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# EARLY AND LATE POSTOPERATIVE COMPLICATIONS IN PATIENTS WITH LOCALIZED AND LOCALLY ADVANCED RENAL CELL CARCINOMA

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**ABSTRACT** — **BACKGROUND:** Modern Russian statistics show that the percentage of renal cell carcinoma (RCC) among all oncological diseases has increased and amounted to almost 5% in 2019. The main method of treating RCC is radical nephrectomy in localized RCC, which is supplemented by the removal of regional lymph nodes in locally advanced RCC.

**AIM:** To evaluate early and late postoperative complications in patients with localized and locally advanced renal cell carcinoma.

**METHODS:** We've analyzed the results of surgical treatment and postoperative complications in 378 patients with clinically proven localized and locally developed RCC.

**RESULTS:** The total number of complications after surgical treatment of patients with localized and locally advanced RCC was 24 (6.3%) patients. Moreover, in the treatment of the localized form of RCC, postoperative complications are 3 times less common than in the locally advanced form of RCC ( $p < 0.05$ ). The most common complication after surgical treatment of RCC was bleeding which we observed in 11 (2.9%) patients.

**CONCLUSION:** After surgical treatment of RCC, the proportion of complications is not high, but they can have unpleasant consequences. In the late postoperative period the most common complication bleeding is followed by lymphorrhea and urinary tract infections.

**KEYWORDS** — renal cell carcinoma, bleeding, postoperative complications, nephrectomy, advanced lymphadenectomy.

## INTRODUCTION

Renal cell carcinoma (RCC) is one of the most important problems of oncurology. Its incidence has increased annually causing morbidity and mortality from this malignant neoplasm [1, 2]. In the structure of oncological diseases, the percentage of RCC in Russia was 4.8% in 2019 [3]. In terms of the growth rate of cancer incidence in Russia, RCC consistently ranks third (43.9%), second only to prostate and thyroid tumors [3].

The main method of treating RCC is radical nephrectomy [4]. The principles of performing radical nephrectomy include early ligation of the renal artery and vein, removal of the kidney along with the surrounding paranephral tissue, and the ipsilateral adrenal gland. The presence of RCC metastases in the lymph nodes is one of the most significant adverse factors that reduces the survival rate of patients to 5 — 30% and contributes to the risk of metastasis to distant lymph nodes. Therefore, in the early stages of development, it is necessary to perform a regional lymphadenectomy, when performing surgery for RCC. In these cases, the expansion of the volume of the operation lengthens the time of the operation, may contribute to an increase in the volume of blood loss and the development of postoperative complications.

*Aim:*

To evaluate early and late complications after surgical treatment of patients with localized and locally developed renal cell carcinoma.

## MATERIALS AND METHODS

The study included 378 patients with proven clinically localized and locally advanced RCC (according to ultrasound and computed tomography). We did not include patients with distant metastases in the study.

Depending on the type of surgical treatment, all patients were divided into two groups:

Group 1: patients underwent radical nephrectomy without extended lymphadenectomy ( $n = 126$ );

Group 2: patients underwent radical nephrectomy with extended lymphadenectomy ( $n = 252$ ).

In all patients, we've recorded the number and severity of complications that developed in the postoperative period: bleeding, lymphorrhea, a urinary tract infection, etc.

The statistical analysis was performed using spreadsheets "EXCEL" and "STATISTICA 8.0". Statistical processing was carried out with the calculation of arithmetic mean values ( $M$ ) and their errors ( $m$ ). Differences were considered significant at  $p < 0.05$ .

## RESULTS

Both groups were dominated by patients with clinically localized RCC and kidney tumor size from 4

cm to 7 cm (cT1b): in the first group — 58 (46%), in the second group — 91 (36.1%). In the second group, there were significantly more patients with a kidney tumor size greater than 7 cm (cT2) compared to the first group: 62 (24.6%) versus 23 (18.2%), respectively ( $p < 0.05$ ). There were also significantly more patients with signs of the tumor leaving the kidney capsule and entering the paranephral tissue (T3a) in group 2: 71 (28.1%) vs. 13 (10.3%) ( $p < 0.05$ ). The distribution of patients in both groups, taking into account the clinical stage of the disease, is shown in Fig. 1.

However, RCC up to 4 cm in size (corresponding to T1a) has a 5% risk of death within 5 years without treatment [5]. Therefore, doctors are increasingly using advanced lymphadenectomy to improve the results of RCC treatment. The addition of extended lymphadenectomy to radical nephrectomy improves the 10-year survival rate of patients with metastatic lymph node involvement. In locally advanced RCC, lymph node dissection is performed both to accurately determine the stage of the disease, and to reduce the frequency of local recurrence and increase the survival

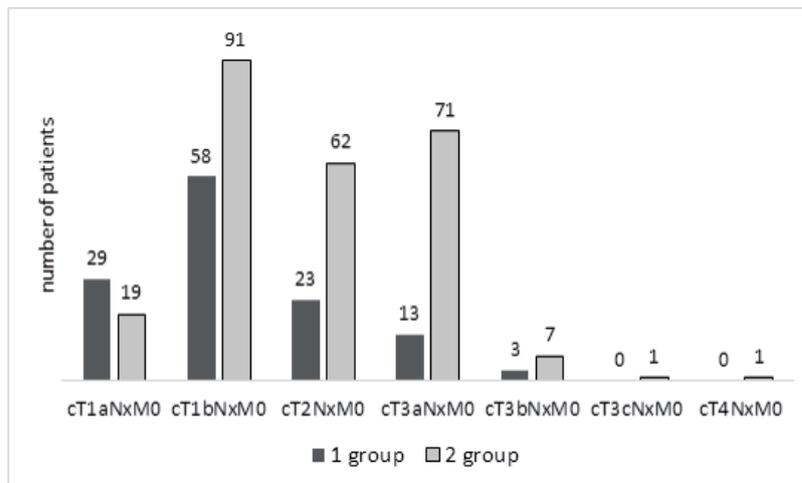


Fig. 1. Distribution of patients in both groups, taking into account a clinical stage of the disease

The duration of the operation in patients of the second group was significantly higher lasting  $171.3 \pm 46.9$  minutes, and in the NE group without regional LAE —  $142.4 \pm 39.3$  minutes ( $p < 0.01$ ).

We have recorded complications after surgical treatment of patients with localized and locally advanced RCC in 24 (6.3%) patients (Fig. 2). Among the patients of the first group of the study, complications were in 6 (4.7%) patients, against 18 (7.1%) people in the second group ( $p < 0.05$ ). Of all the complications, we most often encountered bleeding (both during surgery and in the early postoperative period): in 3 (2.8%) people from the first group and in 8 (3.1%) — from the second ( $p < 0.05$ ). In 10 (2.6%), bleeding was stopped conservatively. Only 1 (0.4%) patient from the second group needed emergency surgery to correct hemostasis.

In the late postoperative period, we have recorded complications in 7 (1.8%) patients. During this period, we most often encountered long-term lymphorrhea.

## DISCUSSION

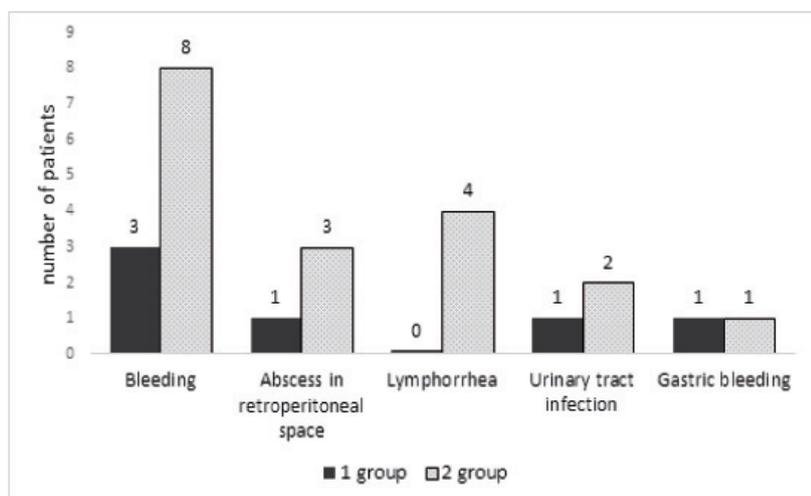
The standard of treatment for localized and locally advanced RCC is radical nephrectomy [4].

rate of patients. However, against the background of the expansion of the volume of surgery in the treatment of RCC, complications may develop in the early and late postoperative period. Our study showed that one or another complication occurs in every 16 patients with surgical treatment of RCC. Moreover, in the treatment of a localized form of RCC, postoperative complications are 3 times less common compared to the locally common form of RCC. According to Wongvittavas N et al. postoperative complications in the surgical treatment of RCC can reach 31% [6].

Bleeding is one of the most dangerous complications of radical nephrectomy. Bleeding often develops when performing an extended lymphadenectomy. This is more often associated with damage to the branches of the aorta and inferior vena cava, lumbar and adrenal vessels. In our study, 11 (2.9%) patients developed bleeding.

## CONCLUSION

After surgical treatment of RCC, the most common complication is bleeding. In the late postoperative period, lymphorrhea and urinary tract infections are most frequent.



*Fig.2. Distribution of patients in both groups, taking into account complications that have developed after surgical treatment*

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