

A Case of Treatment and Prevention of Infectious Complications in a Patient with Perforation of a Tumor of the Ascending Colon into the Retroperitoneal Space

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ABSTRACT

One of the most serious problems is that the colon is a perforation. Frequency of its occurrence fluctuates in wide limits - from 2.3 to 22.3% and postoperative lethality - 23.0-88.9%. A high percentage (up to 60%) of patients with colorectal cancer is hospitalized in an emergency order due to complications such as intestinal obstruction, tumor perforation, paracolic inflammation, intestinal bleeding, anemia. Perforation of a cancerous tumor is a consequence of the decay and seizure of tumor tissues, which leads to the development of retroperitoneal phlegmon and sometimes to the formation of intestinal fistula. Immediate results of surgical treatment, including methods and means of postoperative complications, as well as delayed and urgent measures of postoperative complications. Prevention and treatment of complications associated with severe disorders of the musculoskeletal system. It should be emphasized that the presence of a suppurative complication of colon cancer is not a sign of tumor inoperability. Generally accepted standards regarding the tactics and scope of surgical interventions for limited forms of colon cancer are not available.

Keywords: Colon tumor, Complications of cancer, Perforation

INTRODUCTION

One of the extremely serious complications of a colon tumor is perforation. The frequency of its occurrence, according to various authors, varies widely - from 2.3 to 22.3% and postoperative mortality reaches 23.0-88.9% [1]. A high percentage (up to 60%) of patients with colorectal cancer is hospitalized on an emergency basis due to complications of the disease, such as intestinal obstruction, tumor perforation, paracolic inflammation, intestinal bleeding and anemia [2]. Paracolic inflammatory processes beyond the limits of the intestinal wall amounted to 22.6%. In 38-76.5%, the tumor with perifocal inflammation was localized in the right half of the colon [3]. The immediate results of surgical treatment of patients with a complicated course of colon cancer are directly dependent on the timely diagnosis of the underlying disease and its complications, the validity of the surgical tactics, the choice of the method and technique for performing surgical intervention, as well as the complete prevention and treatment of postoperative complications [3]. The frequency of postoperative complications in this category of patients is 31.5% and the annual mortality rates reach 16.3% [4]. In 6% of patients, the inflammatory process spread to the abdominal wall with the formation of cellulitis and fecal fistula. After relief of the inflammatory process, 33.3% of patients routinely perform traditional surgical

interventions [5]. Perforation of a cancer is a consequence of the disintegration and ulceration of tumor tissue that has penetrated the entire depth of the intestinal wall, which leads to the development of retroperitoneal phlegmon, and sometimes the formation of intestinal fistula. The addition of the inflammatory process significantly changes and complicates the course of the underlying disease, makes diagnosis much more difficult and thereby delays the duration of the surgery and limits the choice of the method of operation. It must be emphasized that the presence of suppurative complications of colon cancer is not a sign of tumor inoperability [6].

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There are no generally accepted standards for individual issues regarding tactics and the scope of surgical interventions for complicated forms of colon cancer [5,7].

CASE STUDY

We present the clinical observation of a patient with ascending colon cancer, complicated by retroperitoneal perforation and phlegmon of various localization.

Patient C, 38 years old, 08/09/2016 delivered to the reception room GBUZ NO "GKB №12" Nizhny Novgorod in a state of shock 3 tbsp. At the time of inspection: the state is extremely difficult, confused consciousness. The position is passive, on a gurney. Peripheral lymph nodes are not enlarged. The pharynx is clean, the tongue is dry. Breathing is weakened, no wheezing, the frequency of respiratory movements 33/min. The skin and visible mucous membranes pale cyanotic coloration. Heart sounds are muffled, arrhythmic. Blood pressure 70/30 mm. Hg Art., pulse 110 beats/min, weak filling. The abdomen is painful and rigid in the right half, the peristalsis is sharply weakened. The liver, kidney, spleen are not palpated. Symptom of Pasternack negative on both sides, urination is not difficult.

Locally: in the right lumbar region - hyperemia, swelling, tenderness over an area of 20 × 15 cm. In the right gluteal region - a fluctuating formation with skin flushing above it, sharply painful during palpation, 15 × 15 × 15 cm in size. On the front surface of the right thigh - hyperemia, swelling, infiltration, palpation tenderness in the area of 15 × 20 cm. In the right popliteal fossa - fluctuating formation of 8 × 8 × 8 cm. The right lower extremity is swollen, at the level of the thigh +8 cm, at the level of the tibia +6 cm. On the anterior, lateral and posterior surfaces of the right the laziness - necrotic modified skin and subcutaneous tissue over an area of 25 × 30 cm. Procalcitonin test (PCT) -> 2 ng l - sepsis was diagnosed.

Given the history and objective status of the diagnosis: cancer of the ascending colon. Perforation in the retroperitoneal space. Phlegmon of the right lumbar, gluteus, popliteal areas, right thigh and lower leg. Toxic shock III degree.

08/09/2016 year after preoperative preparation in the conditions of PIT an emergency operation was performed - opening of the phlegmon of the right lumbar, gluteus, popliteal areas, right thigh and lower leg. Opening of

phlegmon of the right lumbar region is supplemented by extraperitoneal access along the right lateral flank of the abdomen. Received up to 1.2 L of purulent discharge with odor (taken for planting and determination of antibiotic sensitivity: August 15, 2016, inoculated with *E. cloacae* 107 CFU/L, sensitive to imipenem, amikacin, cefotaxime, ciprofloxacin, pefloxacin). Separate cuts on the right gluteal region, right thigh, right popliteal fossa and right lower leg revealed purulent drips (taken for seeding and determination of sensitivity to antibiotics - 13.08.2016 sown: *E. fecium* 105 CFU/L, sensitive to fosfomycin; *C. albicans*, sensitive to nystatin). Cavities of wounds are sanitized with a 3% solution of hydrogen peroxide and made with napkins with levomicol and boric acid. Aseptic dressings.

Intensive care was performed in the intensive care unit. Three days after admission, intestinal contents appeared in the dressings, which supported the inflammatory infection of the soft tissues of the lumbar region, the anterior abdominal wall and the right lower extremity. The revealed circumstance required isolation of wounds from intestinal contents. For this purpose, 7 days after admission, laparotomy was performed.

In the ascending part of the colon, a stony density infiltrate was found, almost immobile, measuring 20 × 18 × 10 cm, consisting of the specified section of the colon, retroperitoneal fat, great omentum and vermiform process. Distant metastases were not detected.

It was decided to isolate the right half of the colon and the terminal ileum from the passage of intestinal contents through it, which would prevent it from entering the wounds of the retroperitoneal space. The performance of right-sided hemicolectomy due to the severity of the patient's condition and pronounced inflammatory changes in the area of operation is currently considered inappropriate. The ileum is crossed and muffled at 10 cm from the ileocecal angle. The proximal and distal stumps are sutured with UKL-40, two half-net and Z-stitches. A "plug" (**Figure 1**) developed by the authors is applied below the infiltrate by 15-20 cm onto the transverse colon, which excludes ischemia of the intestinal wall and possible subsequent migration of the anti-reflux construct into the intestinal lumen, which is observed during the formation of the "plug" according to Shalimov (Patent number RF 2253379).

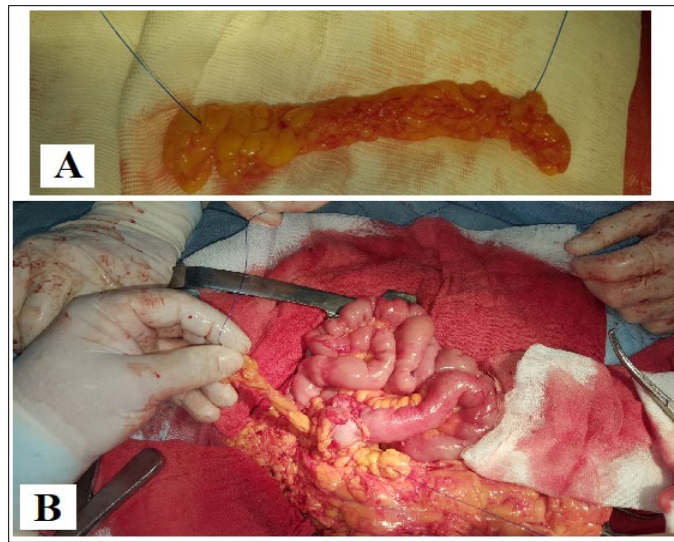


Figure 1. “Plug” before applying (A) and in the process of applying to the transverse colon below the infiltrate (B).

For the formation of the "plug" according to the developed method, the thickness of the intestinal wall (d), the diameter of the section of the intestine ($D1$), on which the implementation of the “plug” is planned, is determined. When obtaining the desired parameters using the formula $D2=2\sqrt{D1d}$, the required diameter of the corrugated part of

the small intestine ($D2$) is calculated. For intraoperative measurement of tissue parameters in millimeters, as well as to control the circumference of the ring during its formation, we use a surgical instrument “gauge-limiter” (**Figures 2 and 3**).



Figure 2. Surgical instrument “gauge-limiter”.

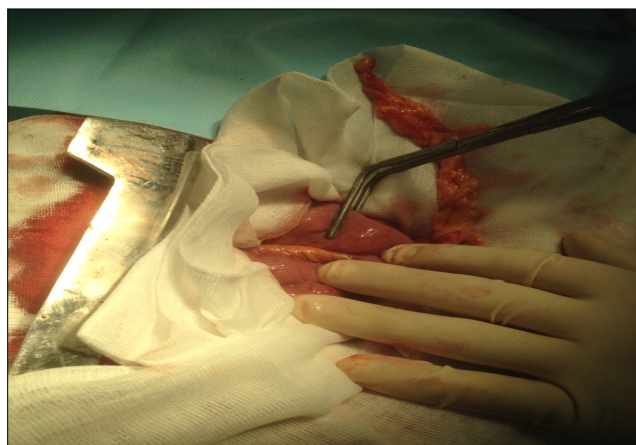


Figure 3. The measuring instrument determines the thickness of the intestinal wall and its diameter. The formula determines the diameter of the “stub”.

With the help of a semicircular ruler installed on the branches and fixed with a notched lock, the tool can measure and fix the distance between the working surfaces. This

feature allows on the working surfaces to bind the ends of the ligature-omental tape and, thus, to form a skeleton ring of a given circumference (**Figure 4**).

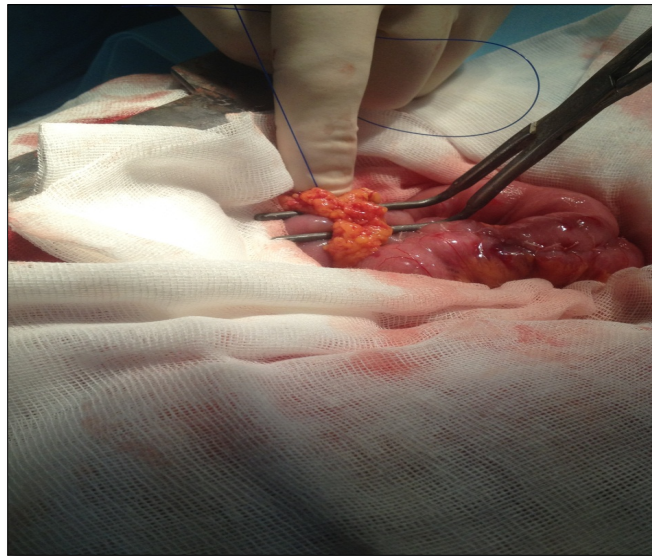


Figure 4. We fix the diameter of the “plug” with a given distance between the branches of the gauge-limiter and then tie the ends of the ligature.

The data of the scientific calculation substantiate the practical execution of the operation: the intestinal antipyretic wall is brought closer to the mesenteric, the established situation is fixed by 2-4 nodal sero-muscular sutures, on top

of which a developed “cap” is formed, tying the ends of the ligature.

At 10 cm below the “plug”, an isoperistaltic two-row ileo-transverselyanastomose side to side is formed (**Figure 5**).

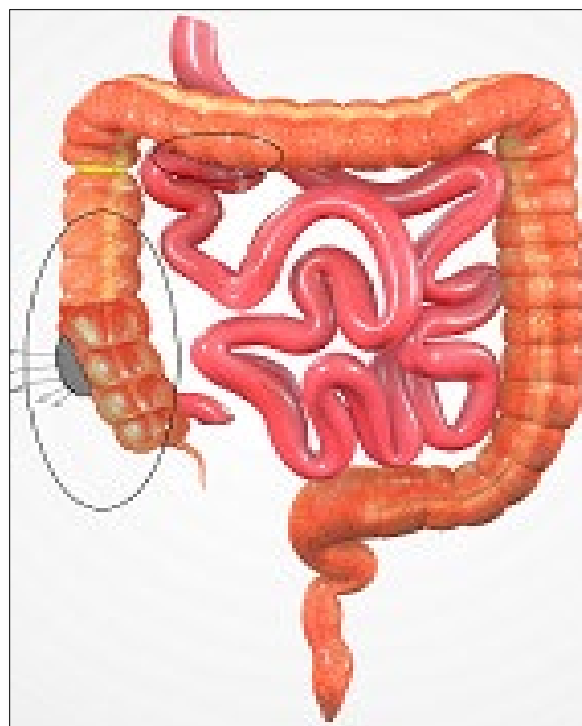


Figure 5. The scheme of operation at the first laparotomy.

Catching drainage in the pelvis. Control of hemostasis. Layer wound seam. Aseptic dressing. Sanitation of wounds, excision of necrotic tissue of wounds of the right lumbar region, thigh, tibia to viable tissues. Open flowed in the upper third of the inner surface of the right thigh. From the moment of receipt of 09/08/2016 to 08/28/2016 (postponed the opening of the abscesses, the first laparotomy) he received a course of antibiotic therapy with ceftriaxone, meropenem, abactal and metrogylism.

According to the subsidence of the inflammation of soft tissues 60 days after admission to the hospital on 10/06/2016, a second laparotomy was performed to remove a colon tumor — a midline laparotomy with excision of the postoperative scar. Granulomas with purulent contents are

determined in the subcutaneous tissue - pus is taken for seeding (10.10.2016 - the etiologically significant aerobic bacterial microflora was not detected). Pronounced adhesions in the abdominal cavity. Viscerolysis. A revision of the abdominal organs revealed a tumor of the ascending part of the colon with a diameter of up to 10 cm.

The ileal stump is up to 12 cm in length, the ileotransverse anastomosis is 3.5 cm in diameter. The “cap” is 10⁻⁹ cm above the anastomosis on the colon, viable: the great omentum tissue is moderately infiltrated, pink; the peritoneum is shiny (**Figure 6**). The section of the right half of the colon without intestinal contents - the “plug” has fulfilled its isolating function.



Figure 6. Cloth packing is viable.

Produced mobilization of the right half of the colon with a segment of the ileum. From the back wall of the ascending colon with a tumor to the tissues of the lumbar region there is a dense cicatricial cord - a consequence of a fistula from this section of the intestine to the lumbar region. Cicatricial cord is crossed, the lumen in the severity is not revealed. Performed right hemicolectomy. The stump of the colon

sutured apparatus UO-60, peritonized with two half-net stitches.

To make the ileotransverse anastomosis arefluxic around the small and large intestine proximal to the 3 cm anastomosis, a ring is formed from the free portion of the greater omentum (**Figure 7**) with a nonabsorbable vikrilovy ligature passed through it (RF Patent No. 2253390).



Figure 7. Scheme of operation in the second laparotomy with the formation of a reflux ileotransverse anastomosis from the area of the greater omentum with a ligature.

The principles of functioning of the reflux structure are reflected in **Figure 8**.

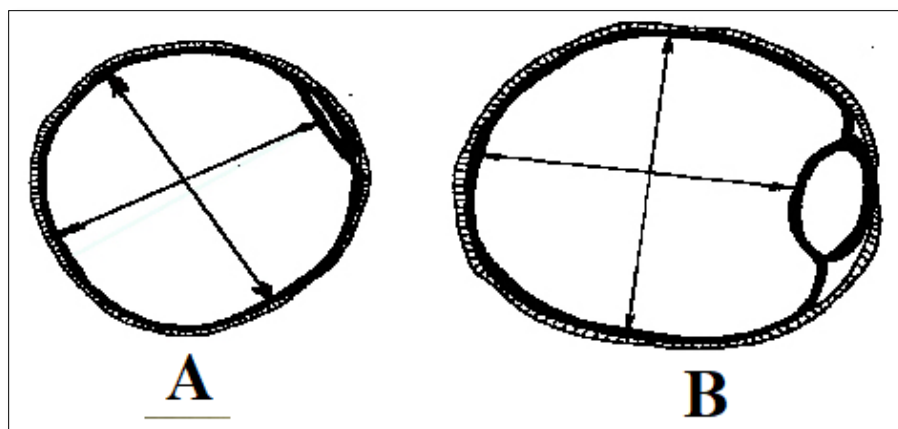


Figure 8. Scheme of reflux construction: A) With an increase in pressure, the large intestine squeezes the ileum on the skeleton, and the contents of the large intestine do not enter the small intestine. B) If the pressure in the lumen of the colon is less than the pressure in the ileum, then the latter is not compressed and its contents enter the large intestine.

Through contraceptives to the stump of the large intestine and in the small pelvis 2 trapping drainage were placed. Layer wound seam. Aseptic dressing.

The drug: 1. The right half of the colon with a terminal 10 cm ileum (**Figure 9**).

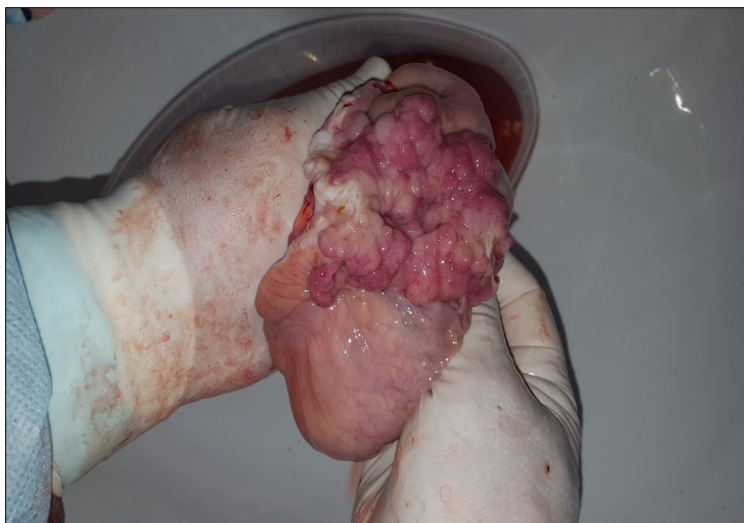


Figure 9. The right half of the colon with the terminal ileum, a tumor of the colon.

In the ascending part, there is a tumor up to 10 cm in diameter, occupying its entire perimeter, having a defect on the back wall of the intestine, which is covered by scar tissue.

Preparation 2. A segment of the colon turned out to the outside of the mucosa, carrying a “plug” (**Figure 10**). Visually destructive changes of the mucous membrane was not detected.



Figure 10. The mucosa of the inverted segment of the colon, carrying the “plug”.

After hemicolectomy, a course of cefazolin was conducted from 10.10.2016 to 10.24.2016. 10/20/2016 - skin plastics.

Histological examination of the right half of the colon No. 10135/45 of 10/13/2016: in the preparation a picture of an adenomatous polyp with areas of malignancy with the transition to a highly differentiated adenocarcinoma. Within the limits of resection of tumor growth no.

Histological examination of the area of the colon outside the zone of “plug” No. 10147/58 dated October 13, 2016 (**Figure 11B**). Coloring hematoxylin-eosin. Increase X100. Fragment of the large intestine mucosa with signs of atrophy

of the glands, moderate lymphoid infiltration, edema and plethora in the submucosal layer, pronounced focal fibrosis of the muscle plate and moderate lymphocytic infiltration.

Histological examination of the area of the colon under the “plug” № 10146/50 from 10/13/2016 (**Figure 11A**). Coloring hematoxylin-eosin. Increase X100. Mucosa with moderate lymphocytic infiltration and atrophy of the glands. Submucous and muscular membranes with edema and plethora with weak leukocyte infiltration, the growth of fibrous tissue is noted in the serous membrane, which proves the viability of the colon wall under the “plug”.

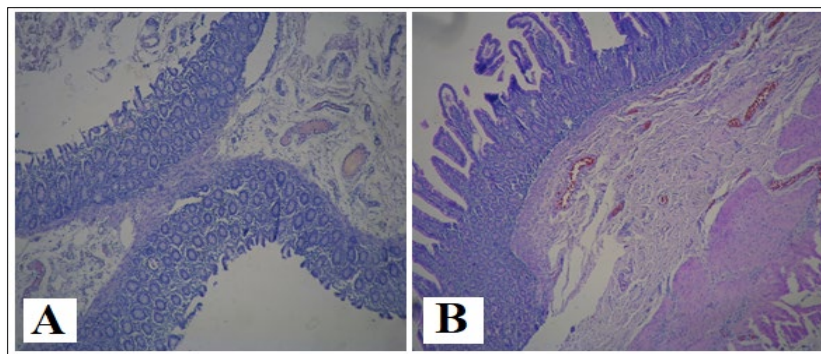


Figure 11. Histological changes in the area of the colon under the “plug” (A) and beyond stub zones (B).

Histological examination of the site of the great omentum, which is not included in the construction of the “plug”, No. 10159/62 dated October 13, 2016 (**Figure 12B**). Hematoxylin-eosin staining. Increase X100. Fragment of adipose tissue of the usual histological structure.

Histological examination of the free area of the gland included in the construction of the “plug”, No. 10155/58

dated October 13, 2016 (**Figure 12 A**). Coloring hematoxylin-eosin. Increase X100. Fat tissue with easily expressed lymphoplasmacytic infiltration. Places of fibrous tissue are found. This study proves the viability of the free portion of the gland.

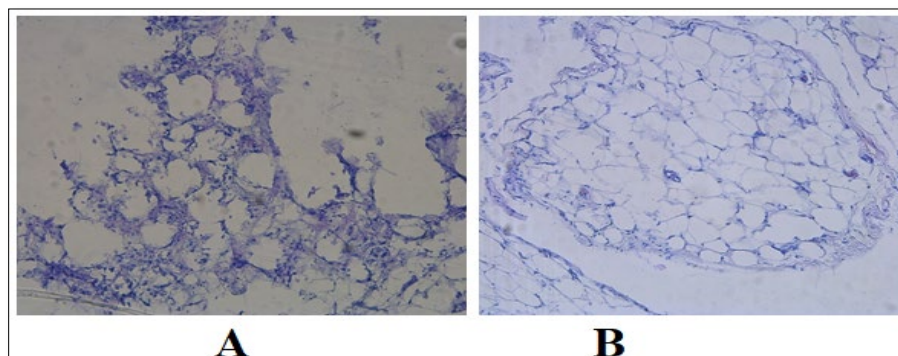


Figure 12. Histological changes in the free area of the greater omentum, which is included in the construction of the “plug” (A) and not included in the design of the “plug” (B).

After the second laparotomy, he has undergone a course of ceftriaxone and metrogil. After 2 months, a hydrogen respiratory test (VDT) with lactulose load was not

performed. The results of the VDT correspond to normal values - the bacterial growth syndrome (SIBO) is not diagnosed (**Figure 13**).

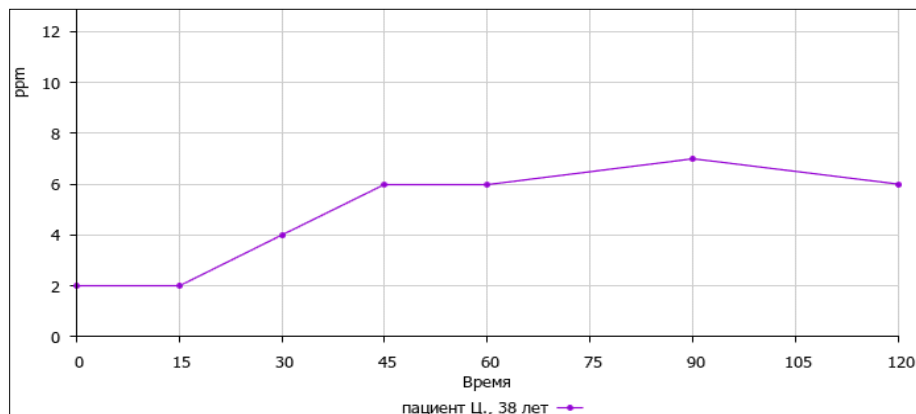


Figure 13. the results of VDT with lactulose load.

A patient with granulating wounds was performing a skin grating (**Figure 14**).



Figure 14. Granulating wrinkles before discharge from the abdominal surgery department.

FINDINGS

1. When colon cancer is complicated by perforation into the retroperitoneal tissue and purulent processes, it is necessary to isolate the soft tissues from the intestinal contents, for which purpose it is advisable to use the “plug” on the large intestine that does not cause its ischemia.
2. The free area of the greater omentum on the gut, the section of the intestine included in the construction of the “plug” retains its viability.
3. The developed methods of creating a “plug” on the intestine and a refluxal small-colonic anastomosis are widely available, safe and adequately provide their intended functions.
4. The formation of the developed a reflux small intestinal anastomosis is appropriate for the prevention of excess bacterial growth syndrome in the small intestine, as evidenced by the results of VDT with lactulose load.

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