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Clinical Characteristics and Outcomes of Patients Undergoing Emergency Surgery for Intestinal Obstruction at a Tertiary Care Centre in Eastern India

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Abstract

Background: Intestinal obstruction is a common surgical emergency and an important cause of morbidity and mortality in low- and middle-income countries, including India. This study aimed to evaluate the clinical, demographic, intraoperative, and postoperative factors influencing outcomes in patients undergoing emergency surgery for intestinal obstruction in a tertiary care centre in Eastern India.

Methods: This prospective observational study was conducted in the Department of General Surgery, Tata Main Hospital, Jamshedpur, from April 2023 to March 2025. Ninety-one patients aged ⩾18 years who underwent emergency surgery for intestinal obstruction were enrolled. Demographic, clinical, laboratory, intraoperative, and postoperative data were recorded on a structured proforma, and patients were followed up for 30 days after discharge. Data were analysed using SPSS version 21 (IBM Corp., Armonk, NY), with $p<0.05$ considered statistically significant.

Results: The mean age of presentation was highest in the 31-40 and 51-60 year groups (19.78% each), with an overall male predominance (70.33%). Adhesions and bands were the leading cause of obstruction (41.75%), followed by hernia (19.78%), malignancy (12.08%), and tuberculosis (12.08%). Abdominal pain and distension were present in all patients (100%), and small bowel obstruction was the most common intraoperative diagnosis (86.0%). Release of adhesions (56.04%) and resection anastomosis (50.54%) were the most frequently performed procedures. Postoperative morbidity occurred in 27.47% of patients, most commonly due to paralytic ileus (12.08%), wound infection (9.89%), and sepsis (8.79%). Mortality was 5.49% (5/91) and occurred in patients with delayed presentation, malignancy, mesenteric ischaemia, or volvulus.

Conclusion: Adhesions and bands were the leading cause of intestinal obstruction in this cohort. Delayed presentation, malignant obstruction, and mesenteric ischaemia were observed among patients with adverse outcomes. These findings highlight the importance of timely diagnosis, appropriate surgical management, and careful perioperative monitoring in patients undergoing emergency surgery for intestinal obstruction.

Categories: Trauma, General Surgery, Gastroenterology
Keywords: adhesions, eastern india, emergency surgery, intestinal obstruction, morbidity, mortality, tertiary care

Introduction

Intestinal obstruction is a common and potentially life-threatening surgical emergency that requires prompt diagnosis and timely management to prevent serious complications and mortality. It represents an important clinical challenge in low- and middle-income countries, where delayed presentation, limited access to timely surgical care, and resource constraints may contribute to adverse outcomes [1,2].

The aetiology of intestinal obstruction varies considerably according to geographic and socioeconomic factors. In developed countries, postoperative adhesions, malignancy, and hernias are the predominant causes of intestinal obstruction [1]. In contrast, abdominal tuberculosis, obstructed hernias, volvulus, intussusception, and parasitic infections continue to represent important causes in developing countries, including Eastern India [3]. These regional variations highlight the need for population-specific studies to better characterise the disease burden and inform appropriate management strategies.

The clinical presentation of intestinal obstruction is diverse, with patients commonly presenting with abdominal pain, abdominal distension, vomiting, and absolute constipation. Plain abdominal radiography and computed tomography are valuable diagnostic modalities that facilitate early diagnosis and appropriate treatment planning [1]. Although conservative management may be appropriate in selected patients, particularly those with adhesive intestinal obstruction, a considerable proportion ultimately require emergency surgical intervention. Surgical treatment is associated with a high risk because of the acute nature of the disease and the frequently compromised physiological condition of patients at presentation.

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Several factors influence outcomes following emergency surgery for intestinal obstruction, including the duration of symptoms before hospital presentation, patient age, comorbidities such as diabetes mellitus and cardiovascular disease, nutritional status, intraoperative findings (including bowel gangrene, perforation, and contamination), and postoperative complications such as wound infection and sepsis [4,5]. Delayed presentation is a particularly important determinant of adverse outcomes, as prolonged obstruction increases the risk of bowel compromise, septic complications, and mortality. Furthermore, sociodemographic factors and healthcare system challenges, including delayed referral, limited access to healthcare services, and resource constraints in tertiary care centres in Eastern India, may further contribute to poor clinical outcomes [6].

Despite advances in surgical techniques and perioperative care, emergency surgery for intestinal obstruction remains associated with substantial postoperative morbidity and mortality. Previous studies have reported variable outcomes depending on the study population, underlying cause of obstruction, and timeliness of surgical intervention [1,2,5]. Identifying the factors associated with adverse outcomes is essential for effective risk stratification, timely surgical intervention, and optimisation of perioperative management. Therefore, the present study aimed to describe the demographic and clinical characteristics, aetiological patterns, and outcomes of patients undergoing emergency surgery for intestinal obstruction at a tertiary care centre in Eastern India, and to explore the clinical characteristics observed among patients who experienced adverse outcomes.

Materials And Methods

Study design

This was a prospective observational study conducted in the Department of General Surgery, Tata Main Hospital, Jamshedpur, Jharkhand, India, from April 2023 to March 2025, after approval by the Institutional Thesis and Ethics Committee.

Inclusion criteria

Patients aged 18 years and above who were diagnosed with intestinal obstruction and underwent emergency surgical intervention at the Department of General Surgery, Tata Main Hospital, Jamshedpur, during the study period were included.

Exclusion criteria

Patients younger than 18 years, pregnant women, patients who were unable to provide informed consent, patients with intestinal obstruction managed conservatively without surgery, and patients who declined surgical intervention were excluded.

Sample size

The sample size was calculated using the standard formula for an infinite population and subsequently adjusted with a finite population correction for an expected study population of 120 patients, yielding a minimum required sample size of 91 patients, all of whom were enrolled.

Study procedure

All patients presenting with clinical features of intestinal obstruction were evaluated and admitted. Initial conservative management (bowel rest, nasogastric decompression, Foley catheterisation, fluid resuscitation, broad-spectrum antibiotics, and serial abdominal girth monitoring) was instituted in all patients, with regular clinical reassessment. The decision to proceed to surgery was based on clinical evaluation, radiological findings, and overall patient progress; only patients who underwent surgery were included in the analysis. Patients were followed up telephonically or in person at 30 days post-discharge to assess for persistent symptoms, wound-related issues, stoma complications, and other postoperative events. Postoperative morbidity was defined as the occurrence of at least one postoperative complication, including paralytic ileus, wound infection, sepsis, respiratory infection, or anastomotic leak. Each patient was counted only once in the calculation of overall morbidity, even if multiple complications occurred.

Patients were monitored for postoperative complications and mortality during hospitalisation. Following discharge, patients were followed up telephonically or in person for 30 days to assess postoperative events, including mortality.

Data collection

Data were recorded on a standardised proforma capturing demographic details; clinical presentation (duration and type of symptoms, comorbidities); clinical examination (signs of dehydration/sepsis, abdominal signs, per-rectal findings); radiological investigations (erect abdominal radiography, and contrast-enhanced computed tomography of the abdomen and pelvis where a diagnostic dilemma existed); laboratory investigations (haemogram, renal and liver function, electrolytes, and lactate where indicated);

intraoperative findings; operative procedure performed; timing metrics (duration of surgery, time from symptom onset to surgery, and time from admission to surgery); and postoperative course, including complications, reoperation, and mortality.

Ethical considerations

The study was approved by the Institutional Ethics Committee and Scientific Research Committee of Tata Main Hospital, Jamshedpur (Ref. No. DMH/281/2023, dated 07 June 2023). Written informed consent was obtained from all participants. All patients were treated according to standard diagnostic and treatment protocols, patient confidentiality was maintained, no additional cost was imposed on participants, and patients retained the freedom to withdraw from the study at any stage without affecting their treatment. No standard therapy was withheld for the purposes of the study.

Statistical analysis

Data were entered in Microsoft Excel (Microsoft Corp., Redmond, WA, USA) and analysed using SPSS version 21 (IBM Corp., Armonk, NY). Continuous variables were summarised as mean ± standard deviation, and categorical variables were presented as frequencies and percentages. The analysis was primarily descriptive and characterised the demographic and clinical profiles, aetiological patterns, operative findings, and postoperative outcomes of the study population. The clinical characteristics and outcomes of patients who died were described separately. No inferential comparative or multivariable regression analyses were available for the present analysis. Accordingly, the findings were interpreted descriptively, without claiming statistically established associations or independent predictors of adverse outcomes.

Results

A total of 91 adult patients aged 18 years or older were included in the study. The largest proportions of patients belonged to the 31-40-year and 51-60-year age groups, with 18 (19.78%) patients in each group. Overall, males constituted 64/91 (70.33%) of the study population, while females accounted for 27/91 (29.67%) (Table *1*).

Age group (years)	Male, n (%)	Female, n (%)	Total, n (%)
18-20	9 (9.89)	2 (2.20)	11 (12.09)
21-30	9 (9.89)	6 (6.59)	15 (16.48)
31-40	13 (14.29)	5 (5.49)	18 (19.78)
41-50	5 (5.49)	2 (2.20)	7 (7.69)
51-60	14 (15.38)	4 (4.40)	18 (19.78)
61-70	9 (9.89)	6 (6.59)	15 (16.48)
71-80	3 (3.30)	2 (2.20)	5 (5.49)
81-90	2 (2.20)	0 (0.00)	2 (2.20)
Total	64 (70.33)	27 (29.67)	91 (100.00)

TABLE 1: Age and Gender Distribution of Study Patients (N=91)

Data are presented as numbers (percentages). Percentages are calculated using the total study population (N=91) as the denominator.

Adhesions and bands were the leading cause of intestinal obstruction, accounting for 38/91 (41.75%) cases, followed by hernia 18/91 (19.78%), malignancy 11/91 (12.08%), tuberculosis 11/91 (12.08%), volvulus 7/91 (7.69%), intussusception 3/91 (3.29%), non-tuberculous stricture 2/91 (2.19%), and mesenteric ischaemia 1/91 (1.09%) (Table *2*). Adhesions and bands were the leading cause of intestinal obstruction, accounting for 38 of 91 (41.75%) cases, followed by hernia in 18 (19.78%) cases. The predominance of adhesions and bands may be related to previous abdominal surgery; however, the specific cause of adhesions was not established in this study.

Etiology	Number of cases	Percentage (%)
Adhesions and bands	38	41.75
Hernia	18	19.78
Malignancy	11	12.08
Tuberculosis	11	12.08
Volvulus	7	7.69
Intussusception	3	3.29
Stricture (non-tuberculous)	2	2.19
Mesenteric ischaemia	1	1.09

TABLE 2: Etiological Distribution of Intestinal Obstruction (N=91)

Data are presented as the number and percentage of patients for each aetiology. Percentages are calculated using the total study population (N=91) as the denominator.

Abdominal pain, abdominal distension, and abdominal tenderness were observed in all 91 (100%) patients. Vomiting was reported in 78 (85.7%) patients, followed by constipation and dehydration in 55 (60.4%) patients each. Fever was present in 18 (19.8%) patients. Increased bowel sounds were observed in 80 (87.9%) patients, whereas absent bowel sounds were noted in 11 (12.1%) patients. A previous surgical scar was documented in 40 (44.0%) patients. On examination, a palpable abdominal mass was identified in 24 (26.4%) patients, ballooning on per rectal examination in 43 (47.3%), a collapsed rectum in 27 (29.7%), and stool staining in 21 (23.1%) (Table 3).

Clinical finding	Number (n=91)	Percentage (%)
Abdominal pain	91	100
Abdominal distension	91	100
Vomiting	78	85.7
Constipation	55	60.4
Dehydration	55	60.4
Fever	18	19.8
Abdominal tenderness	91	100
Increased bowel sounds	80	87.9
Absent bowel sounds	11	12.1
Previous surgical scar	40	44.0
Palpable abdominal mass	24	26.4
Ballooning on per rectal examination	43	47.3
Collapsed rectum	27	29.7
Stool staining	21	23.1

TABLE 3: Clinical Presentation and Examination Findings (N=91)

Data are presented as numbers (percentages). Clinical findings may overlap, as individual patients may present with multiple findings.

Previous abdominal surgery was reported in 40 (44.0%) patients. Diabetes mellitus was the most frequently documented comorbidity, affecting 36 (39.6%) patients, followed by hypertension in 27 (29.7%). Cardiac

disease, renal disease, and asthma were present in 10 (11.0%), 5 (5.5%), and 4 (4.4%) patients, respectively. Among the laboratory abnormalities, leukocytosis was the most common, occurring in 51 (56.0%) patients, followed by hypokalemia in 24 (26.4%), anemia in 17 (18.7%), hypoalbuminemia in 12 (13.2%), and deranged renal function in 5 (5.5%) (Table *4*).

Variable	Number (n=91)	Percentage (%)
Previous abdominal surgery	40	44.0
Diabetes mellitus	36	39.6
Hypertension	27	29.7
Cardiac disease	10	11
Renal disease	5	5.5
Asthma	4	4.4
Leukocytosis	51	56
Hypokalaemia	24	26.4
Anaemia	17	18.7
Hypoalbuminaemia	12	13.2
Deranged renal function	5	5.5

TABLE 4: Comorbidities and Laboratory Findings (N=91)

Data are presented as numbers (percentages). Comorbidities and laboratory abnormalities may coexist in individual patients.

Intraoperatively, small bowel obstruction was identified in 78/91 (86.0%) patients, large bowel obstruction in 11/91 (12.1%), and compound obstruction in 2/91 (2.2%). The most commonly performed procedure was release of adhesions in 51/91 (56.04%) patients, followed by resection and anastomosis in 46/91 (50.54%), stoma formation in 33/91 (36.26%), herniorrhaphy in 18/91 (19.78%), hemicolectomy in 5/91 (5.50%), untwisting of volvulus with or without sigmoidopexy in 4/91 (4.39%), and reduction of intussusception in 3/91 (3.29%) patients. The reported mean duration of surgery was 4.11 ± 2.14 hours, the mean interval from symptom onset to surgery was 3.78 ± 3.24 days, and the mean interval from admission to surgery was 7.78 ± 2.47 hours. Hospital stay was 1-4 days in 35/91 (38.5%) patients, 5-8 days in 43/91 (47.3%), and more than 9 days in 13/91 (14.3%) patients (Table *5*).

Parameter	Value
Intraoperative diagnosis	
Small bowel obstruction, n (%)	78 (86.0)
Large bowel obstruction, n (%)	11 (12.1)
Compound obstruction, n (%)	2 (1.9)
Surgical procedures	
Release of adhesions, n (%)	51 (56.04)
Resection anastomosis, n (%)	46 (50.54)
Stoma formation, n (%)	33 (36.26)
Herniorrhaphy, n (%)	18 (19.78)
Hemicolectomy, n (%)	5 (5.50)
Untwisting of volvulus (± sigmoidopexy), n (%)	4 (4.39)
Reduction of intussusception, n (%)	3 (3.29)
Operative variables	
Duration of surgery (hours), mean ± SD (range)	4.11 ± 2.14 (2.11-5.6)†
Symptom onset to surgery (days), mean ± SD (range)	3.78 ± 3.24 (1-6)†
Admission to surgery (hours), mean ± SD (range)	7.78 ± 2.47 (6.1-9.3)†
Hospital stay	
1-4 days, n (%)	35 (38.5)
5-8 days, n (%)	43 (47.3)
More than 9 days, n (%)	13 (14.3)

TABLE 5: Intraoperative Diagnosis, Surgical Procedures, and Operative Variables (N=91)

†indicates the continuous operative variables presented as mean ± standard deviation and range.

Categorical variables are presented as numbers (percentages), and continuous variables are presented as mean ± standard deviation, with the reported range. Patients may have undergone more than one surgical procedure.

SD: standard deviation.

Postoperative morbidity was observed in 25 of the 91 (27.47%) patients. The reported complications included paralytic ileus in 11 (12.08%) patients, wound infection in 9 (9.89%), sepsis in 8 (8.79%), respiratory infection in 7 (7.69%), and anastomotic leak in 4 (4.39%). As patients could experience multiple complications, the complication counts were not necessarily mutually exclusive. Five patients died, corresponding to a reported mortality rate of 5.49% (Table *6*).

Postoperative complication/outcome	Number (n=91)	Percentage (%)
Paralytic ileus	11	12.08
Wound infection	9	9.89
Sepsis	8	8.79
Respiratory infection	7	7.69
Anastomotic leak	4	4.39
Overall morbidity	25	27.47
Mortality	5	5.49

TABLE 6: Postoperative Complications and Mortality (N=91)

Data are presented as numbers (percentages). Individual complications are not mutually exclusive because patients may develop multiple postoperative complications. Overall morbidity represents patients who experienced at least one postoperative complication.

Table 7 summarises the characteristics of the five patients who died during the study period. Three deaths occurred in patients with colorectal malignancies, one in a patient with mesenteric ischaemia, and one in a patient with volvulus. Three patients died due to septicemic shock, while the remaining two died due to respiratory tract infections. The duration of symptoms before presentation ranged from three to six days. All five patients underwent emergency surgical intervention according to the underlying cause of obstruction. Five in-hospital deaths were recorded among the 91 patients, corresponding to an in-hospital mortality rate of 5.49%.

Age/sex	Symptom duration	Operative finding	Procedure	Cause of death
75/F	3 days	Carcinoma sigmoid colon	Resection anastomosis	Septicemic shock
65/M	3 days	Mesenteric ischaemia	Resection anastomosis	Septicemic shock
45/M	3 days	Carcinoma caecum	Resection anastomosis	Respiratory tract infection
55/M	4 days	Carcinoma colon	Resection anastomosis	Septicemic shock
66/M	6 days	Volvulus	Untwisting of volvulus	Respiratory tract infection

TABLE 7: Details of Patients Who Died (n=5)

This table summarizes the clinical characteristics, underlying etiologies, causes of death, and surgical management of patients who died during hospitalization (N=5).

Discussion

This prospective observational study of 91 patients undergoing emergency surgery for intestinal obstruction at a tertiary care centre in Eastern India provides valuable insights into the demographic characteristics, aetiological factors, clinical presentation, and surgical outcomes of this common surgical emergency.

Age and gender distribution

Intestinal obstruction predominantly affected middle-aged and older adults in this study, with 36/91 (39.56%) patients belonging to the 31-40-year and 51-60-year age groups. Similar age distributions have been reported in previous studies conducted in diverse populations [7]. A marked male predominance was observed, with 64/91 (70.33%) patients being male, which is consistent with earlier reports in which males accounted for approximately 62%-68% of cases [8]. This predominance may be attributed to the higher incidence of external hernias, postoperative adhesions, and greater occupational exposure to strenuous physical activity among men.

Aetiological factors

The relatively higher proportion observed in the present study may be explained by the high prevalence of

previous abdominal surgery, which was documented in 40/91 (43.9%) patients. Hernias were the second most common cause, affecting 18/91 (19.78%) patients, emphasising the importance of timely elective hernia repair to prevent obstruction and strangulation. Malignancy and abdominal tuberculosis each accounted for 11/91 (12.08%) cases, reflecting the persistent dual burden of colorectal malignancy and tuberculosis in this region.

Clinical presentation and examination

Abdominal pain and abdominal distension were present in 91/91 (100%) patients, confirming these symptoms as the hallmark clinical features of intestinal obstruction, consistent with previous reports [7,9,10]. Increased bowel sounds were observed in 80/91 (88.0%) patients, whereas absent bowel sounds were noted in 11/91 (12.0%), suggesting that most patients presented during the early mechanical phase of obstruction rather than after the development of paralytic ileus. Previous abdominal surgical scars were identified in 40/91 (45.5%) patients, further supporting the predominance of adhesive intestinal obstruction in this cohort.

Hospital stay and intraoperative findings

Nearly half of the patients (43/91, 47.3%) required a hospital stay of 5-8 days, which is comparable to the duration reported in previous studies. Small bowel obstruction was the predominant intraoperative finding, occurring in 78/91 (86.0%) patients. This observation is consistent with previously reported rates of approximately 72%-88% and reflects the greater susceptibility of the small intestine to adhesive disease, hernias, and inflammatory pathologies [10].

Comorbidity profile

Previous abdominal surgery (40/91, 43.9%), diabetes mellitus (36/91, 39.6%), and hypertension (27/91, 29.7%) were the most frequently observed comorbidities. These conditions were more prevalent than those reported in several earlier studies [7,8,11]. The higher burden of comorbidities in the present study may reflect the referral pattern of a tertiary care centre and highlights the importance of comprehensive preoperative assessment and optimisation of high-risk patients.

Postoperative morbidity and mortality

Postoperative morbidity was defined as the occurrence of at least one postoperative complication, including paralytic ileus, wound infection, sepsis, respiratory infection, or anastomotic leak. Each patient was counted only once in the calculation of overall morbidity, even if multiple complications occurred.

Overall postoperative morbidity occurred in 25/91 (27.47%) patients, a rate comparable to the 28.3% reported previously [12]. Paralytic ileus was the most common postoperative complication, affecting 11/91 (12.08%) patients, followed by wound infection (9/91, 9.89%) and sepsis (8/91, 8.79%). Similar patterns of surgical-site infection, septic complications, and respiratory infections have been described in earlier studies [7,10,12].

The overall mortality rate was 5/91 (5.49%), which falls within the 4%-15% range reported in comparable studies [9]. Mortality was predominantly associated with delayed presentation (3-6 days), advanced age, malignant intestinal obstruction, and mesenteric ischaemia. These findings are consistent with previous reports identifying delayed surgical intervention, bowel ischaemia, and compromised bowel viability as important predictors of adverse outcomes [13]. Septicaemic shock and respiratory tract infection were the immediate causes of death in this cohort, underscoring the importance of early recognition of sepsis, prompt surgical intervention, and meticulous postoperative pulmonary care in high-risk patients.

Overall, the findings of this study suggest that the demographic profile and aetiological spectrum of intestinal obstruction in this tertiary care population are broadly comparable with those reported in previous studies. However, delayed presentation, malignant obstruction, and bowel vascular compromise remain the principal determinants of adverse outcomes. Early diagnosis, prompt referral, timely surgical intervention, and vigilant postoperative management are essential to reduce morbidity and mortality in patients undergoing emergency surgery for intestinal obstruction.

Limitations

This study was conducted at a single tertiary care centre and included a relatively modest sample size, which may limit the generalisability of the findings. As an observational study, it could not establish causal relationships between clinical characteristics and outcomes. The analysis was primarily descriptive, and no comparative or multivariable analyses were performed to identify independent predictors of morbidity or mortality. Furthermore, the small number of deaths (5/91, 5.49%) limited meaningful comparisons between survivors and non-survivors and precluded reliable identification of independent predictors of mortality. The observations regarding delayed presentation, malignancy, and mesenteric ischaemia among patients who died are descriptive and do not establish statistically significant associations or causal relationships. These findings should therefore be interpreted cautiously. Further multicentre studies with larger sample

sizes, adequate outcome events, and appropriate comparative and multivariable analyses are warranted to validate these findings and investigate factors associated with adverse outcomes.

Conclusions

This study described the demographic and clinical characteristics, aetiological patterns, surgical management, and postoperative outcomes of 91 patients undergoing emergency surgery for intestinal obstruction at a tertiary care centre in Eastern India. Adhesions and bands were the most common cause of obstruction (41.75%), followed by hernia (19.78%). Postoperative morbidity occurred in 27.47% of patients, while mortality was 5.49%. Among the five patients who died, three had colorectal malignancy, one had mesenteric ischaemia, and one had volvulus. These observations describe the clinical profile and outcomes of the study population but do not establish independent predictors or statistically significant associations with mortality. Although timely diagnosis, appropriate surgical management, and careful postoperative monitoring are important aspects of clinical care, their effects on morbidity and mortality were not directly evaluated in this study. Further research involving larger patient populations and comparative statistical analyses is needed to investigate factors associated with adverse outcomes.

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

Concept and design: Pawanjeet Kumar, Pramod Kumar, Ankita Chatterjee

Acquisition, analysis, or interpretation of data: Pawanjeet Kumar, Pramod Kumar, Ankita Chatterjee

Drafting of the manuscript: Pawanjeet Kumar, Pramod Kumar, Ankita Chatterjee

Critical review of the manuscript for important intellectual content: Pawanjeet Kumar, Pramod Kumar, Ankita Chatterjee

Supervision: Pawanjeet Kumar, Pramod Kumar, Ankita Chatterjee

Disclosures

Human subjects: Informed consent for treatment and open access publication was obtained or waived by all participants in this study. Institutional Ethics Committee and Scientific Research Committee, Tata Main Hospital, Jamshedpur issued approval DMH/281/2023. This study was approved by the Institutional Ethics Committee and Scientific Research Committee, Tata Main Hospital, Jamshedpur (Ref. No. DMH/281/2023, dated 07 June 2023). Written informed consent was obtained from all participants prior to enrollment. **Animal subjects:** All authors have confirmed that this study did not involve animal subjects or tissue. **Conflicts of interest:** In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

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References

1. Adhikari S, Hossein MZ, Das A, Mitra N, Ray U: Etiology and outcome of acute intestinal obstruction: a review of 367 patients in Eastern India. Saudi J Gastroenterol. 2010, 16:285-7. 10.4103/1319-3767.70617
2. Jena SS, Obili RC, Das SA, Ray S, Yadav A, Mehta NN, Nundy S: Intestinal obstruction in a tertiary care centre in India: are the differences with the western experience becoming less?. Ann Med Surg. 2021, 72:103125. 10.1016/j.amsu.2021.103125
3. Catena F, De Simone B, Coccolini F, Di Saverio S, Sartelli M, Ansaloni L: Bowel obstruction: a narrative review for all physicians. World J Emerg Surg. 2019, 14:20. 10.1186/s13017-019-0240-7
4. Maung AA, Johnson DC, Piper GL, et al.: Evaluation and management of small-bowel obstruction: an Eastern Association for the Surgery of Trauma practice management guideline. J Trauma Acute Care Surg. 2012, 73:S362-9. 10.1097/TA.0b013e31827019de
5. Nakanwagi AM, Kijjambu SC, Ongom P, Luggya TS: Outcomes of management of intestinal obstruction at an urban tertiary hospital in sub Saharan Africa: a cross-sectional study. BMC Surg. 2021, 21:408. 10.1186/s12893-021-01405-x

6. Mariam TG, Abate AT, Getnet MA: Surgical management outcome of intestinal obstruction and its associated factors at University of Gondar Comprehensive Specialized Hospital, northwest Ethiopia, 2018. Surg Res Pract. 2019, 2019:6417240. 10.1155/2019/6417240
7. Girón F, Chaves CE, Rodríguez L, et al.: Association between clinical and surgical variables with postoperative outcomes in patients treated for intestinal obstruction for non-malignant conditions: a cross-sectional study. Sci Rep. 2023, 13:14544. 10.1038/s41598-023-41328-6
8. Gejoe G, Yadev I, Rahul M: Emergency laparotomies at a tertiary care center-a hospital-based cross-sectional study. Indian J Surg. 2017, 79:206-11. 10.1007/s12262-016-1446-5
9. Malik AM, Shah M, Pathan R, Sufi K: Pattern of acute intestinal obstruction: is there a change in the underlying etiology?. Saudi J Gastroenterol. 2010, 16:272-4. 10.4103/1319-3767.70613
10. Altamimi A, Hassanain M, Nouh T, et al.: Predictors of morbidity and mortality post emergency abdominal surgery: a national study. Saudi J Gastroenterol. 2018, 24:282-8. 10.4103/sjg.SJG_11_18
11. Ooko PB, Sirera B, Saruni S, Topazian HM, White R: Pattern of adult intestinal obstruction at Tenwek hospital, in south-western Kenya. Pan Afr Med J. 2015, 20:31. 10.11604/pamj.2015.20.31.5830
12. Gyedu A, Abantanga F, Kyei I, Boakye G, Stewart BT: Changing epidemiology of intestinal obstruction in Ghana: signs of increasing surgical capacity and an aging population. Dig Surg. 2015, 32:389-96. 10.1159/000438798
13. Soressa U, Mamo A, Hiko D, Fentahun N: Prevalence, causes and management outcome of intestinal obstruction in Adama Hospital, Ethiopia. BMC Surg. 2016, 16:38. 10.1186/s12893-016-0150-5