

# Pattern of Intestinal Obstruction and its Management: A Tertiary Care Hospital-based Study

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## Abstract

**Introduction:** The intestinal obstruction is one of the common abdominal emergencies and is associated with significant morbidity and mortality, especially when it progresses to bowel ischemia. The diagnosis and management of the patient with intestinal obstruction are one of more challenging emergency that a surgeon can come across. Early diagnosis of obstruction, skillful operative management, proper technique during surgery, and intensive post-operative treatment carries grateful results.

**Methods:** This present study scheduled for 50 patients which came in emergency trauma center, 40 are male and 10 are female, including 14 years and above age. The study is related to how patients present in emergency trauma center, examination, basic investigation, management, outcome, and hospital stay.

**Results:** The maximum number of patients were in age group of 30–50, mostly are male of them. 80–90% of patients presents with abdominal distension, vomiting, and abdominal pain. Majority of them are associated with adhesions and bands, malignancy, and stricture. Sixteen patients were operated with resection and anastomosis, 12 with release of adhesions and band, 15 with hemicolectomy with stoma formation and two with herniorrhaphy, and five patients were kept on conservative management.

**Conclusion:** A Bowel obstruction can either be a dynamic or adynamic obstruction of the small or large intestines, still intestinal obstruction remains an important surgical emergency. Emergency measures should be taken in all intestinal obstruction patients which help to provide a good outcome and less possible post-operative complications and also less mortality. Early operation is mandatory to avoid the development of peritonitis and systemic sepsis associated with multiorgan failure. According to my case study, surgical intervention is must in majority of the patients with intestinal obstruction.

**Key words:** Intestinal obstruction, mechanical obstruction, intestinal obstruction clinical findings

## INTRODUCTION

Intestinal obstruction is defined as obstruction in forward propulsion of the contents of the intestine either due to dynamic, adynamic, or pseudo-obstruction. It is predisposed by varying underlying anomalies and diseases, which are difficult to define preoperatively. Intestinal obstruction can be diagnosed easily, the underlying cause except post-operative adhesions and external hernias are difficult to be diagnosed preoperatively. A grateful result can be achieved if emergency measures taken like

early diagnosis of obstruction, pre-operative preparation, skillful operative management, proper technique during surgery, and intensive post-operative treatment. The diagnosis and management of the patient with intestinal obstruction are one of the more challenging emergencies that a general surgeon can come across. Although the mortality due to acute intestinal obstruction is decreasing with better understanding of pathophysiology, improvement in diagnostic techniques, fluid and electrolyte correction, much potent anti-microbials, and surgical management, but still mortality ranges from 3% for simple obstruction to as much as 30% when there is vascular compromise or perforation of the obstructed bowel. This is further influenced by the clinical setting and related comorbidities.<sup>[1]</sup> Most of the mortalities occurs in elderly individuals who seek late treatment and who are having associated pre-existing diseases such as diabetes mellitus, COPD, and cardiac diseases. Old age, comorbidity,

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**Month of Submission :** 12-2022  
**Month of Peer Review :** 01-2023  
**Month of Acceptance :** 01-2023  
**Month of Publishing :** 02-2023

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non-viable strangulation, and a treatment delay of more than 24 h were significantly associated with an increased death rate.<sup>[2]</sup> Avicenna, who lived in the medieval period, has had a great influence on the medical knowledge of the world by writing an encyclopaedia of medicine entitled “Qanun of Medicine.” According to Qanun, 16 causes are involved in intestinal etiologies of bowel obstruction such as “reeh,” mucoid phlegm, abdominal hot and dry distemperament, decreased bile secretion, job, and so on while modern medicine considers some of them, for instance, volvulus, intestinal herniation, worm, intestinal pseudo-obstruction, and opiate.<sup>[3]</sup> Ambrosius pare (1510–1590) was first to recognize obstruction as a pathological entity. For severe cases, he used mercury in water, lead bullets smeared with mercury.<sup>[4]</sup> Jonathan Hutchison performed first successful operation for intussusception in 1871 and hirschprung in 1877 reduced intussusception by salt water and enema.<sup>[5]</sup> Roentgen in 1893 discovered X-ray and Schwartz in 1911 pointed out the virtue of scout film; Kloiber of Germany (1919) emphasized the importance of x-ray in locating the level of obstruction. How toxic substances get accumulated in bowel was described by Whipple and Williams (1926) described influence of anaerobic infection as a cause of toxemia.<sup>[6]</sup>

## METHODS

Average every year, General Surgery Department of tertiary care center of South Gujarat receives 100–150 patients of Intestinal Obstruction and performs 50–70 surgery on patients of Intestinal Obstruction. Conveniently, 50 cases selected for study in criteria of history, clinical examination and radiological examination, 14 years and above age with clinical and radiological evidence based diagnosed, conservative, and operated intestinal obstruction. According to the patient's treatment protocol; history was taken according to criteria such as personal and social history, chief complaint, past history, any operative history, and family history. In Emergency Trauma Centre, Plain X-ray erect abdomen or lateral decubitus to detect fluid gas levels and ultrasound abdomen was performed in all cases. CT scan abdomen done in selected cases of mass abdomen.<sup>[7]</sup> After the admission along with above procedure, resuscitation with IV fluids especially ringer lactate and normal saline infusion started till hydration and urine output become normal. Ryle's tube and Foley's Catheter carried out and antibiotic prophylaxis started,<sup>[8]</sup> close observation of all bedside parameters such as pulse rate, blood pressure, respiratory rate, abdominal girth, bowel sounds, tenderness, and guarding was looked. Such individuals are excluded in this study like diagnosed case

of strangulation or clinical peritonitis requiring an urgent operative intervention, previously confirmed or strongly diagnosed peritoneal carcinosis, previous obesity surgery, active diagnosed abdominal malignancy or remission of <10 years duration, and recent abdominal surgery within 30 days.<sup>[9,10]</sup> After resuscitation, patients with signs of acute intestinal obstruction were managed by appropriate surgical procedure after resuscitation. Cases and findings were recorded and photographs were taken. Surgery adopted and criteria for deciding the procedure were noted. Histopathological examination of the specimen of resection/biopsy was done whenever necessary. The post-operative period was monitored carefully and all parameters were recorded hourly basis depending on the patient's general conditions and toxemia. Routine intermittent oxygen inhalation was instituted in patients having strangulation of the bowel to reduce the damage induced by Ischemia. In this large nationwide cohort of patients with adhesive SBO, we found no benefit regarding preventive antibiotic administration in non-operative treatment; however, antibiotic administration was associated with a longer hospital stay. These results did not support routine administration of antibiotics at admission to prevent bacterial translocation.<sup>[11]</sup>

## RESULTS

In my study, total number of cases are 50 in which 40 (80%) are male and 10 (20%) are female, maximum number of patients were from age group 21–30 that is 11 (22%) and least number of patients were between 71 and 80 that is 1 (2%) of the patients [Table 1].

In my study, 50 patients were included in the study and presentation is shown in Table 2. Maximum number of patients among 50 were presented with pain in abdomen 50 (100%) followed by abdominal distention were seen in 49 (98%) patients, vomiting in 41 (82%) patients, fever in 37 (74%) patients, and only a single patient was presented with abdominal lump which was the least common finding in presentation. Resection and anastomosis were done in 16 cases, which included cases of adhesion,

**Table 1: The relation between gender-wise age distribution in case of intestinal obstruction**

Age groups	Male (n=50)	Female (n=50)	Total (n=50)	Percentage
14–20	6	3	9	18
21–30	7	4	11	22
31–40	9	-	9	18
41–50	8	2	10	20
51–60	7	-	7	14
61–70	2	1	3	6
71–80	1	-	1	2
	40	10	50	100

**Table 2: The clinical features present in the case of intestinal obstruction**

S. No.	Clinical features	No. of cases (n=50)	Percentage
1	Pain in abdomen	50	100
2	Fever	37	74
3	Vomiting	41	82
4	Groin swelling	0	0
5	Abdominal distension	49	98
6	Abdominal lump	1	1
7	Absence of bowel sound	22	44

**Table 3: Types of operations**

Types of operations	No. of patients (n=50)	Percentage
Resection and anastomosis	16	38
Release of adhesions and band	12	24
Hemicolectomy with stoma formation	15	34
Herniorrhaphy	2	4

**Table 4: Etiology of intestinal obstruction**

Etiology of intestinal obstruction	Numbers of patients (n=50)	Percentage (n=50)
Adhesions and band	12	24
Hernia	2	4
Malignancy	10	20
TB stricture	3	6
Appendicitis with obstruction	4	8
Worm infestations	1	2
Ileal stricture	9	18
Meckel's diverticulum	5	10
Small bowel gangrene	4	8

**Table 5: Following are the parameters that included in my study for pre-operative management, intra, and post-operative management<sup>[9,10]</sup>**

Parameters evaluated in pre-operative management	Parameters evaluated in Intra and post-operative management
Per abdomen findings, vitals (blood pressure, pulse, oxygen saturation, respiratory rate), hemodynamic stability, radiograph or computed tomography, vascular compromise, level of obstruction, content of nasogastric tube, and any comorbid condition (such as hypertension, diabetes, tuberculosis, and HIV)	Level of obstruction or perforation, any positive findings such as malignant mass or perforation or obstruction, viability of bowel loops, vascular compromise, resection/anastomosis and stoma formation, ventilatory support, serum albumin and protein levels, sutures used in operative procedures, bleeding, fever, wound condition, hospital stay duration, and follow-up of the patient

stricture, ileocecal growth, and volvulus of small intestine. Adhesiolysis was done in 12 cases which included post-operative adhesions, inflammatory adhesions, and constricting bands. Hemicolectomy and stoma formation

**Table 6: Age-wise incidence of intestinal obstruction in different studies**

Age group	Present study (n=50) (%)	Singh <sup>[15]</sup> (n=50) (%)	Eggelston <sup>[16]</sup> (n=50) (%)
11–20	18	10	12
21–30	22	16	12
31–40	18	18	13
41–50	20	15	13
51–60	14	10	17
61–70	6	6	13

**Table 7: Comparison of etiology of intestinal obstruction in different study**

Etiology of intestinal obstruction	Present study (n=50) (%)	Ellis and Biaraj <i>et al.</i> <sup>[19]</sup> (%)	Ramachandran <sup>[15]</sup> (%)
Adhesions and band	24	53	23
Hernia	4	26	13.6
Malignancy	20	-	9.3
TB stricture	6	-	8.6
Appendicitis with obstruction	-	-	18
Ileal stricture	-	3	2%

**Table 8: Comparison study of clinical features in different study**

Clinical features	Present study (n=50)	Kapan <sup>[20]</sup> <i>et al.</i> in 2012 (n=100)
Pain in abdomen	100	100
Fever	74	64
Vomiting	82	90
Groin swelling	0	-
Abdominal distension	98	86
Abdominal lump	1	-
Absence of bowel sound	44	-

**Table 9: Comparison study of operative procedure in different study**

Types of operations	Present study (n=50) (%)	Tiwari <i>et al.</i> <sup>[21]</sup> (n=35) (%)
Resection and anastomosis	38	45.7
Release of adhesions and bands	24	14
Hemicolectomy with stoma formation	34	11.42
Herniorrhaphy	4	-

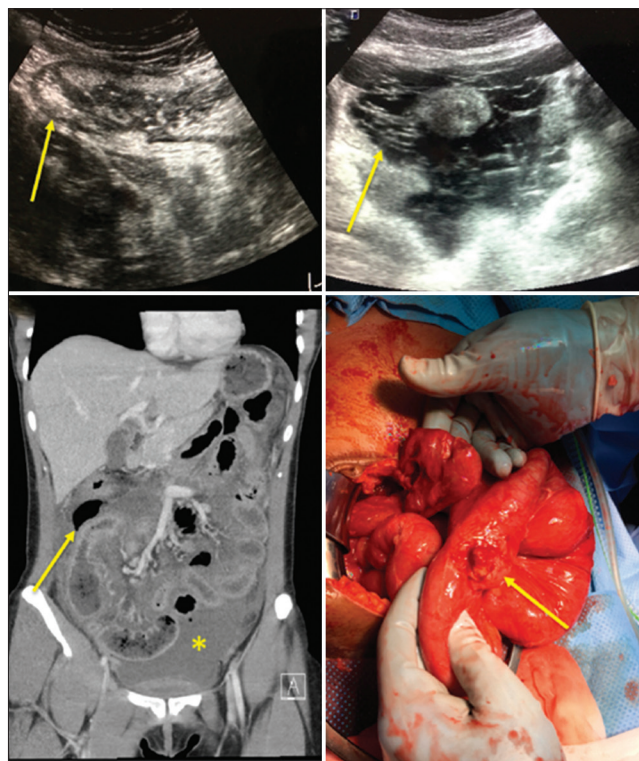
were done in 15 cases [Table 3]. In my study, patients were suffered from fever and respiratory infection after operative procedure.

Among the 50 patients, 24% of patients presenting with obstruction having adhesions with band and malignancy, 20% of patients with malignancy, 18% with stricture, 10%





**Figure 1: The meckel's diverticulum with vascular compromise of bowel loops**



**Figure 2: The intestinal tuberculosis<sup>[12]</sup>**

with Meckel's diverticulum, and only one patient present with worm infestations [Table 4].

In my study, 16 patients were operated with resection and anastomosis, 12 with release of adhesions and band, 15 with hemicolectomy with stoma formation and two with herniorrhaphy, and five patients were kept on conservative management.

Non-specific features of the abdominal tuberculosis result in difficulty in establishing a diagnosis. After a diagnosis

has been established, prompt initiation of treatment helps prevent morbidity and mortality as it is a treatable disease.<sup>[12]</sup> Some parameters that included in my study for pre-operative management, intra, and post-operative management [Table 5].

## DISCUSSION

Intestinal obstruction is a common surgical problem that surgeons face in usual emergency clinical practice. Each case of intestinal obstruction needs different approach and management. The delay in the treatment will lead to high mortality. Since the advancement in understanding the anatomy/physiology, fluid, and electrolyte management along with modern antibiotics and intensive care unit, the mortality has been decreasing consistently. Acute mesenteric ischemia (AMI) is a life-threatening condition that often presents with abdominal pain. Early diagnosis with contrast-enhanced computed tomography and revascularization can reduce the overall mortality in AMI.<sup>[13]</sup>

I have compared my study with other studies according to the criteria such as age incidence, sex incidence, etiology, and malignancy that causing intestinal obstruction. In the study, maximum intestinal obstruction still remains a common and important surgical emergency. Obstruction due to adhesions is increasing in incidence due to increased abdominal and pelvic surgeries. The obstruction due to external hernias is decreasing due to early elective surgeries.<sup>[14]</sup> Intestinal obstruction occurs in all age groups, but in this case study, maximum cases in seen in age group between 25 and 50 years.

The studies reported by Gillis JR<sup>[17]</sup> who has reported 17% of cases in the age group of 50–60 years and 60% of the cases of intestinal obstruction occur in the age group of 30–50 years. Singh *et al.*<sup>[16]</sup> and Ramachandran<sup>[15]</sup> reported that maximum number of cases occurs in the age group of 25–40 years. In the present cases reported between 25 and 50 years of age group [Table 6]. Intestinal obstruction occurs in specific age groups, according to my study, there are maximum cases seen in male than female, among previous study like Sufian S *et al.*<sup>[18]</sup> and Shakeed reported maximum cases in male and equal in male and female, respectively.

Studies reported by Ellis and Biaraj *et al.*,<sup>[19]</sup> found that the maximum cases of adhesions and band seen in intestinal obstruction and Ramachandran<sup>[15]</sup> found that cases of adhesion and band, malignancy mostly related with intestinal obstruction [Table 7].

In another study done by Halis N *et al.*<sup>20</sup> in 2012, presentation of symptoms and signs analysis shown that, patients with intestinal obstruction most commonly present with pain abdomen and abdominal distension, and most consistent signs are tenderness and increase in bowel sounds [Table 8].

The study reported by Tiwari *et al.*<sup>[21]</sup> reported operative procedures undertaken according to etiological factors such as adhesiolysis, resection and anastomosis, colostomy, internal hernia reduction, and in my present study, patients were operated like resection and anastomosis (38%), release of adhesions and band (24%), hemicolectomy with stoma formation (34%), and herniorrhaphy (4%) [Table 9]. The pre operative and intra operative findings of my patient; like adhesions in intestinal obstruction in tuberculosis and The meckel's diverticulum with vascular compromise of bowel loops showing in figures [Figures 1 and 2].

## CONCLUSION

A bowel obstruction can either be a mechanical or functional obstruction of the small or large intestines, still intestinal obstruction remains an important surgical emergency. All the patients with intestinal obstruction having fluid and electrolyte imbalance so have to be corrected and which should be life-threatening if not corrected, late presentations of the patient with complications possess a challenging problem to the surgeons for management. Early operation is mandatory to avoid the development of peritonitis and systemic sepsis associated with multi organ failure. According to my case study, surgical intervention is must in majority of the patients with intestinal obstruction.

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**How to cite this article:** Patel T, Astik H, Amin R. Pattern of Intestinal Obstruction and its Management: A Tertiary Care Hospital-based Study. *Int J Sci Stud* 2023;10(11):41-45.

**Source of Support:** Nil, **Conflicts of Interest:** None declared.