

Original Research Article

Clinical study of adhesion obstruction at a tertiary care hospital: a prospective observational study

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ABSTRACT

Background: Adhesion obstruction is one of the most common presentations of acute abdomen and an important cause of general surgical consultation. This study aimed to analyse demographic features, clinical features, predisposing factors, and management of this surgical problem.

Methods: The present study was a prospective observational study and was conducted in the Department of General Surgery of SMHS hospital entitling 267 patients who were diagnosed and treated over 5 years from May 2014 to April 2019.

Results: The most common age group diagnosed with acute intestinal obstruction was between 31 to 40 years, with the incidence more in males (65.5%) as compared to females (34.4%). The most common clinical feature was abdominal pain (98.1%) followed by vomiting (93.6%), constipation (86.1%) abdominal distension (82.3%). Postoperative adhesions (40.07%) followed by obstructed hernias (23.3%) and malignancies (14.6%) were the most common predisposing factors. Ischemia was the most common complication in 11.2% of patients followed by necrosis at 6.7% and perforation at 2.9%. Adhesiolysis was the most common surgical procedure performed 43.8% followed by anatomical repair 21.7% and resection and end to end anastomosis 15.3%, enterotomy 10.86%, and Hartman's procedure 8.2%.

Conclusions: Adhesive intestinal obstruction is an important surgical emergency. Post-operative adhesions remain the most common cause of acute intestinal obstruction, with patients most commonly presenting with pain abdomen, all necessary steps must be taken to lessen the chances of adhesions after any surgical procedure.

Keywords: Abdominal pain, Acute intestinal obstruction, Post-operative adhesion

INTRODUCTION

In the developed countries the common cause of admission following abdominal surgeries is adhesive small bowel obstruction.¹ The mortality of patients having acute intestinal obstruction has significantly reduced over time because of advanced diagnostics, better antimicrobials, correction of fluid and electrolyte balance.²

The etiology of intestinal obstruction may vary from country to country or among zones within a specific country therefore knowledge of the disease patterns and outcomes may raise the index of suspicion and reduces delays in diagnosis, operative intervention. This is especially helpful in settings where diagnostic modalities are limited so making a definitive diagnosis challenging. The causes of intestinal obstruction etiology include Adhesions (60%), hernia strangulation (20%), Malignancy (5%).³ 5-15% of all hospital admissions are

caused by sudden onset of severe abdominal pain due to mechanical obstruction.⁴

However, the recurrence rate of adhesive small bowel obstruction is as high as 30% following surgery with a mortality rate of 2-8% despite all the advances in diagnosis and treatment.⁵ Thus, leading to increased morbidity and mortality, and high socioeconomic costs, the prompt treatment of adhesive small bowel obstruction is essential.⁶

Causes of intestinal obstruction may be different, adhesion obstruction being the commonest, makes the knowledge of this surgical problem important for early diagnosis and appropriate intervention. Delay in treatment will result in high morbidity and mortality to the patients. This can occur in males and females and any age group, starting from neonates to the elderly. The etiology varies with the age group.

An important challenge to surgeons is to appropriately diagnose this condition despite atypical and non-specific clinical features such as abdominal distention, mild abdominal pain to a state of dehydration leading to hypovolemic shock requiring early surgical intervention.⁷ Adhesive Intestinal obstruction is a severe condition that demands a quick and correct diagnosis as well as an immediate, robust and effective management therapy.⁸ The management of patients with acute SBO remains controversial. There are no uniform strategies regarding indications for or timing of the operation. Adhesive bowel obstruction is an important cause of morbidity and mortality, especially when associated with gangrene and perforation of the associated bowel segment. Hence, the surgeons can have a deep insight into the acute abdomen and have a good clinical judgment to rule out acute intestinal obstruction.⁹

Tsumura classified the different locations of obstructive band adhesions and estimated their frequency: anterior visceroparietal (40%), anterior visceroparietal adhesions associated with viscerovisceral adhesions (small bowel) (32%), viscerovisceral adhesions (small bowel) (16%), posterior visceroparietal adhesions (between posterior peritoneum and small bowel) (8%), anterior and posterior visceroparietal adhesions associated to viscerovisceral adhesions (4%).¹⁰

Strangulated obstruction requires emergency surgery, and early recognition is often life-saving since a delay in treatment is an independent predictive factor of mortality and, also, bowel strangulation is an independent predictor of complication and, even more, of mortality while the mortality rates of patients with strangulated obstruction are two to 10 times higher than those of patients with non-strangulated obstruction. Moreover, accurate early recognition of intestinal strangulation in patients with mechanical bowel obstruction is important to allow safe nonoperative management of carefully selected patients. Traditionally, such recognition is based on the presence

of one or more of the classical signs: vascular compromise, continuous abdominal pain, fever, tachycardia, peritoneal signs on physical examination, leukocytosis, and metabolic acidosis.¹¹

We, therefore, conducted this prospective observational study to analyse and define the demographic features, clinical features, predisposing factors, and management of this surgical problem. Moreover, we evaluated the incidence and causes of bowel ischemia, necrosis, and perforation.

Aims and objectives

This study aims to analyse demographic features, clinical features, predisposing factors, and management of this surgical problem.

METHODS

The present study was a prospective observational study and was conducted in the Department of General Surgery of SMHS hospital entitling 267 patients who were diagnosed and treated over 5 years from May 2014-April 2019. Patients less than 15 years and hemodynamically unstable were excluded from this study. A detailed well-informed consent was taken from all the subjects included in the present study.

All the patients included in this study were diagnosed with acute intestinal obstruction after initial stabilization and proper assessment which included clinical, biochemical, radiological features (plain x ray abdomen and CECT abdomen and pelvis). The final diagnosis was made based on operative findings. Demographic data and symptoms, clinical history, physical examination, and all the appropriate investigations were collected from all the study subjects who presented with acute intestinal obstruction as per a prescribed proforma. All observations were discussed and compared with recent literature and derived conclusions.

Ethical approval was not required as it's an observational study. Statistical analysis was done using chi-square analysis and an independent sample T-test was performed among categorical and continuous variables to evaluate the significance of difference among groups and statistical package for social sciences (SPSS) version 20.

Inclusion criteria

All the patients were admitted with an inability to pass stools and flatus for more than 48 hours with acute abdomen and diagnosed as acute intestinal obstruction.

Exclusion criteria

Age less than 15 years, hemodynamically unstable patients.

RESULTS

Age distribution of patients

In our study of 267 patients, 98 were between 31 and 40 years (36.7%) and it was the most common age group diagnosed with acute intestinal obstruction followed by 41-50 years (20.5%) and 51-60 years (16%), as shown in the Table 1.

Table 1: Age distribution of the patients (n=267).

| Age group (years) | No. of patients (%) |
|-------------------|---------------------|
| 15-20 | 20 (7.4) |
| 21-30 | 25 (9.3) |
| 31-40 | 98 (36.7) |
| 41-50 | 55 (20.5) |
| 51-60 | 45 (16.8) |
| 61-70 | 15 (5.6) |
| >71 | 9 (13) |

Gender distribution of patients

In our study, the incidence of intestinal obstruction was more in males (65.5%) as compared to females (34.4%) as shown in Table 2.

Table 2: Gender distribution of the patients (n=267).

| Gender | No. of patients (%) |
|--------|---------------------|
| Male | 175 (65.5) |
| Female | 92 (34.4) |

Clinical features

In our study, the most common clinical feature was abdominal pain (98.1%) followed by vomiting (93.6%), constipation (86.1%) abdominal distension (82.3%) as shown in Table 3.

Table 3: Clinical features (n=267).

| Clinical features | No. of patients (%) |
|---------------------------|---------------------|
| Abdominal pain | 262 (98.1) |
| Abdominal distention | 220 (82.3) |
| Constipation | 230 (86.1) |
| Vomiting | 250 (93.6) |
| Abdominal tenderness | 205 (76.7) |
| Increased bowel sounds | 170 (63.6) |
| Palpable mass per abdomen | 15 (5.6) |

Predisposing factors

In our study, the most common predisposing factor for acute intestinal obstruction was post-operative adhesions (40.07%) followed by obstructed hernias (23.3%) and malignancies (14.6%) as shown in Table 4.

Table 4: predisposing factors (n=267).

| Predisposing factor | No. of patients (%) |
|--------------------------|---------------------|
| Post-operative adhesions | 107 (40.07) |
| Obstructed hernias | 65 (23.3) |
| Tuberculosis | 27 (10.1) |
| Malignancy | 39(14.6) |
| Volvulus | 13 (4.8) |
| Intestinal ascariasis | 9 (3.37) |

Complications

In our study, ischemia was the most common complication in 11.2% of patients followed by necrosis at 6.7 % and perforation at 2.9% respectively as shown in Table 5.

Table 5: Complications.

| Complication | No. of patients (%) |
|--------------|---------------------|
| Ischemia | 30 (11.2) |
| Necrosis | 18 (6.7) |
| Perforation | 8 (2.9) |

Management

In our study adhesiolysis was the most common surgical procedure performed 43.8% followed by anatomical repair 21.7% and resection and end to end anastomosis 15.3%, enterotomy 10.86%, and Hartman's procedure 8.2% as shown in Table 6.

Table 6: Operative procedures (n=267).

| Operative procedures | No. of patients (%) |
|--------------------------------------|---------------------|
| Adhesiolysis | 117 (43.8) |
| Anatomical repair (hernia) | 58 (21.72) |
| Resection and end to end anastomosis | 41 (15.3) |
| Enterotomy | 29 (10.86) |
| Hartman's | 22 (8.2) |

DISCUSSION

Intestinal obstruction is one of the common causes of acute abdomen, presenting to ER and it continues to be the most common diagnosis that needs an emergency medical and surgical intervention. It can have a varied etiology, and management of which requires quick, appropriate diagnosis, rational and effective therapy.

This study aimed to analyze demographic features, clinical features, predisposing factors, and management of this surgical problem. The present study was conducted in the Department of General Surgery of SMHS hospital entitling 267 patients who were diagnosed and treated over 5 years from May 2014-April 2019.

Age

In our study of 267 patients, 98 were between 31 and 40 years (36.7%) and it was the most common age group diagnosed with acute intestinal obstruction followed by 41- 50 years (20.5%) and 51-60 years (16%).

Babu et al in their study observed that the majority of patients belonged to the age group of 31 to 40 years.¹¹ Venkata et al reported in their study the mean age of presentation was 32 years.¹²

Our results were following the results of the literature.

Gender

In our study, the incidence of intestinal obstruction was more in males (65.5%) as compared to females (34.4%) having male predominance.

Souvik et al reported in their study a male predominance with a percentage of males being 65% as compared to female's 35%.¹³ Our study was also in concordance with the study Wysocki et al showing male predominance with an M: F ratio of 1.5:1.¹⁴

Clinical features

In our study, it was observed that the most common clinical feature was abdominal pain (98.1%) followed by vomiting (93.6%), constipation (86.1%) abdominal distension (82.3%).

Our results are in concordance with the study conducted by Jean-Jacques et al.¹⁵

Cheadle et al reported abdominal pain (92%), vomiting (82%), abdominal tenderness (64%), and distention (59%) as the most frequent symptoms and signs.¹⁶

Predisposing factors

In our study, the most common predisposing factor for acute intestinal obstruction was post-operative adhesions (40.07%) followed by obstructed hernias (23.3%) and malignancies (14.6%). Post-operative adhesions were common in patients with intra-abdominal sepsis, prolonged surgery, multiple surgeries, and post-operative wound infections. Placement of drains for a long period also attracts adhesion of omentum to parities and bowel loops. Raw areas and rough handling of tissues are also attributed as causes of adhesions. Several studies postulate that adhesions are responsible for 32-74% of bowel obstruction and are the leading cause of small intestinal obstruction representing 45-80% of it.

Ramani et al reported in their study that the most common predisposing factor causing intestinal obstruction was post-operative adhesions.¹⁷

Vijayakumaran et al reported in their study that 31.86% of patients were diagnosed to have post-operative adhesions.¹⁸

Tamijmarane et al reported in their study that adhesions are responsible for 32-74% of bowel obstruction and are the leading cause.¹⁹

The statistics in this study almost compares with that of the other studies since adhesions contributed to the majority of the cases.

Complications

Ischemia was the most common complication in 11.2% of patients in our study followed by necrosis at 6.7% and perforation at 2.9% respectively. Much attention should be paid to the treatment of the patients having these complications since the incidence of bowel ischemia, necrosis, and perforation is significantly high. About the risk of strangulation in the present study, a significantly much higher risk was noticed in incarcerated hernias in comparison to all the other obstruction causes.

Alam et al reported in their study that ischemia was the most common complication.²⁰ Kossi et al reported an incidence of ischemia of 20%, necrosis of 8%, and perforation of 2%.²¹

Our results were as per the results of the literature.

Management

In our study adhesiolysis was the most common surgical procedure performed 43.8% followed by anatomical repair 21.7% and resection and end to end anastomosis 15.3%, enterotomy 10.86%, and Hartman's procedure 8.2%.

Our results were in accordance with the results of the study conducted by Babu et al.¹¹ Ramani et al reported that adhesiolysis was the most common surgical procedure performed accounting for at least 74% followed by resection and anastomosis.¹⁷

This study has some limitations. This being a prospective observational study, it has a long follow-up period and is prone to bias and confounding. Additional research may be needed to thoroughly evaluate follow-up of patients with adhesion obstruction.

CONCLUSION

Adhesive intestinal obstruction is an important surgical emergency that is a frequent cause of admissions to hospital emergency in surgical departments. Post-operative adhesions remain the most common cause of acute intestinal obstruction, with patients most commonly presenting with pain abdomen. As postoperative adhesions remain the most common cause of acute

intestinal obstruction, all necessary steps must be taken to lessen the chances of adhesions after any surgical procedure. Thus, intra-abdominal adhesions should be avoided or minimized to reduce morbidity and future obstruction (to some extent) in a patient undergoing surgery. Intra-abdominal sepsis-like appendicitis, hollow viscus perforation and peritonitis, pelvic inflammatory disease, tuberculosis, etc., should be recognized early and treated. Gentle handling of tissues should be advocated and taught to all the residents. Strict adherence to the basic surgical principles of minimizing tissue trauma with meticulous hemostasis, minimization of ischemia and desiccation, and prevention of infection and foreign body retention. Thorough lavage of the peritoneal cavity, should be done when there is spillage of blood and body fluids into peritoneal cavity, multiple surgeries are to be avoided, the minimally invasive approach should be adopted where ever possible, anti-adhesive films also can be used in the face of the danger of adhesions like multiple pre-existing adhesions. Obstructed hernia constituted another important predisposing factor for intestinal obstruction, hence patients need to be educated about the complications of hernia and thus advised to get a surgical opinion at early stages itself. Also important is to assess in detail those patients presenting with significant bowel symptoms and to evaluate them for malignancy. Diagnosis of bowel malignancies at an early stage itself can reduce the complications and ensure a better prognosis. Furthermore, a general improvement in health care infra-structure especially in the rural communities could further reduce mortality as patients may then present early.

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