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RECENT ADVANCES IN THE THERAPEUTIC STRATEGIES FOR ADHESIVE SMALL BOWEL OBSTRUCTION

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Abstract. Adhesive Small Bowel Obstruction (ASBO) is a common intestinal blockage caused by postoperative adhesions. Initial management typically involves conservative measures such as bowel rest, fluids, and Gastrografin®, which succeed in over 70% of stable patients. Surgery is reserved for complications like ischemia or failed conservative treatment, with laparoscopic techniques offering improved outcomes and reduced duration of hospitalization. Preventive strategies, including meticulous surgical methods and anti-adhesive materials, are crucial in minimizing recurrence. Emerging therapies, such as gene therapy, show promise but require further research. Effective ASBO management combines tailored conservative care, timely surgery, and robust prevention, with a emphasis on advancing diagnostics and treatment protocols.
Keywords: ASBO, treatment, laparoscopic adhesiolysis, adhesion prevention, surgical management

Introduction

Adhesive small bowel obstruction (ASBO) is a significant clinical challenge, often resulting from postoperative adhesions. The treatment of ASBO involves a combination of conservative management and surgical intervention, with the choice of treatment depending on the severity and progression of the obstruction. Recent advancements in both diagnostic and therapeutic approaches have improved the management of ASBO, although the optimal treatment strategy remains a topic of continuing investigation and debate. The following sections outline the current treatment modalities for ASBO, as derived from the provided research papers.

Conservative Management

- Supportive Care: Initial management of ASBO often involves conservative measures such as bowel rest, intravenous fluids, nasogastric decompression, and pain management. These measures aim to stabilize the patient and potentially resolve the obstruction without surgery [1,2].
- Nasointestinal Tube (NIT) Placement: NIT placement is an alternative to traditional conservative treatment, providing in situ decompression. It has shown a treatment success rate of 68.1% in patients with reversible electrolyte imbalances or low neutrophil count/lymphocyte ratio3.
- Oral Water-Soluble Contrast: The use of oral water-soluble contrast agents like Gastrografin® has been explored as a diagnostic and therapeutic tool. It aids in predicting the necessity of surgery and can resolve obstructions in certain instances, with a nonoperative management success rate of 78%2.

Surgical Intervention

- Indications for Surgery: Surgery is indicated in cases of bowel ischemia, peritonitis, or when conservative management fails. Clinical signs such as abdominal rebound, free intrabdominal fluid, and transition zone on imaging are predictors for surgical intervention[4,5].
- Surgical Techniques: Exploratory laparotomy and laparoscopic adhesiolysis are common surgical approaches. Laparoscopy is increasingly favored due to its minimally invasive nature, minimizing peri-operative complications and mortality[5,6].
- Outcomes and Complications: Delayed surgery is associated with a higher risk of complete bowel obstruction and the necessity of bowel resection. However, the risk of late small bowel resection for ischemia is relatively low at 0.92.

Alternative and Complementary Treatments

- Acupuncture and Herbal Medicine: In some cases, especially in elderly patients with poor surgical performance, alternative treatments such as acupuncture and herbal medicine have been employed to manage symptoms and stimulate bowel movement[7].

Prevention Strategies

- Primary and Secondary Prevention: Preventive measures include meticulous surgical techniques to minimize adhesion formation and the use of anti-adhesive agents during surgery. Laparoscopic surgery is preferred for its lower risk of adhesion formation[8,9].
- Anti-Adhesive Gels: The application of anti-adhesive gels during surgery has been shown to significantly reduce the recurrence of ASBO in pediatric patients[9].

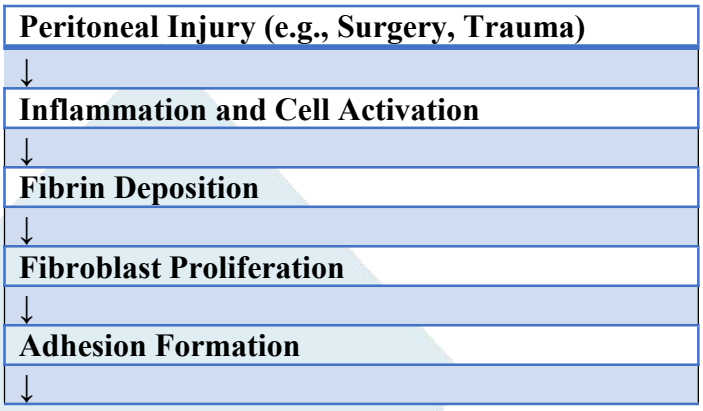
While conservative management remains the first line of treatment for ASBO, surgical intervention is crucial in cases of severe or complicated obstructions. The choice between laparotomy and laparoscopy depends on the patient's condition and the surgeon's expertise. Despite advancements in treatment, the prevention of adhesions through careful surgical practice and the use of anti-adhesive agents remains a critical component in managing ASBO effectively.

Pathophysiology and Clinical Presentation

Adhesive small bowel obstruction (ASBO) is a prevalent cause of mechanical intestinal obstruction, often occurring in patients with a history of laparotomy due to the formation of fibrous bands, or adhesions, that can constrict the bowel[5]. The pathophysiology involves the development of these adhesions post-surgery, which may result in obstruction by kinking or compressing the bowel loops. Clinically, ASBO presents with symptoms indistinguishable from other types of bowel obstructions, including abdominal pain, vomiting, and distension[8]. Diagnosis is primarily clinical but is significantly aided by imaging studies, with CT scans being the most informative, providing details on the presence of ischemia or strangulation[5]. Management of ASBO typically begins with non-operative measures, such as nasogastric decompression and the use of oral water-soluble contrast agents like Gastrografin®, which can help resolve the obstruction in many cases[2]. However, surgical intervention becomes necessary in cases of bowel ischemia, peritonitis, or when conservative management fails[2,4]. The decision for surgery is often guided by clinical and tomographic features, such as abdominal rebound tenderness and the presence of free intrabdominal fluid[4]. While open surgery has been the traditional approach, laparoscopic techniques are increasingly favored due to their association with reduced peri-operative complications and mortality, provided patient selection is appropriate5. Overall, the management of ASBO requires a careful balance between timely surgical intervention and conservative treatment to minimize morbidity and mortality[10,4].

The following flowchart outlines the pathophysiological progression of Adhesive Small Bowel Obstruction (ASBO). It is structured to allow for easy modification and annotation.

Figure 1.0



Mechanical Obstruction
↓
Clinical Manifestations: Pain, Vomiting, Distension

Non-Operative Management

Non-operative management of adhesive small bowel obstruction (ASBO) is a widely adopted approach, particularly in stable patients, and involves strategies such as the use of water-soluble contrast agents like Gastrografin. This method has been shown to reduce the necessity of surgical intervention and shorten hospital stays when initial conservative management fails after 48 hours[11]. In pediatric cases, non-operative management is prevalent, especially in younger children, although operative management is more common in teaching hospitals. Delayed surgery in these cases is associated with longer hospital stays and increased complications, but not with higher mortality or bowel resection rates[12]. A large retrospective study supports the use of Gastrografin, demonstrating that 78% of patients with ASBO can be managed non-operatively, with a low risk of late bowel resection for ischemia[2]. However, a prospective cohort study indicates that while operative treatment reduces recurrence rates, it is associated with higher mortality within the first year compared to non-operative management. Predictors for successful non-operative management include the presence of contrast in the colon on imaging, which significantly increases the likelihood of avoiding surgery. Overall, while non-operative management is effective for many patients, careful assessment using imaging and clinical indicators is crucial to identify those who may require surgical intervention to prevent complications

Surgical Management

The surgical management of adhesive small bowel obstruction (SBO) involves a nuanced approach that balances the necessity of immediate intervention with the potential benefits of conservative management. Adhesive SBO is a frequent complication following abdominal surgeries, often necessitating surgical intervention due to potential complications such as intestinal necrosis and peritonitis6. While exploratory laparotomy has traditionally been the standard surgical approach, recent advancements have seen a shift towards minimally invasive techniques like laparoscopy, which are associated with reduced operative time, blood loss, and postoperative complications compared to open surgery. Laparoscopic adhesiolysis, in particular, has shown promising results, with studies indicating reduced duration of hospitalization and quicker recovery times. However, the choice between laparoscopic and open surgery often depends on the surgeon's expertise and the patient's specific condition16. In cases where conservative management is initially pursued, the use of oral water-soluble contrast agents like Gastrografin® can aid in decision-making, with emergency surgery reserved for patients showing signs of ischemia or persistent symptoms. The timing of surgical intervention remains a critical factor, as delays in surgery for patients not responding to conservative treatment can increase morbidity and mortality. Despite the advancements in surgical techniques, the prevention of adhesion formation through meticulous surgical practices and the use of pharmacological agents remains a key strategy in managing adhesive SBO. Overall, the management of adhesive SBO requires a tailored approach, considering both the potential benefits of non-operative management and the necessity for timely surgical intervention in complicated cases18.

Role of Adhesion Prevention Strategies

Adhesion prevention strategies play a crucial role in managing adhesive small bowel obstruction (SBO), a common complication following abdominal surgery that significantly impacts patient quality of life and healthcare systems. Meticulous surgical techniques are fundamental in preventing adhesion formation, despite the availability of various pharmacological and surgical

strategies. Laparoscopic surgery and the use of adhesion prevention materials (APM) have been increasingly employed since 2000, showing potential in minimizing the incidence of SBO. Physical barrier agents, such as Seprafilm®, composed of hyaluronic acid and carboxymethylcellulose, are FDA-approved and can reduce the risk of adhesion formation, although their clinical utility remains controversial due to conflicting study results. Additionally, anti-inflammatory and fibrinolytic agents have been explored, but their effectiveness is limited by the lack of comprehensive in-vitro and in-vivo studies. Emerging therapies, including gene therapy and stem cell-based approaches, offer promising new strategies for adhesion prevention, although further research is needed to optimize these methods3. Nonoperative management of SBO, using protocols like Gastrografin® administration, has proven effective in many cases, with a significant percentage of patients managed without surgery. These strategies collectively aim to reduce the burden of adhesion-related complications, highlighting the necessity of continued research and development in this field to enhance patient outcomes and reduce the socioeconomic impact of adhesive SBO.

Outcomes and Prognosis

The management and prognosis of adhesive small bowel obstruction (ASBO) involve a complex interplay between operative and non-operative strategies, each with distinct outcomes. Non-operative management is often the first line of treatment in stable patients, with studies showing a significant proportion of patients responding well to conservative measures. For instance, in a Yemeni cohort, 67.6% of patients with ASBO were successfully managed conservatively, with most showing improvement within 1-2 days. Similarly, a large prospective trial demonstrated that 78% of patients were managed non-operatively, although 36% eventually required surgery. The use of oral water-soluble contrast, such as Gastrografin®, has been shown to aid in the decision-making process, minimizing the necessity of surgery and associated potential complications2. However, when surgical intervention is necessary, the timing and method of surgery significantly impact outcomes. Early operative management has been associated with reduced mortality and complications, as hospitals with higher rates of early operations reported lower mortality and serious complications. Laparoscopic approaches, including single-port and multi-port techniques, have been explored, with studies indicating reduced duration of hospitalization and fewer complications compared to open surgery, although patient selection is crucial. Despite the benefits of surgery in minimizing recurrence rates, as seen in a Danish study where operative treatment led to a 92.5% recurrence-free survival compared to 66.6% in non-operative cases, it also increased the risk of mortality within the first year. Prognostic score indices have been suggested to aid in surgical decision-making, potentially enhancing outcomes by identifying patients at higher risk of complications. Overall, while non-operative management remains a viable initial approach, careful monitoring and timely surgical intervention are essential, particularly in cases of bowel compromise or peritonitis, to optimize patient outcomes and minimize mortality potential complications.

Table 1: Outcomes and Prognosis in Adhesive Small Bowel Obstruction (ASBO)

Year	Authors	Results	Prognosis
2021	Tyagunov et al.	- The study found that mortality rates were similar between the early surgery group and the late surgery group, with an overall mortality rate of 7.0% and a postoperative mortality rate of 15.2%. Notably, all patients who underwent surgery after 24 hours survived, indicating	- The overall mortality rate for patients with acute adhesive small bowel obstruction (AASBO) was found to be 7.0%, with a postoperative mortality rate of 15.2% for those who underwent surgery. This indicates a significant risk

		that delayed surgery may be beneficial in certain cases.	associated with surgical intervention in these patients.
2021	Behman et al.	- The study found that among 27,026 patients admitted for their first episode of adhesive small bowel obstruction (aSBO), 23% were managed operatively, with a 30-day mortality rate of 4.2%. The proportion of patients treated with early operation varied significantly across hospitals, ranging from 0% to 33%, with a median of 10%.	- The study found that there was a 17% lower likelihood of 30-day mortality for every 10% increase in the proportion of patients managed with an early operation for adhesive small bowel obstruction (aSBO) at the hospital level, indicating that early operative management is associated with improved survival outcomes.
2022	Timerbulatov et al.	- Laparoscopic surgery for acute adhesive small bowel obstruction (AASBO) was completed in only 46.2% of patients scheduled for the procedure, with 53.8% requiring conversion to open surgery due to factors such as massive adhesions and intraoperative complications. The overall rates of surgical complications were lower in laparoscopic operations (6.4%) compared to open surgery (12.69%).	- The mortality rate for patients undergoing laparoscopic surgery for acute adhesive small bowel obstruction (AASBO) was reported at 6%, while the mortality rate for those undergoing open surgery was slightly higher at 6.3%. This indicates a comparable prognosis between the two surgical approaches in terms of mortality.
2022	Coco et al.	- The review article discusses the role of various prognostic score index models in the management of small bowel obstruction (SBO), emphasizing that their widespread implementation has the potential to improve patient outcomes and reduce resource consumption by aiding in the decision-making process regarding surgical intervention.	- The prognosis for patients with small bowel obstruction (SBO) is significantly influenced by the timing of surgical intervention. Delays in reaching the operating room can lead to higher rates of bowel resection and increased morbidity and mortality. For instance, patients who undergo surgery within 24 hours of admission have a lower incidence of bowel resection compared to those who take longer than 24 hours, highlighting the importance of timely surgical management to improve outcomes.
2022	Kapshytar et al.	- After surgical intervention, 75.5% of patients had adhesions successfully crossed, while 18.4% required small bowel resection and 4.1% underwent small bowel + bicuspid end ileostomy.	- The study indicates a mortality rate of 6.1% among patients, with causes of death including sepsis, multiple organ failure, and COVID-19 associated pneumonia, suggesting that while

		Additionally, 18.4% of patients had simultaneous surgeries performed, indicating a varied approach based on individual patient needs.	surgical intervention can be effective, there are significant risks involved.
2023	Maienza et al.	- The study found that 78% of patients with adhesive small bowel obstruction (SBO) were managed nonoperatively, with 183 of these patients (36.0%) ultimately requiring surgery. This indicates that a significant majority of cases can be treated without the need for immediate surgical intervention.	- The study found that 78% of patients with adhesive small bowel obstruction (SBO) were managed nonoperatively, indicating a favorable prognosis for the majority of patients who do not require emergency surgery.
2023	Mortensen et al.	- Patients who underwent operative treatment for adhesional small bowel obstruction had a significantly better 1-year recurrence-free survival rate of 92.5% compared to 66.6% for those managed non-operatively, indicating that operative management reduces the risk of recurrence.	- Patients undergoing operative treatment for adhesional small bowel obstruction have a significantly better 1-year recurrence-free survival rate (92.5%) compared to those managed non-operatively (66.6%), indicating a lower risk of recurrence for those who have surgery.
2023	Gómez et al.	- The study included 68 patients with multiple adhesive small bowel obstructions (MASBO) who underwent laparoscopic management, with 27 patients treated using Single-Port single incision laparoscopic surgery (SILS) and 41 patients using Multi-port Laparoscopic Surgery. The average surgical time was significantly shorter for the SILS approach at 129 minutes compared to 167 minutes for the multi-port approach, and the mean hospital stay was also shorter for SILS at 3.2 days versus 5.2 days for multi-port.	- The prognosis for patients undergoing laparoscopic management of multiple adhesive small bowel obstruction (MASBO) is generally positive, as both Single-Port single incision laparoscopic surgery (SILS) and Multi-port laparoscopic surgery are deemed feasible and safe when performed by qualified surgeons. Successful outcomes are significantly influenced by appropriate patient selection and medical judgment.

2023	Elisa Maienza et al.	- A total of 661 patients with adhesive small bowel obstruction (SBO) were included in the study, with 78% managed nonoperatively. Among those, 183 patients (36%) eventually required surgery, and delayed surgery revealed complete small bowel obstruction in all patients who failed conservative treatment, with small bowel resection necessary in 19 patients (10%).	- The study found that 78% of patients with adhesive small bowel obstruction (SBO) were managed nonoperatively, with a significant portion (36%) eventually requiring surgery. Among those who underwent delayed surgery, all patients exhibited complete small bowel obstruction, and a small bowel resection was necessary in 10% of these cases, indicating a relatively low risk of severe complications in the majority of patients managed conservatively.
2024	Gailan et al.	- Out of 102 patients with adhesive small bowel obstruction (ASBO), 69 patients (67.6%) successfully responded to conservative management without the need for surgical intervention, while 33 patients (32.4%) required surgical intervention due to failed conservative treatment. Most patients (88.4%) who underwent conservative management showed improvement within 1–2 days.	- The study found that conservative management of adhesive small bowel obstruction (ASBO) had a success rate of 67.6%, with the majority of patients (88.4%) showing improvement within 1–2 days, indicating a favorable prognosis for those who respond well to this treatment approach.

Controversies and Gaps in Knowledge

Adhesive small bowel obstruction (SBO) presents significant challenges in diagnosis, treatment, and prevention, with ongoing controversies and gaps in knowledge. The management of adhesive SBO is contentious, particularly regarding the timing and necessity of surgical intervention. While emergency surgery is required for cases with bowel ischemia or peritonitis, most adhesive SBOs can be managed nonoperatively, often using protocols involving oral water-soluble contrast agents like Gastrografin® to aid in decision-making and potentially avoid unnecessary surgeries. However, there is no consensus on the optimal timing for surgical intervention, as prolonged nonoperative management can increase morbidity, yet early surgery may reduce recurrence risk. Diagnostic tools such as CT scans and water-soluble contrast studies are crucial for distinguishing adhesive SBO from other causes and predicting surgical needs. Despite advancements in surgical techniques, including laparoscopy and endoscopic approaches, and the development of pharmacological strategies to prevent adhesions, the prevention of adhesion formation remains a critical area requiring further research6. The socioeconomic burden of adhesive SBO, due to its high incidence and potential complications like intestinal necrosis and peritonitis, underscores the necessity of continued investigation into increased efficacy of management and prevention strategies. Overall, while current protocols show promise, the medical community must address these controversies and gaps to improve patient outcomes.

Future Directions

Future directions in the management of adhesive small bowel obstruction (ASBO) are increasingly focused on integrating advanced surgical techniques and enhancing conservative treatment strategies. The traditional approach of waiting for 72 hours before surgical intervention is being challenged by recent studies advocating for earlier surgical management, particularly within 24 hours, to reduce morbidity, mortality, and hospital stay, while enhancing the feasibility of therapeutic laparoscopy27. Laparoscopic surgery, although debated due to potential visceral potential complications, is gaining traction as technological advancements improve its safety and efficacy in emergency abdominal conditions, including ASBO28. Concurrently, conservative treatment methods are evolving, with the introduction of deep endoscopy-assisted nasointestinal drainage and the use of water-soluble contrast, which have shown promising results in enhancing treatment outcomes and minimizing the necessity of surgery. The economic burden of ASBO surgery is significant, with in-hospital stays being the primary cost driver, highlighting the necessity of strategies that minimize postoperative complications and hospital duration30. Minimally invasive surgery not only reduces adhesion formation by 50% compared to open surgery but also potentially accelerates recovery and decreases the risk of recurrent ASBO, although its impact on the overall incidence of ASBO remains uncertain31. Future research should emphasis on refining patient selection criteria for early surgical intervention, leveraging new radiological tools for better diagnosis, and exploring the use of adhesion barriers to prevent adhesion-related complications in the minimally invasive era.

Conclusion

The management of Adhesive Small Bowel Obstruction (ASBO) requires a delicate balance between conservative treatment and surgical intervention. Conservative measures are effective for most stable patients, while timely surgery is crucial in complicated cases to prevent morbidity and mortality. Laparoscopic techniques and preventive strategies, such as anti-adhesive materials, have advanced the field, though optimal treatment timing remains debated. Continued research and innovation are essential to refine protocols and improve long-term outcomes for patients with ASBO.

References:

1. Egamberdieva, G. N., & Sh, E. N. (2022). THE ROLE OF THE NURSE IN PREVENTING CHANGES IN THE REPRODUCTIVE HEALTH OF CHILDREN IN ADOLESCENCE. *Теория и практика современной науки*, (10 (88)), 23-26.
2. Karabaev Jasurbek Mavlyanjanovich. (2025). CURRENT CHALLENGES AND ADVANCES IN PEDIATRIC TRAUMATOLOGY. *International Multidisciplinary Journal for Research & Development*, *12*(05), 157–160. Retrieved from https://www.ijmrd.in/index.php/imjrd/article/view/3051
3. Qoraboyev Jasurbek Mavlonjon O‘G‘Li, & Raximova Ruxshona Shavkat Qizi (2024). KATTALARDAGI OG‘IR MIYA SHIKASTLANISHI. Eurasian Journal of Medical and Natural Sciences, 4 (2), 156-162. doi: 10.5281/zenodo.10776140
4. Tashmamatova, D. K. (2025). UNDERSTANDING AND MANAGING CONSTIPATION IN CHILDREN AGED 0-3: CAUSES, DIAGNOSIS, AND TREATMENT STRATEGIES. *ORIENTAL JOURNAL OF MEDICINE AND NATURAL SCIENCES*, *2*(1), 4-12.
5. Ибрагимова Х., & Эгамбердиева Г. (2020). ЭКОЛОГИЯ И ЗДОРОВЬЕ ЧЕЛОВЕКА. Мировая наука, (1 (34)), 226-229.
6. Корабоев, Ж. (2024). ПАТОЛОГИЧЕСКИЕ ПЕРЕЛОМЫ КОСТЕЙ. В МЕЖДУНАРОДНАЯ КОНФЕРЕНЦИЯ АКАДЕМИЧЕСКИХ НАУК (Т. 3, Выпуск 7, сс. 32–35). Zenodo. https://doi.org/10.5281/zenodo.11632660

7. Корабоев, Ж. (2024, June). ПАТОЛОГИЧЕСКИЕ ПЕРЕЛОМЫ КОСТЕЙ. In *Международная конференция академических наук* (Vol. 3, No. 6, pp. 32-35).
8. Эгамбердиева, Г. (2018). Методика обучения будущих учителей сетевым технологиям с использованием виртуальных машин. *Мировая наука*, (9 (18)), 67-69.
9. Эгамбердиева, Г. Н. (2024). OPPORTUNITIES FOR APPLICATION OF PERSONALIZED EDUCATION IN MEDICAL SCHOOLS. *IMRAS*, *7*(1), 771-773.
10. Эгамбердиева, Г. Н. (2024). УПРАВЛЕНИЕ ИННОВАЦИОННЫХ ТЕХНОЛОГИЙ СРЕДНИХ МЕДИЦИНСКИХ ПЕРСОНАЛОВ В ЛПУ. *PEDAGOG*, *7*(11), 247-249.
11. Эгамбердиева, Г. Н. (2025). ВЕГЕТОСОСУДИСТАЯ ДИСТОНИЯ У ДЕТЕЙ. *AMERICAN JOURNAL OF EDUCATION AND LEARNING*, *3*(1), 469-474.
12. Эгамбердиева, Г. Н., & Умарова, Т. А. (2019). Определение понятия здорового образа жизни. *Теория и практика современной науки*, (2 (44)), 384-387.