

Original Research Article

Acute intestinal obstruction in adults: etiology, clinical presentation, investigations and management: a longitudinal study

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ABSTRACT:

Background: Aim of the study was to evaluate the causes of acute intestinal obstruction, modes of presentation and outcome of conservative and operative management in acute intestinal obstruction.

Methods: The study was conducted in tertiary care academic hospital from November 2017 to October 2019. 60 Patients over 18 years of age who were diagnosed with acute intestinal obstruction were included in this study.

Results: The result of present study showed that mean age distribution was 46 ± 15.4 years. Incidence in males was more compared to females. Pain in abdomen was found in 54 (90%), vomiting in 38 (63%), distension of abdomen in 37 (61%) and constipation in 42 (70%) as patient's chief complaint. Commonest cause was adhesions followed by obstructed inguinal hernia.

Conclusions: From the result of present longitudinal study it can be concluded that conservative management can be tried in patients with previous history of abdominal operation and intestinal tuberculosis. Acute intestinal obstruction was more common in male than female. X ray abdomen in standing position and USG helps in ascertaining the site of intestinal obstruction.

Keywords: Etiology, Clinical presentation, Investigations

INTRODUCTION

Acute intestinal obstruction is one of the commonest surgical emergencies in all age groups that accounts for 20% all admissions in surgical practice.¹ The clinical presentation varies from slight discomfort, abdominal distension, vomiting and constipation to the state of sepsis or hypovolemic shock or both requiring an emergency intervention which all depends on age of the patient, comorbidity, nutritional and hydrational status, level of obstruction, the presence of contamination in the peritoneal cavity. Hence early diagnosis, prompt resuscitation and appropriate management is needed for uneventful recovery and reduction in the mortality rate.²

Intestinal obstruction is predisposed by various underlying conditions which are difficult to define preoperatively. There are various etiologies for acute intestinal obstruction, more common causes like adhesion, hernia, malignancy to uncommon condition like intussusception.³ Basic investigation x ray and USG are initial study, CT scan is recommended only if there is suspicion high or negative radiography.

Management of uncomplicated obstructions includes fluid resuscitation with correction of metabolic derangements, intestinal decompression, and bowel rest. Surgeon who are treating patient with acute intestinal obstruction must consider the risk of surgery with the

consequences of inappropriate conservative management.⁴

Present study is an attempt to study and know the current status of the acute intestinal obstruction with respect to etiology, clinical presentations, imaging investigations, management and outcomes for better understanding of the disease and to find out appropriate management.

METHODS

The present study was carried out in a tertiary care academic hospital from November 2017 to October 2019. It was a tertiary care hospital based longitudinal study. All patients above the age of 18 years, attending surgery outpatient department, emergency department and getting hospitalized with of acute pain in abdomen were included in the study. Patients were recruited using the below mentioned inclusion and exclusion criteria.

Inclusion criteria

All the patients presenting with features which suggestive of acute Intestinal obstruction i.e. acute pain in abdomen, distension, vomiting and constipation, X-ray abdomen standing position showing multiple air fluid level/dilated bowel loops, coming to surgery outpatient department or emergency department and getting admitted in surgery wards, age >18 years with or without co-morbid conditions were included in the study.

Exclusion criteria

Sub-acute intestinal obstruction (continuous passage of flatus/faeces beyond 6-12 hours after onset of symptoms)^{6,7}. Patients diagnosed with acute intestinal obstruction but not willing for admission or any management were excluded from the study.

Sample size 60 cases was calculated on the basis of Incidence of site of intestinal obstruction of Priscilla et al study.¹⁵

P- Incidence of small intestine obstruction

q- 100- p

L - ± 10

$N = 4 \times P \times Q / 100$

$= 4 \times 83 \times 17 / 100$

$= 56$

X ray machine Heliophos-D(Fixed) machine was used for x ray abdomen in standing position.

USG machine was a Esaote My Lab X 50 vision machine with higher resolution was used. CT scan machine was Toshiba Activation 16; 16 slice helical CT scan machine with automated pressure injector.

The present study was carried out after the approval of the institute ethics committee.

Study was conducted using following heads like history taking, physical examination, blood investigations, imaging study - x ray abdomen, ultrasonography, management.

After admission of patient detail history was taken. Chief complaints of patient with onset, duration, and progress was noted. Physical examination was done under headings of inspection, palpation, percussion and auscultation. Temperature, pulse, respiratory rate, blood pressure, blood sugar level, IV fluid input and urine output monitoring and abdominal girth charting was done. Blood investigations done. In imaging study, x-ray of abdomen in standing position was taken in every patient. Ultrasonography was done in all 60 patients.

Management of acute intestinal obstruction was decided based on condition of patient and cause of obstruction. After admission of patient, primary treatment like Intravenous fluid, Ryles Tube insertion, antibiotics, antiemetic and analgesics was given and case was monitored carefully with TPR, BP charting, urine output and abdominal girth monitoring. Those cases who showed reduction in abdominal girth and improvement in general condition were observed for next 24 - 72 hours. Patients who responded well were decided to manage conservatively. In conservative management, patients were exposed to repeat x-ray abdomen in standing position in view of resolution of obstruction.

Those patients who did not respond to conservative management (obstruction not relieved), were decided to manage surgically. Patients, those started deteriorating on conservative management were posted for surgery immediately.

Patients those were hemodynamically unstable were also posted for surgery after adequate resuscitation. Patient with high risk for perforation, bowel ischemia, volvulus treated surgically immediately after resuscitation. Surgeries like exploratory laparotomy with adhesiolysis, band release, resection and anastomosis were performed in various conditions accordingly. Post operatively patients were monitored carefully for any complications like surgical site infection, fistula formation, Respiratory tract infection etc.

Statistical analysis

Descriptive statistics

The demographic factor were presented as mean, standard deviation, tables.

Analytical statistics

Statistical analysis was done by using EPI-INFO software version 7.

The frequency and percentage was calculated for qualitative data. The mean and standard deviation was calculated for quantitative data. Level of significance 0.05.

RESULTS

Result of present study are illustrated under various factor.

Epidemiology

Age, gender, clinical presentation, investigations, etiology and management

Age

Majority of patients were in age ranges between 40 to 50 years (5th decade) with 23.3 %, followed by 21-30 years (21.7%). Least participants were found in 70-80 years of age group. Mean age of this study was 46.00 with Standard Deviation 15.44.

Gender

Out of 60 patients 41 were males and 19 were females with percentage of 68.3% and 31.7 respectively. Male to Female ratio was 2.1:1.

Clinical presentation according to chief complaints

Pain in abdomen

All 60 (100%) patients had pain in abdomen. Majority of them presented with colicky like of pain. Cases with strangulated hernia presented with severe colicky pain in abdomen. Clinical presentation according to chief complaints mentioned below in the Table 1.

Table 1: Clinical presentation.

Symptom	No. of patients	Percentage
Pain in abdomen	60	100.0%
Vomiting	38	63.3%
Distension	60	100%
Constipation	48	80.0%

Investigations

X ray abdomen in standing position findings multiple air fluid levels seen in 44 patients (73.33%), dilated bowel loops seen in 44 patients and coffee bean appearance seen in 1 patient.

Etiology

Cause of intestinal obstruction listed in Table 2.

Table 2: Etiology.

Diagnosis	No. of patients	Percentage
Adhesion	19	31.66
Obstructed inguinal hernia	14	23.33
Abdominal TB	12	20.0
Colon carcinoma	5	8.3
Mesenteric ischaemia	4	6.7
Intussusceptions	2	3.3
Faecolith	1	1.7
Stricture due to inflammatory bowel disease	1	1.7
Sigmoid volvulus	1	1.7
SMA syndrome	1	1.7
Total	60	100

Management

Out of 60 cases of intestinal obstruction 48 cases (80%) underwent operative management and 12 cases (20%) were managed conservatively. Among 48 cases of operative management, initially 6 patients with normal physiological parameters was planned for conservative treatment. But later on they deteriorated, so these 6 patient also underwent surgery.

Table 3: Surgical management.

Procedure	No. of patients	Percentage
Exploratory laparotomy with adhesiolysis with band releas	19	39.58
Resection anastomosis	11	22.91
Hernia repair	10	20.83
Hemicolectomy with resection anastomosis	6	12.5
Colostomy	2	4.1
Total	48	100

Incidence of site of obstruction

On the basis of imaging investigations X ray abdomen (standing position view), USG findings, CECT and operative findings, small bowel obstruction was found in 50 cases (83.33%) of 60 cases and large bowel obstruction was found in 10 cases (16.66) out of 60 cases.

Complications

Post-operative complications like surgical site infection, upper respiratory tract infection, septicaemia were found in 13 cases out of 60 cases.

Post-operative complications

Out of 60 patients 13 cases (8.3%) had complication post operatively during hospital stay. Surgical site infection

occurred in 5 patients (8.3%), respiratory tract infection occurred in 3 cases (5%). Septicaemia occurred in 3 cases out of them 2 had septic shock and they died. Anastomotic leak was seen in 2 cases out of 11 operated case of resection and anastomosis.

Outcomes

Outcomes in this study was uneventful recovery, morbidity and mortality. Uneventful recovery seen in 47 patients (78.3%), morbidity seen in 11 patients (18.33%), mortality seen in 2 patients (3.3%).

DISCUSSION

Acute intestinal obstruction is one of the most common emergency. Early diagnosis and treatment reduces morbidity and mortality. Following headings were discussed in details, summarized and compared with other studies done across world.

Epidemiology

Age, gender, clinical presentation, investigations, etiology, management.

Age

Intestinal obstruction occurs in all age groups. Incidences differs among different age groups. Mean age of present study was 46 ± 15.4 years which was comparable with incidences of recent study done by Shivakumar et al with mean age of 46.5 years, Mean age of Akgün et al study was 48.5, mean age of Ojo et al study was 42.2.^{8,11,16}

Gender distribution

Acute intestinal obstruction is more common in male than female. In present study males were affected more than female. Males were 68.3% (41 cases out of 60 patients) and female were 31.7% (19 cases out of 60). Present study was compared with Shivakumar et al study in which 66 % male affected which is more than female 34%. In Soressa et al 65.8% males and 35.2 females were affected.^{13,16}

Clinical presentation

In the present study, pain in abdomen was complained by all 60 cases (100%) vomiting by 38 cases (63.3%), distension also by all 60 cases (100%) and constipation by 48 cases out of 60 (80%). Patients with vomiting was suggestive of proximal bowel obstruction. Shukla et al reported that pain in abdomen was complained by 100% cases, vomiting by 58%, distension by 34.5 % and constipation by 25% cases.¹⁴ So present study result is consistent with study of Shukla et al with the findings of pain in abdomen and vomiting.

Investigations

In present study repeat X ray abdomen and USG was done in those cases who managed conservatively in view of resolution and progress. After initial clinical, radiological evaluation (x ray and USG of abdomen) and current status, decision was taken to manage accordingly. Sensitivity of abdominal radiograph x ray in the detection of bowel obstruction ranges 70-80% and specificity is low. In present study out of 60 cases, multiple air fluid level in dilated loops of bowel seen in 44 cases (73.33%) and dilated bowel loops seen in 44 cases (73.33%) which is compared with results of Priscilla et al in which multiple air fluid level in dilated loops of bowel seen in 81% cases and dilated bowel loops seen in 52% cases. In Kumar et al multiple air fluid level seen in 31%, dilated bowel loops seen in 32% and coffee bean appearance seen in 5%.⁵

Diagnosis of small bowel obstruction can be made with the help of ultrasound abdomen, when the diameter of intestine measures more than 25mm and when the distal ileum is collapsed. Sensitivity of USG is 85% and specificity is 85% and 82% accuracy. It is helpful in identifying causes of intraluminal obstruction. On USG out of 60 cases dilated bowel loops were seen in 46 cases (76.66%) due to obstruction and collection of fluid, obstructed bowel loops seen in 14 cases (23.33%) at inguinal hernia orifice. In every patient of obstructed inguinal hernia looked for bowel ischemic/necrosis changes due to compromised bowel blood supply due to obstruction/strangulation at hernia. Free fluid or inter bowel fluid seen in 7 cases (11.6%). Patient with thick oedematous bowel loop mainly at ileo-caecal junction seen in 4 cases (6.6%), these patients further evaluated for abdominal tuberculosis as most common site of abdominal intestinal TB.

Etiology

Acute intestinal obstruction is emergency condition and most common causes of intestinal obstruction is post-operative adhesion and hernia worldwide. In the present study, post-operative adhesion was most common cause for acute intestinal obstruction. Post-operative adhesion was seen in 19 cases (31.66%) out of 60 cases. Patient with intestinal obstruction with previous history of surgery suggest adhesion and band formation. Hemodynamically stable cases were planned for conservative management. If they failed to conservative treatment then they underwent surgery of exploratory laparotomy with adhesiolysis and bands release. Present study result is consistent with result of Sharif et al study, in which post-operative adhesion found in 25%. Adhesion was most common cause for obstruction found in Sharif et al study with 40%.¹² Obstructed inguinal hernia was second most common cause for intestinal obstruction in present study. Obstructed inguinal hernia found in 14 cases (23.33%) out of 60 cases. Which was consistent with Sharif et al study i.e., 22%.¹²

Table 4: Comparison of various studies.

Etiology	Akgün et al ⁸	Markogianakis et al ⁹	Souvik et al ¹⁰	Ojo et al ¹¹	Sharif et al ¹²	Shukla et al ⁵	Aquinas et al ²	Priscilla et al ¹⁵	Kumar et al ¹⁶	Present study
Post Op adhesion (%)	25.30	64.80	15.53	51.60	25	46	40	26	40	31.66
Aeoominal TB (%)	0.10	-	14.17	1.40	26.81	2.50	4	3	8	20.00
Oestructeo hernia (%)	24.00	14.80	35.96	12.90	12.50	4	30	32	22	23.33
Volvulus (%)	28.60	-	6.26	10.17	8.30	5	4	6	4	1.70
Malignancy of intestine (%)	16.80	13.70	16.62	18	6.70	6.50	14	11	18	8.33
Intususception (%)	1.40	-	2.18	1.80	1	2	6	1	4	3.30
Mesentric ischaemia (%)	-	14	9.26	2	4.20	-	2	-	2	6.70
SMA Synorome	-	-	-	-	-	-	-	2	-	1.70

Management

Patient were either subjected to conservative treatment or operative treatment. Criteria for selecting patients for surgery was increasing pain in abdomen, increasing distension of abdomen, tachycardia Toxicity features like fever, leucocytosis and failure of conservative treatment. Obstructed or strangulated hernia, volvulus, intussusception, mesenteric ischemia posted immediately for surgery. Patient with suspicious malignancy with stable parameter investigated further and after all metastatic and PAC work up patient posted for surgery accordingly. Conservative treatment advocated for patients with normal physiological parameter typically in abdominal Tuberculosis, Postoperative bands adhesion, appendicular lump induced obstruction. Bands and adhesion were diagnosed on the basis of previous history of surgery and imaging investigations.

In present study out of total 60 cases, 48 cases (80%) underwent surgery and 12 cases (20%) managed conservatively. Present study compared with Souvik et al, in which 78.5% cases underwent surgical treatment and 21.5% cases managed conservatively. In present study among 48 cases of operative management, initially 6 patient with normal physiological parameters was planned for conservative treatment. But later on these patients started deterioration so these 6 patient also underwent surgery.

Out of 60 cases 12 patient (20%) responds well to conservative management without any recurrence. In present study, adhesiolysis and band release was done in 19 cases (39.58%) out of 48 cases. Sharif et al treated

39.0% cases by adhesiolysis and band release which is very similar to present study.⁵ Resection anastomosis (RA) was done in 11 cases (22.91%) out of 60 cases which was consistent with report of Akgün et al.⁸ RA was done in carcinoma of bowel, mesenteric ischemia, gangrenous bowel loops, intussusception and wilkkie syndrome. 14 cases (23.33%) with obstructed inguinal hernia posted immediately for surgery. All cases were underwent hernia repair and out of them, 3 patients Underwent RA by midline abdominal incision intraoperatively because of gangrenous bowel.

Hemicolectomy with resection anastomosis done in 6 cases (12.5%) out of 60 cases. Carcinoma of bowel was treated by hemicolectomy and RA. Present study hemicolectomy result was consistent with result of Akgün et al study.⁸ In present study, colostomy done in 2 cases (4.1%) out of 60 cases, which was done on the basis intraoperative findings of edematous, infected, adhesive inflammatory bowel in a patient of IBD and volvulus.

Outcomes of present study was divided into uneventful recovery, morbidity and mortality. If patient had any complications during hospital stay and post-operative, was considered under morbidity. In present study out of 60 cases 47 cases (78.3%) had uneventful recovery consistent with study result of Priscilla et al in which 76 cases (76%) has uneventful recovery.¹⁵ In present study out of 60 cases 11 (18.33%) patients had complications during hospital stay or post operatively. These cases took time for recovery. Comorbidity delayed the hospital stay and recovery of patients. Present study compared with Priscilla et al in which 18 cases (18%) had morbidity.¹⁵ In

present study, 2 patient (3.3%) died who had complications like septicaemia and shock and both of them were diagnosed with mesenteric ischemia. These 2 case were considered under mortality. Present study outcomes was compared with Soressa et al study in which mortality rate was 2.5 %. Mortality rate of Souvik et al was 66.76 %.¹⁰

Limitation

Limitation of study was patient of sub-acute intestinal obstruction (continuous passage of flatus/faeces beyond 6-12 hours after onset of symptoms), patients diagnosed with acute intestinal obstruction but not willing for admission or any management.

CONCLUSION

From the result of present longitudinal study it can be concluded that conservative management can be tried in patients with previous history of abdominal operation and intestinal tuberculosis. Earlier diagnosis and prompt intervention associated with good prognosis or result and any delay in diagnosis associated with poor outcomes.

Acute intestinal obstruction found more common in males than females. Adhesion of bowel is one of the most common cause for acute intestinal obstruction followed by obstructed inguinal hernia. Pain in abdomen and distension is most common presenting feature followed by vomiting and constipation. X ray abdomen in standing position and USG helps in ascertaining the site of intestinal obstruction and also helps to differentiate mechanical cause of obstruction from non-mechanical cause of obstruction which ultimately helps to decide the need of surgical intervention. Small bowel obstructions are more common than large bowel obstruction.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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