



## **MODERN METHODS OF RECOVERY OPERATIONS IN PATIENTS WITH COLOSTOMY.**

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<b>Article history:</b>	<b>Abstract:</b>
<b>Received:</b> January 8 <sup>th</sup> 2023	Literature data on the results of reconstructive surgeries performed in patients with a previously applied colostomy were analyzed. The issue of restoring the integrity of the large intestine is quite relevant in colorectal surgery, the imposition of colostomy varies from 7 to 63 %. Despite the improvement of existing and development of new methods of reconstructive operations, the active use of intraoperative and postoperative diagnostic methods, it is not possible to completely avoid complications. The incidence of failure of colonic anastomosis sutures reaches 3.8-14.6%. Further study and development of methods of reconstructive operations after colostomy is needed to minimize the number of postoperative complications and improve the results of treatment of patients with colorectal pathology.
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At the present stage of colorectal surgery, colostomy is used in many patients with complicated cancer, diverticulosis, and colon injuries колостомы, the frequency of which varies from 7 to 63 % [1].

Restoring the integrity of the colon is one of the main issues of colorectal surgery. Most surgeons have to deal with various pathologies that require resection of the colon area. Very often and for some reason, it is impossible to apply a primary anastomosis. In such cases, the surgeon is forced to complete the operation by applying a colostomy.

The imposition of a colostomy can be a consequence of abandonment of the pathological process, an error in diagnosis, late treatment of the patient, a serious condition of cancer patients (from 76 to 90 % of patients are hospitalized later than 24 hours after the first signs of the disease appear) [2].

Also, the cause may be the presence of severe intestinal obstruction, peritonitis, intraoperative bleeding, which worsens the general condition of the patient and makes it more appropriate to apply a colostomy.

The presence of a colostomy has a number of negative factors that significantly affect the patient's quality of life. Therefore, in the future, the question still arises about restoring the physiological patency of the intestine. The goal of this approach is to ensure the patient's recovery, minimize the risk of postoperative complications, and achieve good long-term results.

Patients with urgent complications of colorectal cancer (CRC) account for more than 60% of all patients with tumors of this localization.

In 1948, C. F. Dixon published the results of the treatment of 400 patients who underwent the first restoration of the natural passage of the colon by forming a colorectal anastomosis with a manual suture, with a mortality rate of 2.6% and a complication rate of 40.7% [3].

Univariate and later multivariate analysis revealed that the most significant factors affecting 5-year survival were age 70 years and older, the presence of complications such as acute intestinal obstruction and tumor perforation, comorbidity, the nature of surgical interventions performed (single-stage surgical interventions), and the presence of acute intestinal obstruction and tumor perforation.

the presence of postoperative complications, tumor growth along the resection lines (R1-resection), tumor growth along the length of the intestine >7 cm, the absence of adjuvant treatment.

In addition, there were statistically significant differences in 3- and 5-year survival rates [2].

Emergency surgical interventions in colon cancer are associated with 15-20% mortality and 40-50% postoperative complications, which are significantly higher than in elective CRC surgery [2, 4, 5], and a 5-year survival rate, which is 10,0-39,6% [2, 4].

Performing emergency resection procedures in patients with complicated CRC in general surgical hospitals was accompanied by a high frequency of severe postoperative complications classified according to Clavien-Dindo as stage IIIB (17.1%) (including anastomosis failure-14.2%), IVA – IVB-8.3%, and mortality was 24.4 % [6].



Localization of the tumor in the colon is one of the prognostic factors. It is believed that patients with colorectal cancer have a better prognosis than patients with cancer rectum [7].

When performing a single-factor analysis, the location of the tumor, the size of the tumor, the duration of surgery, and the level of hemoglobin are low.

before surgery, the amount of blood loss, male gender, diabetes mellitus, stenosing nature of the tumor, the degree of anaesthetic risk according to ASA >2, open surgery, and bleeding from the anastomosis were associated with the risk of anastomosis failure. Based on the results of a multi-factor analysis

The main independent risk factors were low tumor location, tumor size, duration of surgery, male gender, diabetes mellitus, lack of preventive fatigue, open surgery, and bleeding from the anastomosis.

When performing a single-factor analysis of a male patient: albumin level of 100 g / l (in case of anastomosis failure), location of the tumor in the lower ampullary rectum, locally advanced nature of the tumor (T4), presence of affected regional lymph nodes (N1-2), duration of surgery, intraoperative blood loss, intra-operative transfusion of drugs **RESULTS:** open surgery, lateral lymphodissection, total mesorectomy, high ligation of the inferior mesenteric artery, tumor size, and simultaneous resection of other organs were associated with the risk of anastomosis failure. According to the results of a multivariate analysis, independent risk factors were male gender, albumin level [8].

Factors influencing postoperative mortality are gender, age, type of urgent complication, comorbidity, laboratory parameters (general clinical blood test. leukocyte count; biochemical blood test-creatinine index, D-dimer level), tumor localization, type of emergency surgery performed, tumor-associated factors: stage of adenocarcinoma

differentiation аденокарциномы, pathological stages T and N, tumor size along the length of the intestine (up to 4 cm, 4-7 cm, more than 7 cm), the nature of the performed procedure resection intervention (R0/R1). Emergency surgery alone is not a risk factor. In this study, the level of postoperative mortality was most affected by tumor perforation, the presence of diseases of the cardiovascular system in combination with diseases of other systems, resection interventions with the formation of a primary anastomosis and two-stage surgical interventions with the removal of the tumor at the 1st stage, and an increased level of D-dimera in передоперационном the preoperative period [9].

The reasons for the development of anastomosis failure are a number of factors that may or may not be modifiable. They can also be divided into general: age, gender, obesity, smoking, diabetes mellitus, poor

nutrition, fluid transfusion, duration of surgery, long-term corticosteroid therapy, use of NSAIDs; and local: type of surgery, level of anastomosis, type of anastomosis, radiation therapy.

Modifiable factors include: smoking cessation, proper nutrition, targeted fluid therapy, tightness of the anastomosis, its blood supply, compliance with the principles. aseptics and ablasy.

When comparing laparoscopic and open surgery, there was no statistical difference in the failure of the anastomosis, but recent studies show that in laparoscopic operations, the percentage of anastomosis failure remains low (1-19 %) [10, 11, 12]. Since the introduction of stapling devices, surgeons have sought to find a way to strengthen the staple suture to prevent failure. Biological adhesives, stenting of the anastomosis, and strengthening of the anastomosis with a second row of nodal sutures were used for this purpose. However, there is currently no consensus on the choice of a method for preventing anastomosis failure. There is no evidence that any of the above methods prevent the development of insolvency.

One of the most modern and promising methods is the assessment of anastomotic perfusion using indocyanin green (ICG). However, the use of this method requires special equipment and is complicated by the lack of a clear classification of disorders in the anastomosis and related tactical decisions [12, 13].

One of the methods of laparoscopic application of an anastomosis and its intraoperative evaluation is that the laparoscopic line of the stapler suture is supported by separate nodal seromuscular sutures. To assess the anastomosis, a conventional laparoscope with инфуляцией CO2 insufflation at the level of 6 mm of water is inserted through the anal opening, which makes it possible to identify and eliminate suturing defects, eliminate bleeding, assess the presence of ischemic areas and simultaneously perform a pneumohydroprobe. The operated patients developed a number of complications: intra-abdominal bleeding - 1.6%; anastomosis failure-5-6. 2%; submucosal hematoma-1.6%; intraluminal bleeding-3.1% [13].

The frequency of anastomosis failure when using such methods as the formation of a discharge colostomy, transanal intubation of the large intestine, extraperitonization of the anastomosis is 20-30%, and the frequency of complications – up to 50%.

Some surgeons suggest performing the recovery stage for up to 3 months [14, 17]. Others - 6-12 months, claiming that by this time the inflammation in the intestinal wall completely disappears [15, 16, 17].

Some authors suggest a method for restoring intestinal continuity using a duplicated anastomosis. Postoperative complications occurred in 8.5% of cases



(wound suppuration, adhesive small bowel obstruction) [17].

One of the most urgent problems of abdominal surgery is the failure of sutures межкишечныхof intestinal anastomoses. The incidence of such complications, according to various authors, reaches 2.0-8.1% - in small intestinal anastomoses and 3.8-14.6% - in operations on the colon [18, 19]. Failure of anastomoses is associated with a mortality rate of 14-21.7% [20], and with the development of widespread peritonitis and abdominal sepsis, the mortality rate increases to 43-82.9%.

The level of serum oxypoline in the group of patients without phenotypic signs of dysplasia was (36.9±1.6) mmol/l, which is almost twice as high as in the control group (21.2±0.8) mmol/l. Such changes may be due to increased proteolytic activity in patients with suture failure

anastomoses. This is confirmed by the data of a number of authors that in case of failure and development of peritonitis, a pronounced and persistent inconsistency in the proteinase – inhibitor system develops. протеиназplasma proteases [21].

Measures to reduce intra-intestinal pressure include direct (intubation of the intestine, transanal decompression) and indirect methods (blockade, medication, physiotherapy) decompression. Measures to improve the quality characteristics of the intestinal suture consist in developing a method for forming a colonic anastomosis that provides a high level of mechanical strength and biological tightness [22].

A large number of studies are devoted to the analysis of the performed intraoperative aerohydrotest or the use of intra-intestinal administration of methylene blue after applying a colorectal anastomosis to exclude technical errors in its execution. This method does not lead to the complete elimination of postoperative failure, but there is a 3-fold reduction in the number of failures compared to the control group [23, 24]. An effective method is also intraoperative colonoscopy, which is performed to control bleeding and the quality of application of highly located anastomoses. Assessment of microcirculation in the area of anastomosis overlap is another important method for determining the risk колоректальногоof colorectal anastomosis failure. Application of laser Doppler flowmetry. it allows to identify critical decreases in blood supply to the anastomotic zone and, if necessary, correction, which leads to a decrease in the number of patients up to 1% [25].

One of the methods of surgical prevention is intraoperative fluorescence angiography, performed by injecting индоцианина green indocyanine with autofluorescence in the infrared range into the peripheral vascular bed. This allows you to visually assess the blood supply to the intestinal wall at the

stage of resection and anastomosis, and leads to a decrease in the number of cases.

4% [26, 27].

A method for determining the tissue viability index in the area of anastomosis is proposed for clinical use. This calculated indicator is defined as the ratio of intramural pressure at the mesenteric and anti-splashing edges of the intestine to the systemic arterial pressure at the shoulder. The authors proved that lowering this indicator below 1 leads to an increase in the number of anastomosis failures [28].

Transabdominal strengthening or so-called laxative sutures is a technique for strengthening the colorectal anastomosis by forming 4 serous-muscular sutures on top of the formed anastomosis from the abdominal cavity for 3, 6, 9, 12 hours according to the conventional dial. Based on the results of a retrospective comparative study by R. Gadiot et al. it is shown that this technique can significantly reduce the frequency колоректальногоof colorectal anastomosis failure. Thus, the failure of the anastomosis developed in 1.4% of cases. In addition, the strengthening technique allowed us to abandon the formation of preventive fatigue in 8.4% of cases.

In a retrospective comparative study, K. Maeda et al. the technique of transabdominal anastomosis strengthening was performed laparoscopically, which also allowed to strengthen low anastomoses, which are placed 4-7 cm from the edge of the anus. An important technical aspect of this technique was the fact that all patients were additionally submerged at the intersection of circular and linear stapler sutures. In a prospective comparative study, S. J. Baek et al. 110 patients were included, of which 47 patients were included in the main group with anastomosis strengthening, in which preventive fatigue was formed in 6 (12.8%) patients. The incidence of anastomosis failure in patients developed in 6.4% of cases. Conclusions The problem of restoring the integrity of the large intestine is quite relevant for colorectal surgery, the application of colostomy varies from 7 to 63%. Despite the improvement of existing and development of new methods of reconstructive operations, the active use of intraoperative and postoperative diagnostic methods, it is not possible to completely avoid complications. The incidence of failure of colonic anastomosis sutures reaches 3.8-14.6%.

Further study and development of methods of post-colostomy reconstructive surgery is required to minimize the number of postoperative complications and improve the results of treatment of patients with colorectal pathology.

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