



## ANALYTICAL STUDY OF DIFFERENT SURGICAL MODALITIES AND THEIR OUTCOMES IN THE MANAGEMENT OF SMALL BOWEL OBSTRUCTION.

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### ABSTRACT

**Background:** Small bowel obstruction is one of the leading causes of admission in emergency department worldwide. The aim of this study is to evaluate different surgical techniques and their outcomes in the management of small bowel obstruction. **Subjects and Methods:** A retrospective study of 95 patients > 14 years of age suffering from small bowel obstruction admitted in the department of general surgery in Indira Gandhi Institute of Medical Sciences was done. The study period was April 2016 to March 2018. **Results:** Various surgical techniques were employed among which adhesiolysis (34.7%) was the commonest operation done followed by resection anastomosis (23.15%) and ileostomy creation (15.7%). The commonest fatal post-operative complication observed was pulmonary complications (9.47%) with an overall mortality rate of 10.5%. **Conclusion:** Early diagnosis and timely intervention is the cornerstone in the surgical management of small bowel obstruction. Any delay may increase morbidity and adverse outcome.

**KEYWORDS :** Small Bowel Obstruction, Emergency operation.

### Introduction

Bowel obstruction occurs when normal propulsion and passage of intestinal contents cannot occur due to any reason.[1] It represents a substantial burden on the national health care system of any country. In a study in United States it has been estimated that 1% of all hospitalisations, 3% of emergency surgical admissions to general hospitals and 4% of major celiotomies are done for bowel obstruction or procedures that require adhesiolysis.[2] Bowel obstruction can be dynamic (mechanical) where peristalsis is working against a mechanical obstruction or adynamic (functional) which results from atony of the intestine in absence of any mechanical cause. The obstruction can be simple where the blood supply is intact, strangulated where the blood supply is interrupted and closed loop where a segment of the bowel is obstructed at both proximal and distal ends. About 80% of bowel obstructions occur in small intestine; the other 10-20% occur in colon.[3] Acute mechanical obstruction is a surgical emergency. Emergency operation being defined as those types of surgeries that should be performed by necessity within 24 h of a patient's admission, or within 24 h of the development of a specific complication.[4] One of the key components in the management is early diagnosis as delay may result in bowel ischemia, necrosis and perforation. Most of the common causes of small bowel obstruction are adhesions, intestinal tuberculosis, obstructed hernias etc.

### Subjects and Methods:

Ours was a prospective study and all patients admitted with a provisional diagnosis of small bowel obstruction from April 2016 to March 2018 were included in the study.

**Exclusion criteria:** Individuals <14 years of age and terminally ill patients and patients treated conservatively were excluded from the study.

**Inclusion criteria:** Individuals >14 years and surgically treated were included in the study. Patients were followed up for 6 months from their day of operation.

All patients were subjected to thorough clinical examination,

routine blood investigations (e.g. Complete blood count, random blood sugar) and radiological investigations (e.g. Plain x-ray abdomen supine and erect, ultrasound of whole abdomen and pelvis, computerised tomography scan of whole abdomen) wherever necessary. Definitive surgical modality was chosen according to the etiology diagnosed.

### Results

**TABLE 1. showing etiological profile.**

Etiology	No. of cases	percentage
Adhesiolysis	33	34.8%
Intestinal Tuberculosis	25	26.31%
Hernia	22	23.15%
Volvulus	4	4.2%
Miscellaneous	11	11.57%

#### Miscellaneous:

Malignancy – 2(2.1%)

Round worm – 2(2.1%)

Meckel's Diverticulum – 2(2.1%)

Intra-abdominal abscess – 2(2.1%)

Mesenteric cyst – 2(2.1%)

Gall stone ileus – 1(1.05%)

**TABLE 2. Showing the operative procedures performed.**

Operations	Adhesiolysis	Intestinal Tuberculosis	Hernia	Volvulus	Miscellaneous	Total
Adhesiolysis	27	6	–	–	–	33(34.7%)
Resection anastomosis	4	3	7	4	4	22(23.1%)
Ileostomy formation	2	13	–	–	–	15(15.7%)
Reduction with Herniorrhaphy	–	–	15	–	–	15(15.7%)

Simple Enterotomy	-	-	-	-	3	3(3.1%)
Laparotomy with surgical drainage	-	-	-	-	2	2(2.1%)
Strictureplasty	-	3	-	-	-	3(3.1%)
Enucleation	-	-	-	-	2	2(2.1%)

**TABLE 3. Showing distribution of post operative complications.**

Complications	Adhesions	Intestinal Tuberculosis	Hernia	Volvulus	Miscellaneous	Total
Pulmonary complications	3	2	2	1	1	9(9.47%)
Anastomotic leak	1	2	1	-	1	5(5.2%)
Shock	1	2	1	-	1	5(5.2%)
Burst abdomen	1	2	1	-	1	5(5.2%)
Fluid + electrolyte imbalance	1	2	1	-	1	5(5.2%)

**TABLE 4. Showing post operative mortality .**

	Adhesions	Intestinal Tuberculosis	Hernia	Volvulus	Miscellaneous	Total
Mortality	3	2	3	1	1	10(10.5%)

**DISCUSSION**

It was a prospective study of the 95 patients admitted in the emergency department in Indira Gandhi Institute of Medical Sciences, Patna. Analysis of different causes of obstruction showed that adhesion (31 out of 33 had a history of previous abdominal operation) was the commonest cause of small bowel obstruction (34.8%) followed by intestinal tuberculosis (26.31%) and obstructed/strangulated hernia (23.15%). A study conducted in Western Sudan, showed obstructed/strangulated hernia to be more prevalent than adhesion, while small bowel volvulus was found to be the least prevalent by far.[5] Intestinal tuberculosis with an incidence of 26.31% was found to be an important cause of intestinal obstruction in our present study correlating with the other studies done in a developing country like India e.g. Adhikari et al – 14.17%.[6] Most common pathology was simple adhesion while stricture was found in 4 out of 16 patients. Terminal ileum and ileocecal region were predominantly involved. Hernias (obstructed/strangulated) as a cause of small bowel obstruction in the present series was about 23.15. In a different study done by other workers like Haridimos et al, and Ihedioha its incidence was 18.5% , and 18% respectively.[7,8] A study in Saudi Arabia, incidence was found to be 18.5%.[9] High incidence of strangulation in our study can be explained by the fact that most of the patients presents late for surgery when hernia becomes obstructed or strangulated. Incidence of small bowel volvulus was 4.2%. Gurleyik et al (1998) found the incidence to be 13%.[10] In miscellaneous group rare cases were included which comprised of 2 (2.1%) cases each of round worm impaction, meckel's diverticulum, intra-abdominal abscess and mesenteric cyst. One case (1.05%) was that of gall stone ileus. Incidence of malignancy was low 2.1% which was lower than studies done in western countries like Haridimos et al (13.4%) as they took large bowel tumors also into account and also incidence of malignancy here is lower than in western countries.[7]

Resection and primary end to end anastomosis was done in case of gangrenous segment of bowel due to any cause using

3.0 polyglactin suture. Where the rest of the gut was found unhealthy resection and ileostomy was done. In obstructed hernias with signs of healthy gut, simple reduction with open herniorrhaphy with 1 no. prolene suture was done. In some cases of intestinal tuberculosis where stricture was the culprit, stricturoplasty was done. In malignancy, resection and anastomosis was the operation of choice. In round worm impaction and gall stone ileus, simple enterotomy and removal of the causative agent was done. In mesenteric cyst (chylolymphatic cyst), enucleation was the operation of choice while in meckel's diverticulum, resection anastomosis was done. In intraabdominal abscess exploratory laparotomy and drainage of the abscess was operation of choice.

Depending on the clinical settings and presence of related or unrelated comorbidities, mortality rates range from up to 3% for simple obstructions to as great as 30% when there is vascular compromise or perforation of the obstructed bowel.[11] The mortality rate in the present study was 10.52%. There was no intraoperative mortality. In a study in Tenwek hospital by Philip et al mortality was 4.5%.[12] It was important to note that in most of the patients there was more than one complications like pulmonary complications (9.4%), anastomotic leak, shock, burst abdomen, fluid and electrolyte imbalance each being (5.2%). The high mortality rate could be explained by the fact that most of the patients were malnourished and had comorbidities, and they presented late leading to delay in the diagnosis ultimately presenting with strangulated bowel.

**CONCLUSION**

The surgical management of postoperative adhesions form a major share in the management of small bowel obstruction. Laparotomy as soon as possible should be done. Obstruction due to intestinal tuberculosis is common and often presents very late and most of the time requires creation of an ileostomy. It is better to create an ileostomy than to go for primary anastomosis whenever there is any doubt of viability of rest of the gut or suspicion of any pathology e.g tuberculosis. In cases where the rest of the bowel is found healthy, primary anastomosis can be done. One of the keys in management of intestinal obstruction is early diagnosis. Particularly, accurate early recognition of strangulation is crucial because if ignored it leads to bowel ischemia, necrosis and perforation which increases morbidity and mortality significantly.

Limitation of this study was lack of long term follow up and individuals < 14 years of age were not included.

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