Original Research Article

Journal of College of Medical Sciences-Nepal, Vol-21, No.2, Apr-Jun 2025

ISSN: 2091-0657 (Print); 2091-0673 (Online) Open Access
DOI: 10.3126/jcmsn.v21i2.76390

Characterizing Disease and Outcomes in Intestinal Obstruction: A Retrospective Study in a Tertiary Center of Chitwan, Nepal

Sushim Bhujel[1], **Binaya Timilsina**[1], **Saroj Babu Pradhan**[1], **Sagar Khatiwada**[2], **Sandesh Shrestha**[1], **Rupak Raj Ghimire**[1], **Narayan Prasad Belbase**[1]

[1]Department of Gastrointestinal and General Surgery, College of Medical Sciences Teaching Hospital, Bharatpur, Chitwan, Nepal, [2]Department of Surgical Oncology, B.P. Koirala Memorial Cancer Hospital, Bharatpur, Nepal.

ABSTRACT

Background

Intestinal obstruction is a major surgical emergency requiring timely intervention to minimize morbidity and mortality. While conservative management can be successful in select cases, delay in surgical intervention can lead to poor outcomes.

Methods

A retrospective descriptive study was conducted at the Department of Gastrointestinal and General Surgery, College of Medical Sciences Teaching Hospital, Bharatpur, Nepal. Data from October 2022 to October 2024 were analyzed. Eighty-five patients diagnosed with intestinal obstruction were included. Patient demographics, etiology, treatment approaches, and outcomes were analyzed using SPSS version 16.0.

Results

The most common etiology of intestinal obstruction was adhesive bowel obstruction(ABO) (38.82%), followed by hernias (17.65%) and malignancies (10.58%). Conservative management was attempted in 40 cases (47.05%), with a success rate of 55%. Patients requiring surgery upfront (45 cases, 52.94%) primarily had signs of strangulation, ischemia, or peritonitis. Laparoscopic adhesiolysis was performed in 14 cases, demonstrating shorter hospital stays (6 ± 1.5 days) compared to open surgery (7 ± 3 days). Postoperative complications included surgical site infections (24.59%) and ileus, with a 30-day mortality rate of 3.36%.

Conclusions

The study emphasizes that the most frequent cause of intestinal obstruction is still Adhesive bowel obstruction. Conservative management is feasible for a substantial proportion of intestinal obstruction cases; however, a significant percentage require surgical intervention. Furthermore, this study shows that laparoscopic surgery has the potential to improve patient outcomes and sheds light on whether it is a feasible alternative for a subset of ABO patients.

Keywords: intestinal obstruction; adhesive bowel obstruction; laparoscopic adhesiolysis.

Correspondence: Dr. Sushim Bhujel, Department of Gastrointestinal and General Surgery, College of Medical Sciences-Teaching Hospital, Bharatpur, Chitwan, Nepal. Email: drsushimbhujel@gmail.com, Phone: +977-9845736524.
Article received: 2025-03-12. **Article accepted**: 2025-05-25. **Article published**: 2025-06-30.

INTRODUCTION

Intestinal obstruction is a significant surgical emergency accounting for approximately 1.9% to 16% of all surgical admissions.[1] These arise from various etiologies including adhesions, hernias, volvulus, and benign as well as malignant strictures.[1,2] The management of intestinal obstruction has significantly advanced with improved diagnostic tests and imaging.[3,4] While these advancements are undeniable, the disease outcomes are also influenced by several other factors such as delayed presentation, timing of surgical intervention, managing complex etiologies, adherence to evidence-based protocols.[5] Conservative management is successful mostly in cases of adhesive small bowel obstruction (ABO).[6] However, when conservative treatment fails, or in the presence of complications such as strangulation, ischemia, or peritonitis, prompt surgical intervention becomes imperative. The need for timely escalation to surgical intervention cannot be overstated.[7] Through the research, we focus on the disease characterization and management approach while viewing it as a nuanced approach, that balances conservative and operative management strategies.

METHODS

A descriptive cross-sectional study was conducted in Department of Gastrointestinal and General Surgery, College of Medical Sciences -Teaching Hospital, Bharatpur, Nepal reviewing data from the past two years (October 1, 2022 – October 1, 2024). Data were collected retrospectively following ethical approval from Institutional Review Committee (Reference number: COMSTH-IRC/2024-129). All those cases with an age above 18 years who presented with clinical features and radiological diagnosis of intestinal obstruction admitted to Department of Gastrointestinal and General Surgery during the study period were enrolled. These cases were managed within hospital protocols for management of intestinal obstruction. Patients with incomplete data and those under 18 years of age were excluded.

Sample size for the study was calculated using following formula.

$$n = z^2 * (pq / d^2) = 1.962^2 (0.05*0.95/0.05^2) = 73.139$$

Where, n = sample size, p = prevalence of intestinal obstruction was estimated to be 5%. This has been estimated from past one-year data of department of Gastrointestinal and General Surgery of College of Medical Sciences, q = 1-p, d = estimate error i.e. 5%, z = 1.96 at 95% confidence interval.

Convenience sampling method was used. Out of total 5639 patients admitted from Emergency Department to Department of Gastrointestinal and General Surgery unit, the records of 84 patients diagnosed with intestinal obstruction were retrieved from institution's database and reviewed. Patient characteristics, presenting symptoms, investigations, CECT abdomen and pelvis, type of surgery, and outcome were recorded in a pretested proforma.

These data were then stratified based on different Etiology-Based Categorization and Treatment based Approach Categorization. A. Upfront Surgery (undergoing immediate surgical intervention). B. Graduated (Stepwise) Approach Group (non-operative management initially, the approach's success and failure and need for subsequent Delayed Surgery). These were then correlated with overall morbidity and mortality of the disease. All collected data were checked for completeness and accuracy. Collected data were entered into Statistical Package for Social Sciences (SPSS) data software version 16.0. For descriptive statistics categorical variables were described using frequency and percentage and illustrated using appropriate graphs or charts, continuous variables were described using mean and median with Interquartile Deviation (IQR).

RESULTS

A total of 85 patients were included in this study, with mean age 56.52 $\pm$14 years. A male predominance was noted (M:F ratio = 1.36), consistent with other studies. Adhesive bowel obstruction was the most prevalent etiology, accounting for 38.82% of cases. Hernia-related obstruction constituted 17.65% of cases.Malignant obstruction accounted for 10.58% of cases._Other causes included volvulus (5.88%), abdominal tuberculosis (4.70%), ischemic colitis

(3.52%), intussusception (3.52%), and other uncommon etiologies such as Meckel's diverticulitis, GIST, appendicular perforation, and phytobezoar (Table 1).

Table 1. Etiology of intestinal obstruction.

Etiology	Frequency (%)	Graduated (Stepwise) Approach		Upfront surgery
		Attempted group	Successful group	
Adhesive Bowel Obstruction	33(38.8)	25	11	8
Hernia	15(17.65)			15
a) Inguinal hernia	7			
b) Femoral hernia	3			
c) Epigastric hernia	2			
d) Obturator hernia	2			
e) Paraduodenal hernia	1			
Malignancy	9(10.58)			9
a) Caecum and ascending colon	2			
b) Decending colon	2			
c) Rectosigmoid	4			
d) Small bowel	1			
Volvulus	5(5.88)	3	3	2
Intussusception	3(3.52)			3
Abdominal TB	4(4.7)	3	1	1
Non specific	4(4.7)	4	4	
GIST	1(1.17)			1
Terminal ileitis	2(2.353)	2	2	
Ischemic colitis	3(3.52)	1	1	2
Meckel's diverticulitis	1(1.17)	1	0	0
Appendicular perforation/abscess	3(3.52)			3

The most common etiology was adhesive bowel obstruction, with a total of 33 patients. Among these 8 patients underwent upfront surgery, while 25 were initially managed conservatively. Of the initial non-operatively managed patients, 14 failed conservative treatment and eventually required delayed surgical intervention.

Laparoscopic surgery was performed exclusively in patients who failed initial conservative management and CECT-confirmed diagnosis of adhesive bowel obstruction (ABO), 14 cases were successfully managed using a laparoscopic adhesiolysis and band release. Postoperatively, these patients exhibited no evidence of recurrent obstruction or bowel injury and experienced shorter hospital stays, averaging 6 ± 1.5 days.

45 (52.94%) patients underwent surgery following initial resuscitation, on account that these patients had signs of strangulation, hemodynamic instability, diffuse peritonitis, high suspicion of bowel gangrene/ perforation. Most common etiology requiring upfront surgery were obstruction related to hernias (15 cases), followed by malignancy (9 cases) then adhesive bowel obstruction (8 cases), 3 of intussusception, and 3 of appendicular perforation.

Among the 40 patients initially managed conservatively, 22 (55%) had successful symptom resolution, while 18 (45%) required delayed surgery. The success rate of non-operative management was highest in adhesive bowel obstruction 11 of 25 (44%). Volvulus, Abdominal Tuberculosis, Terminal ileitis, ischemic colitis and phytobezoars were other etiologies, where non-operative management was successful.

The most common surgical procedure performed for intestinal obstruction was adhesiolysis and band release, accounting for 22 cases. Herniorrhaphy was the second most common surgical intervention, addressing obstruction due to hernias. The third most frequently performed procedure were different hemicolectomies, primarily undertaken for colonic malignancies and ischemic colitis (Table 2).

Table 2. List of operations.

Open Adhesiolysis / Band release	8
Laparoscopic adhesiolysis / Band release	14
Herniorrhaphy	13
Right sided Hemicolectomy	4
Right sided Hemicolectomy with loop ileostomy	2
Left sided Hemicolectomy	6
Sigmoid colectomy with colo-colic anastomosis ileostomy	1
Ileal resection	7
Jejunal resection	3
Appendectomy/ drainage of pelvic abscess	3
fragmentation and milking of the bezoar	1

In terms of surgical interventions and outcomes, bowel resection with anastomosis was required in

a total of 23 patients. The predominant indication for resection was bowel ischemia with gangrene or strangulation; Among these 9 were cases of obstructions related to hernias, Malignancy accounted for 9 cases requiring surgical resection anastomosis. Abdominal tuberculosis, volvulus, ischemic colitis was among other etiologies requiring bowel resection anastomosis (Table 2). Regarding overall, postoperative comorbidities, postoperative ileus was noted in 4 patients (4.76%), surgical site infections (SSI) in 15 (17.85%). Patients who underwent laparoscopic surgery had a shorter hospital stay, median averaging 6 ± 1.5 days. Those managed non-operatively had a median stay of 5 days, while patients who underwent open surgery had an extended stay of 7±3 days. The overall 30 days mortality rate for diagnosed cases of intestinal obstruction was 3 (3.36%).

DISCUSSION

This study provides a comprehensive analysis of the etiology, management, and outcomes of intestinal obstruction in a tertiary care center in Nepal. The mean age of the patient in our study was 56.52± 14 years, male predominance, male-to-female ratio was 1.36, the finding was similar to other studies which showed male predominance with regards to the disease[10,11] Adhesive bowel obstruction (ABO) was the most prevalent cause 39.3%, consistent with global studies as well as prevailing patterns in Nepal, that report adhesions as the leading cause of small bowel obstruction, accounting for 50–70% of cases. [1,8,9] Hernias (17.9%) and malignancies (10.7%) were also significant contributors. Additionally, 4.7% etiologies were nonspecific, which included cases where patients presented with features, diagnosis of intestinal obstruction but showed no significant intraabdominal findings on oral and IV contrast CECT scan, these cases resolved with conservative approach and had a normal scan on follow up colonoscopy examination as well. The relatively high incidence of hernia-related obstructions (17.9%) of intestinal obstruction cases, suggests gaps in early diagnosis, general public awareness and need for early elective repair of hernias.

In this study, approximately 47.05% of patients with intestinal obstruction (IO) were initially managed conservatively (Graduated approach), using nonoperative strategies Intravenous antibiotics, nasogastric decompression, intravenous fluids, therapeutic oral gastrograffin and close monitoring. Of these patients, 55% successfully avoided surgery, with resolution of their symptoms, indicating that conservative management can be effective when appropriately selected. However, the study also observed a 45% failure rate in conservative management, highlighting the inherent challenges and risks associated with this approach. Several factors could contribute to this failure rate: the progression of some partial obstructions to complete obstructions, development of complications ischemia or perforation. Furthermore, even with careful patient selection, it remains challenging to predict which cases will respond to conservative treatment and which will require surgical intervention. When comparing our findings with existing literature, Stephen B. Williams et al analyzed outcomes in 329 patients with small bowel obstruction (SBO), reporting that 43% were successfully treated conservatively, while 57% required surgery. Although our overall rates differ slightly due to the inclusion of colonic obstructions in our cohort, the trend of a substantial proportion needing surgical intervention remains consistent.[12] Additionally, our study may give a valuable insight into the feasibility of laparoscopic surgery for ABO. Specifically, 14 cases were successfully managed using laparoscopic adhesiolysis and band release, demonstrating the potential of laparoscopy in appropriately selected patients. Postoperatively, there were no cases of recurrent obstruction or bowel injury. The patients who underwent laparoscopic surgery experienced shorter hospital stays, averaging 6 ± 1.5 days, compared to 7 ± 3 days for patients who underwent open surgery. These findings are consistent with the study by Otani K et al., and Ming-zhe Li et al., which evaluated the differences in surgical outcomes between laparoscopic and open approaches for ABO,

further supporting the efficacy and advantages of minimally invasive technique. Major finding in the researches were the benefits of laparoscopic surgery as compared to open surgery, a shorter hospital stays and fewer complications. Regarding Postoperative complications, surgical site infections (SSIs) occurred in 24.59% of patients. Notably, patients who underwent laparoscopic interventions had lower incidence of SSI, further reinforcing the benefits of minimally invasive surgery in select cases. Overall, when comparing our findings with existing literature, 3.36% 30-day mortality rate observed in our study was lower than reported outcomes with regards to the disease.[13]

CONCLUSIONS

The study highlights that adhesive bowel obstruction remains the most common cause of intestinal obstruction. Conservative management is feasible for a substantial proportion of intestinal obstruction cases; however, a significant percentage require surgical intervention. Additionally, this study provides insight into the feasibility of laparoscopic surgery as a viable option for selected patients with ABO, demonstrating its potential for improved patient outcomes.

Limitations: The limitation in our study, because our study only included patients from a single hospital, the results may not be generalizable. The sample size may be small to project the result for a general population. The follow up data are subjected to recall bias. To mitigate these, we have put Standardized Instruments, validated questionnaires and techniques to optimize the reliability of data collection.

Conflict of interest: None

Funding: None

REFERENCES

1. Poudel S, Panthi S, Gautam S, Bhandari S, Bhattarai B, Pokharel S et al. Intestinal Obstruction among Patients Admitted in the Department of Surgery of a Tertiary Care Centre: A Descriptive Cross-Sectional Study. Journal of the Nepal Medical Association 2022; 60: 344–347. [DOI]
2. Arun Rao, Ramesh, Darapaneni Akshay Siva Krishna. A study of etiology and management of intestinal obstruction. International Journal of Frontiers in Medicine and Surgery Research 2024; 5: 013–018. [DOI]
3. Branco BC, Barmparas G, Schnüriger B, Inaba K, Chan LS, Demetriades D. Systematic review and meta-analysis of the diagnostic and therapeutic role of water-soluble contrast agent in adhesive small bowel obstruction. British Journal of Surgery 2010; 97: 470–478. [DOI]
4. Kolluru R, M K S, Mohapatra M, Das S, Sen KK, Madhesia AK et al. Diagnostic performance of contrast enhanced computed tomography in intestinal obstruction. Panacea Journal of Medical Sciences 2024; 14: 157–163. [DOI]
5. Batebo M, Loriso B, Beyene T, Haile Y, Hailegebreal S. Magnitude and determinants of treatment outcome among surgically treated patients with intestinal obstruction at Public Hospitals of Wolayita Zone, Southern Ethiopia: a cross sectional study, 2021. BMC Surg 2022; 22. [DOI]
6. Ghimire P, Maharjan S. Adhesive Small Bowel Obstruction: A Review. Journal of the Nepal Medical Association. 2023; 61: 390–396. [DOI]
7. Colonna AL, Byrge NR, Nelson SD, Nelson RE, Hunter MC, Nirula R. Nonoperative management of adhesive small bowel obstruction: what is the break point? Am J Surg 2016; 212: 1214–1221. [DOI]
8. Rami Reddy SR, Cappell MS. A Systematic Review of the Clinical Presentation, Diagnosis, and Treatment of Small Bowel Obstruction. Curr Gastroenterol Rep. 2017; 19.[DOI]
9. Khalefa B Al, Alhwamda M. Causes of mechanical intestinal obstructions and diagnosis in adults. 2024. [DOI]
10. Arun Rao, Ramesh, Darapaneni Akshay Siva Krishna. A study of etiology and management of intestinal obstruction. International Journal of Frontiers in Medicine and Surgery Research

2024; 5: 013–018. [DOI]

11. Barman A, Kumar Sinha P, Saha AK. A Study On Intestinal Obstruction Regarding Its Epidemiology, Etiology And Management In A Peripheral Medical College. 2024; 17: 2024. [DOI]
12. Williams SB, Greenspon J, Young HA, Orkin BA. Small bowel obstruction: Conservative vs. surgical management. Dis Colon Rectum 2005; 48: 1140–1146. [DOI]

Citation: Bhujel S, Timilsina B, Pradhan SB, Khatiwada S, Shrestha S, Ghimire RR, Belbase NP. Characterizing Disease and Outcomes in Intestinal Obstruction: A Retrospective Study in a Tertiary Center of Chitwan, Nepal. JCMS Nepal. 2025; 21(2): 168-173.