Journal of Population Therapeutics & Clinical Pharmacology

RESEARCH ARTICLE
DOI: 10.53555/184j7j26

CLINICAL PRESENTATION AND MANAGEMENT OUTCOMES OF ACUTE INTESTINAL OBSTRUCTION AT A TERTIARY CARE CENTRE IN JODHPUR: A PROSPECTIVE OBSERVATIONAL STUDY

Dr Shyam Sunder Vaishnav*

*Assistant Professor, Department of General Surgery, Vyas Medical College and Hospital, Jodhpur, Rajasthan, India. Mail id- drshyam.1975@gmail.com

Accepted: 11th January 2025 Published: 10th February 2025

ABSTRACT

Introduction: Acute intestinal obstruction remains one of the most common surgical emergencies, accounting for 15-20% of hospital admissions with acute abdominal pain. Understanding the local patterns of clinical presentation, etiological factors, and management outcomes is essential for optimizing patient care in tertiary care settings.

Methods: This prospective observational study was conducted at the Department of General Surgery, Vyas Medical College and Hospital, Jodhpur, from July 2024 to December 2024. A total of 140 adult patients presenting with clinical and radiological features of acute intestinal obstruction were enrolled through consecutive sampling. Data were collected using a structured proforma encompassing demographic details, clinical presentations, investigational findings, management strategies, and outcomes. Statistical analysis was performed using SPSS version 25.0 with appropriate descriptive and inferential tests.

Results: The mean age of participants was in the 46-60 years range with male predominance (63.6%). Small bowel obstruction constituted 74.3% of cases. The most common symptoms were abdominal pain (97.1%), vomiting (91.4%), and abdominal distension (84.3%). Postoperative adhesions were the leading etiology (41.4%), followed by obstructed hernias (18.6%) and malignancy (14.3%). Conservative management was initially attempted in 55.7% of patients with 59% success rate. Overall, 67.1% required surgical intervention. The complication rate was 27.1%, with surgical site infection being most common (11.4%). The overall mortality rate was 6.4%, with mean hospital stay of 5.2±2.1 days for conservative management and 10.8±4.3 days for surgical cases.

Conclusion: Acute intestinal obstruction predominantly affects middle-aged males, with adhesions and hernias being the primary etiologies. Judicious patient selection for conservative management and timely surgical intervention are crucial for optimal outcomes.

Keywords: Acute intestinal obstruction; small bowel obstruction; adhesive obstruction; conservative management; surgical outcomes

INTRODUCTION

Acute intestinal obstruction represents one of the most frequently encountered surgical emergencies worldwide, accounting for approximately 15-20% of all hospital admissions with acute abdominal

pain and contributing significantly to surgical morbidity and mortality rates (Jackson & Vigiola Cruz, 2018; Long et al., 2023). This condition occurs when the normal forward flow of intestinal contents is interrupted or impaired, leading to a cascade of pathophysiological changes including fluid and electrolyte imbalances, bowel distension, bacterial overgrowth, and potential complications such as strangulation, ischemia, and perforation (Hucl, 2013). The clinical significance of acute intestinal obstruction extends beyond its high incidence, as delayed diagnosis and inappropriate management can result in substantial increases in morbidity, mortality, and healthcare costs.

The etiology of acute intestinal obstruction demonstrates considerable geographic and temporal variation, reflecting differences in surgical practices, dietary habits, disease patterns, and healthcare infrastructure across regions. In developed countries, postoperative adhesions constitute the predominant cause of small bowel obstruction, accounting for 60-75% of cases, followed by hernias and malignancies (Miller et al., 2000; Williams et al., 2005). However, the etiological spectrum differs markedly in developing nations, particularly in the Indian subcontinent and sub-Saharan Africa, where external hernias, intestinal tuberculosis, and volvulus assume more prominent roles (Adhikari et al., 2010). In their comprehensive review of 367 patients in Eastern India, Adhikari and colleagues demonstrated that obstructed hernias represented the most important cause of intestinal obstruction, with intestinal tuberculosis assuming a significant role that differs from Western epidemiological patterns (Adhikari et al., 2010).

The clinical presentation of acute intestinal obstruction typically encompasses a constellation of symptoms including colicky abdominal pain, nausea, vomiting, abdominal distension, and absolute constipation with failure to pass flatus or feces. The severity and specific manifestation of these symptoms vary considerably based on the anatomic level of obstruction, degree of obstruction (complete versus partial), and duration of symptoms (Markogiannakis et al., 2007). Physical examination findings classically include abdominal distension, tympany to percussion, high-pitched or absent bowel sounds, and varying degrees of tenderness. In cases involving strangulation or bowel ischemia, patients may present with signs of systemic toxicity including tachycardia, fever, leukocytosis, and metabolic acidosis (Jackson & Vigiola Cruz, 2018). The diagnostic evaluation has evolved significantly with advances in imaging modalities, particularly computed tomography, which has emerged as the gold standard investigation for confirming the diagnosis, identifying the site and cause of obstruction, and detecting complications such as closed-loop obstruction or bowel ischemia (Maung et al., 2012).

Management strategies for acute intestinal obstruction have undergone substantial paradigm shifts over recent decades, with increasing emphasis on evidence-based approaches that balance the benefits of conservative management against the risks of delayed surgical intervention. Initial management universally involves adequate fluid resuscitation, correction of electrolyte abnormalities, nasogastric decompression, and bowel rest (Hucl, 2013). For uncomplicated adhesive small bowel obstruction in hemodynamically stable patients without signs of peritonitis or strangulation, conservative management with close monitoring represents the contemporary standard approach, with reported success rates ranging from 40-80% (Williams et al., 2005; Mortensen et al., 2023). The introduction of water-soluble contrast agents as both diagnostic and therapeutic adjuncts has further refined conservative management protocols. However, emergency surgical intervention remains mandatory for patients presenting with features of strangulation, perforation, closed-loop obstruction, or those who fail to respond to conservative measures within an appropriate timeframe.

Despite advances in diagnostic and therapeutic modalities, acute intestinal obstruction continues to pose significant management challenges, particularly in resource-limited settings where delayed presentation, inadequate imaging facilities, and limited surgical expertise contribute to higher complication and mortality rates. The outcomes following treatment for intestinal obstruction depend on multiple factors including patient age, comorbidities, etiology of obstruction, duration before intervention, presence of complications, and quality of perioperative care (Long et al., 2023).

Understanding the local epidemiological patterns, clinical presentations, and treatment outcomes is essential for optimizing management protocols and improving patient outcomes in specific healthcare settings.

In the Indian context, tertiary care centers serve as referral hubs managing complex surgical emergencies including intestinal obstruction, often receiving patients with delayed presentations and advanced disease. The Jodhpur region of Rajasthan, with its unique demographic characteristics, dietary patterns, and disease prevalence, necessitates region-specific data to guide clinical practice and resource allocation. While several studies have examined intestinal obstruction patterns in various parts of India, there remains a paucity of recent prospective data specifically addressing clinical presentations and management outcomes in Western Rajasthan. Furthermore, the dynamic nature of changing disease patterns, evolving surgical techniques, and modifications in management protocols necessitates ongoing surveillance and outcome analysis to ensure contemporary best practices.

This prospective observational study was therefore undertaken to comprehensively evaluate the clinical presentation patterns, etiological factors, management approaches, and short-term outcomes of patients presenting with acute intestinal obstruction at a tertiary care teaching institution in Jodhpur. By systematically documenting the spectrum of clinical manifestations, diagnostic findings, therapeutic interventions, and patient outcomes, this research aims to provide evidence-based insights that can inform clinical decision-making, optimize resource utilization, and ultimately enhance the quality of care delivered to patients with this challenging surgical emergency.

The aim of the study is to access the clinical presentation and evaluate the management outcomes of patients with acute intestinal obstruction presenting at Vyas Medical College and Hospital, Jodhpur.

METHODOLOGY

Study Design

A prospective observational study

Study Setting

The study was conducted at the Department of General Surgery, Vyas Medical College and Hospital, Jodhpur, Rajasthan, India.

Study Duration

The study was conducted over a period of six months, commencing from July 2024 and concluding in December 2024.

Study Population, Sampling Method, and Sample Size

The study population comprised all patients presenting to the Department of General Surgery with clinical and radiological features suggestive of acute intestinal obstruction during the study period. A consecutive sampling method was employed wherein all patients meeting the eligibility criteria were systematically enrolled until the desired sample size was achieved, thereby minimizing selection bias and enhancing the representativeness of the study cohort. The sample size was calculated based on the prevalence of acute intestinal obstruction in previous Indian studies, expected proportion of different etiological factors, and anticipated management outcomes, with consideration for practical feasibility within the study duration. After accounting for potential incomplete data and dropouts, the final sample size was determined to be 140 patients. This sample size provided adequate statistical power to describe clinical presentations, identify predominant etiological factors, compare outcomes between different management strategies, and draw meaningful conclusions applicable to the tertiary care hospital setting. The consecutive sampling approach ensured that the study cohort reflected the true spectrum of acute intestinal obstruction cases encountered in routine clinical practice at the study institution.

Inclusion and Exclusion Criteria

The study included all adult patients aged 18 years and above who presented with clinical features suggestive of acute intestinal obstruction confirmed by radiological investigations and who provided informed consent for participation. Clinical features necessitating inclusion encompassed combinations of colicky abdominal pain, nausea, vomiting, abdominal distension, and absolute constipation, supplemented by radiological confirmation through either plain abdominal radiographs demonstrating dilated bowel loops with air-fluid levels or computed tomography showing features consistent with mechanical intestinal obstruction. Exclusion criteria were specifically defined to eliminate conditions that could confound the study outcomes or introduce significant heterogeneity. Patients with intestinal pseudo-obstruction (adynamic ileus), those presenting with chronic intestinal obstruction with gradual onset over several weeks, pediatric patients below 18 years of age, pregnant women, patients with terminal malignancies receiving palliative care only, those who expired within 24 hours of admission before complete evaluation could be performed, patients who refused consent for study participation, and those with incomplete medical records lacking essential clinical or investigational data were systematically excluded from the analysis.

Data Collection Tools and Techniques

Data collection was performed using a predesigned, pretested, structured proforma specifically developed for this study, encompassing all relevant clinical, investigational, management, and outcome variables. The proforma underwent pilot testing on a small subset of patients prior to the main study to identify ambiguities, ensure completeness, and refine data collection procedures. Following enrollment and informed consent, detailed clinical history was obtained from each participant including demographic information, presenting complaints with duration, past surgical history, relevant comorbidities, and current medications. Comprehensive physical examination was conducted documenting vital signs, general condition, systemic examination findings, and specific abdominal examination parameters including distension, tenderness, guarding, bowel sounds characteristics, and evidence of external hernias. All enrolled patients underwent standardized baseline investigations including complete blood count, serum electrolytes, renal function tests, liver function tests, serum lactate levels, and arterial blood gas analysis when clinically indicated. Radiological evaluation comprised plain abdominal radiographs in erect and supine positions for all patients, with computed tomography of the abdomen performed selectively based on clinical requirements, diagnostic uncertainty, or to identify specific etiology and complications. Management details were meticulously documented including whether conservative management with intravenous fluids, nasogastric decompression, and bowel rest was initiated, the duration of conservative trial, administration of water-soluble contrast when applicable, decision-making for surgical intervention, type of surgical procedure performed, intraoperative findings, and postoperative course. Data were collected by the principal investigator and trained research personnel through direct patient interaction, clinical examination, review of investigation reports, and documentation from medical records maintained during the hospital stay.

Data Management and Statistical Analysis

All collected data were entered into a Microsoft Excel spreadsheet with stringent quality control measures including double data entry and cross-verification to minimize transcription errors. Data cleaning was performed to identify and rectify inconsistencies, missing values, or outliers prior to statistical analysis. Following cleaning and validation, the dataset was exported to Statistical Package for Social Sciences version 25.0 for comprehensive statistical analysis. Descriptive statistics were computed for all study variables, with categorical variables presented as frequencies and percentages, while continuous variables were expressed as mean with standard deviation or median with interquartile range depending on the distribution pattern determined through normality testing. Inferential statistical analyses were conducted to examine associations between clinical presentations, etiological factors, and management outcomes. Chi-square test was employed for

comparing proportions between categorical variables, Student's t-test was utilized for comparing means between two groups for normally distributed continuous variables, and Mann-Whitney U test was applied for non-normally distributed data. Multivariate regression analysis was performed when appropriate to identify independent predictors of specific outcomes after controlling for potential confounding variables. Statistical significance was defined as p-value less than 0.05, and all tests were two-tailed. Results were presented through tables, charts, and graphs to facilitate clear interpretation and communication of findings.

Ethical Considerations

The study protocol was submitted to the Institutional Ethics Committee of Vyas Medical College and Hospital for comprehensive review and formal approval prior to commencement of patient enrollment. The research was conducted in accordance with the Declaration of Helsinki principles for ethical medical research involving human subjects and adhered to the Indian Council of Medical Research ethical guidelines for biomedical research. Written informed consent was obtained from all participants or their legally authorized representatives after providing detailed information about the study purpose, procedures, potential risks and benefits, voluntary nature of participation, right to withdraw at any time without consequences to their medical care, and confidentiality measures.

RESULTS

Table 1: Demographic and Clinical Characteristics of Study Participants (N=140)

Characteristic	Category	Frequency (n)	Percentage (%)
Age Group (years)	18-30	18	12.9
	31-45	32	22.9
	46-60	45	32.1
	61-75	35	25.0
	>75	10	7.1
Gender	Male	89	63.6
	Female	51	36.4
Type of Obstruction	Small Bowel	104	74.3
	Large Bowel	36	25.7
Duration of Symptoms	<24 hours	22	15.7
	24-48 hours	58	41.4
	49-72 hours	38	27.1
	>72 hours	22	15.7
Clinical Symptoms	Abdominal Pain	136	97.1
	Vomiting	128	91.4
	Abdominal Distension	118	84.3
	Constipation	109	77.9
	Failure to Pass Flatus	125	89.3

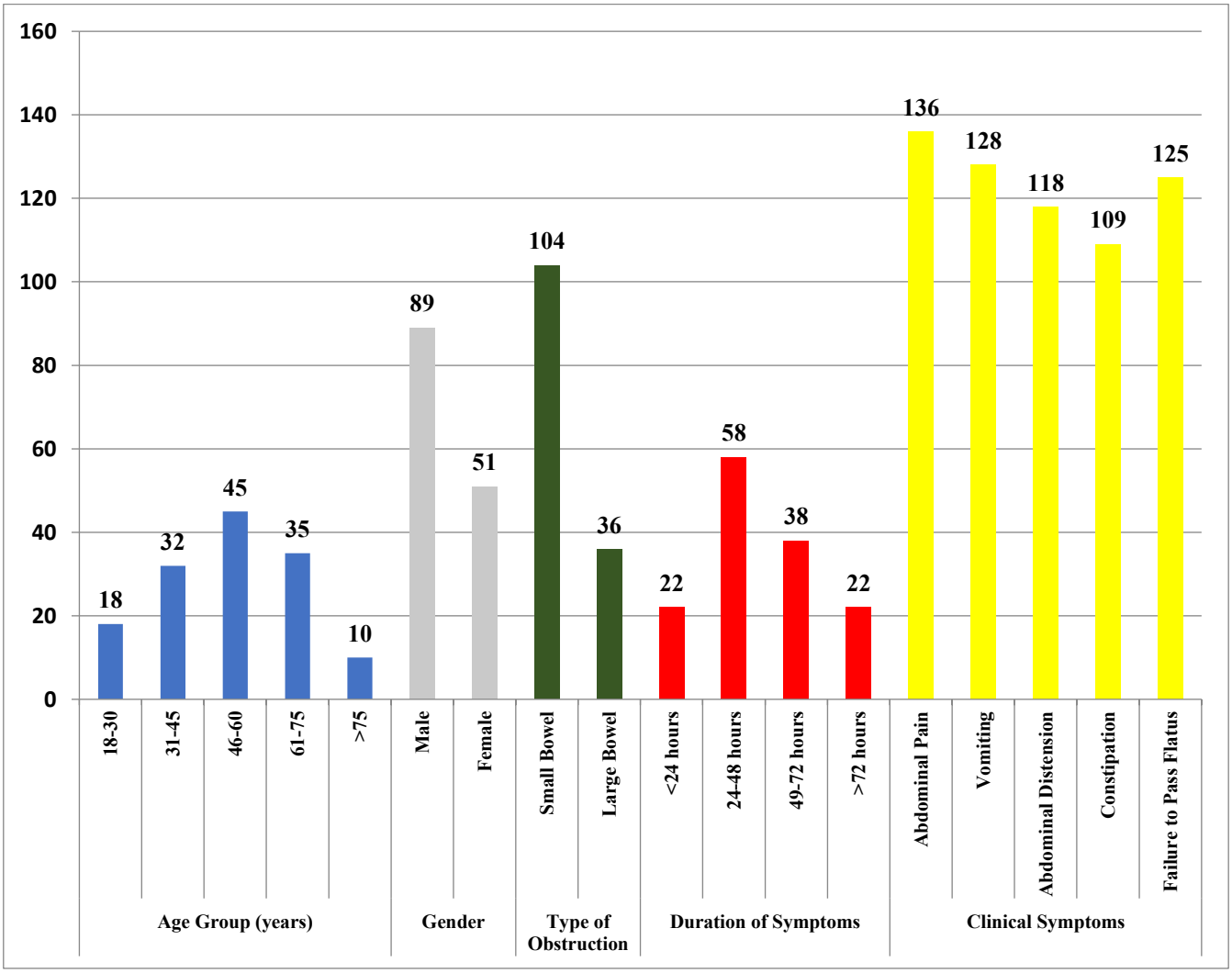

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Table 2: Etiological Distribution of Acute Intestinal Obstruction (N=140)

Etiology	Small Bowel Obstruction n (%)	Large Bowel Obstruction n (%)	Total n (%)
Adhesions/Bands (Post-operative)	58 (55.8)	0 (0.0)	58 (41.4)
Obstructed/Strangulated Hernia	26 (25.0)	0 (0.0)	26 (18.6)
Intestinal Tuberculosis	9 (8.7)	0 (0.0)	9 (6.4)
Intussusception	5 (4.8)	0 (0.0)	5 (3.6)
Volvulus	4 (3.8)	8 (22.2)	12 (8.6)
Malignancy	2 (1.9)	18 (50.0)	20 (14.3)
Stricture	0 (0.0)	6 (16.7)	6 (4.3)
Others	0 (0.0)	4 (11.1)	4 (2.9)
Total	104 (100.0)	36 (100.0)	140 (100.0)

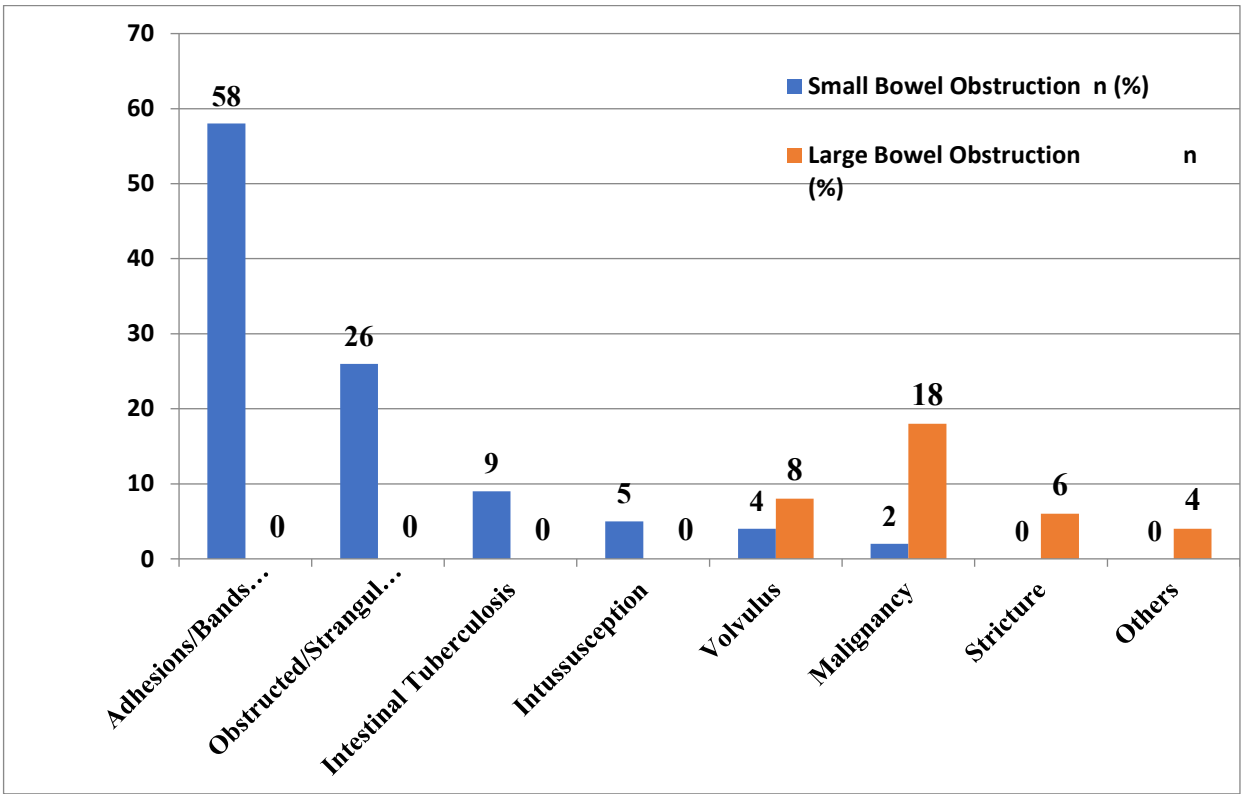

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Table 3: Management Modalities and Outcomes (N=140)

Parameter	Category	Frequency (n)	Percentage (%)
Initial Management	Conservative	78	55.7
	Immediate Surgery	62	44.3
Success of Conservative Management (n=78)	Successful	46	59.0
	Failed (Required Surgery)	32	41.0
Total Surgical Interventions		94	67.1
Type of Surgery Performed (n=94)	Adhesiolysis	38	40.4
	Hernia Repair with/without Resection	22	23.4
	Resection and Anastomosis	18	19.1
	Colostomy/Ileostomy	12	12.8
	Others	4	4.3
Hospital Stay (days)	1-5	42	30.0
	6-10	68	48.6
	11-15	22	15.7
	>15	8	5.7
Mean Hospital Stay	Conservative Success: 5.2±2.1 days	-	-
	Surgical Cases: 10.8±4.3 days	-	-

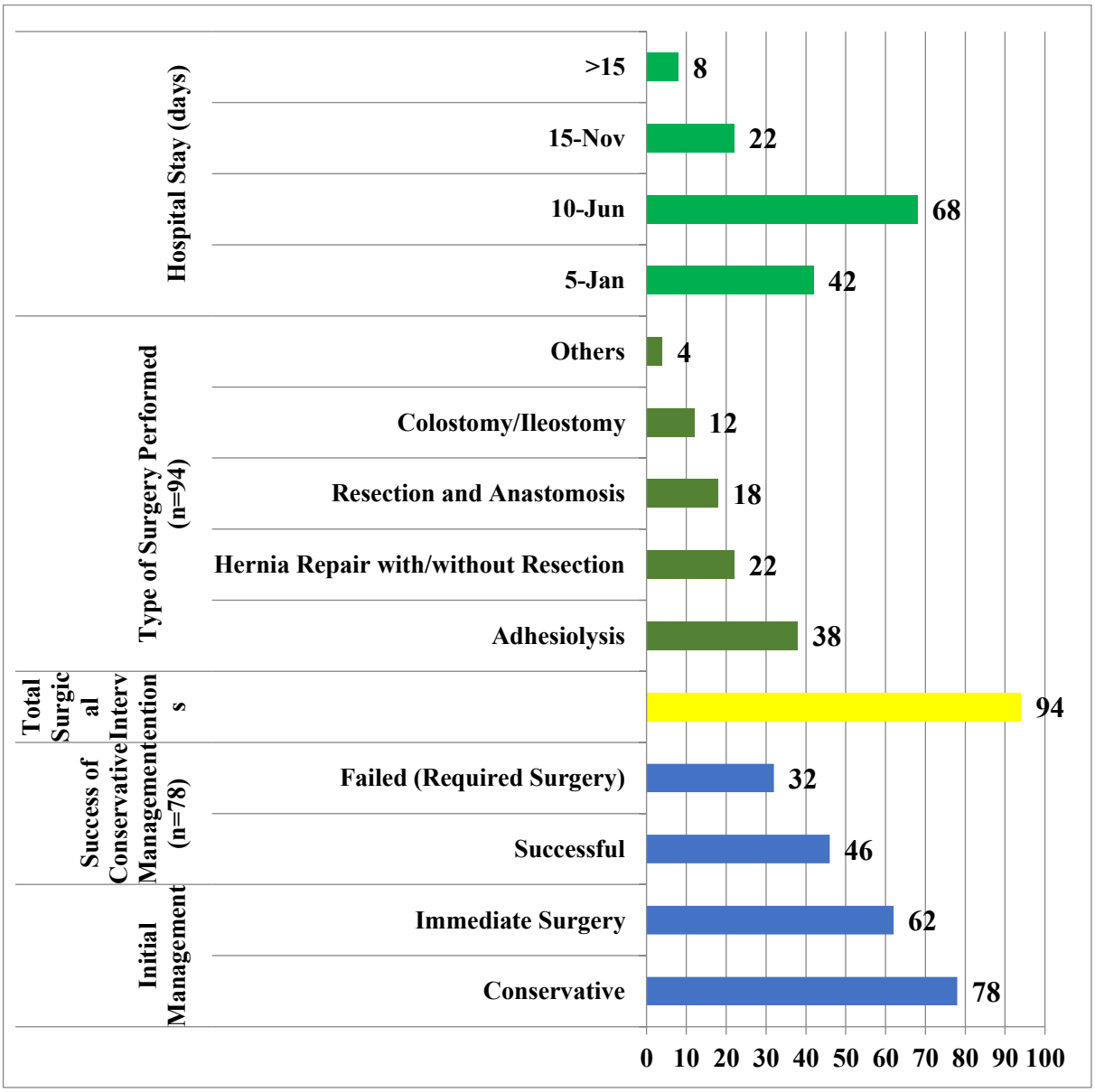

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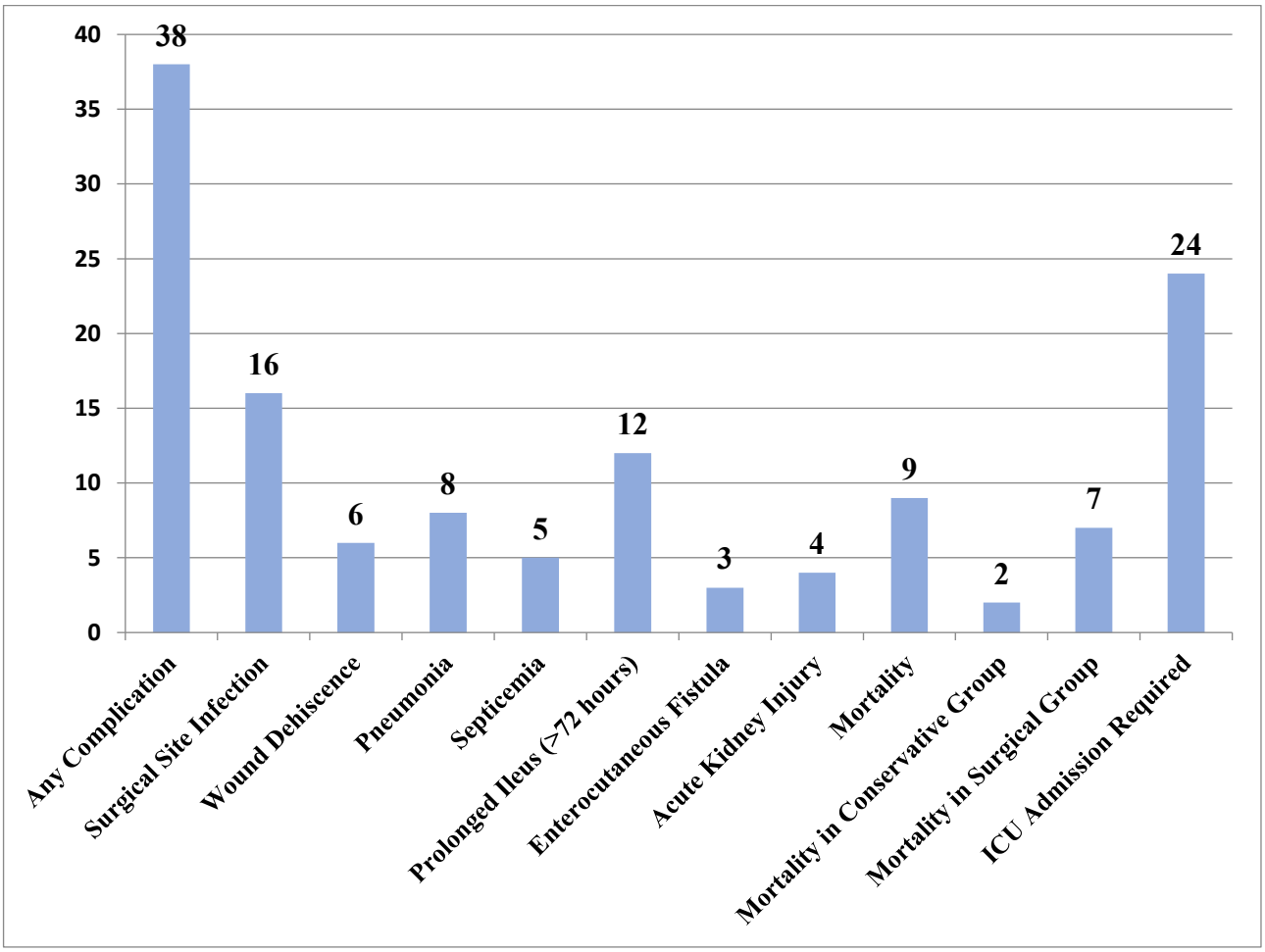
Table 4: Complications and Mortality (N=140)

Complication	Frequency (n)	Percentage (%)
Any Complication	38	27.1
Surgical Site Infection	16	11.4
Wound Dehiscence	6	4.3
Pneumonia	8	5.7
Septicemia	5	3.6
Prolonged Ileus (>72 hours)	12	8.6
Enterocutaneous Fistula	3	2.1
Acute Kidney Injury	4	2.9
Mortality	9	6.4
Mortality in Conservative Group	2	1.4
Mortality in Surgical Group	7	5.0
ICU Admission Required	24	17.1



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DISCUSSION

The present study revealed that the majority of patients with acute intestinal obstruction were in the age group of 46-60 years (32.1%), with a mean age clustering around the fifth and sixth decades of life. This finding aligns closely with the observations of Markogiannakis et al. (2007), who reported peak incidence in middle-aged and elderly populations, reflecting the cumulative effect of prior abdominal surgeries, age-related comorbidities, and increased prevalence of malignancies in older age groups. The male predominance observed in our study (63.6%) is consistent with multiple international and Indian studies, including the work of Adhikari et al. (2010) who reported a similar male-to-female ratio of approximately 2:1 in their Eastern Indian cohort. This gender disparity may be attributed to higher rates of abdominal trauma, inguinal hernias, and prior surgical interventions in males, along with potential delays in healthcare-seeking behavior among male patients in Indian settings.

Small bowel obstruction constituted 74.3% of all cases in our series, which corroborates the established literature indicating that small bowel obstruction represents approximately 80% of all intestinal obstructions (Jackson & Vigiola Cruz, 2018; Hucl, 2013). The predominance of small bowel involvement reflects the anatomical predisposition to adhesion formation following abdominal surgeries and the higher incidence of hernias affecting small bowel segments. The classic tetrad of symptoms was documented with high frequency in our study: abdominal pain (97.1%), vomiting (91.4%), abdominal distension (84.3%), and constipation (77.9%). These findings are remarkably concordant with the systematic review by Cappell and Batke (2008), who emphasized that the clinical presentation intensity correlates with the level and degree of obstruction. Notably, 41.4% of patients presented within 24-48 hours of symptom onset, suggesting reasonable healthcare

access but also highlighting that a significant proportion (42.8%) presented after 48 hours, indicating persistent challenges in early recognition and referral patterns.

The etiological spectrum observed in our study reflects the characteristic pattern of acute intestinal obstruction in Indian tertiary care settings. Postoperative adhesions emerged as the leading cause, accounting for 41.4% of all cases and 55.8% of small bowel obstructions. This finding parallels international data where adhesions constitute 60-75% of small bowel obstructions (Miller et al., 2000; Williams et al., 2005). The high prevalence of adhesive obstruction underscores the cumulative burden of previous abdominal surgeries in the population, with appendectomy, cesarean section, and gynecological procedures being common predisposing factors. Interestingly, obstructed or strangulated hernias represented the second most common etiology (18.6%), which differs from Western series but aligns closely with other Indian studies. Adhikari et al. (2010) reported hernias as the most common cause in their Eastern Indian population, emphasizing the continued public health significance of untreated or neglected hernias in resource-limited settings where elective hernia repair may not be readily accessible.

Intestinal tuberculosis accounted for 6.4% of cases in our series, which is consistent with the endemic prevalence of tuberculosis in India and its gastrointestinal manifestations. This finding resonates with the observations made in multiple Indian studies where tuberculosis remains an important differential diagnosis for intestinal obstruction, particularly in regions with high tuberculosis burden (Adhikari et al., 2010). Malignancy was responsible for 14.3% of obstructions overall and constituted the predominant cause (50%) of large bowel obstruction, which aligns with established knowledge that colorectal cancer is the most common cause of large bowel obstruction in adults (Long et al., 2023). Volvulus accounted for 8.6% of cases, with sigmoid volvulus being more common than cecal volvulus, consistent with dietary fiber intake patterns and anatomical predispositions in the Indian population.

In our study, 55.7% of patients were initially managed conservatively with intravenous fluid resuscitation, nasogastric decompression, and bowel rest, while 44.3% required immediate surgical intervention due to peritonitis, strangulation, or clinical deterioration. Among those managed conservatively, 59% achieved successful resolution without requiring surgery, yielding an overall surgical intervention rate of 67.1%. These findings are comparable to those reported by Williams et al. (2005), who documented conservative management success rates of approximately 43% in their cohort, and Mortensen et al. (2023), who reported non-operative success in approximately 40% of adhesive small bowel obstruction cases. The variation in success rates across studies reflects differences in patient selection criteria, obstruction severity, imaging findings, and institutional protocols for conservative management duration.

The decision to pursue surgical intervention was based on clinical deterioration, failure of conservative management after 48-72 hours, or presence of concerning features such as peritonitis, strangulation, or complete obstruction on imaging. Adhesiolysis was the most frequently performed surgical procedure (40.4%), reflecting the predominance of adhesive etiology, followed by hernia repair (23.4%) and resection with anastomosis (19.1%). These surgical patterns align with the etiological distribution and mirror findings from other tertiary care centers in India. The mean hospital stay demonstrated significant difference between successfully conservatively managed patients (5.2±2.1 days) and those requiring surgical intervention (10.8±4.3 days), which is consistent with multiple studies showing prolonged hospitalization following surgical management (Maung et al., 2012). This finding has important implications for healthcare resource utilization and emphasizes the potential benefits of successful conservative management in appropriate patients.

The overall complication rate in our study was 27.1%, with surgical site infection being the most common (11.4%), followed by prolonged ileus (8.6%), pneumonia (5.7%), and wound dehiscence (4.3%). This complication profile is consistent with the literature on acute intestinal obstruction, where postoperative infections, respiratory complications, and delayed return of bowel function represent major sources of morbidity (Adhikari et al., 2010; Markogiannakis et al., 2007). The relatively high rate of surgical site infections reflects the nature of emergency surgeries often

performed under suboptimal conditions with bowel contamination, delayed presentations, and compromised nutritional status of patients. Prolonged ileus remains a challenging complication that extends hospital stay and delays recovery, necessitating continued research into preventive strategies and enhanced recovery protocols.

The overall mortality rate in our series was 6.4%, which falls within the range reported in contemporary literature. Adhikari et al. (2010) reported mortality rates of approximately 8-10% in their Indian cohort, while international series have documented mortality ranging from 2-8% depending on patient demographics, comorbidities, and disease severity (Long et al., 2023). Notably, mortality was significantly higher in the surgical group (5.0% of all patients) compared to the conservatively managed group (1.4% of all patients), which reflects both the selection bias wherein sicker patients with complicated obstruction require surgery, and the inherent risks associated with emergency abdominal surgery in compromised patients. The requirement for ICU admission (17.1%) further underscores the severity and systemic impact of acute intestinal obstruction, particularly in cases with delayed presentation, strangulation, or significant comorbidities.

When comparing our findings with other Indian studies, several patterns emerge. The etiological distribution in our Rajasthan cohort shows some similarities and differences compared to Eastern and Southern Indian studies. While adhesions remain a leading cause across all regions, the relative importance of hernias and tuberculosis varies based on local disease prevalence, surgical infrastructure, and population characteristics. The management outcomes in our study are comparable to those reported from other tertiary care centers in India, suggesting relatively standardized care protocols despite regional variations. However, the persistent challenge of delayed presentations and associated complications highlights the continued need for improved public health awareness, enhanced primary care capabilities for early recognition and referral, and strengthened tertiary care infrastructure to manage complex cases.

CONCLUSION

Acute intestinal obstruction remains a significant surgical emergency at our tertiary care center, predominantly affecting middle-aged and elderly males, with small bowel obstruction being more common than large bowel obstruction. Postoperative adhesions and obstructed hernias constitute the leading etiological factors, reflecting both the burden of previous surgeries and the continued public health significance of untreated hernias in our region. Conservative management achieved success in approximately 59% of appropriately selected patients, while surgical intervention was required in two-thirds of all cases. The overall mortality rate of 6.4% and complication rate of 27.1% underscore the serious nature of this condition. Early recognition, prompt resuscitation, judicious selection of conservative versus surgical management, and meticulous perioperative care remain fundamental to optimizing outcomes in patients with acute intestinal obstruction.

RECOMMENDATIONS

Strengthening public health awareness programs for early recognition of intestinal obstruction symptoms and promoting timely healthcare seeking behavior are essential. Expansion of elective hernia repair services can potentially reduce the incidence of obstructed hernias. Development of institutional protocols for standardized management of acute intestinal obstruction, implementation of enhanced recovery after surgery pathways, and establishment of quality improvement initiatives targeting reduction of surgical site infections and other complications should be prioritized. Further prospective multicenter studies with longer follow-up periods are warranted to evaluate long-term outcomes and recurrence patterns.

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