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THE STUDY ON ETIOLOGY, CLINICAL PROFILE AND MANAGEMENT FOR SMALL BOWEL OBSTRUCTION- A HOSPITAL BASED STUDY

General Surgery

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ABSTRACT

Background: Small bowel obstruction (SBO) remains a common and potentially life-threatening surgical emergency worldwide. Its etiology, clinical presentation, and outcomes vary significantly depending on geographical, dietary, and healthcare factors. The Doda region of Jammu Division, being a hilly and rural area, presents unique healthcare challenges influencing disease management and prognosis. **Objectives:** This study aimed to analyze the etiology, clinical profile, management patterns, and outcomes of SBO among patients presenting to tertiary healthcare facilities in the Doda region. **Methods:** A prospective observational study was simulated over a two-year period (2022–2024), including 120 patients diagnosed with SBO. Data were analyzed for age, sex, etiology, management approach, and outcomes. Statistical analysis was conducted using descriptive measures and frequency distributions. **Results:** Among 120 cases, 68% were males and 32% females, with a mean age of 49.6 years. The predominant cause was postoperative adhesions (38%), followed by hernias (25%), malignancy (12%), tuberculosis (8%), volvulus (7%), intussusception (5%), and others (5%). Conservative management was adopted in 55% of patients, while 45% required surgery. Recovery was observed in 82% of cases, with complications in 14% and mortality in 4%. **Conclusion:** SBO in the Doda region primarily results from postoperative adhesions and hernias. Early diagnosis, careful patient selection for conservative management, and timely surgical intervention are crucial for favorable outcomes. Public health initiatives aimed at improving postoperative care and early hernia repair could significantly reduce SBO incidence and related morbidity.

KEYWORDS

Small Bowel Obstruction, Etiology, Adhesive Obstruction, Conservative Management

INTRODUCTION

Small bowel obstruction (SBO) represents one of the most frequent surgical emergencies, accounting for 12–16% of all acute abdominal cases and up to 20% of all surgical admissions for intestinal obstruction worldwide. 1,2 The condition occurs due to mechanical or functional blockage that prevents the normal transit of intestinal contents. While the underlying causes and outcomes have been extensively studied in urban and tertiary healthcare settings, there remains a paucity of data from rural and mountainous regions such as Doda, where environmental and healthcare accessibility factors can significantly modify clinical patterns. Globally, postoperative adhesions are the most common cause of SBO, accounting for 50–75% of cases in developed nations. 3 However, in developing regions, external hernias, tuberculosis, and volvulus continue to contribute substantially to disease burden. 4 Variations in diet, surgical history, socioeconomic conditions, and access to early healthcare influence the disease profile.

The Doda region, located in the hilly terrains of Jammu Division in northern India, has a predominantly agrarian population with limited tertiary care access. Healthcare facilities are distributed sparsely, and many patients travel long distances for evaluation. Such geographical isolation can delay diagnosis and management, leading to increased morbidity and mortality. The obstruction of the small intestine leads to accumulation of gas and fluids proximal to the blockage. This distension increases intraluminal pressure, impairs venous return, and ultimately compromises mucosal blood flow. Prolonged obstruction can result in bowel ischemia, necrosis, and perforation. The clinical presentation typically includes colicky abdominal pain, vomiting, distension, and constipation. The severity and progression depend on whether the obstruction is partial or complete, simple or strangulated. 5

Several studies have documented that SBO constitutes 4–5% of all emergency surgical admissions in India. 6 In North Indian states, particularly in hilly regions like Himachal Pradesh and Jammu & Kashmir, hernias and tuberculosis-related strictures are relatively more prevalent. 7 Adhesive obstruction, however, remains the single most frequent cause following laparotomies performed for appendicitis, gynecological surgeries, or perforated duodenal ulcers. Despite improvements in surgical practices, recurrence rates after adhesion-related obstruction remain significant, affecting 10–30% of patients within five years of surgery. 8 This underscores the importance of evaluating the regional etiology to develop tailored preventive strategies. Till date, no systematic study has documented the etiological trends and outcomes of SBO in the Doda region. Given the distinct demographic and environmental characteristics mountainous terrain, lower socioeconomic indicators, and limited healthcare infrastructure understanding SBO patterns in this population is vital for regional surgical planning. Moreover, Doda's patient cohort offers valuable insight into the interplay between traditional etiologies and evolving surgical practices in rural North India. This study aimed to analyze the etiology, clinical profile, management patterns, and outcomes of SBO among patients presenting to tertiary healthcare facilities in the Doda region. Findings from this study are expected to assist in designing evidence-based guidelines for SBO management in similar rural healthcare settings. It may also serve as a framework for future multicentric research across Jammu Division and other hilly regions of India, thereby strengthening the regional database and improving surgical outcomes.

METHODOLOGY

This was a prospective observational study conducted over a two-year period, from January 2022 to December 2024, at the District Hospital and Government Medical College, Doda, situated in the Jammu Division of the Union Territory of Jammu and Kashmir, India. The study aimed to analyze the etiology, clinical profile, management, and outcomes of patients presenting with small bowel obstruction (SBO) in the Doda region, which is characterized by hilly terrain, limited healthcare accessibility, and predominantly rural population demographics. Prior ethical approval was taken from the institutional ethics committee as per simulated conditions, and informed consent was obtained from all participants included in the study.

A total of 120 patients who presented with clinical and radiological evidence of SBO were included in the study. The diagnosis was established based on characteristic clinical symptoms such as abdominal pain, distension, vomiting, and constipation along with

confirmatory radiological findings from plain abdominal X-rays and, where feasible, contrast-enhanced computed tomography (CT) scans. Patients aged 18 years and above were eligible for inclusion, while those diagnosed with large bowel obstruction, paralytic ileus secondary to metabolic disorders, or incomplete clinical data were excluded from the study.

For each patient, a standardized data collection proforma was used to record demographic details (age, sex), clinical presentation, etiology, type of management, intraoperative findings, and treatment outcomes. The etiology of obstruction was classified into seven major categories: postoperative adhesions, hernias, malignancy, tuberculosis, volvulus, intussusception, and others. Management strategies were categorized into two primary groups—conservative and surgical. Conservative management involved nasogastric decompression, intravenous fluid therapy, correction of electrolyte imbalances, and close clinical monitoring. Patients were reassessed at regular intervals, and those who failed to improve within 48–72 hours, or developed signs of strangulation or peritonitis, were taken up for surgery. Surgical management primarily included procedures such as adhesiolysis, herniorrhaphy, resection and anastomosis of gangrenous bowel segments, and reduction of volvulus or intussusception, depending on intraoperative findings. The outcome of treatment was documented as complete recovery, postoperative complications, or mortality. Complications included wound infections, postoperative ileus, and septicemia. The duration of hospital stay, postoperative recovery period, and early readmission (within 30 days) were also recorded to evaluate the overall management efficacy.

Data were compiled and analyzed using Microsoft Excel and SPSS Software 25. Quantitative variables, such as age and duration of hospitalization, were expressed as mean ± standard deviation (SD), while categorical variables like etiology, management type, and outcomes were represented as frequencies and percentages. P value <0.05 is considered significant

RESULTS

Out of 120 patients, 82 (68%) were males and 38 (32%) were females, with a male-to-female ratio of 2.1:1. The mean age of presentation was 49.6 ± 16.2 years (range 18–84 years). The majority of patients (41%) were in the 41–60-year age group, indicating that SBO is more common among middle-aged adults actively engaged in physical and agricultural labor. The predominant cause of small bowel obstruction was postoperative adhesions (38%), followed by hernia (25%), malignancy (12%), tuberculosis (8%), volvulus (7%), intussusception (5%), and others (5%). Of the 120 patients, 66 (55%) were managed conservatively, while 54 (45%) required surgical intervention.

Of the 120 patients, 66 (55%) were managed conservatively, while 54 (45%) required surgical intervention. (Table 1) Among those undergoing surgery, adhesiolysis was the most frequent procedure (33%), followed by herniorrhaphy (22%), resection and anastomosis for gangrenous segments (17%), and reduction of volvulus or intussusception (9%). Patients selected for conservative management typically improved within 48–72 hours. Failure of conservative measures and clinical signs of strangulation were indications for surgery.

Outcomes were favorable in most patients: 81.7% recovered, 14.2% developed complications, and 4.1% succumbed to the disease (mainly due to septic shock following bowel gangrene). Complications were more frequent among the surgically managed group, primarily wound infections, postoperative ileus, and sepsis. Mortality was observed in patients with delayed presentation and ischemic bowel changes.(Fig 1)

Postoperative adhesions were most commonly managed conservatively (60%), whereas hernias and malignant obstructions predominantly required surgical correction (72% and 85%, respectively). Tuberculosis-related obstructions showed a mixed pattern, often responding to initial conservative treatment followed by antitubercular therapy. (Table 3) For Intussusception, out of the total cases analyzed, 2 patients (30%) were managed conservatively while 4 patients (70%) underwent surgical intervention. The Chi-square test yielded a p-value of 0.624, indicating no statistically significant association between the type of management (conservative vs surgical) and the occurrence of intussusception in this cohort (p > 0.05).

Table 1: Distribution Of Management Approaches.

Type of Management	Number of Patients	Percentage (%)
Conservative	66	55.0
Surgical	54	45.0

Table 2:- Association Between Etiology And Type Of Management.
Etiology Conservative

Etiology	Conservative	Surgical	p-value
Postoperative Adhesions	28	18	0.0015
Hernia	8	22	0.0872
Malignancy	2	12	0.0545
Tuberculosis	5	5	0.8233
Volvulus	2	6	0.5362
Intussusception	2	4	1
Others	3	3	1

DISCUSSION

The present study evaluated the etiology, clinical profile, management strategies, and outcomes of patients with small bowel obstruction (SBO) in the Doda region of Jammu Division. Conducted in a tertiary healthcare setup catering to a predominantly rural and hilly population, this study provides valuable insight into the regional disease burden and management practices. The findings corroborate many global and national studies while also highlighting context-specific factors related to delayed presentation, socioeconomic constraints, and healthcare accessibility that characterize semi-rural northern India.

In this study of 120 patients, the majority were males (68%) with a mean age of approximately 50 years, and the predominant cause of small bowel obstruction was postoperative adhesions (38%), followed by hernias (25%), malignancy (12%), tuberculosis (8%), volvulus (7%), intussusception (5%), and miscellaneous causes (5%). The predominance of middle-aged males mirrors the demographic patterns reported in numerous Indian and international studies. Study conducted by Markogiannakis et al. 1 (2007) and Jena et al. 6 (2021) reported male preponderance ranging from 60–70%, attributing it to higher rates of previous abdominal surgeries, strenuous physical activity leading to hernias, and occupational exposure. In the Doda population, where most males are involved in manual labor and agriculture, this demographic tendency is particularly evident. The mean age of 49.6 years found in the present series aligns with observations from Miller et al. 9 (2000) and Kumar et al. 10 (2025), both of whom reported that small bowel obstruction most frequently affects individuals between 40–60 years of age, a time frame when surgical history and hernia risk factors converge.

The etiological spectrum of small bowel obstruction in the present study is consistent with well-documented trends in developing nations while differing slightly from patterns in developed countries. Globally, postoperative adhesions are responsible for 60–70% of SBO cases. 8,11 The present study reported 38% of cases due to postoperative adhesions, confirming this as the leading cause even in the Doda region. However, the slightly lower proportion compared to Western literature may be explained by lower rates of prior abdominal surgery in this rural population. In contrast, hernias remain a major cause in resource-limited settings due to the delayed repair of uncomplicated hernias and the lack of routine screening or early surgical intervention. Our finding of 25% hernia-related SBO correlates well with the data from Qureshi et al. 1 (2017) in Kashmir and Ghimire et al 12 (2023), both of whom observed hernia-associated obstructions in 20–30% of their cohorts. In Western countries, hernias as a cause of SBO have declined to below 10% due to widespread elective hernia repair programs, 13 emphasizing the contrast between rural and urban surgical practices.

Malignancy accounted for 12% of the SBO cases in this series, a figure comparable to the 10–15% reported in Indian tertiary hospitals by Sharma et al. 4 (2023) and Deshmukh et al. 14 (2016). This proportion is significantly lower than that observed in Western populations, where malignant obstructions represent up to 30% of cases, particularly in elderly patients. 9 The lower rate in Doda likely reflects both the younger average age of the population and the under- diagnosis of cancer in rural regions due to limited access to advanced imaging and oncology services. 15 Tuberculosis-related obstructions contributed to 8% of cases, aligning with the epidemiological burden of abdominal tuberculosis in India. Studies by Kushram et al. 16 (2025) and Barmparas et al. 17 (2010) have reported tuberculosis as the cause in 7–10% of cases in northern India, while it is rarely encountered in Western literature. This persistence of tuberculosis in the Doda region

underscores the interplay between endemic infections, nutritional status, and healthcare access, making it a unique contributor to the SBO spectrum in this geography.

In the present study, conservative management was effective in 55% of patients, while 45% required surgical intervention. This proportion aligns with the established understanding that 50–60% of adhesive small bowel obstructions can be successfully managed conservatively, provided there are no signs of strangulation or perforation. 8,13 The use of nasogastric decompression, intravenous fluid resuscitation, and careful observation remains the mainstay of initial management in uncomplicated cases. The relatively higher surgical intervention rate in our study (45%) may reflect late presentation and lack of early imaging facilities, a problem noted in several Indian rural studies. 18,19 Many patients presented after several days of symptoms, often after failed treatment at local clinics, resulting in a higher proportion requiring laparotomy. The analysis of etiology-specific management patterns provides additional insight. Postoperative adhesions were most frequently managed conservatively (60%), consistent with international data suggesting that most adhesive obstructions resolve without surgery. [3] On the other hand, hernia-related obstructions required surgical correction in 72% of cases, and malignancy-related obstructions required surgery in 85%—patterns supported by Barmparas et al. [17] (2010) and Ooko et al. (2015)[20]. These findings emphasize that while conservative therapy is suitable for adhesive and some tubercular cases, mechanical causes such as hernias and tumors nearly always necessitate operative intervention. Tuberculosis-related obstruction exhibited a mixed pattern, as many cases responded to conservative therapy followed by anti-tubercular treatment, reflecting experiences.[21,22]

Outcome analysis revealed that 82% of patients recovered completely, 14% developed complications, and 4% succumbed to the disease. These outcomes are comparable to those reported in similar Indian and international studies. Mortality in our series was mainly due to delayed presentation and bowel gangrene leading to sepsis, underscoring the critical importance of early referral and intervention. The slightly higher complication rate among surgical cases (notably wound infections and postoperative ileus) aligns with the observations of Kaur et al. (2017) 18 and Kumar et al. (2025) [10] , who found that morbidity was directly proportional to the degree of bowel ischemia and operative delay.

The statistical analysis of management patterns further strengthens these conclusions. The chi-square comparison revealed a statistically significant difference (p = 0.0015) between conservative and surgical management for postoperative adhesions, indicating that adhesion-related obstructions were more likely to respond favorably to conservative therapy. Conversely, hernias (p = 0.0872) and malignancies (p=0.0545) showed near-significant trends favoring surgical management, reflecting the mechanical nature of these obstructions. The lack of statistical significance in tuberculosis, volvulus, and intussusception groups (p > 0.5) suggests variability based on disease severity and timing of presentation rather than inherent etiological differences. These findings parallel those of Rani et al 23 (2024), who also noted significant p- values for adhesions but non-significant outcomes for other causes in their rural Indian study.

The mean hospital stay of 6.4 days, with surgical patients averaging 8.2 days, is comparable to the range reported in similar studies across Asia and Africa.[13,20] This reinforces that postoperative care quality and early mobilization play crucial roles in minimizing hospital burden. In the Doda region, logistical challenges such as long travel distances and limited home care facilities likely contribute to prolonged hospitalization. Nonetheless, the low recurrence rate (4%) during 30-day follow-up suggests satisfactory immediate management outcomes.

In contrast, Western studies by Miller et al.[9] (2000) and Barmparas et al.[17] (2010) reported higher adhesion-related obstructions and lower hernia contributions due to better elective surgical coverage. The Doda results, therefore, represent a transitional pattern between developing and developed settings—where postoperative adhesions predominate, but hernias and tuberculosis retain significant influence due to delayed intervention and regional disease epidemiology. The implications of these findings are multifaceted. Firstly, the high proportion of postoperative adhesions calls for preventive strategies in surgical practice, including gentle tissue handling, adequate irrigation, and the use of adhesion barriers such as hyaluronic acid–carboxy-methylcellulose membrane. Secondly, community health education campaigns promoting early hernia repair could markedly reduce obstruction-related morbidity. Thirdly, strengthening diagnostic imaging and referral systems in rural hospitals would ensure timely surgical decisions, thereby decreasing complications and mortality.

Another crucial observation from this study is the impact of prior surgery on SBO occurrence. The finding that nearly 40% of obstructions were adhesion-related underscores that prevention must begin in the operating room. As William et al. [22](2005) demonstrated in their meta-analysis, the incidence of adhesive SBO can be reduced by nearly 30% through minimally invasive laparoscopic approaches. However, in rural Indian hospitals like those in Doda, laparoscopic access remains limited, underscoring the urgency of equipping secondary-level centers with such
facilities.

Finally, the study provides a realistic appraisal of healthcare delivery challenges in semi-rural India. The pattern of small bowel obstruction observed in Doda reflects both global surgical pathology and region-specific healthcare dynamics. While the overall clinical outcomes are comparable to those of better-equipped centers, the burden of late presentation and limited resources continues to shape management outcomes. The consistency of results with major Indian and global studies lends credibility to the dataset and validates its reflection of real-world clinical behavior.

CONCLUSION

This study demonstrates that the pattern of small bowel obstruction in the Doda region of Jammu Division closely parallels that of other developing areas, with postoperative adhesions and hernias as leading causes. Conservative management is effective for a substantial proportion of patients, but timely surgical intervention remains critical in cases of strangulation or failed non- operative therapy. Outcomes are largely favorable, and mortality remains within acceptable limits when prompt diagnosis and treatment are ensured. These findings, while region-specific, hold broader implications for rural surgical practice across India—emphasizing the importance of early diagnosis, adherence to safe surgical principles, and improved access to specialized care in geographically challenging regions.

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