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INTRACORPOREAL RESECTION OF THE KIDNEY IN COLD ISCHEMIA WITH REGIONAL PERFUSION

Abstract. Renal cell carcinoma (RCC) is one of the most important problems of oncourology, due to the annually increasing morbidity and high mortality rate. According to the cancer registry, the incidence of renal cell cancer in the Republic of Kazakhstan (RK) occupies 12-13 rank places in the frequency of occurrence among all oncopathologies, on average, equally often affecting both sexes.

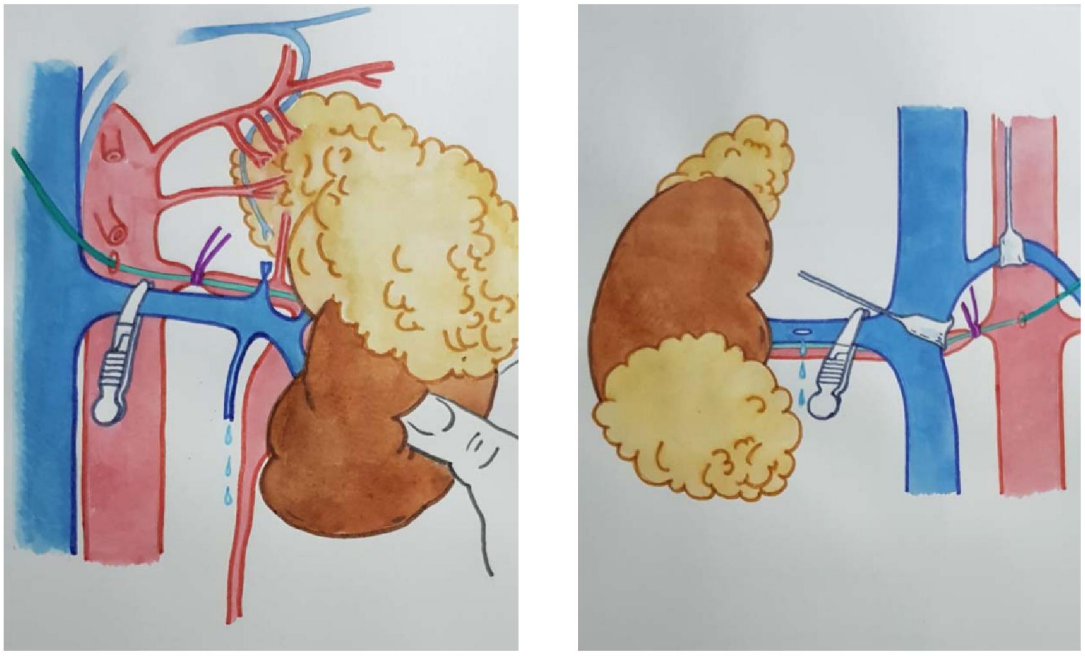
Keywords: carcinoma, oncourology, renal, cell.

Renal cell carcinoma (RCC) is one of the most important problems of oncourology, due to the annually increasing morbidity and high mortality rate. According to the cancer registry, the incidence of renal cell cancer in the Republic of Kazakhstan (RK) occupies 12-13 rank places in the frequency of occurrence among all oncopathologies, on average, equally often affecting both sexes [1]. Among the malignant neoplasms of the genitourinary system in the RK, RCC ranks 2nd after prostate cancer [1]. As is known, the main method of treatment of RCC is surgical and until recently the standard of treatment was radical nephrectomy. However, in recent years, with the improvement of diagnosis, early stages of kidney cancer have begun to be detected and the advantage of organ-preserving methods of treatment has been proved. According to the latest protocols of diagnosis and treatment of RCC, tumors of category T1a (up to 4 cm) are subject to partial nephrectomy (ie, resection of the kidney), and in tumors of category T1b (4 to 7 cm) - should be an individual approach based on the experience of the surgeon, the possibilities of the clinic and localization of the process in the kidney. This, as a rule, refers to the choice of resection methods for elective (electoral) indications. Quite a difficult situation arises with relative, and even more difficult with absolute indications, when it is necessary to decide on the feasibility and technically possible implementation of organ-sparing intervention in patients with cancer of the only / only functioning kidney with a large or centrally located formation, or with multifocal tumor growth. Currently, in this group of patients, the treatment strategy is reduced to nephrectomy with the introduction of the patient into the renoprival state with subsequent hemodialysis, or extracorporeal resection of the kidney with its subsequent autotransplantation. And if nephrectomy followed by hemodialysis dramatically worsens the quality of life of patients, extracorporeal resection of the kidney has many disadvantages and is accompanied by a large number of complications (risk of damage to the renal vessels, the risk of rejection of autograft, volemic, metabolic and hypothermic complications). As can be seen from the above, this category of patients is extremely difficult, both in the choice of treatment tactics and subsequent management and requires hemodialysis machines or other methods of detoxification. All of the above requires careful selection of patients and the choice of optimal treatment tactics, the search for alternative therapies.

The aim of the study was to improve the results of organ-preserving treatment of the only / only functioning kidney.

Material and methods. This method of surgical treatment was used in 4 patients with cancer of the only or only functioning kidney: in 2 cases, the right and in 2 cases, the left kidney. After median laparotomy, complete mobilization of the kidney and infrarenal aorta was performed. After preliminary bolus

heparinization, renal artery cannulation was performed punctually through the aorta. Blood flow to the kidney was isolated by clamping an artery over the cannula and renal vein at the confluence of the IVC. Then there was the regional perfusion of chilled (5-8^0 C) Custodial saline through a cannula in the renal artery. To prevent the ingress of this solution into the systemic circulation, the gonadal vein was crossed on the left, the lumen of the renal vein was opened on the right, through which the perfusion fluid was evacuated and the complete washing of the kidney from the blood to the pure solution was carried out (picture 1 A and B). Additionally, the kidney was covered with ice outside. Then resection of the kidney was carried out with the removal of the tumor and followed by suturing the cups, vessels and parenchyma of the kidney. After the resection was completed, the defect in the venous wall was sutured, the cannula was removed, the kidney was connected to the systemic blood flow and the defect in the aorta was sutured.

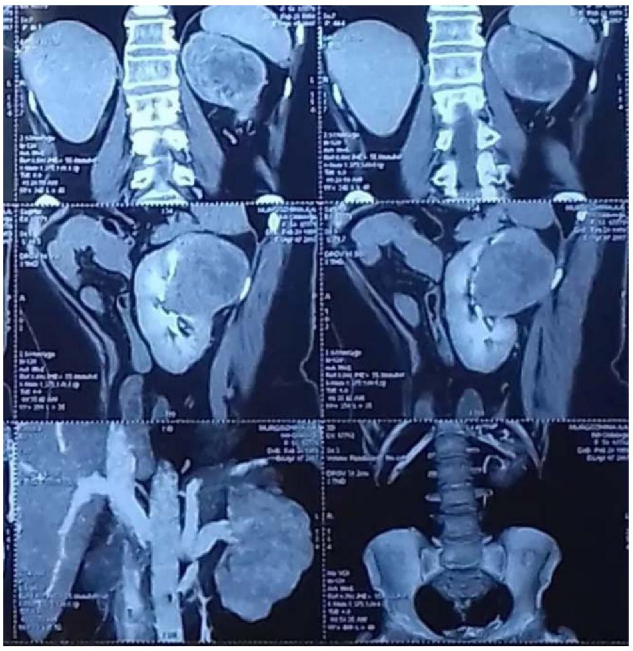


A B

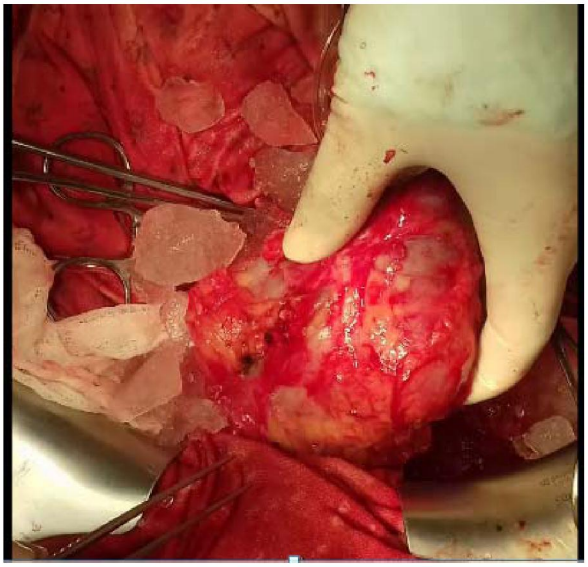
Picture 1 – a schematic view of kanalirovaniya renal artery (A – left, B – right) with irrigation of perfusion solution into the kidney and its isolation

Results. The average time of ischemia was 100 minutes (minimum 60 minutes, maximum 117 minutes). The average volume of blood loss is 345 ml (maximum – 500 ml). The maximum volume of formation is 10.5 cm. In three cases, a single tumor, in one - two tumors. In no case did not require additional appointment of extracorporeal detoxification methods. All patients before the operation, the value of creatinine was not greatly exaggerated, the highest level was in the range of 125 μmol/l. In the early postoperative period, the maximum value was in the range of 230 μmol/l, the rise was observed on 2-3 days after surgery. After the restoration of gastrointestinal function, there was a decrease in creatinine to preoperative levels. In 3 cases, kidney cancer was detected, in one – angiomyolipoma. Among the three cases of kidney cancer during the follow-up period (2 years), remission was observed in 2 cases, in one – progression after 6 months with the appearance of liver metastases.

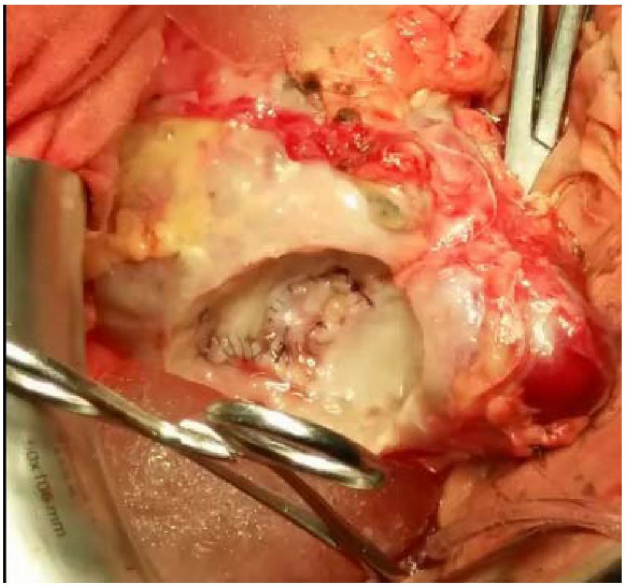
The following figures show a case study. Patient, N. 63 years old, Diagnosis: Carcinoma of the right kidney, condition after nephrectomy (2012), progression, metastasis to the only remaining left kidney the size of 9,5x6,0x5,0 cm, sprouting into the sinus of the kidney and the upper group of cups. Resection of the only remaining left kidney was performed according to the above procedure. The following pictures show the results of MSCT before surgery, intraoperative view, MSCT results in 2 years after surgery.



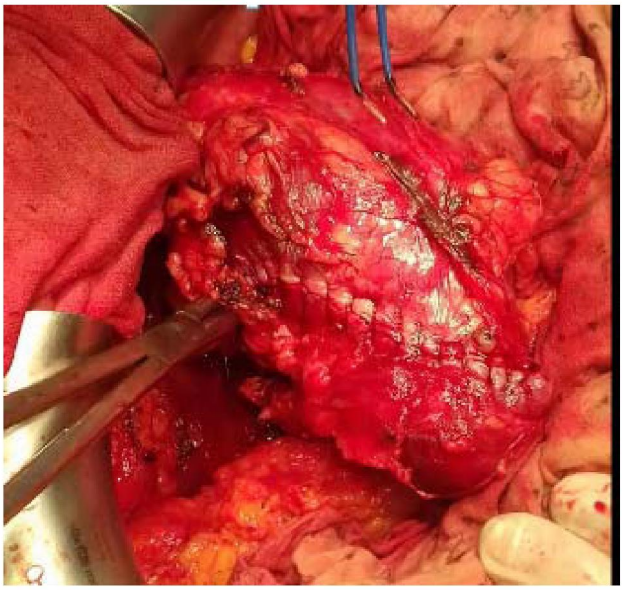
Picture 2 –
The results of the MSCT with bolus amplification carried out before surgery



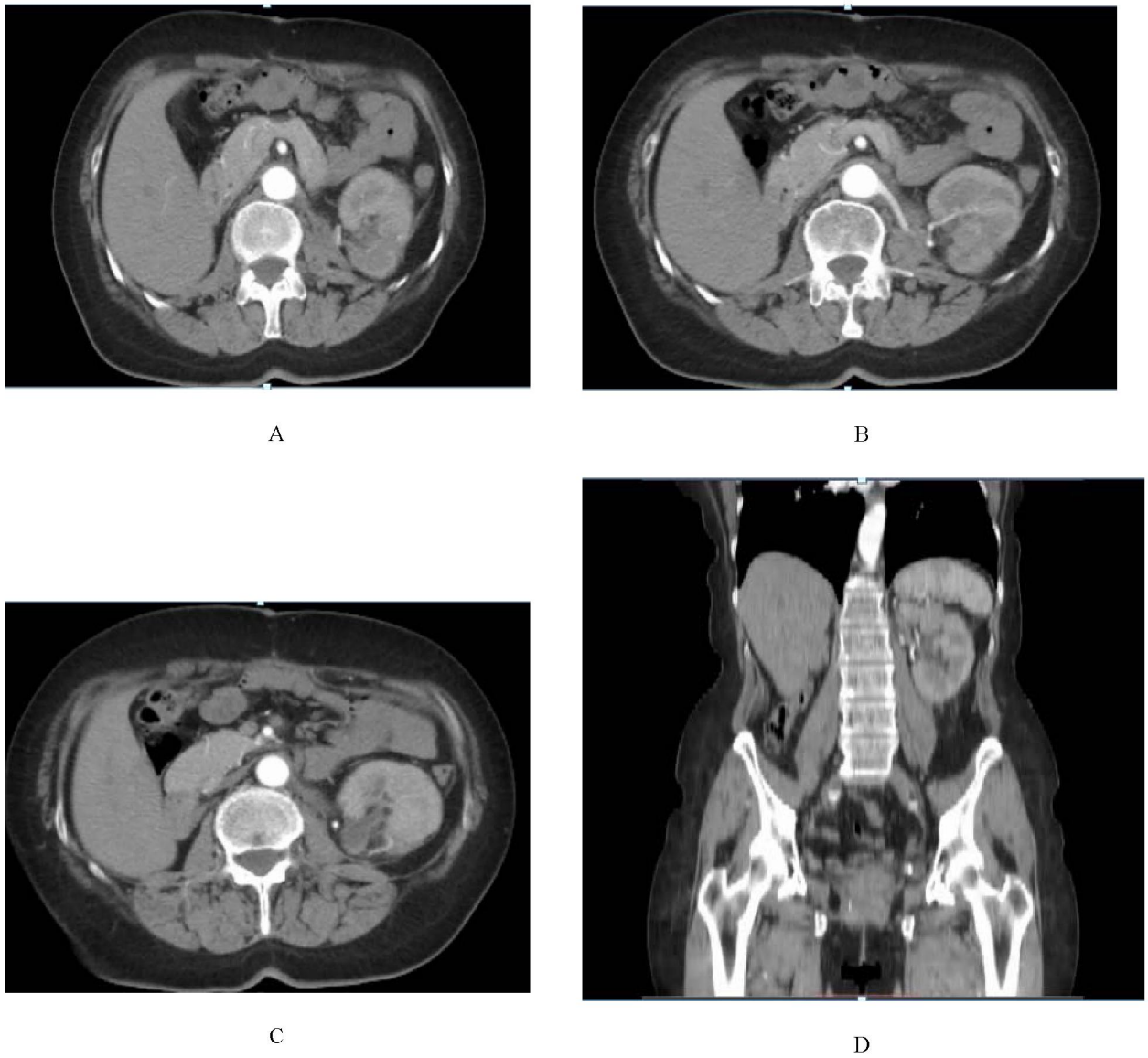
Picture 3 –
The left kidney is mobilized, the formation located in the upper pole is seen, mainly along the lateral edge with the transition to the back surface



Picture 4 –
View of kidney after resection and suturing of the abdominal system, the sinus of the kidney, blood vessels. Kidney of "white" color is a result of laundering it from formed elements



Picture 5 –
The final view of the kidney after resection – the kidney is connected to the systemic circulation



A B C D

Picture 6 (A,B,C,D)– the result of MSCT of abdominal and retroperitoneal organs in different scanning planes – without signs of recurrence (2 years after resection)

Discussion. This technique was developed by a team of authors on the basis of the Kazakh Research Institute of Oncology and Radiology, when we were forced to go for extracorporeal resection of the only remaining left kidney with a 9 cm tumor growing into the sinus and the upper cup. However, intraoperatively, we faced certain difficulties and had to change tactics, in addition, the lack of "artificial kidney" devices in the clinic increased the risk of possible complications. To increase the tolerance of renal tissue to ischemia, local hypothermia with icing on the kidney, perfusion therapy with cardioplegic solutions, which is used for extracorporeal resection and sometimes for resection in vivo, can be used. From the literature it is known that in the latter case, the perfusion of the renal vessels (artery) was performed by puncture with a syringe needle or opening of the lumen of the artery with subsequent irrigation solution [2,3]. Our technique was characterized by the fact that we cannulated the renal artery through the aorta, which is a great advantage due to the fact that the intima is not damaged and does not develop in the subsequent narrowing of the renal artery. And the second, irrigation is carried out with the necessary volume and creates sufficient pressure in the vessels and capillaries of the kidney, contributing to adequate washing them from the blood elements. It turned out that a similar technique has already been carried out by colleagues from St. Petersburg, which was published in the journal «Урологические

ведомости» (2015, №1) [4]. This technique was used to treat cancer of the left kidney, but the article States that in such situations on the right side they performed an autopsy of the renal artery with its cannulation, which in our opinion is impractical.

Conclusion. Thus, this method of operation has obvious advantages, low risk of postoperative complications, good results with careful selection of patients and in some situations can serve as an alternative to extracorporeal resection of the kidney.

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РЕГИОНАРЛЫҚ ПЕРФУЗИЯСЫ МЕН БҮЙРЕКТІҢ СУЫҚ ИШЕМИЯ КЕЗІНДЕГІ ИНТРАКОРПОРАЛДЫҚ РЕЗЕКЦИЯСЫ

Аннотация. Бүйрек жасушаларының карциномасы (CRP) онкологияның маңызды мәселелерінің бірі болып табылады, себебі жыл сайын аурудың көбеюі және өлім-жітімнің көп болуы. бүйректік жасушалық карцинома ауруы аурудың барлық патологиялары арасында пайда болу жиілігі бойынша 12-13 құрайды, орта есеппен екі жынысқа да бірдей әсер етеді.

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ИНТРАКОРПОРАЛЬНАЯ РЕЗЕКЦИЯ ПОЧКИ В УСЛОВИЯХ ХОЛОДОВОЙ ИШЕМИИ С РЕГИОНАРНОЙ ПЕРФУЗИЕЙ

Аннотация. Почечно-клеточный рак (ПКР) относится к одной из наиболее важных проблем онко-урологии, в связи с ежегодно возрастающей заболеваемостью и высоким уровнем смертности. По данным канцер-регистра заболеваемость в Республике Казахстан (РК) почечно-клеточным раком занимает 12-13 ранговые места по частоте встречаемости среди всех онкопатологий, в среднем одинаково часто поражая оба пола.

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