is very poor even when treated with a radical nephrectomy and targeted therapy.

Conflicts of interest statement

The authors declare that they have no financial or non-financial conflicts of interest related to the subject matter or materials discussed in the manuscript.

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