



## A Study of Surgical Management of Intestinal Obstruction

**Dr V Srikanth**

Assistant Professor, Department of General Surgery, Sri Sai Hospitals, Vijayawada, Andhra Pradesh. \* CORRESPONDING AUTHOR

**Dr J Sambasiva Rao**

Associate Professor, Department of General Surgery, Siddhartha Medical college, Vijayawada, Andhra Pradesh.

### ABSTRACT

The diagnosis and management of the patient with intestinal obstruction is one of the more challenging emergency that a general surgeon can come across. Although the mortality due to acute intestinal obstruction is decreasing but not in rural areas because of late presentation with complications. With better understanding of pathophysiology, improvement in diagnostic techniques, fluid and electrolyte correction immediately to restore volume, much potent anti-microbials and surgical management, 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 co-morbidities.

Early diagnosis of obstruction, careful selection of cases for surgery, skillful operative management, proper technique during surgery and intensive post-operative treatment yield grateful results.

#### Methods :

Number of cases – 50. After admission at NRI Hospital & Research Centre, Chinakakani, investigations and operative procedures performed were collected from the inpatients, were interpreted.

#### Results :

- Intestinal obstruction is more common in the age group of 30-60 years than in younger age group. Male and female are nearly in equal ratio.
- Small bowel obstruction is more common than large bowel obstruction.
- Four cardinal features of intestinal obstruction are pain abdomen, vomiting, distension and constipation.
- Plain X-ray abdomen in erect is most important investigation.
- Most common etiological factor is postoperative adhesions and next is hernia
- Malignant obstruction is more common in large bowel than small bowel.
- Large bowel volvulus is common than small bowel volvulus.
- Intravenous fluids and electrolytes, gastrointestinal aspiration, antibiotics and then appropriate surgery are still the mainstay of the treatment.

#### Interpretation and Conclusion :

Intestinal obstruction remains still a common and important surgical emergency. Obstruction due to adhesions increasing in incidence due to increased abdominal & pelvic surgeries. The obstruction due to external hernias decreasing due to early elective surgeries. The morbidity and mortality depends on the age of the patient, etiology of obstruction, site of obstruction, state of hydration, viability of the bowel, delay in diagnosis and surgical intervention and associated medical illness.

### KEYWORDS

Small intestine; Large intestine; Bands; Adhesions; Stricture; Malignancy; Hernia; Volvulus; Intussusception; Ultrasonography; CT scan; Colonoscopy; Serum electrolyte; Strangulated internal hernia; Mesenteric vascular occlusion

### INTRODUCTION :

Intestinal obstruction is a common surgical emergency all over the world. It 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 pre-operatively.

Though intestinal obstruction can be diagnosed easily, the underlying cause except postoperative adhesions and external hernias are difficult to be diagnosed preoperatively.

Early diagnosis of obstruction, pre-operative preparation, skillful operative Management, proper technique during surgery and intensive postoperative treatment carries a grateful result. The diagnosis and management of the patient with intestinal obstruction is one of the more challenging emergency 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-mi-

crobials 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 co-morbidities<sup>1</sup>. Most of the mortalities occurs in elderly individuals who seek late treatment and who are having associated pre-existing diseases like, diabetes mellitus, COPD and cardiac diseases.

### AIMS AND OBJECTIVES:

- To study the various causes of intestinal obstruction.
- To study the various clinical features of intestinal obstruction.
- Modalities of treatment required
- To study the various surgical procedures and its outcome in relation to etiological factors in intestinal obstruction patients.

### METHODOLOGY :

The materials for the study of surgical management of intestinal obstruction were collected from cases admitted to vari-

ous surgical wards in NRI,Chinakakani. . During the period from November 2013 to October 2015, 50 cases of intestinal obstruction have been studied with age groups ranging from 11 years to 70 years, Patients belonged to the paediatric age group or patients who were having sub acute intestinal obstruction treated conservatively are excluded from the study Cases selection was done in the criteria of history, clinical examination and radiological examination. All the cases studied subjected to surgery and the diagnosis was established.

Soon after the admission, clinical data were recorded according to the proforma. The diagnosis mainly based on clinical examination and often supported by radiological examinations.

The investigations done in the cases for study were:

**Blood**

Routine examination includes haemoglobin percentage , WBC count and differential count , ESR and blood urea , serum creatinine, serum electrolyte, blood grouping and typing.

**Urine**

Routine examinations – albumin, sugar and microscopy.

**Radiology Imaging**

Plain x-ray erect abdomen or lateral decubitus to detect fluid gas levels and ultrasound abdomen was done in all cases.CT scan abdomen done in selected cases of mass abdomen.

Immediately after the admission along with above procedure , resuscitation with IV fluids especially ringer lactate and normal saline infusion started till the hydration and urine output become normal. Nasogastric decompression with Ryles tube carried out and antibiotic prophylaxis started. And close observation of all bedside parameters like pulse rate, blood pressure, respiratory rate, abdominal girth, bowel sounds ,tenderness and guarding was looked for. Patients who showed reduction in abdominal distension and improvement in general condition especially in individuals with postoperative adhesions ,a chance of conservative management was taken for further 12 to 24 hours, those who showed improvement by moving bowels, reduction in pain/tenderness, is decided for conservative treatment. Such individuals are excluded in this study.

Patients with clear-cut signs and symptoms of acute obstruction were managed by appropriate surgical procedure after resuscitation. I attended operative procedures in majority of the 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 postoperative period was monitored carefully and all parameters were recorded hourly or four hourly basis depending upon the patients general condition and toxemia. Routine intermittent oxygen inhalation was instituted in patients having strangulation of the bowel to reduce the damage induced by ischemia.

Postoperative follow up after the discharge of patients was done in majority of the patients upto 6 months. Most of the patients did not come for follow up after one or two visits.

The results are tabulated mostly stressing on following points - age, sex, symptoms, examination findings, investigations, abnormalities, probable causative factors, operative findings and operative procedure adopted.

**RESULTS :**

The study of 50 cases of intestinal obstruction during November 2013 to OCTOBER 2015 at NRI Hospital & Research Centre, Chinakakani studied as follows:

**TABLE 1: SHOWING THE AGE AND SEX DISTRIBUTION OF THE CASES**

Age group	Male	Female	Total	Percentage
11-20	2	4	6	12%
21-30	5	2	7	14%
31-40	5	4	9	18%
41-50	6	4	10	20%
51-60	4	6	10	20%
61-70	5	3	8	16%
	27	23	50	100

**TABLE 2:PRESENTING SYMPTOMS AND SIGNS**

Sl.NO.	Clinical features	No. of Cases	Percentage
1	Pain abdomen	50	100%
2	Vomiting	43	86%
3	Distension of abdomen	50	100%
4	Constipation	30	60%
5	Dehydration	30	60%
6	Fever	7	14%
7	Tenderness over the abdomen	40	80%
8	Guarding	20	40%
9	Palpable mass	13	26%
10	Increased bowel sounds	44	88%
11	Absent bowel sounds	6	12%

**TABLE 3:ETIOLOGY OF INTESTINAL OBSTRUCTION**

Etiology of Intestinal Obstruction		Number of patients (n=50)	Percentage
1. Adhesion and band		21	42%
2. Hernia		10	20%
3. Malignancy	Adenocarcinoma of colon	4	16%
	Carcinoid tumor of small intestine	2	
	Ovarian tumor with peritoneal metastasis and adhesions between loops	1	
	Stomach carcinoma infiltrating transverse colon	1	
4. T.B stricture		07	14%
5.Volvulus		04	08%

**TABLE 4: TYPES OF OPERATION**

		pa-tients(n=50)	
A. Resection and end-to-end ileo-ileal anastomosis		17	34%

B. Release of adhesions and bands	15	30%
C. Herniorrhaphy	10	20%
D. Hemicolectomy	4	8%
E. Untwisting of volvulus	2	4%
F. Resection and end-to-end jejuno-ileal anastomosis	1	2%

**TABLE 5: POSTOPERATIVE COMPLICATIONS**

Postoperative complications	Number of patients(n=50)	Percentage
A. Wound infection	5	10%
B. Respiratory infection	4	8%
C. Enterocutaneous fistula	2	4%
D. Prolonged ileus	3	6%
E. Deaths (Septicaemia)	5	10%

**DISCUSSION :**

Intestinal obstruction continues to be a frequent emergency, which surgeons have to face (1-4% of emergency operations).

Brewer et al analysed 1000 consecutive abdominal surgeries in 1976 and reported an incidence of 2.5%<sup>18</sup>. Jain et al in 1973 reported an incidence of 3.2%<sup>19</sup>. In our hospital 1667 cases of total abdominal surgeries were done in November 2010 to October 2012, of which 50 cases were intestinal obstruction comprising about 3%. The involvement of small bowel in obstruction is much more common than that of large bowel (Sufian and Mostsumoto)<sup>8</sup>. 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<sup>2</sup>. The associated medical problems (like respiratory cardiac or metabolic diseases) and advanced age carries a considerable contribution in adding the mortality.

**Age incidence**

Though intestinal obstruction occurs in all age groups, here the youngest patient was 11 years and oldest patient was 70 years. In this study, 20% belongs to 50-60 years age group & 58% belongs to 30-60 years age group. Studies by Gill Eggleston<sup>21</sup> 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 30-60 years. Their studies almost correlate with the present study.

However, studies reported by Harban Singh<sup>9</sup> and C. S. Ramachandran<sup>10</sup> says that the maximum number of cases occur in the age group of 21-40 years, of these the etiological factors were obstructed hernia. The explanation which I would like to give in presently the etiological shift is towards adhesions and then hernia, which are decreasing from the earlier twentieth century commonest cause of intestinal obstruction due to awareness as people are seeking treatment early for hernia.

**Comparison of causes of intestinal obstruction in different studies**

Cause	Present Study	S.S. Gill and Eggleston <sup>21</sup> 1965	G.J.Cole <sup>18</sup> 1965	Playforth <sup>12</sup> 1970	C. S. Rama Chandran <sup>10</sup> 1982	Brooks and Butler <sup>13</sup> 1994	Blair et al <sup>11</sup> 1999
Adhesion	42%	15%	15%	10%	23%	23%	53%
Hernia	20%	27%	27%	35%	13.0%	25%	20%
Intussusception	-	12%	12%	12%	7.4%	18%	-
Tuberculosis	14%	3.5%	3.5%	3%	8.0%	-	-
Malignancy	16%	3.4%	3.4%	4%	6.3%	5%	-
Volvulus	8%	3.4%	25%	4%	26.6%	1%	3%
Mesenteric vascular thrombosis	-	-	-	-	-	-	26%

The most common etiological factor in the present study is adhesion which included postoperative, inflammatory and congenital bands. Postoperative adhesion occurs in 93% of cases of previous abdominal surgery, of these every third patient will behaving one of the other clinical signs and symptoms related to adhesion. Among 93% of the postoperative adhesions, 5% of the cases can develop acute intestinal obstructions, most of them will be within first year (39-60%).

In the present series 42% of the cases of obstruction are due to adhesion and bands. Among adhesion and bands 61.9% are due to post operative adhesion, 23.8% are due to inflammatory adhesions and 15.3% are due to congenital bands.

Mclver<sup>16</sup> found that 80% of adhesions and 21% are due to congenital causes, Perry et al, found that 79% were post operative adhesions, 18% inflammatory and 28% were congenital. In the inflammatory causes 42% followed acute appendicitis, 14.5% diverticulitis and other resulted from pelvic infection, Crohn's disease and Cholecystitis.

On review of the earlier Indian studies, 10% of intestinal obstruction were related to adhesion and more recent studies in 1982 reports 23%. The rise in the incidence of adhesions related obstructions are attributed to increased number of abdomino-pelvic surgeries. In the Western studies, the adhesion related obstruction range from 40-60%. Developing countries like Virginia also reported 40% of the obstructions related to adhesions.

**CONCLUSION :**

Intestinal obstruction remains still an important surgical emergency.

Late presentation of the patient with complications possesses a challenging problem to the surgeons for management.

Patients with a clinical picture of obstruction of the bowel demand vigorous correction of fluid and electrolyte, which can be severe, and life threatening.

Postoperative adhesions are the common cause to produce intestinal obstruction as abdominal and pelvic surgeries are on rise.

Clinical, radiological and operative findings put together can bring about the best and accurate diagnosis of intestinal obstruction.

Mechanical obstruction is not associated with any specific bio-chemical marker, which can help the surgeon for differentiate simple obstructions from ischemia or a closed loop obstruction with impending bowel infarction. Diagnosis of strangulation is still a challenge.

Majority of the patients intestinal obstruction needs surgical relief of obstruction

Early operation is mandatory to avoid the development of peritonitis and systemic sepsis associated with multi-system organ failure.

#### SUMMARY :

Clinical study of 50 cases of intestinal obstruction was done at NRI Medical College during November 2013 to October 2015.

Intestinal obstruction whether in small bowel or large bowel occurs nearly in equal ratio in both sexes.

Intestinal obstruction is more common in the age group of 30-60, the active period of one's life. Large bowel obstruction is more common in patients above 40 years than in younger group.

Small bowel obstruction is more common than large bowel obstruction.

Pain abdomen, vomiting, distension and constipation are the four cardinal features of intestinal obstruction, present in most of the cases. Tenderness, guarding, rigidity, rebound tenderness and shock are the cardinal features of strangulated intestinal obstruction. When the strangulation occurs in external hernia, the hernia is tense, tender, and irreducible with no expansible impulse.

Plain x-ray abdomen taken in erect posture is the single most important investigation required for the patients.

Most common etiological factor for intestinal obstruction is adhesions due to postoperative and inflammatory causes.

Hernia is second most common cause of intestinal obstruction. Hernia related obstruction were higher in early twentieth century, due to early surgical treatment for hernia the incidence is decreasing.

Intestinal tuberculosis with stricture is next common cause of intestinal obstruction.

Malignant obstruction is far more common in large bowel, than in small bowel. In large bowel, malignant obstruction is more common on the left side than the right side.

Volvulus is next common cause of intestinal obstruction. Sigmoid volvulus is the commonest in large bowel obstruction.

Rare causes of intestinal obstruction is also important like in this study we found Carcinoid tumor of the small intestine.

Intravenous fluids and electrolytes, gastrointestinal aspiration, antibiotics and then appropriate surgery are still the main stay of the treatment.

Among the factors influencing the mortality and morbidity are age, state of hydration, nutritional status, viability of the bowel, etiology of obstruction, site of obstruction, delay in diagnosis and surgical intervention and associated medical illness.

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