ISSN: 2692-5206
AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES

ORCID: 0009-0006-5966-9149

UDK: 616.341-007.272-02:073:089

COMPARATIVE ANALYSIS OF SURGICAL AND CONSERVATIVE TREATMENT METHODS IN ACUTE INTESTINAL OBSTRUCTION

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Abctract: This thesis explores the comparative analysis of surgical and conservative treatment methods for acute intestinal obstruction (AIO). The study emphasizes modern diagnostic technologies, preventive measures, and effective rehabilitation strategies. Key findings highlight the global impact of enhanced recovery protocols (ERAS) and the importance of integrating dietary and surgical innovations to optimize patient outcomes.

Keywords: acute intestinal obstruction, surgical treatment, conservative management, prevention, rehabilitation, ERAS, diagnostics.

Introduction

Acute intestinal obstruction (AIO) is a critical medical condition characterized by the partial or complete blockage of the intestinal lumen, leading to severe complications such as

ISSN: 2692-5206
AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES

ischemia, necrosis, and even death if left untreated. Globally, AIO accounts for approximately 20% of emergency surgical admissions, with mortality rates ranging from 5% to 25%, depending on timely intervention and the underlying cause.The treatment strategies for AIO can be broadly classified into surgical and conservative approaches. Conservative management, including nasogastric decompression, intravenous fluid therapy, and electrolyte balance, is effective in 30-40% of cases, particularly for non-mechanical obstructions or early-stage presentations. However, surgical intervention remains the cornerstone for addressing mechanical obstructions caused by adhesions, hernias, or tumors, which constitute approximately 60-75% of cases.This study aims to compare the clinical efficacy, recovery outcomes, and complication rates of surgical and conservative treatments for AIO. By analyzing patient outcomes from diverse demographics and clinical scenarios, the research seeks to provide evidence-based recommendations for optimizing treatment protocols and improving prognosis. Statistical data from multicenter studies and recent clinical trials will underscore the findings to ensure a robust and comprehensive analysis.

Diagnostic and treatment methods:Modern diagnostic technologies have significantly enhanced the identification of the causes of acute intestinal obstruction (AIO). Imaging techniques such as computed tomography (CT), ultrasound (US), and endoscopy play pivotal roles in determining the underlying etiology of AIO with high sensitivity and specificity. CT scans are particularly effective in diagnosing mechanical obstructions, with an accuracy rate of approximately 90%, while US is widely utilized due to its non-invasive nature and portability, especially in emergency settings [1]. Endoscopic evaluation is often employed to directly visualize obstructions and assess pathological changes in the intestinal lumen [2].The treatment of AIO involves two primary approaches: conservative management and surgical intervention. Conservative methods, including nasogastric decompression, fluid resuscitation, and electrolyte correction, are predominantly used in cases of functional obstruction or early-stage AIO, with reported success rates of 30-50% [3]. Conversely, surgical procedures, such as adhesiolysis, bowel resection, or hernia repair, remain the standard for mechanical obstructions caused by adhesions, hernias, or malignancies. Surgical management has shown superior outcomes in resolving complete obstructions but is associated with higher complication rates and longer recovery periods [4].Types and Causes of AIOAIO can be classified into mechanical and non-mechanical (functional) types, each with distinct pathophysiological mechanisms. Mechanical obstructions account for the majority of cases (approximately 60-80%) and are caused by structural abnormalities, such as adhesions (50-70% of mechanical cases), tumors, volvulus, or hernias [5]. Non-mechanical obstructions, on the other hand, result from conditions that impair bowel motility, such as paralytic ileus or pseudo-obstruction [6].Among the most common causes of AIO are adhesions, often developing as a postoperative complication, and tumors, which constitute up to 20% of cases in older adults [7]. Hernias, particularly in developing countries, remain a significant cause of mechanical obstructions, with an incidence of 10-20% [8]. Other less frequent causes include inflammatory strictures, foreign bodies, and intussusception, particularly in pediatric populations [9].

Preventive Measures and Recovery

Preventive Strategies and Dietary Guidelines:Preventing acute intestinal obstruction (AIO) involves addressing its primary causes and minimizing risk factors. Postoperative adhesions, the leading cause of AIO, can be reduced through minimally invasive surgical techniques

ISSN: 2692-5206
AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES

such as laparoscopy, which decreases adhesion formation by up to 30% compared to open surgeries [1]. The use of anti-adhesion barriers, such as hyaluronic acid-based products, has also shown promise in reducing postoperative complications by 40-50% in high-risk patients [2].Dietary recommendations for AIO prevention include maintaining a high-fiber diet to promote bowel motility and prevent constipation, a significant contributing factor to functional obstructions. Studies indicate that individuals consuming 25-30 grams of fiber daily are 35% less likely to develop non-mechanical intestinal obstructions [3]. Hydration and avoiding excessive intake of fatty or processed foods further support gastrointestinal health.

Effective Postoperative Rehabilitation:Postoperative rehabilitation is crucial for improving outcomes and reducing recurrence rates. Key interventions include:

1. Early mobilization: Encourages intestinal motility, reducing paralytic ileus by 20-30% [4].
2. Gradual reintroduction of oral feeding: Studies show that starting liquid diets within 48 hours post-surgery can decrease hospital stay by an average of 3-4 days [5].
3. Physical therapy and breathing exercises: Help prevent pulmonary complications, which occur in 15-20% of AIO patients post-surgery [6].

Scientific and practical implications

Impact on clinical practice:The findings of this research have practical implications for optimizing treatment protocols and improving patient outcomes. For example, adopting evidence-based dietary and surgical guidelines can significantly lower morbidity and healthcare costs. Research conducted in Japan and the United States suggests that implementing enhanced recovery after surgery (ERAS) protocols can reduce complication rates by 15-25% and shorten recovery times by an average of 2-3 days [7].

Comparison of global scientific advances:A comparative analysis of international practices reveals significant advancements in both diagnosis and treatment. For instance, the European Society for Clinical Nutrition and Metabolism (ESPEN) recommends individualized nutrition plans as part of AIO management, a practice increasingly adopted in developing countries [8]. In contrast, countries like China focus on integrating traditional medicine with modern surgical techniques, achieving remarkable results in reducing recurrence rates [9].

Tab.1.supporting data table for acute intestinal obstruction thesis

Aspect	Statistics
Adhesion prevention (laparoscopy)	Reduces adhesion-related AIO by 30%
Fiber intake	Decreases risk of AIO by 35%
Early feeding post-surgery	Shortens hospital stay by 3-4 days
ERAS protocols	Reduce complications by 15-25%
Global adoption of ESPEN guidelines	Improves nutritional outcomes in 85% of cases

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AMERICAN ACADEMIC PUBLISHER
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Conclusion: Preventive measures and effective postoperative rehabilitation significantly impact the management of acute intestinal obstruction (AIO). Minimally invasive surgical techniques, combined with anti-adhesion strategies, reduce recurrence rates and postoperative complications. High-fiber diets and adequate hydration are essential for preventing non-mechanical obstructions, while early mobilization and gradual reintroduction of oral feeding enhance recovery outcomes.Globally, enhanced recovery protocols (ERAS) and individualized nutrition plans, as recommended by ESPEN, have demonstrated 15-25% reduction in complications and improved recovery times. These findings emphasize the need for integrating global best practices into local healthcare systems to optimize AIO treatment outcomes.

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