

Comprehensive individualized approach to the treatment of patients with acute intestinal obstruction of tumor genesis

M. A. Kubrak, S. M. Zavgorodnyi, M. B. Danyliuk, Yu. O. Chemeris

Zaporizhzhya State University of Medicine and Pharmacy

Abstracts

Objective. To analyze the results of using a comprehensive individualized approach to the treatment of patients with acute intestinal obstruction of tumor genesis.

Materials and methods. The study included 125 patients with acute intestinal obstruction as a complication of colon cancer.

Results. The use of a strategy of a comprehensive individualized approach to the treatment of acute intestinal obstruction of tumor genesis made it possible to increase the proportion of delayed surgical interventions from 65.31 to 81.08% ($p = 0.0297$), reduce the proportion of operations that ended in colostomy from 79.59 to 21.62% ($p = 0.0081$), reduce the incidence of perioperative complications from 42.86 to 17.57% ($p = 0.0267$) and mortality from 12.25 to 5.41% ($p = 0.0491$).

Conclusions. The use of the developed strategy for the complex treatment of acute intestinal obstruction of tumor genesis significantly improved early perioperative outcomes in patients of this category.

Keywords: colon; cancer; complications; acute intestinal obstruction; surgical interventions; endoscopy.

Obstructive acute intestinal obstruction (OAI) first in the structure of complications of colorectal cancer, according to various authors [1, 2], it accounts for 40.0 to 60.0% of all complications of this pathology, and it also has high postoperative mortality rates of 42.0 to 57.0% [3, 4]. The first explanation for this is that the majority of patients with APN of tumor genesis have advanced and senile age and concomitant somatic diseases, often decompensated against the background of this complication [5, 6].

Given this, most doctors prefer to perform emergency surgery, the main purpose of which to eliminate intestinal obstruction and save the patient's life without considering the possibility of performing radical surgery [7]. However, after emergency surgical care, both early and long-term results of treatment of colon cancer are negative: perioperative complications and mortality rates remain consistently high, and patient survival rates are extremely low [8, 9].

Therefore, the issue of optimal perioperative treatment of patients with HFN of tumor genesis remains controversial.

The aim of the study was to analyze the results of using a comprehensive individualized approach to the treatment of patients with HFN of tumor genesis.

Materials and methods

A retrospective and prospective cohort study was conducted at the surgical inpatient units of the Zaporizhzhia City Emergency and Ambulance Hospital and Zaporizhzhia City Hospital No. 7, covering the period from 2018 to 2023 and including 180 patients with complicated forms of colorectal cancer.

All patients were divided into two groups: the main group (prospective part of the study) – 109 (60.56%) patients and the control group (retrospective part) – 71 (39.44%) patients.

In the intervention group, women predominated – 57 (52.29%), men were 52 (47.71%). In the control group, there were 36 (50.70%) men and 35 (49.30%) women ($U = 231.5$; $p = 0.7369$). The average age of patients was (69.78 ± 16.37) years in the main group and (67.97 ± 12.71) years in the control group ($U = 298.0$; $p = 0.8745$).

The structure of complicated forms of colon cancer in both groups was dominated by HCC of tumor genesis – 74 (67.89%) patients in the main group and 49 (69.01%) patients in the control group ($U = 184.5$; $p = 0.4831$).

At the stage of hospitalization, patients with UC in both groups were examined, including abdominal ultrasound, plain radiography of the chest and abdominal cavities, colonoscopy, computed tomography of the abdominal cavity with intravenous contrast, and clinical and laboratory diagnostics.

Patients with UC in the control group underwent surgical intervention after the examination in accordance with the existing standards for the treatment of colorectal cancer complicated by UC.

In the main group, a comprehensive individualized approach to the treatment of APN was used, depending on its degree, which was determined by the method described by P. V. Svirep and co-authors [10]:

Grade I – compensated UC (constipation lasting 2–3 days, which is eliminated by diet and laxatives; no abdominal distension; no signs of intoxication and homeostasis

disorders; X-ray examination reveals slight pneumatization of the colon; colonoscopy reveals narrowing of the intestinal lumen by the tumor to 1.5 cm);

Grade II – subcompensated UC (persistent constipation for up to 3 to 5 days without self-voiding; the effect of laxatives is small or temporary; periodic abdominal distension with impaired gas passage; symptoms of intoxication and dehydration; radiological signs of colon dilation and overflow of its contents, fluid levels may be detected; tumorous narrowing of the intestinal lumen up to 1 cm during colonoscopy);

Grade III – decompensated UC (constant cramping abdominal pain, abdominal distension, nausea and vomiting, intestines are not emptied and gas is not passed; signs of water and electrolyte imbalance, anemia, hypoproteinemia; X-ray dilation of the colon up to 8–10 cm in diameter with multiple fluid levels in the form of Kloiber's bowls and arches; complete narrowing of the intestinal lumen during colonoscopy).

The statistical analysis of the results was performed using the computer programs STATISTICA 13.0, TIBCO Software Inc. (license JPZ8041382130ARCN10–J) and Microsoft Excel 2013 (license 00331–10000–00001–AA404). The data are presented as arithmetic mean and standard deviation ($M \pm m$) in the case of a normal distribution of the trait and sample median (Me) with the indication of the upper Q_1 (75%) and lower Q_3 (25%) quartiles in the case of a trait distribution that differed from the normal one. The variables in the study groups were compared using the Mann–Whitney test (U) and the statistical significance of differences was determined. Differences at p values of 0.05 were considered statistically significant.

Results

In the control group of 49 patients with AKI, 1 (2.04%) underwent urgent surgery, 16 (32.65%) – urgent and 32 (65.31%) – delayed.

The average preoperative period was 9.10 (5.30; 12.80) hours. The preoperative preparation, which was carried out mainly in the operating room, was restrictive in nature and included perioperative antibacterial prophylaxis and correction of electrolyte disorders, elimination of hemorrhage and hydrobalance deficits through the use of infusion solutions (crystalloids, plasma substitutes, blood products).

In 39 (79.59%) patients, the surgical intervention was completed with a colostomy. A small-bowel anastomosis was formed in 7 (14.29%) patients during right-sided hemicolectomy and bypass anastomoses, and a large-bowel anastomosis in 3 (6.12%) patients.

In the main group, according to the clinical course of UCN, instrumental and laboratory examinations, 10 (13.51%) of

74 patients were diagnosed with grade I (compensation) of the disease, 61 (82.43%) with grade II (subcompensation), and 3 (4.05%) with grade III (decompensation).

All patients with compensated and subcompensated AKI in the surgical department received conservative treatment, which included infusion therapy to correct electrolyte disturbances and eliminate hemorrhage and hydrobalance deficits (crystalloids, plasma substitutes, blood products), stimulation of peristalsis (proserine, metoclopramide, sorbilact, 10% sodium chloride solution) and preparation for endoscopic decompression of the colon by performing cleansing enemas.

Therapeutic and diagnostic colonoscopy was performed in 71 (100.0%) patients with I and II degrees of UC.

In the main group, according to the results of a complex of conservative therapy and diagnostic colonoscopy, 47 (63.51%) patients with UC were able to completely eliminate its symptoms, 13 (17.57%) did not achieve the desired effect, and 11 (14.86%) patients had endoscopic decompression that resulted in the development of a complication (intestinal perforation in the tumor area), which required urgent surgical intervention.

Thus, in the main group, 3 (4.05%) patients with decompensated AKI underwent urgent surgery ($U = 186.5$; $p = 0.1214$), 11 (14.86%) patients underwent urgent surgery ($U = 73.0$; $p = 0.0319$), and 60 (81.08%) patients underwent delayed surgery ($U = 47.5$; $p = 0.0297$).

The average duration of preoperative preparation of patients was 19.70 (8.50; 31.40) hours ($U = 56.0$; $p = 0.0347$).

Due to the comprehensive conservative preoperative preparation of patients and endoscopic bowel decompression during diagnostic colonoscopy, the surgery was completed with colostomy in the main group in only 16 (21.62%) patients with UC ($U = 28.5$; $p = 0.0081$). A small-bowel anastomosis was formed in 10 (13.51%) patients ($U = 320.5$; $p = 0.7067$), and a primary colon anastomosis – in 48 (64.85%) patients ($U = 19.0$; $p = 0.0042$). In order to protect the primary colon anastomosis, a preventive ileostomy was placed in 11 (22.92%) patients with its subsequent closure in 2 weeks.

In the main group, 19 (25.68%) patients underwent surgical intervention using laparoscopic techniques. In the control group, no such operations were performed on patients with UC.

In the postoperative period, 21 (42.86%) patients in the control group had postoperative complications, while 13 (17.57%) patients in the main group had postoperative complications ($U = 49.5$; $p = 0.0267$).

In both groups, wound complications (seromas, hematomas, infiltrates, suppuration, suture separation) prevailed – in 7 (9.46%) patients in the main group and in 6 (12.24%) patients in the control group ($U = 281.0$; $p = 0.6392$).

In the main group, 1 (1.35%) patient with AKI was diagnosed with pulmonary embolism, 2 (2.70%) patients had acute heart failure with pulmonary edema, 1 (1.35%) patient had a small postoperative hydrothorax, 1 (1.35%) patient had pneumonia, and 1 (1.35%) patient had intra-abdominal bleeding.

In the control group, 2 (4.08%) patients with AKI had pulmonary embolism, 3 (6.12%) had acute heart failure with pulmonary edema, 4 (8.16%) had pneumonia, 2 (4.08%) – prolonged postoperative intestinal paresis, 1 (2.04%) – perforation of acute small intestinal ulcer, 2 (4.08%) – small and medium hydrothorax, 1 (2.04%) – intra-abdominal bleeding.

In the main group, repeated surgical intervention for complications was performed in 3 (4.05%) patients, in the control group – in 5 (10.20%) patients ($U = 134.5$; $p = 0.1278$).

In the main group, 4 (5.41%) patients died, in the control group – 6 (12.25%) patients ($U = 97.5$; $p = 0.0491$).

The average length of stay in the treatment group was 18.00 (12.00; 24.00) days, and in the control group – 17.00 (11.00; 20.00) days ($U = 238.0$; $p = 0.5386$).

Discussion

HCH of tumor genesis is an urgent and unresolved problem of both surgery and oncology [10].

The widespread use of endoscopic methods and the improvement of medical and surgical treatments for UC allows to take an individualized selective approach to the management of patients with this pathology.

Based on the anamnesis, clinical course of the disease, instrumental and laboratory examinations, it is possible to conclude on the degree of compensation of UC and, on this basis, to identify patients who can postpone surgery, undergo drug preparation and undergo endoscopic bowel decompression during colonoscopy as the first stage of treatment [11].

In our study, 95.95% of patients were diagnosed with grade I and II AKI. These data are fully correlated with the data of other studies [12, 13], according to which more than 80.0% of patients have compensated and subcompensated forms of intestinal obstruction, which makes it possible to postpone surgery and prepare them for possible primary radical surgery.

The use of this strategy improves the results of treatment of patients with APN of tumor genesis in the early perioperative period by reducing complications and mortality [14, 15], which was confirmed in our study: the complication rate decreased from 42.86 to 17.57%, and the mortality rate decreased from 12.25 to 5.41%.

Conclusions

1. UC was the leader among the complications of colon cancer, it was diagnosed in 67.89% of patients in the main

group and in 69.01% of patients in the control group ($p = 0.4831$).

2. According to the results of a comprehensive analysis of the clinical course of the disease, instrumental and laboratory examinations, 10 (13.51%) patients in the main group were diagnosed with grade I (compensation), 61 (82.43%) patients with grade II (subcompensation) and 3 (4.05%) patients with grade III (decompensation) of HF.

3. The use of an individualized approach to the treatment of UC allowed to increase the proportion of delayed surgical interventions from 65.31 to 81.08% ($p = 0.0297$) and reduce the proportion of operations that ended with colostomy from 79.59 to 21.62% ($p = 0.0081$), and in 25.68% of patients laparoscopic intervention was performed.

4. An integrated approach to the treatment of patients with AKI reduced the incidence of perioperative complications from 42.86 to 17.57% ($p = 0.0267$) and mortality from 12.25 to 5.41% ($p = 0.0491$).

Prospects for further research

The use of the strategy of a comprehensive individualized approach to the treatment of APN of tumor genesis in patients with colon cancer was accompanied by good results in the early postoperative period. Further work will be aimed at evaluating this treatment strategy in the long term and the possibility of its use in patients with other types of complications of colon cancer.

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