Original Article

Causes and Management of Intestinal Obstruction among Patients Admitted in the Department of General Surgery in El-Demerdash Hospital: A Retrospective Study

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ABSTRACT

Background: Intestinal obstruction occurs when there is a blockage in the normal flow of intestinal contents. This blockage can be caused by either a mechanical obstruction or a functional pathology.

Aim of the Study: To determine the causes of small and large bowel obstruction, and to identify the management (operative or conservative).

Patients and Methods: A retrospective cohort study was conducted at the general surgery department in El-Demerdash Hospital from October 2021 to October 2023.

Results: The most common symptom was vomiting in 69%, abdominal pain in 51%, constipation in 30%, abdominal distension in 24%. Nausea 7%. 55% of the patients had a history of previous abdominal surgery.

Adhesion was the most common cause (42%) while complicated hernia was (24%) and 9% had malignant diseases, 5% had intussusception, 5% had volvulus, 5% had stricture.

76% of the patients were managed with an operative procedure (Laparoscopy was performed in 9%) while 24% were managed conservatively. 12% had wound infection, 4% had leakage, while 4% had stoma complication.

Conclusion: The study found that adhesions, complicated hernias, and malignant diseases are the main causes of intestinal obstruction, with vomiting and abdominal pain being the most common symptoms. Many patients had prior surgeries, indicating that adhesive bowel obstruction is prevalent. This highlights the need for preventive measures during surgeries, such as using laparoscopy to reduce complications. Successful treatment relies on early diagnosis, effective management, and addressing both the obstruction's cause and its effects. While some patients can be treated conservatively, many require urgent surgery.

Key Words: Emergency large bowel surgery, large bowel obstruction, small bowel obstruction.

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INTRODUCTION

Intestinal obstruction occurs when there is a failure of the of the intestinal movement, which can be due to a mechanical or functional issue[1]. There are many potential causes of small and large bowel obstructions[2].

The most common causes include adhesions, tumors and herniation. Adhesions resulting from prior abdominal surgery are the predominant cause in 60%to75%[3].

Large bowel obstruction accounts for 2%-4% of cases. Colonic malignancy is the most common cause, representing 60% of cases. Other causes include adhesions, diverticulosis, hernia, inflammatory bowel disease and volvulus[4].

The clinical symptoms vary depending on the level of blockage. The most common symptoms include colicky abdominal pain, nausea, vomiting, abdominal distention, inability to pass gas, and absence of bowel movements[5].

Early diagnosing can be challenging. Conventional abdominal X-ray is the first imaging method used, with an accuracy of 46–80%. Ultrasound detects obstruction when a dilated loop exceeds 2.5 cm in diameter and 10 cm in length[6]. CT scans are highly specific and sensitive in confirming the diagnosis of bowel obstruction, determining if there is bowel ischemia[7].

Management of a small bowel obstruction is complex and varies among institutions. Key decisions regarding admission, surgery, treatment duration, and the choice

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between laparoscopic and open approaches[8]. About 15–20% of patients with large bowel cancer face acute obstruction requiring this urgent procedure[9].

AIM OF THE WORK

To determine the causes of small and large bowel obstruction and identify management (operative versus conservative) of intestinal obstruction among patients admitted in the general surgery department in El-Demerdash Hospital during the period from October 2021 to October 2023.

PATIENTS AND METHODS

Type of study

A retrospective cohort study.

Study Setting

This study was conducted at general surgery department, El-Demerdash hospital, Cairo, Egypt.

Study Period

From October 2021 to October 2023.

Study Population

Inclusion Criteria: Adult patients (18 years and older) presenting in the emergency room over the past two years and patients who had a clinical and radiological diagnosis of intestinal obstruction.

Exclusion Criteria: Patients less than 18 years old and patients suspected clinically with intestinal obstruction but not confirmed radiologically.

Method: Searched and collected data from previous patients' files, hospital records, hard and soft copies.

Ethical Considerations

Confidentiality: All patients' data were confidential, and they weren't mentioned by name in any published paper.

Statistical Analysis

Data were analyzed using IBM SPSS version 27. Quantitative data were reported as means, standard deviations, and ranges; qualitative data as numbers and percentages. Normal distribution was assessed with the Kolmogorov-Smirnov test. Chi-square or Fisher's exact test compared qualitative data, and the independent t-test was used for parametric quantitative data. A 95%confidence interval and 5% margin of error were set, with significance levels defined as: p>0.05(NS), p< 0.05(S), p<0.01(HS).

RESULTS

The mean age of patients was 51.97. The majority of patients were males (53%) and the females were (47%). The most common symptom at presentation was vomiting (69%), abdominal pain was 51%, constipation was the main symptom 30%, abdominal distension was in 24%. Nausea 7%, absent flatus 3%, abdominal bloating 2%.

In our study about 55%of the patients had history of previous abdominal surgery, and the most frequent prior operation was appendectomy (34.5%) followed by cholecystectomy (20%), hysterectomy (16.4%), TAH BSO (10.9%), cesarean section (3.6%), (Table 2).

Adhesive intestinal obstruction was the most common cause of intestinal obstruction (42%) while complicated hernia comes in the second place (24%) and 9% of the patients had malignant diseases, 5% had intussusception, 5% was due to volvulus, 5% caused by stricture and 7% had miscellaneous diseases, (Table 3).

Nearly 76%of the patients were managed with an operative procedure (Laparoscopy was performed in 9%of the operated patients) while the rest 24% of them were managed conservatively.

Conservative therapy was typically advocated for patients with a preoperative diagnosis of adhesive bowel obstruction.

The conservative management that the patients received was nasogastric decompression, IV fluids, and analgesics. In intussusception cases, hydrostatic enema was added to the previous conservative measures (Table 3).

In our study, a trial of conservative treatment was done in 7% of the cases for 2 to 5 days (6% were adhesive bowel obstruction and 1% was bowel obstruction due to foreign body ingestion) but they didn't show improvement so, the operative management was the curable option in these cases.

In 64.3% of adhesive bowel obstruction cases, the operative intervention was the most suitable option (7 cases had laparoscopic adhesiolysis and the rest were managed by laparotomy adhesiolysis) while 35.7% had successful conservative treatment. All cases of complicated hernias required emergency intervention and were managed operatively. The majority of the cases that were diagnosed with intussusception were managed conservatively (80%) while all the cases that had malignant causes of intestinal obstruction underwent operative management (Table 4).

In our study, 80% of the cases were discharged after 2 to 7 days without complication after showing clinical improvement.

12% of them had prolonged hospital stay from 2 to 3 weeks due to wound infection, 4% suffered from leakage, and 4% had stoma complications such as: parastomal abscess, retracted stoma, and ischemic stoma and perforated stoma

Table 1: CT findings among the studied patients

		Total no. = 100
CT	Dilated bowel loops + Transitional point	42 (42.0%)
	Dilated bowel loops + Complicated hernia	24 (24.0%)
	Dilated bowel loops + mass	9 (9.0%)
	Mild thickening + hyperenhancement	1 (1.0%)
	Branching channels (fistulas) connecting to adjacent ileum loop and sigmoid colon	1 (1.0%)
	Stricture	5 (5.0%)
	Intussusception	5 (5.0%)
	Volvulus + Parrot beak sign	5 (5.0%)
	Collapsed gallbladder + Cholecystoduodenal fistula + Dilated small bowel loops	1 (1.0%)
	Thick walled segment of proximal sigmoid colon	1 (1.0%)
	Prolonged enhancement + defect in the superior mesenteric vein and its branches	1 (1.0%)
	Fecal impaction and distension	1 (1.0%)
	Foreign body in ileal loop	1 (1.0%)
	Marked distension of bowel loops with air-fluid levels	1 (1.0%)
	Large bowel obstruction due to impacted fecolith in descending colon	1 (1.0%)
	Mechanical bowel obstruction + Small bowel feces sign	1 (1.0%)

Table 2: Past surgical history of the studied patients

		Total no. = 100
Past Surgical History	Hysterectomy	9 (16.4%)
	Appendectomy	19 (34.5%)
	Cholecystectomy	11 (20.0%)
	Total abdominal hysterectomy and bilateral salpingo-oopherctomy (TAH BSO)	6 (10.9%)
	Complicated Ectopic Pregnancy	1 (1.8%)
	Colonic resection	1 (1.8%)
	Paraumbilical hernia (PUH) repair	1 (1.8%)
	Right inguinal hernia repair	1 (1.8%)
	Mitral valve replacement	1 (1.8%)
	Prostatectomy	1 (1.8%)
	Small bowel resection	1 (1.8%)
	Diaphragmatic hernia repair	1 (1.8%)
	Surgery for trauma	1 (1.8%)
	Gastric ulcer repair	1 (1.8%)
	Cesarean section	2 (3.6%)

Table 3: Management and causes of obstruction of the studied patients

		Total no. = 100
Management	Conservative	24 (24.0%)
	Operative intervention	76 (76.0%)
	Exploration	8 (8.0%)
	Adhesiolysis	22 (22.0%)
	Hernioplasty	24 (24.0%)
	Small bowel resection	17 (17.0%)
	Colectomy	9 (9.0%)
	Abdominoperineal resection	1 (1.0%)
Cause of Obstruction	Adhesive Intestinal Obstruction	42 (42.0%)
	Malignant mass	9 (9.0%)
	Complicated hernia	24 (24.0%)
	Intussusception	5 (5.0%)
	Volvulus	5 (5.0%)
	Others	7 (7.0%)
	Stricture	5 (5.0%)
	Paralytic ileus	1 (1.0%)
	Diverticulitis	1 (1.0%)
	Mesenteric vascular occlusion	1 (1.0%)

Table 4: Comparison between conservative and operative intervention regarding clinical picture and cause of obstruction in the studied patients

		Conservative	Operative intervention	Test value	*P-value*	Sig.
		No. = 24	No. = 76			
Clinical Picture	Vomiting	13 (54.2%)	56 (73.7%)	3.248*	0.071	NS
	Constipation	8 (33.3%)	22 (28.9%)	0.167*	0.683	NS
	Absent flatus	1 (4.2%)	2 (2.6%)	0.148*	0.701	NS
	Abdominal pain	14 (58.3%)	37 (48.7%)	0.680*	0.410	NS
	Abdominal distension	4 (16.7%)	20 (26.3%)	0.931*	0.335	NS
	Abdominal bloating	0 (0.0%)	2 (2.6%)	0.644*	0.422	NS
	Nausea	3 (12.5%)	4 (5.3%)	1.467*	0.226	NS
	Altered bowel habit	0 (0.0%)	1 (1.3%)	0.319*	0.572	NS
	Swelling	0 (0.0%)	1 (1.3%)	0.319*	0.572	NS
Cause of Obstruction	Adhesive Intestinal Obstruction	15 (62.5%)	27 (35.5%)	5.448*	0.019	S
	Malignant mass	0 (0.0%)	9 (11.8%)	3.123*	0.077	NS
	Complicated hernia	0 (0.0%)	24 (31.6%)	9.972*	0.001	HS
	Intussusception	4 (16.7%)	1 (1.3%)	9.049*	0.002	HS
	Volvulus	2 (8.3%)	3 (3.9%)	0.739*	0.390	NS
	Others	2 (8.3%)	5 (6.6%)	0.086*	0.769	NS
	Stricture	0 (0.0%)	5 (6.6%)	1.662*	0.197	NS
	Paralytic ileus	1 (4.2%)	0 (0.0%)	3.199*	0.073	NS
	Diverticulitis	0 (0.0%)	1 (1.3%)	0.319*	0.572	NS
	Mesenteric vascular occlusion	0 (0.0%)	1 (1.3%)	0.319*	0.572	NS

P-value > 0.05: Non-significant; *P-value* < 0.05: Significant; *P-value*< 0.01: Highly significant

*: Chi-square test

DISCUSSION

Age and Gender

The mean age in our study was 51.97. (53%) were males and (47%) were females similar to many studies, making male sex an important risk factor for developing intestinal obstruction.

In Murat Kapan *et al*. 2012, the male to female ratio was 70.3%to 29.7%, with an average age 51.5 years[10].

Mesfin Yohannes *et al*. 2017 found that male patients had a statistically significant association with intestinal obstruction[11].

Souvik Adhikar *et al*. 2010, observed that intestinal obstruction affected a higher percentage of males (75.20%)276 patients than females (24.79%)91 patients. The mean age of the patients was 41.27 years[12].

AO Oladele *et al*. 2008, found that there were (64.2%)61 males and (35.8%)34 females, with male-to-female ratio, 1.8:1, with a mean age of 40 years[13].

In Yahya Kemal Çalışkan. 2017, study on 1387 cases, 854 was men and 533 women; age range, 18-92 years; mean, 56±15 years)[14].

In S. Thirumuruganand *et al*. 2016, the maximum incidence was seen in age group 31-40, 52% females and 48% males[16].

In Ahmed Iessa Matar *et al*. 2024, (66.0%) was males in the middle-aged group (31–60 years)[17].

Clinical Picture

Our study showed that the most common symptom at presentation was vomiting in 69%, and abdominal pain 51%, constipation in 30%, abdominal distension 24%. Nausea 7%, absent flatus 3%, and abdominal bloating 2%.

Murat Kapan *et al*. in 2012, documented that the most common symptoms were the absence of passage of gas and/or feces (52-90%) and abdominal distension (56-66%)[10].

Mesfin Yohannes *et al*., at 2017 documented that the most common findings were: abdominal pain (95.5%), nausea, vomiting (85.7%), abdominal distension (61.6%), failure to pass feces (71.1%), failure to pass flatus (61.6%), and a history of constipation (20.2%)[11].

In Souvik Adhikar *et al*. in 2010, constipation was 76.02%, colicky pain 71.66%, abdominal distension was 92.92%, and nausea and vomiting 24.8%[12].

In 2017, Yahya Kemal recorded that (74.9%) of 1040 cases had abdominal pain and vomiting[14].

S. Thirumuruganand *et al*. in 2016 found abdominal pain in (80%), abdominal distension (78%), constipation (72%), and vomiting (60%)[16].

Ahmed Iessa Matar *et al*. in 2024, reported constipation (90.6%), vomiting (96.2%), constipation (75.5%), abdominal distention (83.0%), colicky abdominal pain (74.5%) and continuous abdominal pain (19.8%)[17].

Saurabh J. Tiwari *et al*. identified abdominal pain (53.33%), vomiting (78.33%), constipation (86.6%), and abdominal distension (90%)[19].

Past Surgical History

In our study, 55% of patients had a history of previous abdominal surgery, and the most frequent were appendectomy (34.5%), cholecystectomy (20%), hysterectomy (16.4%), TAH BSO (10.9%), cesarian section (3.6%).

In a study by Murat Kapan *et al*. 2012, 93.1% had a prior abdominal surgery. The most frequent was appendectomy[10].

In Yahya Kemal Çalışkan, (20.3%) 282 cases had previous laparotomy[15].

Wei Jiang *et al*, found that 78.62% had prior abdominal surgeries, 19.17% had adhesions from inflammation, and 2.21% from other factors. The most common surgeries were appendectomy (28%), intestinal surgery (19%), and gynecological surgery (18%)[15].

Haridimos Markogiannakis *et al*, found that all patients with adhesive obstruction had prior abdominal surgeries. (72.1%) had one operation, 18.6% had two, and 9.3% had three, with 25.6% having appendectomies, having 23.3% gynecological procedures, and 15.8% having cholecystectomies[18].

Causes of Intestinal Obstruction

In Our study, (42%) had adhesive intestinal obstruction, complicated hernia came in second place (24%) and 9% of the patients had malignant diseases, 5% of the bowel obstruction was caused by intussusception, 5% was due to volvulus, 5% caused by stricture.

In Murat Kapan *et al*.study, 2012, (79.1%) had benign disease, such as adhesions (48.6%) and sigmoid torsion (15.5%). Malignant diseases accounted for the remaining 20% of cases[10].

Oladele *et al*. in 2008, found that adhesive intestinal obstruction is the most common cause. The second most common cause was intestinal volvulus, and hernias were identified as the third most common cause[15].

In Wei Jiang *et al*. study, the most common causes were adhesions (45.17%), malignant bowel obstruction (21.09%), intussusception (8.72%), and hernias (4.73% of the cases)[15].

In the study by Ahmed Iessa Matar *et al*. in 2024, the most common cause was adhesions (41.5%), followed by hernias and large bowel masses (22.6% each)[17].

In Haridimos Markogiannakis *et al*. (2007), adhesions, incarcerated hernias, and large bowel cancer were the most common causes[18].

In the study by Saurabh J. Tiwari *et al*. in 2017, adhesion was found to be the most common cause of intestinal obstruction (33.33%). Other causes included mesenteric ischemia (11.67%), Koch's abdomen (8.33%), sigmoid volvulus (8.33%), and carcinoma (8.33%)[19].

So, the most common cause of intestinal obstruction in our study is similar to the previously mentioned studies.

In the study by Souvik Adhikar *et al*. 2010, an obstructed hernia was found to be the most common cause, followed by large bowel neoplasms, consistent with previous reports[12].

In a 2017 study by Mesfin Yohannes *et al*., sigmoid volvulus was the most common cause of intestinal obstruction, accounting for 58% of 181 cases. Small bowel volvulus followed as the second most frequent cause. Post-operative adhesions, hernias, and intussusceptions ranked third, fourth, and fifth, representing 11%, 12%, and 8% of cases, respectively[11].

A 2017 study by Yahya Kemal Çalışkan found that external strangulated hernias (inguinal, femoral, incisional, umbilical, and epigastric) were the leading cause of intestinal obstruction, accounting for 46.4% of cases. Neoplasms and adhesions followed at 19% and 18.5%, with other issues like volvulus, Crohn's disease, bezoars, and gallstones making up the remaining 16%[14].

The most common cause of intestinal obstruction in the previous studies differs from our study.

Management

In our study, nearly 76% of the patients were managed with an operative procedure (Laparoscopy was performed in 9% of the operated patients) while the rest 24% of them were managed conservatively. Conservative therapy was typically advocated for patients with a preoperative diagnosis of adhesive bowel obstruction.

In the study by Mesfin Yohannes *et al*. (2017), 40.3% of patients were treated conservatively, while 59.7% had surgery. Most conservatively treated patients had large bowel obstruction, whereas most surgical cases had small bowel obstruction, indicating that surgery is more common for small bowel obstruction[11].

In our study, a trial of conservative treatment was done in 7% of the cases for 2 to 5 days (6% were adhesive bowel obstruction and 1% was bowel obstruction due to foreign body ingestion) but they didn't show improvement so, the operative management was the curable option in these cases.

In 64.3% of adhesive bowel obstruction cases, the operative intervention was the most suitable option (7 cases had laparoscopic adhesiolysis and the rest were managed by laparotomy adhesiolysis) while 35.7% had successful conservative treatment.

In Oladele *et al*. 2008, 57.5% of patients with adhesions underwent surgical exploration for adhesiolysis after failed conservative management. 38.9% were managed conservatively, while 61.1% had surgical operations[13].

In Souvik Adhikar *et al*. 2010, patients were either managed conservatively (79 patients, 21.5%) or underwent surgery (288 patients, 78.5%). Surgery was considered for patients with increasing pain, abdominal tenderness, rapid heart rate, fever, leukocytosis, and failed non-operative treatment[12].

In a 2012 study by Murat Kapan *et al*., 56.8% of patients had surgery within 24 hours. Severe ischemic features were present in 48% of those with mechanical bowel obstruction, while 2.7% had perforation and 7.4% had necrosis. Resection was performed on 60.1% of patients, and 37.8% underwent adhesiolysis[10].

In a 2017 study by Yahya Kemal Çalışkan, 85.5% of patients were in Group A, with 77.1% undergoing surgery within 6 hours of admission. The rest in Group A were treated non-operatively unless that failed. The remaining 14.5% of patients formed Group B and were managed non-operatively[14].

In a 2019 study by Wei Jiang *et al*., 3544 patients (72.21%) received conservative therapy, while 1327 (27.04%) required surgery. Of 817 cases with diagnostic endoscopy, 37 (0.75%) were sigmoid volvulus. Adhesive intestinal obstruction had the highest conservative therapy rate at 51.38%, while intussusception had the lowest at 5.17%[15].

In Ahmed Iessa Matar *et al*. 2024, 71.7% of the participants underwent surgical intervention, while 28.3% were managed conservatively[17].

In a 2007 study by Haridimos Markogiannakis *et al*., 58.7% of patients were treated without surgery. Non-operative treatment was more common for acute mechanical small bowel obstruction (69.3%) than for large intestinal obstruction (25%). Of 150 patients, 41.3% required surgery, with 19.3% needing it on the first day[18].

Post-operative complications and follow up

In our study, 80% of the cases were discharged after 2 to 7 days without complication after showing clinical improvement and confirmed by laboratory follow up.

12% of them had prolonged hospital stays from 2 to 3 weeks due to wound infection, 4% suffered from leakage, while 4% had stoma complications such as parastomal abscess, retracted stoma, ischemic stoma and, perforated stoma.

In Mesfin Yohannes *et al*. 2017, post-operative complications occurred in 16.7% of the operated cases. The most frequently observed complication was post-operative wound infection, which was seen in 14 (12.9%) of all operated cases. Other less frequently seen complications included anastomotic leakage in 1 (0.9%) case, wound dehiscence in 2 (1.9%) cases, and pneumonia in one (0.9%) case[11].

In a study by AO Oladele *et al*. in 2008, it was found that 65 out of the total patients treated (68.4%) were discharged and followed up in the surgical outpatient unit. The overall mortality rate was 20%, out of these, 10 patients underwent surgery, while 9 did not, either due to passing away during resuscitation for surgery or during treatment[13].

In a 2010 study by Souvik Adhikar *et al*., 25.89% of 367 patients experienced postoperative complications, including wound infection (11.99%), burst abdomen (4.4%), and prolonged ileus (9.26%). Other issues were basal atelectasis (8.45%), sepsis in intestinal tuberculosis patients (13.46%), and small bowel fistula (1.9%)[12].

In a study conducted by Murat Kapan *et al*. in 2012, the morbidity rate was 41.9%. The most common complications were systemic, including respiratory and cardiovascular issues, as well as acute renal failure, accounting for 27.7%. Wound infection was the second most common complication, at 13.5%[10].

In a study by S. Thirumuruganand *et al*. in 2016, out of 50 cases, 15 cases were found to have wound infections, primarily due to intra-abdominal pathology and poor bowel preparation. Among 4 sepsis cases, 2 cases already had sepsis, and 6 cases had respiratory tract infections, which were commonly observed in hernia patients and patients with COPD (Chronic Obstructive Pulmonary Disease)[16].

Ahmed Iessa Matar *et al*. (2024) found that out of 106 patients, 38 required ICU admission (35%). Most patients (63.2%) stayed in the hospital for 1–5 days, 32.1% for 6–10 days, and 4.7% for over 10 days. 89.6% showed improvement and were discharged, while 2.8% required readmission. The most common postoperative complication was wound infection[17].

In Haridimos Markogiannakis *et al*. 2007, 6 cases (4%) had complications: 2 with septic shock, acute respiratory and renal failure, 1 with pneumonia, 1 with myocardial infarction, 1 with urinary tract infection, and 1 with anastomotic leakage requiring reoperation[18].

In the study by Saurabh J. Tiwari *et al*. in 2017, among the 60 cases examined, complications included death in 9 cases, wound infection in two cases, and burst abdomen, and bowel fistula in one case each[19].

CONCLUSION

The study found that adhesions, complicated hernias, and malignant diseases are the main causes of intestinal obstruction, with vomiting and abdominal pain being the most common symptoms. Many patients had prior surgeries, indicating that adhesive bowel obstruction is prevalent. This highlights the need for preventive measures during surgeries, such as using laparoscopy to reduce complications. Elective hernia repairs should be prioritized, and regular screening for bowel neoplasms is essential. Successful treatment relies on early diagnosis, effective management, and addressing both the obstruction's cause and its effects. While some patients can be treated non-operatively, many require urgent surgery. Postoperative care is vital to minimize complications, and public awareness of risk factors and symptoms should be enhanced to reduce incidence.

ABBREVIATIONS

SBO: Small bowel obstruction, **LBO:** Large bowel obstruction, **IBD:** Inflammatory bowel disease, **TAHBSO:** Total Abdominal Hysterectomy and Bilateral Salpingo-Oophorectomy.

CONFLICT OF INTERESTS

There are no conflicts of interest.

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