

Predicting of Surgical Management of Postoperative Adhesive Intestinal Obstruction

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ABSTRACT

Background: Management of postoperative adhesions-related complications result in a huge workload and cost to surgical health care system. **Aim:** To address adhesions by reviewing prevalence, diagnosing via imaging/exams, setting severity criteria, and guiding treatment choices for safe, effective care.

Patients and Methods: The study involved 60 patients with postoperative adhesive intestinal obstruction at El-Sahel Teaching Hospital. Following clinical and radiological evaluation, patients were categorized into simple and complicated obstruction groups. Twelve patients with suspected complications underwent urgent laparotomy, while 48 with simple obstruction received initial conservative treatment, with delayed surgery if necessary.

Result: In our study, we found that no parameter significantly predicted the final outcome, except for patients with recurrent attacks or those who had undergone multiple abdominal operations. These patients were more likely to receive conservative treatment. Despite the risk of undiagnosed bowel complications, conservative treatment proved effective, with a 60% success rate in our study. We recommend a 2-day cut-off for conservative treatment before considering surgery, allowing time for the obstruction to resolve. Additionally, measures to prevent and manage potential complications should be prioritized. **Conclusion:** Conservative treatment for adhesive intestinal obstruction in stable patients with no strangulation signs is recommended, involving surgical techniques, pharmacological approaches, membrane barriers, and laparoscopic surgery for spontaneous resolution.

Keywords: Adhesive Intestinal Obstruction; Treatment; Clinical.

INTRODUCTION

In most individuals, postoperative adhesions are benign and innocent of any complications, however, some patient develop lifelong adhesion related disease, as, small bowel obstruction, ectopic gestation, secondary female infertility and chronic abdominal pain. Intraperitoneal adhesions are the commonest cause of small bowel obstruction account for more than 60-70 % of all causes ⁽¹⁾.

Adhesions occur after abdominal surgery in almost all cases, especially in the increased number of surgical interventions in modern surgical practice, so it represents a modern surgical overload ⁽²⁾.

Obedient good surgical principles of handling tissues and proper use of surgical instruments and justifiable use of electrocautery devices with good hemostasis and proper antiseptic techniques minimize peritoneal injury, hematoma formation with possible superadded infection and adhesions ⁽³⁾. Good hemostasis is an important part of good surgical technique. Blood clot provide fibrin matrix necessary for adhesion formation of the injured peritoneum ⁽⁴⁾.

The aim of this work was to assess the incidence of adhesions-related problems, the current practice in the diagnosis and treatment of adhesions, and provide an objective, valid, safe and reliable parameters, which are valuable in answering the questions whether to continue or to stop conservative measures in cases of adhesive intestinal obstruction.

PATIENTS AND METHODS

This prospective study included 60 patients of postoperative adhesive obstruction for the management of acute intestinal obstruction due to postoperative adhesions. The following plan was adopted:

Inclusion criteria: Previous abdominal operation, presence of symptoms and signs of intestinal obstruction, which were carefully analyzed using radiological diagnosis of intestinal obstruction.

Exclusion criteria: Cases with adhesive intestinal obstruction due to congenital, post-inflammatory, post-irradiation, or secondary to any cause other than post laparotomy adhesions and patients with intestinal obstruction with Crohn's disease, malignancy, incarcerated hernia or mesenteric vascular disease.

Immediate Assessment clinically and radiologically and laboratory as follows:

In this study, the history of the present illness focused on four cardinal symptoms: abdominal pain, vomiting, constipation, and abdominal distention. The clinical examination revealed general signs such as dehydration, peritonitis, and intestinal strangulation. Routine laboratory investigations were conducted for all patients, including a complete blood picture, liver and kidney function tests, blood glucose levels, and serum electrolyte analysis. Radiological investigations included: 1) erect and supine abdominal X-rays, 2) repeated ultrasonographic examinations with nasogastric suction prior to the exam, and 3) a gastrografin meal and follow-through. The patients were divided into two groups: Group I, which included patients with suspected complicated obstruction based on clinical and radiological signs of strangulation, and Group II, which included patients with suspected simple acute intestinal obstruction (AIO) without clinical or radiological signs of complications. Patients in Group I were treated operatively, while those in Group II were managed conservatively for 2 days with intravenous fluids, nasogastric decompression, and close clinical, laboratory, and radiological monitoring.

During the course of follow-up, any patient who showed one of the following conditions was explored: Deterioration of general condition, particularly with tachycardia, fever, and hypotension.

Generalized abdominal tenderness, rigidity, and rebound tenderness or localized rigidity. Rising leukocytic count on repeated total leukocytic count estimation. Persistence of pain with increased severity and frequency despite good nasogastric suction for 1-2 hours. No improvement after 48 hours of active treatment, manifested by: Progressive abdominal distention or failure of abdominal distention to decrease. Progressive increase or failure of the amount of nasogastric aspirate to decrease. No passage of feces or flatus. No decrease in the number of fluid levels by plain X-ray erect.

Statistical analysis

Statistical analysis was performed using SPSS version 24. Data were presented as mean ± standard error of the mean (SEM) for continuous variables and as frequencies for categorical variables. Chi-square tests were used for categorical data, and t-tests were used for continuous data. A P-value of <0.05 was considered statistically significant.

Ethical considerations:

The data that were collected from participants were confidential. The research participants weren't identified by name in any publication or report that addressed this research. The nature and goal of the research, as well as the risk-benefit evaluation, have been explained to the participants prior to their admission to this study. Informed consent has been obtained from each participant. Approval of General Organization of Teaching Hospitals and Institutes(GOTHI) was obtained. The Helsinki Declaration was followed throughout the study's conduct.

RESULTS

Sixty patients were included in this prospective study. They were 47% males and 53% females. The period of hospital stays for the patients managed conservatively varied from 5 days to 12 days (with a mean 6 ± 1 days) and for the patients managed operatively it varied from 7 days to 15 days (with a mean 9±1 days), as shown in table (1).

Table (1): Number of patients in each group.

	Conservative	Operative
- Total numbers	36	24
- Males	12	16
- Females	24	8
Period of hospital stay (days)	5-12 days	7-15 days

There was significant different between studied groups regarding Pain nature, Severity of pain, History of

previous attack and No. of previous abdominal operation. While there was no significant difference regarding Pain site, Vomiting, Abdominal tenderness, No. of attack of vomiting, Duration of pain before admission, Mean pulse, Mean temperature, Mean WBC and No. of fluid levels (Table 2).

Table (2): Hospital variables in 60 admissions for postoperative adhesive intestinal obstruction in studied groups

	Conservative	Operative	P-value
No of patients	36	24	
Pain nature			
- Colicky	28	12	0.025
- Constant dull aching	8	12	
Pain site			
- Localized	14	12	0.394
- Generalized	22	12	
Severity of pain			
- Mild	22	6	0.006
- Moderate to severe	14	18	
Vomiting			
- Absent	12	4	0.062
- Bilious	16	18	
- Gastric	8	2	
History of previous attack	8	-	0.01
No of previous abdominal operation			
- One	12	16	0.03
- Two	16	4	
- ≥ 3	8	4	
Abdominal tenderness			
- Generalized	24	12	0.196
- Localized	12	12	
No. of attack of vomiting	38. ± 0.5	4 ± 0.5	.094
Duration of pain before admission (days)	4.1 ± 0.8	4.5 ± 0.98	.08
Mean pulse rate/minute	87 ± 6.5	90 ± 6.9	0.092
Mean temperature	37.55 ± 0.3	37.7 ± 0.3	.062
Mean WBC	8525 ± 446	8750 ± 448	.058
No. of fluid levels	6.3 ± 1.25	7 ± 1.46	0.051

These data are expressed as number of patients or as mean and standard error of the mean.

DISCUSSION

Adhesions are now the most common cause of intestinal obstruction. This increase in the proportion of intestinal obstructions that are produced by adhesions may still be continuing ⁽⁵⁾.

Although postoperative intra-peritoneal adhesions are prevalent and present the most common cause of adhesive intestinal obstruction but there are still debate about the proper techniques to prevent its occurrence or decrease it and how to be managed if occurred and when to decide to start by conservative management and the ideal cut-off time to convert to surgery and what type of surgery laparoscopic or traditional open surgery with estimation of outcome and associated morbidity and mortality ⁽⁶⁾.

The main problem in the management of adhesive intestinal obstruction was encountered with those patients presented by symptoms and signs of acute intestinal obstruction with stable general condition with no toxemia or septic shock. Some of these patients were managed conservatively at the start but they didn't respond to conservative treatment and on exploration intestinal strangulation proved to be present.

The diagnostic challenge here is whether we can predict those patients from the start? Can we save the time and effort spent in conservative treatment? We tried to find the answer for this question comparing the data of admission in the group of patients who responded to conservative treatment and the group of patients with failed trial of conservative treatment. We found that most of the historical, physical or laboratory parameters used in comparison were non-significant.

We compared data of admission of the two groups as regard the classic symptoms of compromised bowel as regard continuous abdominal pain and severe pain out of proportion to physical finding, which were said to be pathognomonic of intestinal ischemia. These historic parameters were statically non-significant; hence they were more slightly prevalent in the group with strangulation obstruction than the group of simple obstruction.

Known classic signs of compromised bowel as fever, tachycardia when analyzed these physical parameters are found to be marginally more prevalent in the non-resolving obstruction group or impending strangulation obstruction in comparison with the simple obstruction group. In spite of that fever and tachycardia as well as means of heart rate and temperature and leucocytic count were not significantly different in the two groups. Tenderness of the abdomen also proved that it was not to be discriminative.

The only two parameters, which proved to show significant difference between the two groups, were history of pervious attacks and history of multiple abdominal operations. If the patient had a pervious attack of adhesive obstruction or the patient underwent multiple abdominal operations, the patient was more likely to be managed conservatively.

Our study document that at presentation, recognition of strangulated bowel is very difficult; no single, historical, physical or laboratory parameter or even combination of parameters could be used as an accurate guideline for the diagnosis of strangulation.

The main stay lied in the subsequent follow up for disease progression.

Always we have to consider that conservative treatment of adhesive intestinal obstruction is carried on considering the calculated risk.

Studies recommended that 5 days non-operative management of adhesive intestinal obstruction can be used safely for the majority of postoperative intestinal obstruction patients ⁽⁷⁾. Other recommended surgery to treat intestinal obstruction if it is not resolved within 12 hour of conservative treatment ⁽⁸⁾. Other study, found that non-operative treatment of adhesive intestinal obstruction patients may be accepted for 24-48 hours, if no signs of deterioration is noted ⁽⁹⁾.

In this study we found that 48 hours duration is sufficient for conservative treatment provided that no signs of strangulation are present or developed. Failure to show resolution during this period requires operative intervention.

Classification of intestinal obstruction into two categories either complete or partial intestinal obstruction depending on absolute constipation (for stools and flatus) and absence of gas distal to obstruction on plain X-ray films of the abdomen is impractical because of gas can be found in distal colon in early obstruction or introduced to rectum by per-rectal examination or other manipulations ⁽¹⁰⁾.

Some authors recommended early operation for complete obstruction patients and recommended conservative management partial obstruction patients only, whereas others do not depend on this classification in their decision making ⁽¹¹⁾.

In our series, we found that this traditional distinction has no effect on the management procedure and so we recommend other distinctions if it is simple obstruction or complicated obstruction with strangulation.

The conservative approach was routinely utilized for all cases of simple intestinal obstruction provided that there are no proved signs of strangulation, but if complicated intestinal obstruction was diagnosed, laparotomy was needed.

Study has proved that it is difficult to recognize the early clinical signs of strangulation due to lack of applicable criteria ⁽¹²⁾. Other Study proved that it could not reliably diagnose strangulation by any single or combined clinical parameters or by any simple diagnostic test ⁽⁷⁾.

The difficulty in prediction of strangulated intestinal obstruction had pushed some to immediate surgery in all cases of small bowel obstruction. But the risks of surgery pushed others to start by conservative treatment; the treatment decision is a swinging balance between the possibilities of strangulation and the surgical hazards ⁽¹³⁾.

Study, showed that over a third (37%) of all hospital admissions for adhesive intestinal obstruction are treated surgically and 63% conservatively ⁽¹⁴⁾.

In the present study 40% treated surgically while 60 % treated conservatively. Therefore, the main diagnostic challenges posed by intestinal obstruction are 1-to establish the underlying cause; 2- the identification of strangulation; and 3- to determine which patient can be managed non-operatively because the rate of complications related to adhesion among surgically treated patients is higher and is likely to have long-term consequences ⁽²⁾.

CONCLUSION

From the above findings we concluded that conservative treatment of adhesive intestinal obstruction can be early step in the management provided that there were no obvious signs of bowel strangulation (clinically or radiologically). We recommend a conservative trial of up to 48 hours for spontaneous resolution as occurred in 60 % of the patients in our study.

Finally, we advise every effort to be done in order to minimize adhesion formation especially surgical technique including gentle tissue handling, meticulous hemostasis, limiting foreign body reaction, omentum preservation, prophylaxis against infection, copious irrigation, preventing thermal injury and avoidance of division of unnecessary adhesions, and using pharmacological approaches to adhesion prevention. Absorbable and non-absorbable membrane barriers and lastly that laparoscopic surgery has advantage in adhesion prevention.

DECLARATIONS

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- **Conflicts of interest:** None.
- **Competing interests:** None.

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