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A clinical case of successful application of the "second look" surgical treatment strategy in mesenteric ischemia

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Abstract. In recent decades, with the growth of such pathological conditions and diseases as: multifocal atherosclerosis, diabetes mellitus, malignant neoplasms and a number of others, the number of reported cases of acute mesenteric ischemia (AMI) has increased. Currently, there are no uniform clinical guidelines for AMI approved by the Ministry of Health of the Russian Federation in Russia in the form of a separate document. Diagnosis and treatment are regulated by protocols for the treatment of intestinal obstruction and the recommendations of vascular surgeons, which necessitates further study of this problem and the creation of a unified treatment protocol.

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Introduction. One of the most challenging issues in emergency abdominal surgery remains the diagnosis and surgical treatment tactics in patients with AMI [1, 2, 3]. According to a number of authors, the incidence of AMI is 1-12,9 cases per 100000 population per year [4, 5, 6]. As indicated in studies, among all patients admitted to a surgical clinic under the age of 60, AMI accounts for no more than 1,0% [4, 7, 8]. However, according to the same researchers, with increasing age, the number of patients increases sharply and can reach 10,0% or more.

In the last decade, due to the rapid development of new instrumental visualization methods – multispiral computed tomography (MSCT), magnetic resonance imaging (MRI), ultrasound examination (US) of the abdominal cavity with duplex scanning of visceral vessels, have contributed to an increase in the frequency of detection of this pathology [9, 10]. Thus, in Europe before 2000, the incidence rate of this pathological condition was 2,0 per 100 thousand of the population, whereas in recent years it has exceeded 7,3-12 cases per 100 thousand of the population and is increasing [6]. In the Russian Federation, the rate is 12,9 per 100000 population. According to the State Budgetary Institution of the Republic of Sakha (Yakutia) "Yakut Republican Medical Information and Analytical Center," the region recorded a rate of 2,9-4,5 cases per 100000 population from 2020 to 2025. Despite the development of modern comprehensive treatment methods, the mor-

talidity rate for acute myocardial infarction remains at 65-95% [2, 11, 12].

One of the significant problems of effective treatment of AMI is not only the difficulties that the surgeon faces at the diagnostic stage and during intensive therapy [13, 14], but also the choice of surgical treatment tactics and, above all, how to complete the operation in case of necrosis of any part of the intestine. Modern research shows that the most preferable tactic is the so-called "second look" [2, 15], when the surgeon, after the main stage of the operation – resection of non-viable sections of the intestine, performs tight suturing of the proximal and distal sections of the intestine for a period of 12 to 24 hours. Subsequently, a programmed relaparotomy is performed with a reassessment of the bowel condition. This is because, during this period, episodes of repeated acute myocardial infarction, ongoing ischemia, progression of peritonitis, or failure of the anastomoses are often possible [2, 3].

The main research results discussed in this article were presented and discussed at a meeting of the Ethics Council of the Institute of Medicine of M.K. Ammosov. M North-Eastern Federal University. Minutes of the meeting № 2 of the NEFU Institute of Medicine dated February 10.02.2026.

Description of a clinical case. Patient B., 49 years, was admitted to the emergency room of a multidisciplinary surgical clinic by ambulance with complaints of unbearable, persistent, diffuse abdominal pain, nausea, three vomit-

ings of ingested food, and 2 loose stools streaked with dark blood.

From the patient's medical history, it was revealed that the pain had begun 12 hours earlier after a large meal. Initially, the pain was localized in the epigastrium, then gradually moved to the periumbilical region and the right mesogastrium, becoming unbearable. He vomited the food he had eaten several times, and later noted the appearance of loose stools mixed with blood. The patient's medical history also reveals a severe comorbidity – atrial fibrillation (permanent form), CAD, hypertension disease stage II, hypertension stage II. He regularly takes antiplatelet agents, including Clopidogrel at a dose of 75 mg once daily.

Upon admission to the clinic, the patient's condition, assessed using the integrated scales: qSOFA – 12 points, SAPS II – 20 points, was severe. On palpation, the abdomen was tense, with diffuse tenderness throughout. A "doughy" infiltrate without clear boundaries was evident in the right mesogastrium. Symptoms of peritoneal irritation were strikingly positive. A rectal examination revealed a distinct protrusion of the anterior rectal wall, and the glove contained stool streaked with blood, a "raspberry jelly" color.

Taking into account the clinical picture and concomitant pathology, the examination complex was supplemented with the following laboratory and instrumental research methods: MSCT of the abdominal cavity with angiography of the abdominal aorta and its branches, ultrasound of the abdominal cavity with duplex scanning of

visceral vessels, classical plain radiography of the abdominal cavity in direct and lateral projections, general and biochemical blood tests.

Laboratory blood tests and their immediate results: a noteworthy increase in the leukocyte level to $22,4 \times 10^9/L$, ESR – 45 mm/hour. In the biochemical blood test, the level of urea increased to 12,7 mmol/L, creatinine to 190,0 $\mu\text{mol/L}$, ALT – 129,4 U/L, AST – 140,8 U/L, a decrease in the level of total protein to 52 g/L, albumin to 25 g/L. Significant changes in the concentration of K^+ – 3,7 mmol/L and Na^+ – 145,9 mmol/L are observed.

A plain abdominal radiograph including the chest (fig. 1). The frontal view radiograph shows distended loops of small intestine without clear fluid levels, primarily in the upper abdominal cavity. No free or delimited gas was detected. The stomach is compressed by distended intestinal loops.

Abdominal ultrasound with duplex scanning of the visceral vessels. Liver: typically positioned, contours clear and smooth, capsule not thickened. Right lobe size 122 mm, left 60 mm. Parenchymal echostructure is uniform, vascular pattern is well defined. Portal vein diameter up to 10 mm. Gallbladder is pear-shaped, not enlarged – 7,6 x 4,4 cm, walls thin. No visible stones or masses are visible in the gallbladder cavity. The common bile duct is up to 4-5 mm. The pancreas is not enlarged, measuring 22 x 15 x 18 mm. The gland's contours are smooth and clear, and the parenchymal echostructure is uniform. Additionally, free fluid is detected in the abdominal cavity as thin stripes, delimited by the pelvis. Duplex scanning is complicated by flatulence. No reliable data on the presence of AMI have been obtained.

MSCT of the abdominal organs with angiography of the abdominal aorta and its branches (fig. 2): the liver is not enlarged. The findings of the general examination are completely consistent with the ultrasound scan. Additionally, the abdominal aorta in the suprarenal region is up to 2,0 cm in diameter, and in the infrarenal region 1,6 cm. There are no filling defects or narrowing, with clear, smooth contours. Calcification is visible in the wall, without hemodynamically significant stenosis. It divides into the common iliac arteries at a typical location, without filling defects or lumen narrowing, with clear, even contours. Branching is normal. The superior mesenteric artery is 0,5 cm in diameter, with a 60-90% stenosis in the proximal third due to a soft tissue component; some branches in the distal regions are not contrast-enhanced. The right and



Fig. 1. X-ray of the abdominal cavity in a frontal projection with the chest included. Picture of subtotal paresis of the small intestine

left renal arteries originate in a typical location, with a diameter of 0,5 cm. The inferior mesenteric artery originates in a typical location, with a diameter of 0,3 cm. A small amount of free interintestinal fluid is visible in the abdominal cavity, and a distended stomach with fluid contents of over 500 ml is noticeable. Conclusion: Acute occlusion of the superior mesenteric artery (embolism/thrombosis). Small intestinal infarction cannot be ruled out.

After a brief preoperative preparation (1,5 hours), the patient underwent surgery. A midline laparotomy was performed with a left umbilical bypass. Free hemorrhagic fluid, up to 250 ml in volume, was detected in the abdominal cavity and evacuated with an electric suction device. The small intestine was pneumatized to a diameter of 5-6 cm, and the colon collapsed. At 1 meter 50 cm from the junction of Treitz and 10 cm from the ileocecal angle, the small intestine is purple-red with gray-black necrotic foci up to 2-3 cm in size at the level of the ileal segment. The intestinal walls are markedly edematous and infiltrated, peristalsis is sporadic, and the pulsation of the superior mesenteric artery is weakened. The superior mesenteric artery was isolated closer to the orifice and secured with clamps and tourniquets. A transverse arteriotomy revealed weak blood flow. Next, a staged exploration of the superior mesenteric artery was performed proximally and distally using a Fogarty catheter. An organized thromboembolus up to 7 cm long was removed. After removing the clamps, satisfactory blood flow was achieved. The nonviable portion of the small intestine was resected within the healthy tissue. Small intestinal stumps were created using a GIA device. Proximal intestinal intubation was performed. The abdominal cavity was closed with blocking sutures after thorough de-



Fig. 2. MSCT scan of the abdominal cavity, contrast (Iopromide 370 mg/ml – 80 ml). Thromboembolism of the superior mesenteric artery orifice (thrombus location indicated by arrow)

bridement with antiseptics and drainage in sloping areas. Following surgery, the patient was diagnosed with: Acute occlusion of the superior mesenteric artery (thromboembolism). Acute necrosis (infarction) of the ileum up to 100 cm long. Disseminated serous-hemorrhagic peritonitis. Atrial fibrillation (permanent form). CAD. Hypertension disease stage II, hypertension stage II.

Over the next 24 hours, the patient underwent intensive care in the intensive care unit. Direct anticoagulants were administered as a prerequisite. During surgery, 5000 IU of heparin was administered as a bolus, followed by 20000 IU of heparin administered through an infusion pump over 24 hours. A programmed relaparotomy (second-look operation) was performed 24 hours after the last surgery. A small amount of serous fluid is present in the abdominal cavity and is drained. The small and large intestines are moderately distended. Examination of the sutured sections of the small intestine revealed continued necrosis. Severe tissue edema and cyanosis are noted along a 5,0 cm stretch from the afferent loop suture line, with no vascular pulsation. The affected section of the small intestine was resected and then tightly resutured using a GIA device. The abdominal cavity was closed with blocking sutures. Twenty-four hours after the last operation, another scheduled relaparotomy was performed. There was no abdominal effusion. The small and large intestines were not distended, collapsed, and had a normal pink color. The serous membrane was smooth and visibly shiny. Mesenteric vascular pulsation was distinct, and the formed intestinal stumps were robust. Next, a classic direct small-to-small-intestinal anastomosis was performed using interrupted sutures without mucosal penetra-

tion. The procedure was completed with layer-by-layer closure of the laparotomy wound.

On the fifth day after the last relaparotomy, after his general condition stabilized and laboratory parameters returned to normal, the patient was transferred from the intensive care unit to the specialized surgical department. In the surgical department, anticoagulant therapy was continued: 500 IU of heparin per kg of body weight, combined with intravenous Dextran-40 at a rate of 400 ml per day. The abdominal drainage tubes were gradually removed between days 7 and 9. The patient was discharged from the hospital in satisfactory condition on the 17th day with recommendations to take Xarelto at a dose of 2,5 mg 2 times a day for 1 year, Clopidogrel at a dose of 75 mg/day, long-term.

Conclusions. Based on the results of our clinical case, several conclusions can be drawn: first, the use of modern non-invasive imaging techniques, primarily MSCT angiography, allows for the diagnosis and, consequently, timely surgery of patients with acute myocardial infarction. Second, the use of a surgical treatment strategy based on the "second-look" approach for acute myocardial infarction, in our opinion, as well as that of several other researchers, is preferable and justified. This technique virtually eliminates complications associated with ischemia, peritonitis, and possible recurrent episodes of acute myocardial infarction within 24-48 hours of the initial surgery. This is especially true for patients with severe comorbidities, which can lead to complications in the early postoperative period. Thirdly, prolonged use of anticoagulants (after discharge) is pathogenetically justified and serves its purpose, first of all, to prevent the likelihood of recurrent acute

myocardial infarction, and also improves the trophism of intestinal anastomoses.

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