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### Original Article

# A study of small bowel obstruction with reference to clinical presentation etiology and management.

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#### ABSTRACT

50 cases of small bowel obstruction were studied in Osmania General Hospital, Hyderabad. Clinical features age incidence, sex ratio, presentations, investigations and emergency surgical modalities of treatment were studied. The diagnosis of mechanical bowel obstruction (MBO) was based on symptoms such as abdominal pain, vomiting, abdominal distension and constipation. Majority of the patients were in the 3rd and 4th decades of life. The male and female ratios were 68% and 32% respectively. Plain x-ray abdomen and ultrasonography of abdomen are the investigations of choice. All the cases between 14-90 years were included in the study. The common causes of small bowel obstruction in this study were adhesions (42%), external hernias (16%) and small bowel volvulus (12%). Emergency exploratory laprotomy was performed in all the cases. The commonest operation performed was adhesionolysis. The mortality in this study was 12% (6 deaths) and is due to late presentation after 48 hrs.

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### 1. Introduction

Mechanical bowel obstruction (MBO) is a common emergency surgical problem, which consists 20% of all admissions to the emergency surgical departments [1]. The etiological factors of MBO may vary according to the age of the patients, and socio-economical status of the countries [2-4]

The most common cause of MBO is the obstruction due to the abdominal wall hernias in the first half of the century, while intra abdominal adhesions in the second half of the century [2, 3]. And also, the most common cause of MBO is abdominal wall hernias in developed countries, and intra abdominal adhesions in developing countries [4]. In addition, MBO can be seen more frequently due to the intra abdominal adhesions and abdominal wall hernias in young people, and due to the obstructive tumors and torsions of the bowel in elderly [5].

75% cases of small bowel obstruction are due to Intra-abdominal adhesions. Over 300,000 patients are estimated to undergo surgery annually to treat adhesion-induced small bowel obstruction in the United States.26

Despite advances in diagnosis and treatment methods, clinical evaluation, laboratory and radiological findings are not

adequate for the accurate diagnosis, resulting in high morbidity and mortality [5,9].

The clinical diagnosis of intestinal obstruction is simple but at times it can be most confusing. Intestinal obstruction may simulate many medical conditions which require no surgical intervention. Thus one has to be aware of varieties of manifestations.

Operation for intestinal obstruction range from simplest one e.g.: release of a band to more challenging e.g.: resection of bowel with end-end enteric anastomosis.

#### AIMS AND OBJECTIVES OF THE STUDY

The aim of the study is the various presentations of small bowel obstruction their etiology and their management in Osmania General Hospital

1. To analyze the common symptoms, Physical signs and various modes of presentation of small bowel obstruction at emergency surgical department.
2. To look into the anatomical site of small bowel obstruction with various etiological factors.
3. To study the methods of evaluation, management and postoperative course of these cases.

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4. To study the significance of early detection and surgical management on the outcome of patients.

To study the relative prognosis depending on the age of patient and site of bowel involvement with different pathological factors.

#### MATERIALS AND METHODS

A retrospective review was made of 50 patients admitted on emergency basis with diagnosis of mechanical bowel obstruction from October 2011- October 2013 to study the various presentations of small bowel obstruction, their etiology and management and to compare the age incidence, sex ratio, laboratory and imaging studies and different surgical modalities of treatment.

#### OBSERVATIONS, RESULTS & DATA ANALYSIS

**Table No 1: Age incidence and sex ratio.**

Age	Male	female	Total
14-20	3	1	4
20-30	6	4	10
30-40	9	6	15
>40	16	5	21

The age group 14-20years.- Commonest cause was post appendectomy and congenital bands.

In the age group 21-30 years- Commonest Cause was post op adhesions.

In age group 31 - 40, Commonest cause: adhesions, TB stricture, gynecological operation.

In age group more than 40 years-. Commonest cause: Volvulus, TB, External hernia and Adhesions.

ANALYSIS OF CLINICAL FEATURES 50 cases of small bowel obstruction admitted were analyzed.

**Table No 2: CLINICAL FEATURES**

Clinical feature	Number of cases	Percentage (%)
Abdominal pain	50	100
Vomiting	46	92
Constipation	40	80
Fever	10	20
Shock	6	12
Dehydration	16	32
Blood in stool	2	4

In all cases of small bowel obstruction, Pain abdomen was first symptom followed by vomiting, distension and constipation.

**Table No 3: Local examination findings.**

	No of patients	Incidence (%)
Distension of abdomen	39	78
Visible peristalsis	10	20
Abdomen tenderness	12	24
Increased bowel sounds	26	52
Absent bowel sounds	24	48
Blood on stool PR exam	2	4

**Table No 4: Plain x-ray abdomen findings**

x-ray finding	No of patients	Incidence (%)
Normal appearance	4	8
MAF levels	40	80
MAF with sub diaphragm air	4	8
Ground glass appearance	1	2
Intramural gas	0	0

In present series multiple air fluid levels with dilated small bowel loops on plain x-ray abdomen was the common finding followed by MAF level with sub diaphragmatic air

**Table No 5: Etiology of small bowel obstruction**

Etiology	No of patients	Incidence (%)
Adhesions (Primary / Post operative)	21	42
External hernia	8	16
Intussusceptions	4	8
Meckel's diverticulum band	2	4
Small bowel volvulus	6	12
Mesenteric vascular occlusion	2	4
TB	5	10
Malignancy	2	4

**Table No 6: Operative Procedure performed:**

Emergency exploratory laparotomy was performed in all cases with midline abdominal incision.

Operative procedures included:

1) Laparotomy and lysis of adhesions with intestinal decompression	20 cases
2) Exploratory Lap + Resection and anastomosis	10 cases
3) Exploratory Lap + Resection and EEA + repair of hernia	4cases
4) Exploratory Lap + Stricteroplasty	1case
5) Exploratory Lap and Untwisting of volvulus	6cases
6) Reduction of obstruction hernia and repair	4 cases
7) Limited resection ileum caecum with ileo ascending anastomosis	2cases
8) Rt Hemicolectomy + Ileostomy	1case
9) ileotransverse anastomosis	2 cases

**Table No 7: Postoperative Complications**

Wound infection	12 cases	24%
Fever	7 cases	14%
Paralytic ileum	10 cases	20%
Pneumonia	5 cases	10%
Shock	4 cases	8%
Anastomotic failure	3 cases	6%
Wound dehiscence	6 cases	12%
Enterocutaneous fistula	4 cases	8%
Renal failure	3 cases	6%

**PLAIN X-RAY ABDOMEN**

Figure :- 1

Figure : 2

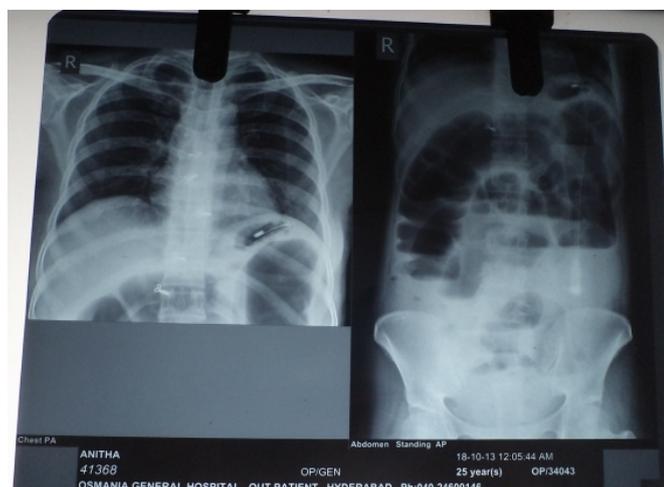


Figure: - 3



Figure :4

Figure :5



Figure :6

Figure :7



**Table No 8: Sex incidence.**

Sex incidence	Male	Female	Incidence ratio
Present OGH	34 (68%)	16 (32%)	2: 1
Leffall and Syphax	17 (23%)	57 (77%)	1: 3

In present series out of 50 cases of small bowel obstruction males outnumbered females in contrast to Leffall and Syphax series where females are more than male patients.

**Table No 9: Comparison of clinical features**

Clinical Features	% Present OGH Series	Leffall and Syphax	Shatila and Webb Series
Pain abdomen	100%	58%	96%
Vomiting	90%	35%	24%
Constipation	80%	86%	78%
Fever	20%	50%	30%
Shock	12%	29%	16%
Abdominal tenderness and Guarding	24%	30%	80%
Tachycardia	50%	70%	40%
Blood motion	4%	5%	8%
Palpable mass or irreducible hernia	16%	29%	62%

Majority of patients presented with diffuse abdominal pain followed by vomiting, distension, constipation and fever with shock. In Leffall and Syphax series pain was usually first symptom and followed by fever and shock. But Shatila and Webb Series has same incidence as present series.

In the other reports, it is reported that the obstruction secondary to small bowel disease are responsible for the 67.8 - 80% of the total obstruction cases, while large bowel causes form only part of 20 - 30% [11, 12, 15]. In the previous studies from our country, the most common etiological causes were reported as strangulated hernias (32.2 - 54%), malignancies (10.2 - 27%), and adhesions (16 - 23%), respectively [11, 12, 16, 17].

In the present study, the most regular causes were adhesions (42%), hernias (16%), and small bowel volvulus (12%),

**Table No 10: ETIOLOGY COMPARISON.**

Etiology	Present OGH Series	Leffall and Syphax	Shatila and Webb	Barnet series
Adhesion	42	60	32	43
Hernias	16	26	64	36
Volvulus	12	12	9	20
Malignancy	4	0	-	-
Intussusption stricture, TB, crohn's& Others	24	2	4	28
Total	50	74	55	150

In OGH study the causes of small bowel obstruction were adhesions (42%) hernia (16%), volvulus (12%) followed by other causes.

In Leffall and Syphax series adhesions (60%) is the most predominant cause followed by hernia. But in the shatila and Webb series hernia is most common cause of small bowel obstruction.

**Table No 11: TIME OF PRESENTATION**

Time of presentation	Present	Leffall series
< 24	30% (15)	30%
1-2 days	26% (18)	50%
2-5days	42% (21)	20%
> 5 days	2% (1)	-

Most of the cases presented after 2 days of onset of symptoms. This is in contrast with Leffall and Shatila series where 60% of patients presented with in 48hrs.

**Table No 12: FINDINGS OF PLAIN X-RAY ABDOMEN (ERECT)**

X-ray erect	Present	Leffal & Syphax series
Dilated MAFL	80%	80%
Sub diaphragmatic air with MAFL	8%	5%
Ground glass appearance	4%	4%
Intramural gas	0	3%
Normal appearance	8%	8%

In both present and Leffal and Syphax series dilated small bowel loops with multiple air fluid levels was the commonest x-ray finding in patients with small bowel obstruction.

**PREDISPOSING FACTORS**

Previous abdominal surgeries and TB were the commonest predisposing factors for intra peritoneal adhesions. Preformed congenital sac was the commonest predisposing factor for strangulated hernia. Long mesentery, adhesive bands and meckle's diverticulum was cause for small bowel volvulus.

Uncontrolled diabetes, hypertension, cardiac disease associated with mesenteric vascular insufficiency.

**Table No 13: SITE OF SMALL BOWEL ISCHEMIA**

Site	Present Series	Leffal and Syphax
Jejunum	8%	2%
Jejunum and Ileum	14%	8%
Ileum	74%	80%
Ileum and Ceacum	6%	10%

Ileum is commonest site for small bowel obstruction in present and Leffal and Syphax series.

**Table No 14: POST OPERATIVE COMPLICATIONS**

	Present series	Shatila and Webb series
Wound infection	24%	14%
Fever	14%	12%
Paralytic ileus	20%	2%
Shock	8%	4%
Anastomotic leak	6%	-
Intraperitoneal sepsis	8%	6%
Pneumonia	16%	9%
ARF	6%	13%

In the present series the most common post-operative complication was wound infection (24%), followed by paralytic ileus (20%). Pneumonia, fever, shock and anastomotic leak were the major causes of postoperative morbidity.

Shatila and Webb series showed similar post op complications as present series but post op renal failure was the most common cause of morbidity.

**Overall Morality:**

Out of 50 cases analyzed there were 6 deaths giving a mortality of 12%. The fatal cases were mostly after 48hours of duration.

**Table No 15: Mortality.**

Series	Mortality
Present series	12%
Leffal and Syphax	30%
Barnett	23%
Shatila & Webb	4%

This figures were not in conformity with series of Leffal and Syphax ,Barnett which showed a mortality 30% and 23%. In contrast Shatila and Web series showed mortality rate of only 4%. In the present series the mortality rate is 12% and is due to late presentation after 48hrs.

**CONCLUSION**

The small bowel obstruction is common surgical emergency. It affects both sexes but with slight male predominance with maximum incidence in age group between 40-60yrs.

Adhesions and hernias are the commonest predisposing cause for small bowel obstruction.

Ileum is most affected part of small bowel

Most cases presented very late

Diagnosis should be mainly based on clinical features and local examination

In more than 97% the single most useful investigation in diagnosis of small bowel obstruction is plain x-ray abdomen.

Clinically at times it is very difficult to differentiate between simple and strangulated obstruction

In Strangulated obstruction early operation is very important and delay in surgical treatment has proportionately increased morbidity and mortality rate.

Thus early operation for relief of acute obstruction should be the dictum.

Most operative procedures are decided on laparotomy.

Common operation done is adhesionolysis.

Bowel decompression after the specific operative procedure is very useful in reducing postoperative morbidity particularly pulmonary complications and wound dehiscence.

Incidence of wound infection particularly after enterotomy and bowel decompression is high. Use of pre operative antibiotics significantly reduces the infection rate.

The results of surgical treatment in acute intestinal obstruction are excellent particularly in simple or non-strangulated obstruction. Mortality in general being only 12%, simple obstruction < 5%, strangulated obstruction mortality is as high as 33%.

*Prognosis mainly depends on*

- Age of the patient
- Duration of presentation
- Site of bowel involved
- Causes of obstruction
- Procedure performed

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