



CLINICAL PROFILE, ETIOLOGICAL SPECTRUM, AND MANAGEMENT OUTCOMES OF INTESTINAL OBSTRUCTION: A PROSPECTIVE OBSERVATIONAL STUDY AT A TERTIARY CARE HOSPITAL IN BIHAR

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ABSTRACT

Background: Intestinal obstruction is one of the most frequently encountered surgical emergencies and remains a major cause of morbidity and mortality worldwide. The clinical presentation, underlying etiology, and outcomes vary according to geographical location, healthcare accessibility, and patient characteristics. Early diagnosis and timely management are crucial for preventing complications such as bowel ischemia, perforation, sepsis, and death.

Objectives: To evaluate the clinical profile, etiological spectrum, management strategies, and treatment outcomes of patients presenting with intestinal obstruction at a tertiary care hospital in Bihar.

Methods: A prospective observational study was conducted in the Department of General Surgery of a tertiary care hospital in Bihar from February 2005 to June 2005. Thirty-six consecutive patients aged 18 years and above with clinically and radiologically confirmed intestinal obstruction were included. Data regarding demographic characteristics, presenting symptoms, etiological factors, treatment modalities, postoperative complications, and outcomes were collected using a structured case record form. Statistical analysis was performed using SPSS version 11.0. Categorical variables were expressed as frequencies and percentages, while appropriate statistical tests were used for comparison. A p-value <0.05 was considered statistically significant.

Results: A total of 36 patients were studied. The mean age was 45.8 ±15.2 years, and males constituted 66.7% of cases. Abdominal pain was the most common presenting symptom, followed by vomiting, abdominal distension, and constipation. Postoperative adhesions (30.6%) were the leading cause of intestinal obstruction, followed by obstructed or strangulated hernias (25.0%), intestinal tuberculosis (13.9%), and malignancy (11.1%). Surgical management was required in 72.2% of patients, whereas 27.8% were managed conservatively. Overall recovery was achieved in 91.7% of patients. Postoperative complications occurred in 22.2% of patients, and mortality was observed in 8.3%. Delayed presentation beyond 48 hours was significantly associated with a higher incidence of postoperative complications (p=0.02).

Conclusion: Postoperative adhesions and obstructed hernias were the predominant causes of intestinal obstruction in the study population. Most patients required operative management and

achieved favorable outcomes. Delayed presentation was associated with increased postoperative morbidity, underscoring the importance of early diagnosis, timely referral, and prompt surgical intervention for improved patient outcomes.

Keywords: Intestinal obstruction; Adhesive bowel obstruction; Hernia; Emergency surgery; Postoperative complications; Surgical outcomes; Bihar.

INTRODUCTION

Intestinal obstruction is one of the most common surgical emergencies encountered worldwide and continues to contribute substantially to morbidity, mortality, prolonged hospital stay, and healthcare expenditure. It is characterized by partial or complete interruption of the normal flow of intestinal contents through the gastrointestinal tract. The condition may involve the small intestine or large intestine and can result from a variety of mechanical or functional causes. Despite advances in diagnostic imaging, perioperative care, and surgical techniques, intestinal obstruction remains a significant challenge for surgeons because delayed diagnosis and treatment may lead to serious complications such as bowel ischemia, strangulation, perforation, sepsis, and death [1].

Globally, intestinal obstruction accounts for a considerable proportion of emergency surgical admissions. Mechanical obstruction constitutes the majority of cases, with postoperative adhesions, incarcerated hernias, malignancies, volvulus, and inflammatory bowel diseases being among the leading etiological factors. The epidemiological profile varies considerably between developed and developing countries due to differences in healthcare infrastructure, disease patterns, socioeconomic conditions, and accessibility to surgical services [2,3]. In high-income countries, postoperative adhesions are recognized as the predominant cause of small bowel obstruction, whereas obstructed hernias continue to represent a major cause in many low- and middle-income nations [4].

In the Asian region, intestinal obstruction remains an important public health concern. Delayed presentation, limited awareness, and restricted access to specialized healthcare services often contribute to increased rates of complications. Studies from various parts of Asia have demonstrated that the etiological spectrum of intestinal obstruction is evolving, with postoperative adhesions becoming increasingly common owing to the growing number of abdominal surgical procedures performed annually [5]. Simultaneously, intestinal tuberculosis, malignancies, and complicated hernias continue to contribute significantly to the disease burden in developing countries [6].

In India, intestinal obstruction constitutes a frequent indication for emergency laparotomy and accounts for a substantial proportion of admissions to general surgical wards. Previous Indian studies have reported that adhesions, obstructed hernias, malignancies, volvulus, and abdominal tuberculosis are among the major causes of bowel obstruction. The clinical presentation is often characterized by abdominal pain, vomiting, abdominal distension, and constipation, although the severity and duration of symptoms may vary depending on the site and cause of obstruction [7]. Timely diagnosis through clinical evaluation supported by radiological investigations plays a critical role in determining management strategies and improving outcomes.

The management of intestinal obstruction ranges from conservative treatment with bowel rest, nasogastric decompression, fluid and electrolyte correction, and close monitoring to definitive surgical intervention when indicated. The choice of treatment depends upon the underlying etiology, severity of obstruction, presence of complications, and overall clinical condition of the patient [8]. Early recognition of patients requiring operative management is particularly important because delayed surgery in cases of strangulation or bowel compromise is associated with increased morbidity and mortality [9].

Although several studies have evaluated intestinal obstruction in different regions of India, considerable variation exists in the etiological profile, clinical presentation, and treatment outcomes across healthcare settings. Data from tertiary care hospitals in Bihar during the mid-2000s remain relatively limited. Understanding the demographic characteristics, clinical features, management

approaches, and outcomes of patients presenting with intestinal obstruction can contribute to improved clinical decision-making and resource allocation. Furthermore, local data are essential for identifying prevalent causes and evaluating the effectiveness of existing treatment practices within specific healthcare environments [10].

Therefore, the present study was undertaken to assess the clinical profile of patients presenting with intestinal obstruction and to evaluate management outcomes among patients treated at a tertiary care hospital in Bihar. The specific objectives were to describe the demographic and clinical characteristics of affected patients, determine the etiological factors responsible for intestinal obstruction, analyze the treatment modalities employed, and assess short-term management outcomes and postoperative complications.

METHODOLOGY

Study Design: This was a hospital-based observational descriptive prospective study conducted to evaluate the clinical profile, etiological factors, management strategies, and short-term outcomes of patients presenting with intestinal obstruction.

Study Setting: The study was conducted in the Department of General Surgery of a tertiary care teaching hospital in Bihar. The hospital serves as a major referral center catering to both urban and rural populations and provides emergency and elective surgical services.

Study Duration: The study was conducted over a period of five months from February 2005 to June 2005.

Study Population: The study population comprised all patients admitted to the Department of General Surgery with a clinical and radiological diagnosis of intestinal obstruction during the study period.

Inclusion Criteria

Patients aged 18 years and above.

Patients admitted with clinical features suggestive of intestinal obstruction, including abdominal pain, vomiting, abdominal distension, and constipation/obstipation.

Diagnosis confirmed by radiological investigations and/or intraoperative findings.

Patients willing to provide written informed consent for participation in the study.

Exclusion Criteria

Patients younger than 18 years.

Patients with paralytic ileus secondary to generalized peritonitis, electrolyte imbalance, or systemic illness without evidence of mechanical obstruction.

Patients who declined participation or did not provide informed consent.

Patients discharged against medical advice before completion of evaluation and treatment.

Sample Size: The sample size was determined based on the number of eligible patients presenting during the study period.

For estimation of a proportion in a descriptive study:

$$n = Z^2pq / d^2$$

Where:

n = required sample size

Z = 1.96 at 95% confidence level

p = anticipated prevalence of intestinal obstruction among surgical admissions (assumed 5% based on available literature)

q = 1 - p = 95%

d = allowable error (7%)

Substituting the values:

$$n = (1.96)^2 \times 0.05 \times 0.95 / (0.07)^2$$

n ≈ 37

Considering the study duration and availability of eligible participants, 36 consecutive patients fulfilling the inclusion criteria were enrolled and analyzed.

Sampling Technique: A consecutive sampling technique was employed. All eligible patients presenting during the study period and satisfying the inclusion criteria were recruited until the target sample size of 36 was achieved.

Data Collection Tools and Procedure: After obtaining informed written consent, detailed demographic and clinical information was recorded using a predesigned and pretested case record form. Information regarding age, sex, presenting complaints, duration of symptoms, previous abdominal surgery, comorbid conditions, and physical examination findings was collected. Routine laboratory investigations including complete blood count, serum electrolytes, blood urea, serum creatinine, and relevant biochemical parameters were performed. Radiological evaluation included plain abdominal radiography in all patients, while ultrasonography and other imaging modalities were used when clinically indicated. Patients were managed according to institutional protocols. Initial management included fluid resuscitation, correction of electrolyte imbalance, nasogastric decompression, and administration of antibiotics when indicated. Decisions regarding conservative or operative management were made by the treating surgical team based on clinical assessment and investigation findings. Operative findings, procedures performed, postoperative complications, duration of hospital stay, and treatment outcomes were documented prospectively until discharge.

Study Variables : Independent variables included age, sex, duration of symptoms, previous abdominal surgery, etiology of intestinal obstruction, site of obstruction, presenting clinical features, laboratory parameters, and type of treatment received. Dependent variables included treatment outcome (recovery, postoperative complications, mortality), duration of hospital stay, requirement of surgical intervention, and occurrence of bowel gangrene, perforation, or other complications. These variables were selected to evaluate factors associated with management outcomes in patients with intestinal obstruction.

Statistical Analysis: Data were entered into Microsoft Excel and analyzed using Statistical Package for Social Sciences (SPSS) version 11.0. Continuous variables were summarized as mean ± standard deviation or median with range, depending upon distribution. Categorical variables were expressed as frequencies and percentages. Associations between categorical variables were assessed using the Chi-square test or Fisher's exact test whenever appropriate. Comparison of continuous variables between groups was performed using Student's t-test. A p-value of less than 0.05 was considered statistically significant.

Ethical Considerations: Written informed consent was obtained from all participants prior to enrollment. Confidentiality and anonymity of patient information were maintained throughout the study. Participation was entirely voluntary, and patients were free to withdraw from the study at any stage without affecting their treatment. The study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki and prevailing institutional guidelines for biomedical research involving human participants.

RESULTS

A total of 36 patients with intestinal obstruction were included in the study. The mean age of the study population was 45.8 ± 15.2 years, with the highest proportion of patients belonging to the 41–50 years age group. Males constituted approximately two-thirds of the study population (Table 1).

Table 1. Demographic Characteristics of Patients with Intestinal Obstruction (N = 36)

Characteristic	Number (n)	Percentage (%)
Age Group (years)		
18–30	7	19.4
31–40	8	22.2

41–50	9	25.0
51–60	6	16.7
>60	6	16.7
Gender		
Male	24	66.7
Female	12	33.3

Mean age: 45.8 ±15.2 years

Abdominal pain was the most common presenting complaint and was observed in all patients. Vomiting, abdominal distension, and constipation/obstipation were also frequently reported clinical features, reflecting the classical presentation of intestinal obstruction (Table 2).

Table 2. Clinical Presentation of Patients at Admission (N = 36)

Clinical Feature	Number (n)	Percentage (%)
Abdominal pain	36	100.0
Vomiting	29	80.6
Abdominal distension	27	75.0
Constipation/Obstipation	25	69.4
Tenderness abdomen	18	50.0
Visible bowel movements	10	27.8
Dehydration	12	33.3

Regarding etiology, postoperative adhesions emerged as the most common cause of intestinal obstruction, followed by obstructed or strangulated hernias. Intestinal tuberculosis and malignancy accounted for a considerable proportion of cases, while volvulus and intussusception were less frequent causes (Table 3).

Table 3. Etiology of Intestinal Obstruction (N = 36)

Etiology	Number (n)	Percentage (%)
Postoperative adhesions	11	30.6
Obstructed/strangulated hernia	9	25.0
Intestinal tuberculosis	5	13.9
Malignancy	4	11.1
Volvulus	3	8.3
Intussusception	2	5.6
Others	2	5.6

Most patients required operative intervention, whereas approximately one-fourth were successfully managed conservatively. Overall recovery was achieved in the majority of patients. Postoperative complications occurred in a subset of operated patients, and mortality was observed in a small proportion of cases (Table 4).

Table 4. Management Modalities and Hospital Outcome (N = 36)

Variable	Number (n)	Percentage (%)
Management		
Conservative treatment	10	27.8
Surgical treatment	26	72.2
Outcome		

Recovered and discharged	33	91.7
Postoperative complications*	8	22.2
Mortality	3	8.3

*Complications included wound infection, respiratory infection, prolonged ileus, and wound dehiscence.

Analysis of factors associated with postoperative complications demonstrated a statistically significant relationship between delayed presentation (>48 hours after symptom onset) and adverse postoperative outcomes. Patients presenting after 48 hours had a significantly higher frequency of complications compared with those presenting earlier ($p = 0.02$) (Table 5).

Table 5. Association Between Duration of Symptoms and Postoperative Complications Among Operated Patients (n = 26)

Duration of Symptoms	Complications Present (%)	Complications Absent (%)	Total	p-value
≤48 hours	2 (12.5)	14 (87.5)	16	
>48 hours	6 (60.0)	4 (40.0)	10	
Total	8	18	26	0.02

Chi-square test applied; $p < 0.05$ considered statistically significant.

DISCUSSION

The present prospective observational study evaluated the clinical profile, etiological spectrum, management strategies, and short-term outcomes of 36 patients presenting with intestinal obstruction at a tertiary care hospital in Bihar. The study demonstrated that intestinal obstruction occurred predominantly in middle-aged adults, with a clear male predominance. Postoperative adhesions emerged as the leading cause of obstruction, followed by obstructed or strangulated hernias. Most patients required surgical intervention, and delayed presentation beyond 48 hours was significantly associated with increased postoperative complications. Overall recovery rates were favorable, although a small proportion of patients experienced morbidity and mortality.

The age distribution observed in the present study is comparable to previous reports that have identified intestinal obstruction as a condition primarily affecting adults in the fourth and fifth decades of life [2,5]. The predominance of male patients is also consistent with findings reported from other Indian and international studies [7,9]. This pattern may be attributed to the higher prevalence of hernias among men, occupational factors associated with increased physical exertion, and greater healthcare-seeking behavior among male patients in some regions.

Abdominal pain, vomiting, abdominal distension, and constipation were the most frequently reported presenting symptoms. These findings are in agreement with the classical clinical manifestations of intestinal obstruction described in standard surgical literature [1,2]. Recognition of these symptoms remains essential for timely diagnosis, particularly in resource-limited settings where advanced imaging modalities may not always be readily available. Early clinical suspicion facilitates prompt resuscitation and appropriate surgical referral, thereby reducing the risk of bowel ischemia and perforation.

In the present study, postoperative adhesions accounted for the largest proportion of cases. This observation is consistent with the changing epidemiological trend reported in several studies, where adhesions have gradually replaced obstructed hernias as the leading cause of intestinal obstruction [4,5]. The increasing frequency of abdominal and pelvic surgical procedures has likely contributed to this transition. Nevertheless, obstructed and strangulated hernias remained an important cause in the present cohort, reflecting the continued burden of untreated hernias in developing countries. The occurrence of intestinal tuberculosis as a notable etiological factor also reflects the persistent relevance of tuberculosis in the Indian subcontinent [6].

A substantial majority of patients in this study underwent operative management. This finding is comparable to observations from tertiary care centers where patients often present with advanced disease or complications requiring surgical intervention [9]. Conservative management was successful in selected cases, particularly among patients with adhesive obstruction without evidence of strangulation. Appropriate patient selection for non-operative treatment remains important to avoid unnecessary surgery while preventing delays in intervention when bowel compromise is suspected. The overall recovery rate in the present study was favorable and comparable with outcomes reported in previous studies of intestinal obstruction [7,9]. However, postoperative complications were observed in approximately one-fifth of patients. Wound-related complications and postoperative ileus constituted the major adverse events. Importantly, delayed presentation beyond 48 hours was significantly associated with postoperative complications. Similar observations have been reported by Fevang et al., who demonstrated that prolonged duration of obstruction increases the risk of bowel ischemia, contamination, septic complications, and adverse surgical outcomes [9]. Delayed presentation remains a major challenge in developing countries and may result from limited access to healthcare facilities, socioeconomic barriers, and lack of awareness regarding the seriousness of symptoms.

The mortality rate observed in the present study was within the range reported in the literature for emergency intestinal obstruction management [9]. Mortality was primarily associated with advanced disease, delayed presentation, and the presence of bowel compromise. These findings emphasize the importance of early diagnosis, prompt referral, adequate preoperative resuscitation, and timely surgical intervention in reducing mortality.

From a clinical perspective, the findings highlight the need for strategies aimed at reducing delays in presentation and treatment. Improved patient education regarding symptoms of bowel obstruction, early referral from peripheral healthcare facilities, and strengthening emergency surgical services may contribute to better outcomes. Furthermore, adherence to meticulous surgical techniques and measures to minimize postoperative adhesion formation may help reduce the incidence of future obstruction.

The strengths of the present study include its prospective design, systematic data collection, and evaluation of both clinical characteristics and treatment outcomes within a tertiary care setting. However, certain limitations should be acknowledged. The sample size was relatively small, limiting the statistical power for subgroup analyses. The study was conducted at a single center, which may restrict the generalizability of findings to other populations. In addition, long-term follow-up was not performed, preventing assessment of recurrence rates and late postoperative complications.

Despite these limitations, the study provides useful insight into the contemporary pattern of intestinal obstruction in a tertiary care hospital in Bihar during the study period. The findings reinforce the importance of early diagnosis, appropriate patient selection for conservative management, and timely surgical intervention in improving patient outcomes.

CONCLUSION

Intestinal obstruction remains a common surgical emergency associated with significant morbidity and potential mortality if diagnosis and treatment are delayed. In the present study, middle-aged adults were most frequently affected, with a predominance of male patients. Postoperative adhesions emerged as the leading cause of intestinal obstruction, followed by obstructed or strangulated hernias, highlighting the evolving etiological pattern observed in surgical practice.

The majority of patients required operative management, while carefully selected patients were successfully managed conservatively. Overall treatment outcomes were favorable, with most patients recovering and being discharged. However, delayed presentation beyond 48 hours was significantly associated with an increased risk of postoperative complications, emphasizing the importance of early recognition and timely intervention. The findings underscore the need for prompt diagnosis, adequate preoperative resuscitation, and appropriate surgical decision-making to optimize outcomes.

Strengthening awareness among patients and primary healthcare providers regarding the early symptoms of intestinal obstruction may facilitate timely referral and reduce complication rates. Further multicentric studies with larger sample sizes and long-term follow-up are recommended to better characterize disease patterns and evaluate long-term outcomes.

DECLARATIONS

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Conflict of Interest: The authors declare that there are no conflicts of interest related to this study.

Informed Consent: Written informed consent was obtained from all participants before enrollment in the study.

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