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Original article

Acute Intestinal Obstruction: A Retrospective Study at Misurata Medical Center

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Abstract
Acute mechanical bowel obstruction is a common intra-abdominal surgical emergency, accounting for 12–16% of acute abdominal pain cases. Despite advances in diagnostics and surgical techniques, it remains a major clinical challenge due to varied causes and presentations. Both small and large bowel obstructions often require urgent, individualized management. This retrospective observational study reviewed 60 adult patients (aged >14 years) admitted with acute intestinal obstruction at Misurata Medical Center between March 2022 and February 2023. Paralytic ileus cases were excluded. Data included demographics, prior surgeries, clinical features, investigations, and treatment outcomes. Of the 60 patients, 37 (61.7%) underwent surgery, while 23 (38.3%) were managed conservatively. The male-to-female ratio was 1.85:1, with the majority (81%) aged 20–40 years. Abdominal pain was the predominant symptom (95%), followed by vomiting (70%), constipation (55%), distension (46.7%), and obstipation (15%). A significant proportion (63.3%) had prior abdominal surgery, mainly war-related laparotomies. Adhesions and fibrous bands were the leading cause (58.3%), followed by obstructed hernias (26%), malignancies (10%), volvulus (3.3%), and primary peritonitis (1.7%). Conservative management was successful in 23 patients, but surgical intervention was required in most cases due to complications or lack of improvement. Intraoperative findings guided procedures: obstructed hernias with gangrene required resection and anastomosis with hernia repair; malignant obstructions were treated with resection, bypass, or stoma formation, followed by oncologic referral; adhesive obstructions were managed with adhesiolysis, with resection if bowel viability was compromised; volvulus was treated with resection and either primary anastomosis or Hartmann's procedure.
Keywords. *Intestinal Obstruction, Malignancy, Volvulus.*

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Introduction

Acute mechanical bowel obstruction is one of the most common intra-abdominal emergencies encountered by general surgeons. It accounts for approximately 12% to 16% of all acute abdominal emergencies. Due to its multiple etiologies, intestinal obstruction—whether of the small or large bowel—continues to be a significant cause of emergency surgical admissions [1]. Despite advances in diagnostic and therapeutic modalities, it remains a major clinical and surgical challenge in both developed and developing countries. In the Libyan context, the burden of acute bowel obstruction remains high, often compounded by limited access to advanced diagnostic tools and surgical care. This condition generally carries a favorable prognosis when recognized and managed early. However, delayed presentation, misdiagnosis, or inadequate preoperative resuscitation may significantly increase both morbidity and mortality. The etiology of intestinal obstruction varies, with small bowel obstruction (SBO) being more common. SBO is most frequently caused by postoperative adhesions (approximately 60%), followed by strangulated hernias (20%), malignancy (5%), and volvulus (5%).

Large bowel obstruction (LBO), on the other hand, is most commonly due to colorectal malignancies, particularly those located in the sigmoid or rectosigmoid regions [2]. The primary pathophysiological concerns in bowel obstruction include disturbances in fluid and electrolyte balance, as well as the mechanical impact of increased intraluminal pressure on intestinal perfusion. Proximal to the obstruction site, the bowel dilates due to the accumulation of secretions and swallowed air [3]. This leads to cessation of flatus and bowel movements. Fluid loss from vomiting, bowel wall edema, and impaired absorption contribute to dehydration. Vomiting also results in significant electrolyte loss, particularly potassium, hydrogen, and chloride ions. This, combined with compensatory renal mechanisms, often leads to metabolic alkalosis [4]. Another complication is the bacterial overgrowth and translocation across the compromised bowel wall [5], which may trigger systemic inflammatory responses. As luminal pressure rises and exceeds venous pressure, venous outflow is impaired, causing bowel wall edema and hyperemia. If the condition progresses further, arterial blood flow may be compromised, resulting in ischemia, necrosis, and eventual perforation of the bowel.

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Clinically, patients often present with nausea, vomiting, colicky abdominal pain, and absence of flatus and stool passage. Physical examination may reveal abdominal distension, tympany to percussion, and high-pitched bowel sounds—hallmark features of obstruction. However, the severity of symptoms depends on the location and acuity of the obstruction. Timely identification of intestinal strangulation is critical in deciding whether urgent surgical intervention is needed or if a non-operative approach can be safely pursued. Accurate diagnosis relies heavily on a thorough clinical evaluation, supported by laboratory and radiologic investigations [6].

As Charles V. Mann (1994) aptly stated, "the sun should not both rise and set on a case of unrelieved intestinal obstruction, unless there are positive reasons for delay." [11] More recent studies have reinforced the importance of early intervention, highlighting that delays in diagnosis and treatment continue to contribute significantly to adverse outcomes, particularly in settings with limited resources [6-9]. In light of the clinical importance and variability of acute mechanical bowel obstruction, this retrospective study was conducted to analyze the clinical presentation, underlying causes, management strategies, and outcomes of affected patients admitted to Misurata Medical Center over a one-year period. This research is crucial in understanding the patterns of bowel obstruction in Libya, where healthcare infrastructure faces challenges, and aims to improve the management of such cases in the region.

Methods

This retrospective observational study was conducted at the Surgical Department of Misurata Medical Center, focusing on adult patients (aged 14 years and older) who were admitted with a diagnosis of acute intestinal obstruction over a one-year period from March 2022 to February 2023. A total of 60 patients were included in the study.

Individuals with paralytic ileus, a condition that mimics obstruction but does not involve a physical blockage of the bowel, were excluded from the analysis to ensure that only cases of mechanical bowel obstruction were considered . The study aimed to evaluate various clinical factors, including patient demographics (age ,sex ,(presenting symptoms , underlying etiology of the obstruction, the site of the obstruction (small or large bowel), and the type of surgical or non-surgical intervention employed.

Data collection involved a comprehensive review of the patients' medical records ,which included detailed accounts of their medical history, physical examination findings, and results of diagnostic investigations. Radiological assessments were an integral part of the diagnostic process. All patients underwent baseline X-rays of the abdomen in both erect and supine positions to evaluate the presence of dilated loops of bowel and other signs indicative of obstruction .In addition, ultrasound imaging of the abdomen was performed on a case-by-case basis, depending on the clinical indications and the need for further diagnostic clarification. The decision to proceed with surgery ,as well as the choice of surgical procedure, was guided by intraoperative findings and clinical judgment.

Results

Over the one-year study period, 60 consecutive adult patients with acute intestinal obstruction were admitted to the surgical department of Misurata Medical Center. Among these, 37 patients underwent operative management, while 23 patients were managed conservatively, as illustrated in (Figure 1).

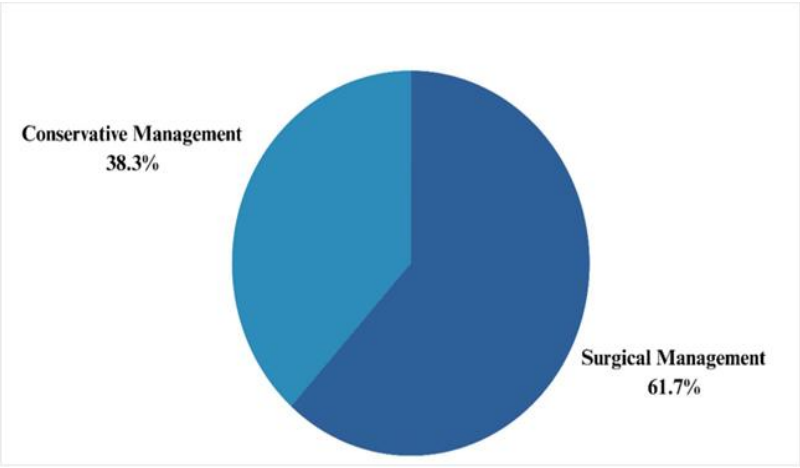

Figure 1. A pie chart representing the percentage of patients with intestinal obstruction who received surgical management versus those who received conservative management

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The age and sex distribution of the patients revealed a male-to-female ratio of 1.85:1. The most common age group for intestinal obstruction was between 20 to 40 years, which accounted for 81% of cases, while the least affected group was those under 20 years of age (19%), as shown in (Figures 2 and 3).

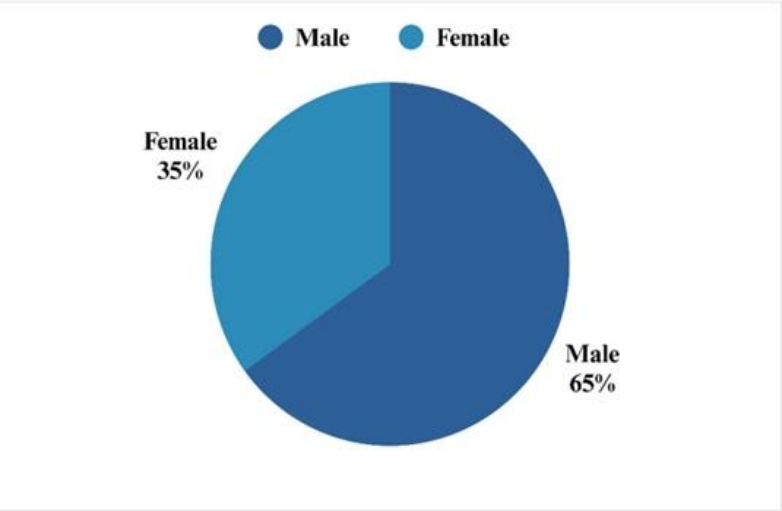

Figure 2. Pie chart representing the male-to-female ratio

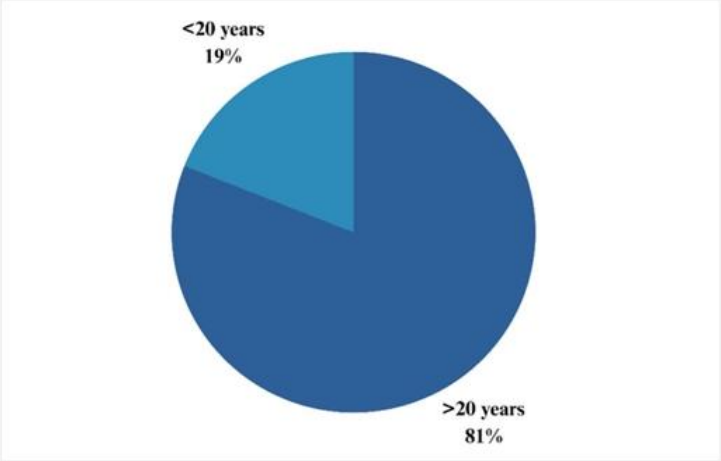

Figure 3. Pie chart representing the age distribution. Note that intestinal obstruction is more common in individuals over 20 years of age

Regarding clinical presentation, abdominal pain was the most common symptom, affecting 95% of patients (57 patients). Other symptoms included abdominal distension (46.7%, 28 patients), vomiting (70%, 40 patients), constipation (55%, 33 patients), and obstipation (15%, 9 patients), as summarized in (Table 1).

Table 1. Clinical presentation of patients with acute intestinal obstruction

Type of Presentation	No. Of Patients	Percentage (%)
Abdominal pain	57	95%
Vomiting	40	70%
Constipation	33	55%
Abdominal Distension	28	46.7%
Obstipation	9	15%

In terms of surgical history, 36.7% of patients (22 patients) had no prior abdominal surgery, while 63.3% (38 patients) had undergone previous surgical procedures, most commonly laparotomy during the war. The etiologies of intestinal

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obstruction are shown in Table 2. Adhesions and bands were the most common cause, accounting for 58.3% of cases. Other causes included obstructed hernia (26%), volvulus (3.3%), malignancy (10%), and primary peritonitis (1.7%), as summarized in (Table 2).

Table 2. Distribution of patients according to causes of intestinal obstruction

Causes of obstruction	No. Of patients	Percentage (%)
Adhesions and bands	35	58.3%
Obstructed Hernia	14	26.7%
Volvulus	2	3.3%
Malignancy	6	10%
Primary Peritonitis	1	1.7%

Regarding management, 23 patients (38.3%) were successfully treated conservatively, while 37 patients (61.7%) required surgical intervention. The decision for surgery was primarily based on the failure of conservative treatment or the nature of the obstruction, such as a strangulated hernia, which necessitated immediate surgery, as summarized in (Table 3).

Table 3. Type of management for patients with intestinal obstruction

Management Type	No. Of patients	Percentage
Conservative	23	38.3%
Operative	37	61.7%

The choice of surgical procedure was based on intraoperative findings. For patients with obstructed hernia, resection of the involved bowel was performed when gangrenous tissue was present, followed by anastomosis and primary repair of the hernia. Malignancy, most commonly located in the large bowel, was treated by primary resection, bypass, or stoma creation. These patients were later referred for additional elective treatment. Adhesions were managed by adhesiolysis and bowel resection if gangrenous. Volvulus was treated by primary resection and anastomosis or, in some cases, a Hartmann's procedure.

Discussion

Intestinal obstruction is a common and potentially life-threatening condition that affects individuals across all age groups. Although our current clinical study excluded infants, we observed that the incidence of intestinal obstruction peaked among patients aged 50–59 years (28%), followed by those aged 40–49 years (22%) and 60–69 years (20%). This pattern of age distribution is in line with findings from previous literature, suggesting that middle-aged and older adults are more frequently affected, possibly due to a higher prevalence of comorbidities, previous abdominal surgeries, and degenerative changes associated with aging. Historically, bowel obstruction has been a significant medical issue, with references dating back to ancient times. Praxagoras of Kos first described the condition around 350 BC, followed by more detailed accounts from Hippocrates. Despite the evolution of surgical techniques and imaging modalities, acute intestinal obstruction continues to be a major contributor to surgical morbidity and imposes a considerable financial burden on healthcare systems worldwide. It remains one of the most frequent indications for emergency abdominal surgery. The etiology of bowel obstruction varies based on geographical location, dietary habits, and healthcare infrastructure. In Western countries, postoperative adhesions account for the majority of small bowel obstructions, a trend also observed in many parts of Asia and the Middle East [7,8].

Our findings are consistent with this global pattern, with adhesions being the leading cause of obstruction in our cohort. This emphasizes the long-term impact of intra-abdominal surgeries and the importance of strategies to reduce postoperative adhesion formation. Among large bowel obstructions, colorectal malignancy was the predominant cause, aligning with global data that highlight cancer as a key contributor to colonic obstruction. We also noted a higher incidence of intestinal obstruction in males compared to females. This gender disparity may be attributed to the higher occurrence of obstructed inguinal hernias among males, a pattern that is particularly pronounced in our local context. Cultural, anatomical, and occupational differences may further contribute to this discrepancy. Moreover, varying dietary patterns, lifestyle factors, and access to healthcare services may influence the incidence and presentation of

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obstruction across genders and regions. Several studies have reported that small bowel obstruction is more prevalent than large bowel obstruction, often accounting for approximately 80% of cases [5,8,9]. Our data support this observation. A study conducted in an Ethiopian hospital found small and large bowel obstructions accounted for 52.3% and 46.7% of cases, respectively [15]. Such variations may be explained by differences in dietary fiber intake, prevalence of colorectal cancer, and rates of elective colonoscopic screening in different populations. The clinical presentation of intestinal obstruction often includes abdominal pain, vomiting, distention, and constipation. In our study, signs such as persistent abdominal pain, fever (>37.2°C), tachycardia (>100 bpm), and palpable abdominal masses were particularly useful in identifying cases with possible strangulation. This was especially notable in external hernia cases, where early intervention is essential to prevent ischemic complications.

Radiologically, plain abdominal X-rays remained a valuable diagnostic tool, showing air-fluid levels in 73% of cases. While CT scans offer superior sensitivity and specificity, their limited availability in resource-constrained settings makes X-rays a reliable first-line option. Time to presentation and intervention is a crucial factor influencing outcomes in intestinal obstruction. Delayed treatment often leads to bowel ischemia, necrosis, or perforation, all of which significantly increase morbidity and mortality. In our cohort, nearly 50% of patients presented within 24 hours, a notably better figure than some studies, which report over 75% of patients presenting after this critical window [16]. Patients who presented earlier had fewer complications, shorter hospital stays, and lower need for bowel resection, reaffirming the importance of timely diagnosis and management.

Our relatively low observed mortality rate may be attributed to early diagnosis, adequate preoperative resuscitation, and timely surgical intervention. Conservative management continues to be the cornerstone of treatment for adhesive small bowel obstruction in the absence of strangulation or peritonitis. A trial of non-operative management, typically limited to 72 hours, includes nil per os (NPO), nasogastric decompression, and close clinical monitoring [18]. While conservative therapy avoids the risks associated with surgery, it carries a risk of recurrence—reported as 12% within the first year and up to 20% within five years [19]. Hernia-related obstructions require a tailored approach. A prompt attempt at manual reduction may be successful in early presentations, but surgical intervention becomes necessary if strangulation is suspected or reduction fails [20,21].

Even when reduction is successful, elective surgical repair during the same admission is advisable to prevent recurrence. For sigmoid volvulus, endoscopic decompression is often effective and avoids emergency surgery in the absence of ischemia. Colonoscopic detorsion, which is both diagnostic and therapeutic, has a high success rate (70–95%) and a low complication rate (approximately 4%) [22,23]. However, definitive surgical intervention is required to prevent recurrence, especially in high-risk or recurrent cases. In cases of perforation, contamination, or suspected ischemia, immediate surgical intervention via laparotomy remains the gold standard. Laparoscopic adhesiolysis is increasingly considered for select patients, especially in centers with laparoscopic expertise. It offers advantages such as reduced postoperative pain and shorter hospital stays, though it carries a higher risk of iatrogenic injury in inexperienced hands [24]. Operative treatment of adhesions has a slightly lower recurrence rate compared to conservative management (8% vs. 12% at 1 year) [26].

Tumors causing small bowel obstruction require segmental resection and histopathological evaluation. Adenocarcinomas, neuroendocrine tumors, GISTs, and lymphomas each necessitate distinct oncologic strategies following surgical management [27,28,29]. Similarly, large bowel obstructions due to diverticulitis or malignancy must be assessed for the feasibility of primary anastomosis versus staged procedures like Hartmann's operation. Elective anastomosis has acceptable leak rates (2.2- 12%), similar to those in elective settings [31,32]. Rectal cancers causing obstruction present unique challenges. In such cases, creating a diverting stoma while deferring resection allows for full staging and neoadjuvant treatment. Emergency laparoscopic procedures for malignancy should be performed only in specialized centers with experience in advanced colorectal surgery [33-35].

Conclusion

In conclusion, our study has demonstrated that adhesions are increasingly recognized as the primary underlying cause of bowel obstruction. This trend is notably linked to the growing incidence of adhesions following previous abdominal surgeries. Additionally, the growing prevalence of elective hernia surgery has led to a decrease in the number of patients presenting with obstructed hernias. Despite these advances, the success in managing acute intestinal obstruction largely hinges on timely diagnosis and effective management. The improvement in surgical techniques, both in terms of intervention and postoperative care, has contributed to a significant reduction in mortality rates associated with intestinal obstruction. However, despite these advancements, the timely recognition of strangulation in cases of bowel

obstruction remains a critical challenge for surgeons. Strangulated obstruction continues to present a serious risk to patient outcomes, underlining the importance of vigilant clinical assessment and early surgical intervention. Continued research and refinement of diagnostic and therapeutic protocols are essential to further reduce the morbidity and mortality associated with this condition.

Conflicts of interest

The authors declare no conflicts of interest regarding the publication of this study.

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