Attahadi Medical Journal
2026;3(2):153-156
https://doi.org/10.69667/amj.26207

OPEN ACCESS

Original article

Operative *versus* Non-Operative Management of Adhesive Small Bowel Obstruction: A Prospective Study at Tobruk Medical Center

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Keywords:
Adhesive Small Bowel Obstruction, Operative Treatment, Non-operative Treatment, Recurrence, Laparotomy

A B S T R A C T

Adhesive small bowel obstruction (ASBO) is a common complication following abdominal surgery, affecting approximately 95% of patients with prior abdominal operations. This study aimed to determine the optimal timing for surgical intervention in ASBO patients and improve clinical management. A prospective comparative study was conducted at the General Surgery Department of Tobruk Medical Centre. Thirty patients with ASBO were randomly assigned to two equal groups: Group A (conservative, non-operative care) and Group B (operative care). In the operative group, 13 patients (86.6%) underwent early exploratory laparotomy. In the conservative group, 8 patients (53.3%) required surgery due to failure of conservative management. The most common prior procedure in both groups was open appendectomy, followed by caesarean section. Recurrence of SBO was significantly higher in the conservative group (7 patients, 46.7%) compared to the operative group (2 patients, 13.3%) (p = 0.0042). Early surgical intervention within 24 hours of admission significantly reduces recurrence rates in ASBO patients.

Introduction

Acute intestinal obstruction is a common surgical emergency. Symptoms of small bowel obstruction include constipation, vomiting, abdominal distension, and pain. Intra-abdominal adhesions, usually resulting from previous surgery, account for approximately 75% of small bowel obstructions [1,2]. Up to 9% of patients develop small bowel obstruction after abdominal surgery [3,4], and 33% of these patients will require surgery [5,6]. The risk of ASBO is highest following colorectal and oncological gynecological surgery [4]. Management of ASBO involves three basic approaches: CT imaging, biologic tests, and clinical evaluation. Effective conservative treatment may leave adhesions that could cause future episodes, while surgery may lead to new adhesion formation [7].

Initial patient stabilization includes correction of fluid and electrolyte imbalances and nasogastric tube decompression. Patients with signs of strangulation require immediate surgery. Non-operative management consists of NPO status, nasogastric decompression, fluid resuscitation, electrolyte correction, and regular clinical and imaging reevaluation. Traditionally, ASBO has been treated with open surgery, though laparoscopic approaches are increasingly used. Laparoscopy offers advantages, including less adhesion reformation, earlier return of bowel function, less postoperative pain, and shorter hospital stays. This study sought to improve management and identify the optimal timing for surgical intervention in patients with adhesive small bowel obstruction (ASBO).

Methods

This prospective comparative study was carried out at the Emergency Department of Tobruk Medical Center between 2023 and January 2026. A total of thirty patients diagnosed with adhesive small bowel obstruction (ASBO) were enrolled and randomly assigned into two equal groups. Group A, the conservative arm, included fifteen patients who received non-operative management, while Group B, the operative arm, comprised fifteen patients who underwent surgical intervention. The mean age in the conservative group was 39.6 ± 12.56 years, whereas in the operative group it was 32.9 ± 14.8 years, a difference that did not reach statistical significance (p = 0.097).

Eligible participants were male and female patients above the age of twelve with a confirmed diagnosis of ASBO. Exclusion criteria included individuals without a history of prior abdominal or pelvic surgery, those with obstruction due to other causes such as incarcerated hernia, patients presenting with signs of strangulation necessitating immediate surgery, and those who declined operative treatment.

All patients underwent complete history, physical examination, laboratory tests (CBC, CRP, electrolytes, liver/kidney function, coagulation profile), plain X-ray (supine and upright), and CT scan of the abdomen and pelvis with water-soluble contrast (Gastrografin). Follow-up X-rays were taken at 8, 16, 24, and 36 hours to assess contrast progression to the colon. Patients were randomized into two groups using a simple randomization method. The randomization determined the initial management strategy (early operative vs

Received*: 21-02-2026 -* ***Accepted****: 19-04-2026 -* ***Published****: 26-04-2026*

Attahadi Medical Journal
2026;3(2):153-156
https://doi.org/10.69667/amj.26207

conservative). However, subsequent interventions in the conservative group were guided by clinical progression and predefined failure criteria.

Decision-Making Protocol

After resuscitation and nasogastric decompression, water-soluble contrast was administered. Failure of non-operative treatment was defined as: persistent obstruction >72 hours, NGT drainage >500 mL on day 3, no contrast reaching the colon within 36 hours, or development of strangulation signs (increased pain, fever, leukocytosis). The operative group received early surgical intervention (within 24 hours of admission). Preoperative antibiotics included cefazolin (30 mg/kg, max 2 g) and metronidazole (15 mg/kg IV). Surgical approach: Open exploratory laparotomy via vertical midline incision or laparoscopic adhesiolysis using three trocars.

Follow-up

Patients were monitored until clinical improvement, then followed up with outpatient: weekly for one month, biweekly for two months, then monthly for three months.

Results

The study included thirty patients, evenly divided between conservative and operative management groups. The mean age was slightly higher in the conservative group (39.6 ± 12.56 years) compared with the operative group (32.9 ± 14.8 years), though this difference was not statistically significant (p = 0.097). Gender distribution was balanced, with a comparable proportion of male and female patients in both groups.

Table 1. Patient Characteristics

Variable	Conservative Group (n=15)	Operative Group (n=15)	p-value
Age (mean ± SD)	39.6 ± 12.56	32.9 ± 14.8	0.097
Male	8 (53.3%)	7 (46.7%)	0.052
Female	7 (46.7%)	8 (53.3%)	

Clinical presentation was similar across groups. Abdominal pain was the most frequent symptom, reported in 80% of conservatively managed patients and 86.6% of those undergoing surgery (p = 0.955). Nausea and vomiting were present in approximately two-thirds of patients in both groups, while constipation was reported in 60% of each group, showing no meaningful difference.

Table 2. Clinical Presentation

Symptom	Conservative Group	Operative Group	p-value
Abdominal pain	12 (80%)	13 (86.6%)	0.955
Nausea/vomiting	10 (66.6%)	11 (73.3%)	
Constipation	9 (60%)	9 (60%)	

Previous surgical history varied, with open appendectomy being the most common prior procedure overall, followed by cesarean section. Other operations included open cholecystectomy and hysterectomy, with comparable distribution between the two groups.

Table 3. Previous Operations

Procedure	Conservative Group	Operative Group
Open appendectomy	3 (20%)	6 (40%)
Cesarean section	2 (13.3%)	3 (20%)
Open cholecystectomy	2 (13.3%)	1 (6.6%)
Hysterectomy	2 (13.3%)	1 (6.6%)

Among patients who required surgery, intraoperative findings revealed single band adhesions as the predominant cause, observed in 37.5% of those failing conservative management and 61.5% of those undergoing early operative intervention. Matted adhesions, ischemic bowel, and bowel perforation were less frequent and showed no significant differences between groups. Notably, the need for stoma formation was recorded in one patient from the conservative failure group, a finding that reached statistical significance (p = 0.031).

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Table 4. Intraoperative Findings (Patients Undergoing Surgery)

Finding	Failure of Conservative (n=8)	Early Operative (n=13)	p-value
Single band adhesion	3 (37.5%)	8 (61.5%)	0.774
Matted adhesion	1 (12.5%)	3 (23.1%)	0.640
Ischemic bowel	2 (25%)	1 (7.7%)	0.715
Bowel perforation	1 (12.5%)	1 (7.7%)	0.871
Stoma required	1 (12.5%)	0	0.031

Analysis of predictive factors for failure of conservative management revealed significant differences between patients who responded successfully and those who required surgical intervention. The mean white blood cell (WBC) count was markedly higher in the failure group (9.94 ± 1.01 G/L) compared with those who succeeded with conservative therapy (8.58 ± 0.37 G/L), a highly significant difference (p = 0.00089). Similarly, C-reactive protein (CRP) levels were elevated among patients who failed conservative treatment (27.5 ± 9.01 mg/L) compared with those who improved without surgery (17.22 ± 2.54 mg/L), with statistical significance (p = 0.0024).

Table 5. Predictive Factors for Failure of Conservative Management

Factor	Successful Conservative (n=7)	Failed Conservative (n=8)	p-value
WBC count (G/L)	8.58 ± 0.37	9.94 ± 1.01	0.00089
CRP (mg/L)	17.22 ± 2.54	27.5 ± 9.01	0.0024
Free peritoneal fluid (CT)	3 (33%)	7 (87.5%)	0.047

During follow-up, recurrence of small bowel obstruction was observed more frequently among patients managed conservatively, affecting seven individuals (46.6%), compared with only two patients (13.3%) in the operative group. This difference was statistically significant (p = 0.0042), underscoring the advantage of surgical intervention in reducing recurrence rates. Mortality was recorded in one patient from each group (6.6%). In the operative arm, death resulted from pulmonary embolism, while in the conservative arm, mortality occurred following surgery for ischemic bowel complicated by multi-organ failure.

Table 6. Outcomes of Follow-Up

Outcome	Conservative Group (n = 15)	Operative Group (n = 15)	p-value
Recurrence of SBO	7 (46.6%)	2 (13.3%)	0.0042
Mortality	1 (6.6%)	1 (6.6%)	—
Cause of Mortality	Multi-organ failure after surgery for ischemic bowel	Pulmonary embolism	—

Discussion

This prospective study demonstrated that early surgical intervention (within 24 hours) in ASBO patients significantly reduces recurrence rates compared to conservative management (13.3% vs 46.6%, p = 0.0042). Patients requiring surgery (either immediately or after failed conservative treatment) were typically younger than 40 years, consistent with findings by Strik et al. [8], who noted that younger patients are more likely to require repeat abdominal surgery. Abdominal pain was the most frequent symptom, occurring in 86.6% of the operative group and 80% of the conservative group. The number of prior SBO episodes was significantly higher in the operative group (p = 0.031), aligning with Khalil et al. [10], who found that prior attack frequency affects recurrence risk. Open appendectomy was the most common preceding surgery, followed by cesarean section, consistent with Kabbash et al. [11], who reported that lower pelvic surgeries (gynecologic, colorectal, appendectomy) are most frequently associated with adhesive bowel obstruction.
Intraoperative findings showed that single-band adhesions were more common in the early operative group, while ischemic bowel and stoma requirements were more frequent in patients who failed conservative treatment. These findings support Konjic F et al. [12], who reported that early surgery improves survival and reduces complications. Laparoscopic adhesiolysis is safe and reliable when performed by experienced surgeons in carefully selected patients [13].

Conclusion

Early surgical intervention within 24 hours of admission for adhesive small bowel obstruction significantly reduces recurrence rates and may prevent complications such as ischemia and bowel perforation. Initial evaluation should focus on identifying signs of strangulation, ischemia, perforation, peritonitis, or sepsis, as these require urgent surgical management.

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Conflict of interest. Nil

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Received: *21-02-2026* - ***Accepted***: *19-04-2026* - ***Published***: *26-04-2026*