

Evaluation of Treatment Modalities of the Adhesive Small Bowel Obstruction

Muhammed Hassen Jaffar Al-sa'adi

Department of Surgery, Al-Sader Teaching Hospital, Misan College of Medicine, Maysan, Iraq

Abstract

Background: Intestinal obstruction (IO) is one of the common serious surgical emergencies. The most common causes of it are adhesions and hernias. Unlike most other causes of IO, there is an important role for conservative treatment in the management of adhesive intestinal obstruction (ASBO). **Objectives:** To assess the causes and types of surgery that lead to (ASBO) and to assess the role of conservative treatment in the management (ASBO). **Materials and Methods:** A retrospective study was conducted over a period of four years. Out of 164 patients with SBO, in 92 patients, adhesion was the cause of obstruction (56%), hernia in 66 patients (40.2%), and miscellaneous causes in 3.8%. **Results:** In total, 78 patients (84.7%) had a simple obstruction, and 14 patients (15.2%) had strangulated obstruction. The leading causes of ASBO are previous laparotomy for abdominal trauma (28.2%), appendectomy (21.7%), and gastrointestinal surgery (20.6%). The conservative treatment was successful in 68% in a mean period of 2 days; hospitalization was shorter in comparison with the operative group. Recurrent ASBO cases were successfully treated conservatively. The overall mortality rate was 4.3% (4.7% in the operative group and 4% in the conservatively treated group). **Conclusion:** In our study, ASBO is the most common cause of IO. Abdominal trauma followed by appendectomies operations are the most common causes of adhesions. There is an important role of conservative treatment in the management of ASBO, with a success rate of 68%.

Keywords: Adhesion, bowel, obstruction, treatment

INTRODUCTION

Intestinal obstruction (IO) is the most common surgical disorder affecting the small bowel^[1] and it represents approximately 12%–16% percent of all emergency department visits for acute abdominal pain.^[2] The serious complications of IOs like ischemia, perforation, and sepsis have been greatly reduced by early diagnosis and correction of the associated pathophysiological changes together with relieving of the cause of obstruction. Among the wide range of causes of IO, postoperative adhesion is the most common cause in developed countries, and strangulated hernias are more common in developing countries.^[3] Generally, the dictum of “Never let the sun set or rise on small intestinal obstruction” has guided the management of IO for a long time which recommended early surgical intervention. However, the management of adhesive mechanical small obstruction is different from other types, with the remarkable success of relieving the obstruction with the conservative approach only. Still,

there is considerable controversy existing concerning the best treatment modality for adhesive mechanical IO, the indication, and the timing of surgery. In the present study, we reported our experience in the management of this serious common surgical problem.

MATERIALS AND METHODS

This is a retrospective study on all patients with the diagnosis of adhesive mechanical small IO who was admitted to the surgical ward of Al-Sadder General Hospital in Misan province from January 2018 to December 2021. There were 92 patients with adhesive, mechanical small bowel obstruction out of a total of

Address for correspondence: Dr. Muhammed Hassen Jaffar Al-sa'adi,
Department of Surgery, Al-Sader Teaching Hospital,
Misan College of Medicine, Maysan, Iraq.
E-mail: drmhj66@gmail.com

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164 patients with mechanical small IO (90 males and 74 females) enrolled in this study. The medical records of the patient were reviewed, including the clinical history and physical examination findings, diagnostic investigations, and treatment details (conservative or surgical). So, according to the modality of their treatment, we have got two groups of patients as follows:

- Group I: 50 patients who were initially treated conservatively (by i.v. fluid resuscitation, nasogastric suction, bladder catheterization, and prophylactic antibiotics). None of them have evidence of strangulation, and their clinical and radiological follow-up was reported.
- Group II: 42 patients who were treated by early surgery (after a short period of resuscitation).

The clinical outcomes and the length of hospital stays were recorded.

Ethical approval

The study was conducted in accordance with the ethical principles that have their origin in the Declaration of Helsinki. It was carried out with the patient's verbal and analytical approval before a sample was taken. The study protocol, subject information, and consent form were reviewed and approved by a local ethics committee according to document number 5902 on February 19, 2023, to get this approval.

RESULTS

The study showed that adhesive IO is the most common cause of IO [Figure 1], and it most commonly occurred in young age groups [Tables 1 and 2].

- This study revealed that the main causes of adhesive intestinal obstruction were previous laparotomies for trauma, followed by appendectomy operations, and the third cause was gastrointestinal surgical operations [Table 3].
- It was found that 34 patients (68%) out of 50 patients who were treated with conservative treatment had responded and returned their normal bowel motion within 14 days (in a mean period of 2 days). No patient responded after 4 days of conservative treatment, and all of those patients were converted to surgical treatment [Table 4].
- 16/50 patients (32%) failed to respond to the conservative treatment and subsequently required surgical intervention. This made the total number of cases that required surgery is 58 patients.
- 14/92 patients (15.2%) with adhesive mechanical small bowel obstruction had evidence of strangulation, and all of them were treated by early surgery.
- Seven patients had a recurrent adhesive mechanical small bowel obstruction, and four of them were successfully treated conservatively.

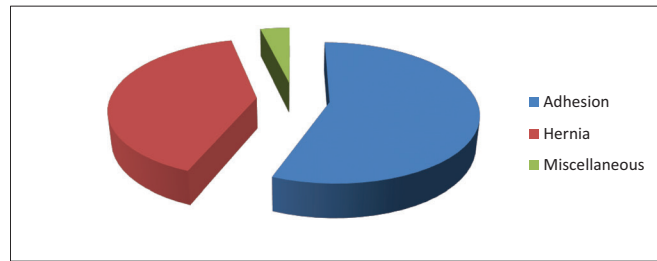


Figure 1: Etiology of mechanical small bowel obstruction

Table 1: The demographic distribution of the patients with their pathology

No. of the patients with mechanical SBO	164
Sex (male/female)	90/74
No. of the patients with adhesive mech. SBO	92 (56%)
Sex (male/female)	52/40
Age range (years)	2–92 years
Mean age	38 years
Simple obstruction	78 (84.7%)
Strangulated obstruction	14 (15.2%)

Table 2: The distribution of the patients' ages

Age (years)	Male	Female
≤5	3	1
6–15	5	3
16–25	9	8
26–35	13	12
36–45	12	10
46–60	10	6
Total	52 (56.5%)	40 (43.4%)

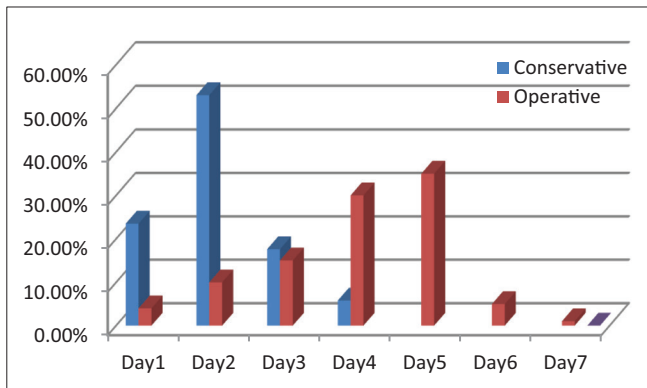
Table 3: causes of adhesive intestinal obstruction

Operation	No.	%
Laparotomy for trauma	26	28.2
Appendectomy	20	21.7
Gastrointestinal surgery	19	20.6
Gynecological operations	15	16.3
No previous surgery	5	5.4
Unknown surgery	4	4.3
Abdominal hydatid cyst surgery	2	2.1
Biliary surgery	1	1
Total	92	

- The average period of resolution of the IO in the patients who were treated surgically was 4.5 days (range 1–7 days) [Figure 2].
- The average length of hospitalization in patients who were treated conservatively was 4 days, and it was 8 days in patients surgically treated.
- The mortality rate for the entire series was 4.3% (4 patients). The operative group mortality was 4.7%, and the mortality rate in the conservatively treated group was 4%.

Table 4: Duration of successful conservative treatment

Time	Patients successfully treated	
	No.	%
1 day	8	23.5
2 day	18	53
3 day	6	17.6
4 day	2	5.8
Total	34	

**Figure 2:** Resolution of obstruction with conservative or operative treatment over a time axis

DISCUSSION

Management of IO has gone through several evolutions between advocating early surgery or advocating conservative treatment and delayed surgery (if needed).^[4,5] For the proper management of IO, it needs to identify the type of IO (mechanical or paralytic ileus), the level of obstruction (small or larger bowel), and the cause of obstruction and to determine whether it is simple or strangulated obstruction. Peritoneal adhesions can be defined as abnormal fibrous bands between organs or tissues or both in the abdominal cavity that are normally separated. Adhesions may be acquired or congenital; however, most are acquired as a result of peritoneal injury. It is estimated that 93%–100% of patients who undergo upper abdominal and 67%–93% of lower abdominal transperitoneal operations will develop postoperative adhesions.^[6] The extent of adhesion formation varies from one patient to another and is most dependent on the type and magnitude of surgery performed, as well as whether any postoperative complications developed.^[7] Another surgical factor that has been shown to contribute to adhesion formation is intraperitoneal foreign bodies, including mesh, glove powder, suture material, tight suturing, abrasions, talc and powders from gloves, fibers of abdominal packs, intestinal contents, overheating by lamps, or irrigation fluid.^[8] Fortunately, most patients with adhesions do not experience any overt clinical symptoms. For others, adhesions may lead to serious complications and can be the cause of significant morbidity and

mortality.^[8,9] In the present study, adhesive mechanical small IO was more common in males than females (56.6% vs. 43.4%), and the mean age was (38 years). This might reflect the effects of a high prevalence of abdominal trauma cases in our society that resulted chiefly from war injuries and the social violence that affect mainly active young males, and this result is nearly similar to Adhikari *et al.*^[10] study in India.

Our study revealed that the main cause of IO was adhesions, and the second cause was hernia; this result is in accordance with another national Iraqi study,^[11] but it is unlike the current situation in developing countries where the hernia is the main cause.^[12,13] It is in developed countries that adhesion is the main cause,^[14,15] and this may be due to an increase in the number of laparotomy operations (mainly for trauma) and an increase in the early treatment of hernia in our country. This change in the underlying etiology of adhesive IO is also detected in other developing countries.^[16]

Adhesive small bowel obstruction may occur following any type of abdominal surgery. It is estimated that the risk of SBO is 0.2%–10% after appendectomy,^[17] 6.4% after open cholecystectomy,^[18] 7.6% after small intestinal surgery,^[19] and 7%–26% after colorectal surgeries.^[19,20] Previous studies have reported that appendectomy, gynecological, and colorectal surgical procedures were the most common causes of adhesive IO.^[16,21–23] In the present study, the most common prior surgery that leads to adhesive small bowel obstruction is the previous laparotomies for trauma (28.25) followed by appendectomy (21.7%).

A controversy exists about the management of adhesive IO. In our study, the conservative treatment was successful in 68% in a period range of 1–4 days (mean 2 days), and operative intervention was needed for those who failed to respond to conservative treatment (32%). Regarding the success rate of conservative modality, about or around this result has been reported in other studies.^[21,24,25] Some authors recommended only a limited observation period of 24–72 h,^[26,27] but others suggest a longer period is safe.^[24] As John *et al.* have suggested to start conservative treatment in stable patients with the administration of a water-soluble contrast agent, and if the contrast reached the cecum after 24 h then continue on that treatment and if not shifted the patient to surgery. In a study by Kabbash *et al.*,^[28] the success rate was about 71.2% in a period range (2–4 days), Schraufnagel *et al.*^[29] reported a success rate of about 82% and an average duration of 4 days and they recommended that the conservative treatment should not prolong more than 5 days, although Shih *et al.*^[24] reported an average period of 6.9 days required for spontaneous resolution.

Four out of seven patients with recurrent adhesive small bowel obstruction were successfully treated by conservative measures, and we think this is important to be tried in

such patients (unless there is evidence of strangulation) as further surgery will lead to more adhesions.^[30]

Average hospital stays were shorter in the conservative group in comparison with those treated surgically (4.0 vs. 8.0 days). In other series, the reported hospital stays were around that reported by our study. In Kabbash *et al.*^[28] study, it was (3–6 days) for the conservative group and (7–14 days) for the operative group, whereas Fevang *et al.*^[31] recorded hospital stays of 3 days for those treated conservatively and 9 days for those treated operatively.

In our study, the mortality rate for the entire series was 4.3%, and it is slightly higher in the operative group in comparison with conservatively treated (4.7% vs. 4%). One of the death was an old age patient (70 years) with a previous history of ischaemic heart disease; he died while he 's on the 2nd day of conservative treatment because he had developed a new MI. Another patient was on conservative treatment, and he developed features of strangulation then he was treated surgically and died because of septicemia. The remaining two deaths were treated by early surgery and both had strangulation obstruction and died because of septicemia. In other series, which advocated conservative treatment, the mortality rate was 1.7%–7.7%.^[31,32] Kodenge *et al.*^[33] who advocated early surgery reported a mortality rate of 15%. Nowadays, adhesive IO can be treated safely and effectively with a reduction in the incidence of further adhesion by laparoscopic surgery.^[34,35] Furthermore, laparoscopy has a dramatic effect in decreasing postoperative adhesions^[36]

CONCLUSIONS

1. All laparotomies, whatever the cause, can cause intraabdominal adhesions, and the laparotomies for abdominal trauma followed by appendectomies operations are the most common causes of adhesions in our study.
2. Mechanical adhesive small bowel obstruction with no evidence of strangulation can be treated conservatively with successful results in 68% of the patients.

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Conflicts of interest

There are no conflicts of interest.

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