



Fat transformation of the tissue of the single left kidney 10 years after treatment of renal cell carcinoma of both kidneys

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ABSTRACT

Renal cell carcinoma morbidity grows in most of countries. All over the world 200,000 new cases are diagnosed every year, and approximately 102,000 patients die of this disease, with an incidence of nearly nine cases per 100,000 inhabitants per year. That's why, renal cell carcinoma is a challenging field in the current oncology research. Among urologic tumors, renal cell carcinoma ranks third in terms of incidence after prostate carcinoma and transitional cell carcinoma of the bladder. Renal cell carcinoma accounts for approximately 3% of adult malignancies and 90–95% of neoplasms arising from the kidney.

Bilateral renal cell carcinoma (BRCC) is a rare disease with poor prognosis which accounts for 2–6% of all cases of renal cell carcinoma. Only a few case reports and series with a small number of patients with bilateral renal cell carcinoma can be found in the literature.

We present an interesting clinical case of bilateral renal cell carcinoma with a total survival rate of more than 10 years.

Keywords: renal cell carcinoma; bilateral tumor; case report; embolization; treatment

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Introduction

Among urologic tumors, renal cell carcinoma ranks third in terms of incidence after prostate carcinoma and transitional cell carcinoma of the bladder, and first in terms of mortality rate. The more-developed countries show higher incidence of kidney cancer in both males and females, whereas the incidence in both sexes are lower in less-developed countries [1]. Higher incidences of kidney cancer are seen in Europe, North America, Argentina, Oceania and Japan [2]. The average age of patients with kidney cancer is 5–60 years [3]. In the Republic of Kazakhstan,

1201 new cases were diagnosed in 2018, 341 patients died of this disease, with an annual incidence of 6.5 cases per 100,000 inhabitants. In the South Kazakhstan region 98 patients were diagnosed with kidney cancer, with an incidence of 3.3 cases per 100,000 inhabitants and 15–17% of them in stage IV [4, 13]. Average 5-year relative survival rate for IV stage cancer is 13% according to Jonasch [5]. Difficulties in treating patients with bilateral tumors and a single kidney tumor are caused by the need to combine, on the one hand, the adequacy of tumor resection and, on the other hand, the maximum possible preservation of renal tissue.

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Case report

In September 2009, a 35-year-old female patient came to the oncology center (South-Kazakhstan regional oncology center, Shymkent, Kazakhstan). The patient complained of pain in the lumbar region.

An initial kidneys ultrasound showed a lesion on the right kidney measuring 19.3×18.9 cm, with inhomogeneous echostructure and undifferentiated cup-pelvis system, and in the lower pole of the left kidney, a lesion measuring 6.8×6.0 cm., with inhomogeneous echostructure, and differentiated cup-pelvis system. According to the results of instrumental and laboratory data of examinations and blood tests, dysfunctions of the filtration and urinary function of the kidneys were not detected (there were no signs of kidney dysfunction).

An initial computed tomography determined in the projection of the right kidney an irregular volume lesion measuring 144×99 mm in diameter, with a heterogeneous structure. In the lower pole of the left kidney, it determined an irregular volume lesion measuring 72×74 mm in diameter, with a heterogeneous structure. In the parenchyma of the upper and middle segment of the left kidney, multiple lesions were found measuring 10–13 mm.

According to the results of aurography, volumetric lesions of both kidneys were found. Decreased function of the right kidney was revealed.

A kidney angiography was performed, in which volumetric lesions of both kidneys were found. The right kidney showed the preservation of the function of the parenchyma and compression of the anatomical structures of the right kidney gate and compression of the pelvis and dysfunction of the outflow of urine on the right. There was a volumetric lesion of the lower pole of the left kidney.

As a result of the research, the patient was diagnosed with synchronous bilateral renal cell carcinoma, renal cell carcinoma of the left kidney T2N0M0 St II, and renal cell carcinoma of the right kidney T3N1M0 St IV.

In October 2009, Tumor Board decided to conduct 2 courses of chemotherapy + immunotherapy with vinblastine at a dose of 5 mg/m^2 , the total dose for 1 course was 10 mg, for 2 courses 20 mg, and immunotherapy-Roferon (interferon alpha-2a) at a dose of 4.5 million IU subcutaneously, every other day, the total dose was 45 million international units.

In November 2009, simultaneous embolization of the right renal artery and selective embolization of the tumor of the lower pole of the left kidney were performed (Fig. 1, 2).

Embolization technique [14, 15]: in the angiographic operating room, the patient underwent a puncture and catheterization of the right femoral artery under local anesthesia according to the Seldinger method, using the 5F laser scanner, and

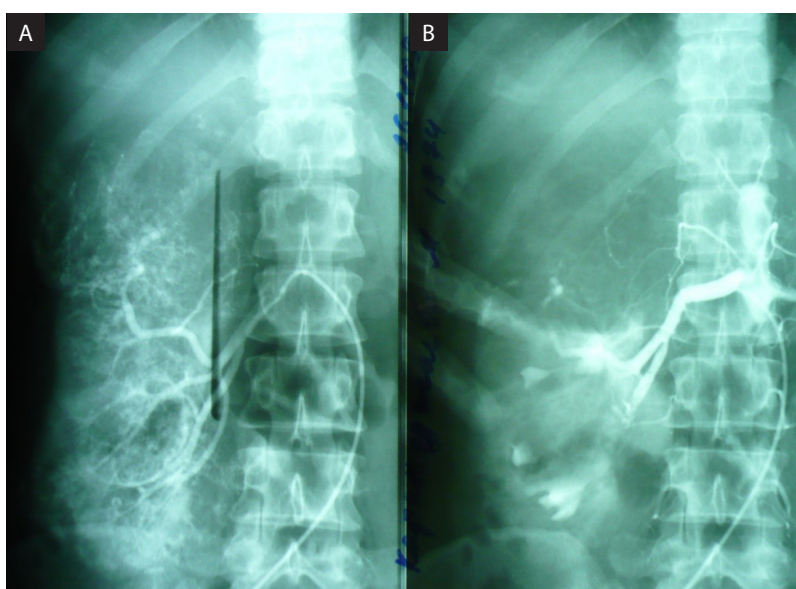


Figure 1. Angiograms of the right kidney. A. Before embolization (renal cell carcinoma of the right kidney with no excretory function); B. After total embolization

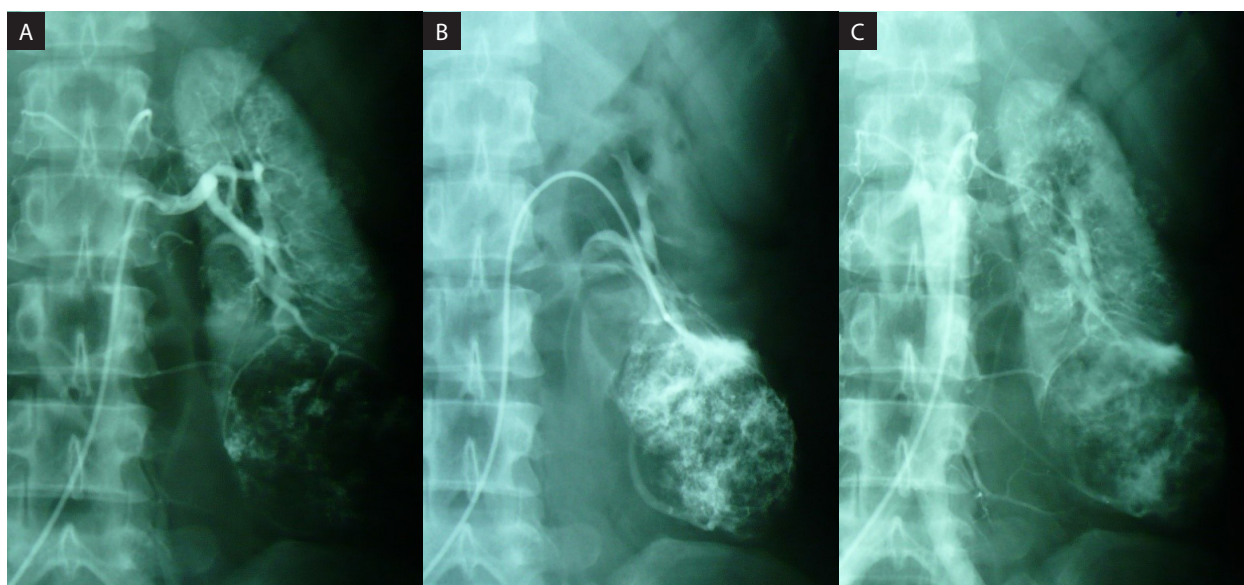


Figure 2. Angiograms of the left kidney. **A.** Before embolization (renal cell carcinoma of the lower pole of the left kidney); **B.** Selective chemoembolization; **C.** After chemoembolization

selective catheterization of the right renal artery with the CB-2 angiographic catheter (cathetercobra C2) 5F was performed under angiographic control. Taking into account the expected nephrectomy of the right kidney, the right renal artery was totally embolized by pieces of a hemostatic sponge (mechanical embolization was performed). Then, after the control angiography, the left renal artery was selectively catheterized with the same catheter, then the artery of the lower pole of the left kidney was superselectively catheterized from which the tumor of the left kidney was supplied. Oil chemoembolization of the tumor of the lower pole of the left kidney

was performed. Alpidol + Vinblastine 5mg (chemo-fat embolization) was used as an embolizing material [16].

In December 2009, the patient underwent a laparotomy, right-sided nephroureterectomy (Fig. 3). The result of postoperative histology was hypernephroid cancer.

In February 2010, the renal artery of the left kidney was embolized. Next, the patient received targeted therapy with sorafenib (nexavar) at dose of 400 mg twice daily.

In July 2010, the second embolization of the renal artery was performed.

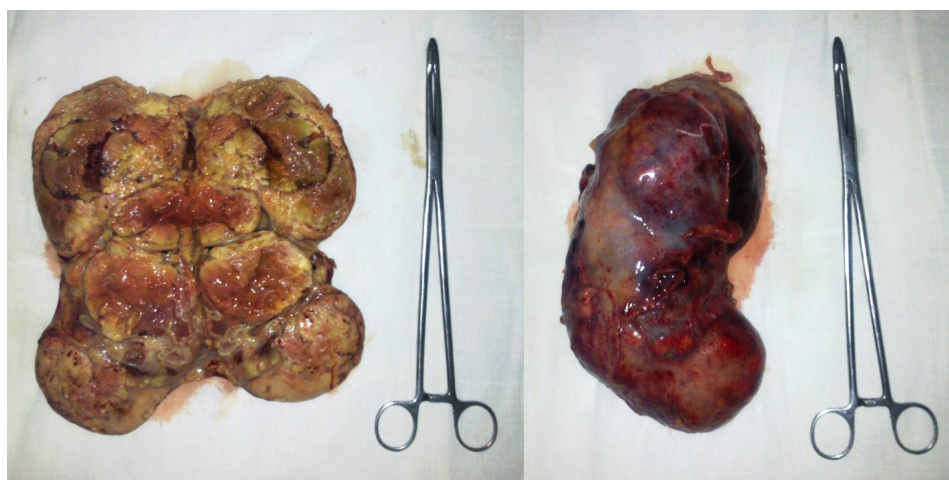


Figure 3. Removed macropreparation of the right kidney



Figure 4. Control angiography of the left kidney after selective embolization, 54 months later

In October 2010, the left renal artery was re-chemoembolized with doxorubicin (adrem) at dose of 50 mg.

Taking into account the stabilization of the process, it was decided to continue treatment with targeted therapy.

In April 2011, selective chemoembolization of the tumor of the lower pole of the left kidney with doxorubicin (adrem) at dose of 50 mg was performed.

In May 2012, an angiography of the left renal artery was performed. It was recommended that targeted therapy should be continued.

In May 2014, angiography of the vessels of the left kidney was performed, the results of which revealed the stabilization of the process (Fig. 4, 5). It was recommended that targeted therapy should be continued with sorafenib (nexavar) at dose of 400 mg twice daily, which the patient received for the next 3 years.

In 2017, an instrumental control examination of the patient was conducted, the results of which revealed stabilization of the process.

Taking into account the stabilization of the process according to the results of the instrumental examination, the therapeutic and clinical improvement of the patient’s condition, it was decided to dynamically monitor the patient twice a year for 3 years, then follow up once a year.

In November 2019, control examination showed focal fats of 0.9–3.9 cm in the tissues of the left kidney (Fig. 6).

Note: the filtration function of the left kidney is restored, the patient’s condition according to ECOG was 0.

Discussion

It should be noted that the sequence of treatment for BRCC is still controversial. Differences between the authors are caused by the choice of the side of the primary operation in synchronous BRCC. This issue has been studied since the 1980s. Some

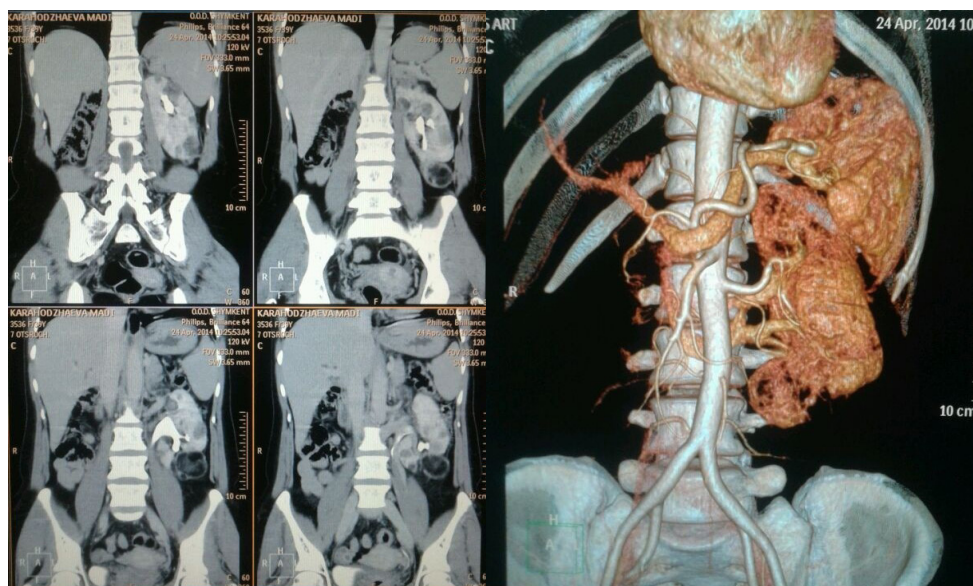


Figure 5. Computed tomography of the abdominal cavity and retroperitoneal space, 54 months later



Figure 6. Computed tomography of the abdominal cavity and retroperitoneal space, 120 months later

authors believe that, first of all, it is necessary to operate on a more affected kidney, on the side where removal is planned [6]. Others believe that the first operation should be a resection on the less affected side [7]. There are also proponents of a simultaneous operation from both sides [8–10]. Some studies compared 3 groups of patients with the first operation on the less affected side, the first operation on the more affected side, and with simultaneous operation on both sides [11]. The results of these studies showed that the choice of the order of operations does not affect the survival rate. But at the same time, the functional results of treatment were not evaluated, which is no less important for patients and their later life. In addition to compliance with oncological principles in the treatment of BRCC, the main thing should be the preservation of renal function (minimizing damage to the renal parenchyma).

Superselective embolization of the tumor plays a certain role in the treatment of BRCC, as an alternative to organ-preserving operations and local methods. Currently, there are few papers published in the literature that study the results of superselective embolization of kidney tumors in patients with BRCC. The total number of patients in the reports does not exceed 27. According to Suvorova [12], embolization of a single kidney leads to stabilization of the tumor size in 80% of cases. It should be noted that the methods of

endovascular occlusion in BRCC are of auxiliary importance when used in the form of preoperative embolization before removal of a larger kidney tumor, selective embolization of the tumor before resection of the kidney.

Thus, the determination of the optimal method of treatment and its results (oncological and functional) is still relevant. Contradictory literature data published in a few articles confirm the need to study BRCC to identify the optimal method of treatment of this pathology.

Conclusion

A clinical case demonstrates that a patient with a bilateral kidney carcinoma can receive specialized treatment. In the case described above, the patient after combined treatment and chemoembolization of the renal artery has lived for 10 years or more with the functions of a single kidney preserved.

In order to individualize approaches in the treatment of patients with bilateral kidney carcinoma, it is possible to use embolization of a kidney tumor as one of the «options» for treatment.

With a bilateral lesion or in the presence of a tumor of a single kidney, it is possible to use superselective embolization of the branches of the renal artery that supply blood to the neoplasm, which allows for a significant therapeutic effect and higher life expectancy of patients.

Conflict of interest

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