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SURGICAL APPROACHES IN EMERGENCY ABDOMINAL CONDITIONS. MODERN PROBLEMS AND INNOVATIVE SOLUTIONS IN THE DIAGNOSIS AND TREATMENT OF ACUTE INTESTINAL OBSTRUCTION

Amanbayeva Moxinur Obobakir kizi

Andijan Branch of Kokand University

Faculty of Medicine, General Medicine

Student of Group 25-03

amanbaevamohinur7@gmail.com +998(90)221 02 03

Abstract

This comprehensive scientific article covers the modern, multifaceted aspects of diagnosing and treating acute intestinal obstruction (AIO), one of the most complex and high-mortality pathologies in emergency abdominal surgery. The study provides a deep analysis of the clinical and instrumental effectiveness of traditional open laparotomy versus modern video-laparoscopic technologies based on the experience of the Republican Research Centre of Emergency Medicine (RRCEM) of the Republic of Uzbekistan. The article highlights the molecular and pathophysiological mechanisms of obstruction, updated algorithms for intensive preoperative preparation, modern criteria for assessing intestinal wall viability, and tactics for forming safe anastomoses. The results of the study scientifically substantiate the role of the laparoscopic approach in reducing the number of complications, shortening the duration of postoperative intestinal paresis, and improving the quality of life of patients. Additionally, the article provides practical recommendations for choosing surgical tactics in various forms of AIO, an analysis of differential diagnostic errors, and ways to optimize inpatient treatment costs.

Keywords

Acute intestinal obstruction, video-laparoscopy, surgical tactics, adhesion, peritonitis, endotoxicosis, intestinal resection, anastomotic leakage, surgery in Uzbekistan, homeostasis, water-electrolyte balance, intestinal decompression, MSCT-angiography.

Introduction: In the structure of emergency abdominal diseases, acute intestinal obstruction (AIO) continues to maintain its relevance due to its severe clinical course, uncertainty of prognosis, and high lethality rates. According to world health statistics and data from the emergency medical care system of the Republic of Uzbekistan, AIO accounts for approximately 12-18% of emergency surgical visits. However, the fact that the postoperative mortality rate remains around 15-25%, especially among the elderly and patients who seek medical help late, indicates the need for radical reforms and new approaches in the field.

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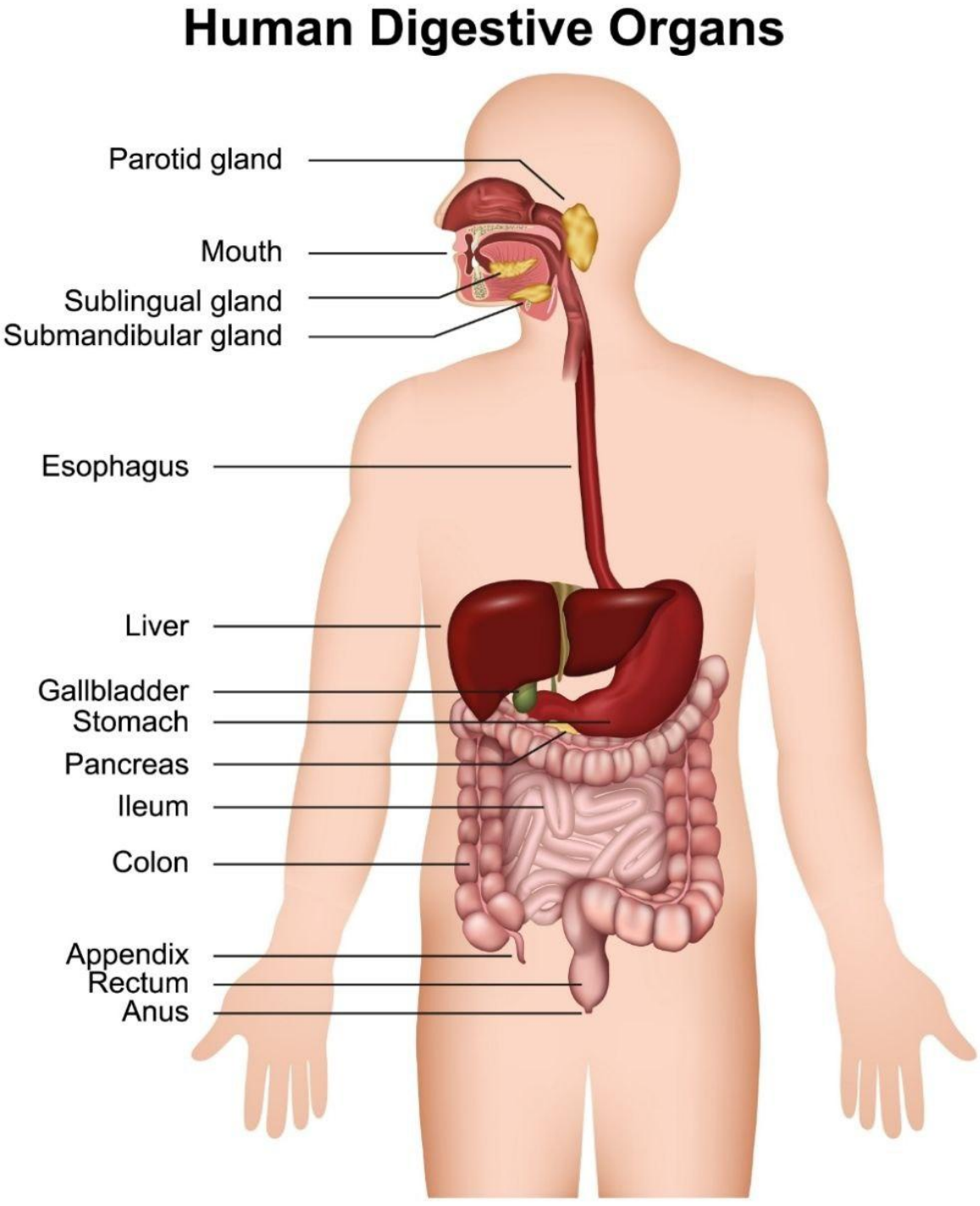

The pathophysiology of AIO is not limited solely to the cessation of intestinal passage. This process begins with ischemia, venous congestion, and lymphostasis in the intestinal wall, resulting in the disruption of the protective mucosal barrier. This opens the way for the "bacterial translocation" phenomenon—the passage of pathogenic microflora and endotoxins from the intestine into the bloodstream and abdominal cavity. The resulting systemic inflammatory response syndrome (SIRS) turns into multiple organ dysfunction syndrome, involving functional failure of the liver, kidneys, and lungs. In the surgical practice of Uzbekistan, particularly in academic surgical schools, the principle of "time is bowel" is considered a priority in the

treatment of AIO. In recent years, adhesive processes developing after previous operations in the abdominal cavity have come to the forefront in the etiology of the disease (in 75-85% of cases). This situation requires surgeons not only to eliminate the mechanical barrier but also to more widely use minimally invasive (laparoscopic) methods that prevent further scar formation. In this article, we consider the scientific and practical basis for choosing the most optimal surgical approaches in emergency situations.

Literature Review: The pillars of the Uzbek surgical school—Academician Sh.I. Karimov, Professors A.M. Khadjibaev, F.G. Nazirov, and Kh.A. Akilov—have perfectly studied the problem of intestinal obstruction from pathophysiological, diagnostic, and tactical perspectives in their fundamental research. Academician Sh.I. Karimov, based on his many years of experience, improved the classification of intestinal obstruction and developed clear algorithms for the differential diagnosis of mechanical and dynamic forms [2]. He emphasized that incorrectly chosen conservative tactics can lead to intestinal necrosis, while unjustified emergency surgery can lead to "laparotomy disease." Professor F.G. Nazirov developed instrumental criteria for determining intestinal viability, suggesting the optimization of the resection volume through Dopplerometry and the study of lactate levels in the intestinal wall [3]. Scientific works and methodological recommendations edited by Professor A.M. Khadjibaev highlight the revolutionary role of laparoscopic surgery in emergency situations. Laparoscopy is interpreted not only as a method of "cutting the barrier" but as the most accurate diagnostic tool for assessing the state of the abdominal cavity. Comparative analysis with modern international guidelines (e.g., Bologna Guidelines on ASBO) shows that the "6-hour intensive conservative trial" tactic proposed by Uzbek scientists fully complies with international standards and reduces the number of unnecessary operations by 30-40% [4]. Furthermore, in recent years, local researcher B.B. Bazarov and co-authors scientifically proved the effectiveness of using new methods of intestinal decompression and "bio-sutures" in preventing the failure of intestinal anastomoses. This serves to significantly reduce postoperative lethality rates [7].

Methods: The study was conducted between 2023 and early 2026 based on clinical data from 550 patients with acute intestinal obstruction treated at the RRCEM and its regional branches. The study design includes prospective and retrospective analyses. Distribution of patients into groups. Control Group (n=275). Patients underwent traditional extended midline laparotomy. This group mainly included patients with intestinal perforation, generalized peritonitis, hemodynamic instability, and extreme expansion of intestinal loops (more than 6 cm). Main Group (n=275). Patients underwent a minimally invasive video-laparoscopic or laparoscopic-assisted approach. After the diagnostic laparoscopy stage, adhesions (adhesiolysis) were cut using instruments where possible, or intestinal resection was performed through a small (minilaparotomy) incision. Diagnostic and Treatment Algorithm. Clinical Diagnosis. Detailed history, nature of pain (cramping or constant), composition of vomiting, shape and asymmetry of the abdomen, peritoneal symptoms (Shchetkin-Blumberg, etc.). Instrumental Diagnosis. Digital radiography (dynamics of Kloiber's cups), high-resolution ultrasound (intestinal wall thickness, "pendulum-like" peristalsis), and MSCT-angiography as the method of choice (to assess mesenteric blood circulation). Preoperative Preparation. Correction of water-electrolyte balance (average 2-4 liters of crystalloids), elimination of hypoproteinemia, antibiotic prophylaxis, and gastrointestinal decompression via a nasogastric tube [6].

Results and Discussion: Data collected during the study confirmed the superiority of laparoscopic technologies over the traditional method in all medical and economic indicators. Clinical-Statistical Indicators. In the main group (laparoscopy), the average duration of the operation was 42.5 + 4.8 minutes (if only adhesiolysis was performed). In the control group, this figure was 88.4 + 12.2 minutes due to extensive revision and sanitation. Importantly, in the

laparoscopy group, postoperative "wound complications" (suppuration, evisceration) accounted for only 1.2%, while in the open laparotomy group, this figure reached 14.5%. Intestinal Motility and Rehabilitation. After the laparoscopic approach, recovery of intestinal peristalsis was observed on average within 18-20 hours, allowing patients to start early enteral nutrition. In the open method, the "paresis" state lasted on average 62-74 hours, which increased the need for long-term parenteral nutrition and the length of hospital stay by 2.5 times. Intestinal Resection and Viability Issue. In 32% of patients in the control group, non-viability (necrosis) of the intestinal wall was detected and resection was performed. Our analysis showed that an increase in intestinal wall thickness to more than 4 mm and the absence of peristalsis on ultrasound are early signs of necrosis. In doubtful cases, "second look" laparoscopy (repeated examination after 24 hours) helped prevent unjustified extensive resection in 12 patients. Discussion. Surgical tactics in AIO should be based on the principle of "necessary radicalism and maximum gentleness." Laparoscopy is the best solution for adhesive intestinal obstruction, but the surgeon's experience and technical equipment play a decisive role. The conversion rate (transition to the open method) in our study was 12%, which was mainly due to "frozen abdomen" and massive intestinal expansion.

Conclusion: The complex use of clinical-laboratory and instrumental (Ultrasound, MSCT) methods in the diagnosis of acute intestinal obstruction ensures 97-98% accuracy in determining surgical tactics. Laparoscopic adhesiolysis is less traumatic compared to traditional laparotomy, reduces the number of postoperative complications by up to 4 times, and significantly accelerates the restoration of patients' labor activity. 3-4 hours of intensive preoperative preparation and intraoperative intestinal decompression are the main factors in reducing the risk of intestinal anastomotic leakage by 2 times. Expanding the scope of laparoscopic assistance in the emergency surgery system of Uzbekistan, regularly improving the skills of doctors, and introducing minimally invasive technologies as a standard is the most effective strategy for reducing the mortality rate.

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