

**DISSERTATION ON**  
**ANALYTICAL STUDY ON PATTERN OF INTESTINAL**  
**OBSTRUCTION**

**Dissertation submitted**  
**in partial fulfillment of the requirements for the degree of**

**MS. DEGREE- BRANCH I**  
**GENERAL SURGERY**



**STANLEY MEDICAL COLLEGE**  
**THE TAMILNADU DR.M.G.R. MEDICAL UNIVERSITY**  
**CHENNAI, TAMILNADU**

**APRIL 2017**

## **CERTIFICATE**

This is to certify that the dissertation titled "**A RETROSPECTIVE ANALYTICAL STUDY ON PATTERN OF INTESTINAL OBSTRUCTION** " is the bonafide work done by **Dr. V . KATHERESAN**, Post graduate student ( 2014 to 2017) in the Department of General Surgery, Government Stanley Medical College and Hospital, Chennai under my guidance and supervision, in partial fulfillment of the requirements of the The Tamilnadu Dr. M.G.R. Medical University, Chennai for the M.S. Degree Branch I General Surgery Examination to be held in April 2017.

**Prof.Dr.G.UTHIRAKUMAR,M.S.**  
Professor of Surgery  
Dept. of General Surgery  
Stanley Medical College  
Chennai – 600001

**Prof.Dr. D. NAGARAJAN, M.S.**  
Head of Department  
Dept. of General Surgery  
Stanley Medical College  
Chennai - 600001

**PROF.Dr.ISSAC CHRISTIAN MOSES M.D., , FICP, FACP**

The Dean  
Govt. Stanley Medical College  
Chennai - 600001

## **DECLARATION**

I, **Dr.V.KATHERESAN** solemnly declare that this dissertation titled "**A RETROSPECTIVE ANALYTICAL STUDY ON PATTERN OF INTESTINAL OBSTRUCTION**" is a bonafide work done by me in the Department of General Surgery, Government Stanley Medical College and Hospital, Chennai under the guidance and supervision of my unit chief **Prof.Dr.G.UTHIRAKUMAR M.S.**, Professor of Surgery and my head of the department **Prof.Dr.D.NAGARAJAN**. This dissertation is submitted to The Tamilnadu Dr. M.G.R. Medical University, Chennai towards partial fulfilment of the university regulations for the award of M.S. Degree (Branch-I) in General Surgery.

**Place: Chennai**

**Date :**

**Dr.V.KATHERESAN**

## **ACKNOWLEDGEMENT**

I thank **Dr.ISSAC CHRISTIAN MOSSES MD., , FICP, FACP** the Dean of Government Stanley Medical College and Hospital, Chennai, for permitting me to use all resources at his disposal for my dissertation work.

I thank **Dr.D.NAGARAJAN, MS.,** Professor and Head of the Department of Surgery, Government Stanley Medical College and Hospital, Chennai, for having given me the opportunity to conduct this study.

I would like to express my gratitude to **Dr. G. UTHIRAKUMAR, MS.,** Professor and the Unit Chief, for the initiation and guidance throughout the course of this study.

I would like to acknowledge the help rendered by **Dr.S.SHANMUGAM,MS.,** (Assistant Professor) and **Dr.R.ABRAHAM JEBA KUMAR, M.S.,** (Assistant Professor) for their help in this study.

I would like to express my gratitude to Professor **Dr.G.V.MANO HARAN, MS.,** I am also thankful to my co-post graduates **Dr.Manoj, Dr . Siva manthira raj junior pg's Dr.jyothiramalingam, ,Dr.ezhil,Dr.hemildaperiyanayaki,Dr.malairaman,Dr.prasad, Dr.sriram cristopher ,** for their help.

I would also like to extend my thanks to Medical Record department and General Surgery department.

I would also like to extend my thanks to my friend Dr.K .MADHUMITHA,my brother Dr.M.VINOTH .

I am extremely thankful to my PATIENTS who consented and participated to make this study possible.

Last but definitely not the least; I would like to thank my family, especially my caring parents,my father **Mr.K.VELLAICHAMY** my mother **Mrs.V.AMUDHA** and my sister **Ms.K.V.PRIYANKA** for their constant support and encouragement throughout this time. Their undying faith and untiring love has helped me bring forth.

# CONTENTS

CHAPTER	TITLE	PAGE NO.
1	INTRODUCTION	1
2	AIM OF STUDY	2
3	REVIEW OF LITERATURE	
	Historical Background	3
	Surgical Anatomy	4
	Definition	10
	Types of Presentation	11
	Aetiology	12
	Pathophysiology	22
	Clinical Features	29
	Diagnosis	34
	Management	41
	Recent Advances	53
4	MATERIALS AND METHODS	56
5	OBSERVATIONS	57
6	DISCUSSION	71
7	CONCLUSIONS	75
8	PROFORMA	
9	BIBLIOGRAPHY	
10	MASTER CHART	



## INTRODUCTION

Acute intestinal obstruction is an enigma with its versatile presentation and wide spectrum of management options available. It presents a constant challenge to the surgeon both in diagnosis and in judgment as regards the line of management for that specific patient, for those specific parameters and for that specific moment in the course of the disease. Intestinal obstruction is a dynamic condition where the parameters are changing as the clock ticks on. 'Time' means everything in intestinal obstruction and a delay in diagnosis or management increases the mortality. With a wide range of conditions known to cause obstruction, the surgeon should be aware of the commonest causes in the geographical region of presentation.

Keeping with these principles, this study hopes to discuss the various causes and clinical presentations, sift out the reliable signs and symptoms and the most common causes. Diagnostic modalities have reached new heights in present times, but our study focuses on using the available basic modalities to further the diagnosis. Different treatment modalities and their outcome in terms of death/morbidity have been tabulated.



## **AIM OF THE STUDY**

1. To identify the cause of acute intestinal obstruction
2. To discuss the various clinical presentation
3. To discuss the various diagnostic modalities
4. Various modalities of management of acute intestinal obstruction
5. To study the outcome of patients with acute intestinal obstruction

# REVIEW OF LITERATURE

## **HISTORICAL HIGHLIGHTS AND PIONEERS IN TREATMENT 1.**

### **HIPPOCRATES and CELSUS: (500 BC)**

Hippocrates the father of medicine, and Celsus the most distinguished medical authors followed the pattern of egyption treatment which was the administration of purgatives and enemata for consecutive days once in a month to clear the bowels and as a prophylactive measure.

### **2. AMBROISE PARE (1510-1590)**

A French physician who identified bowel obstruction for the first time and had reported a patient who died of twisted bowel.

### **3. HEISTER (172)**

Described a successful resection of strangulated intestine with diversion of faecal stream.

#### **4. PILLARE (1776)**

He successfully made a caecostomy for a case of carcinoma rectum.

#### **5. PAUL AND BLACK (1846 & 1892)**

Proved that the exteriorisation of the colon is preparable to a major surgical procedure like primary anastomosis.

#### **6. PAUL AND MICKULICKZ (1908)**

Advocated the procedure of exteriorisation.

#### **7. HENRI HARTMANN (1921)**

He described the Hartmann procedure. It is an alternative procedure for recto sigmoid growth; it involves resection of the sigmoid colon with proximal diversion and over sewing of the distal stump.

#### **8. MUIR (1968)**

On table colonic lavage can be used to prepare the bowel intra operatively for a primary anastomosis. This technique was first described by him.

## **SURGICAL ANATOMY**

The intestine which is the longest part of the digestive tube, is divided into the longer less distensible small intestine and shorter more distensible large intestine.

### **Small intestine**

The small intestine extends from pylorus to the Ileocaecal junction. It is about 6 meters long.

The upper fixed part is the duodenum. The lower mobile part of the intestine is the Jejunum and Ileum.

### **Duodenum:**

Duodenum is 25 cm long. It is divided into four parts:

1. First or superior part – 5 cms
2. Second or descending part – 7.5 cms
3. Third or horizontal part – 10 cms
4. Fourth or ascending part – 2.5 cms.

The Duodenum is mostly retroperitoneal.

### **Jejunum and Ileum**

The Jejunum and Ileum are suspended from the posterior abdominal wall by the mesentry and therefore enjoy considerable mobility.

The Jejunum begins at the duodenojejunal flexure. The Ileum terminates at the Ileo caecal junction.

### **Large Intestine**

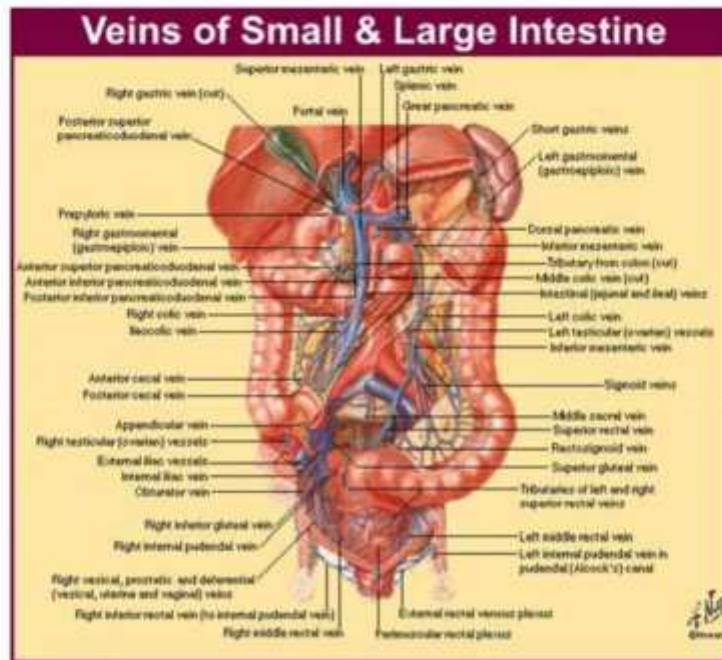
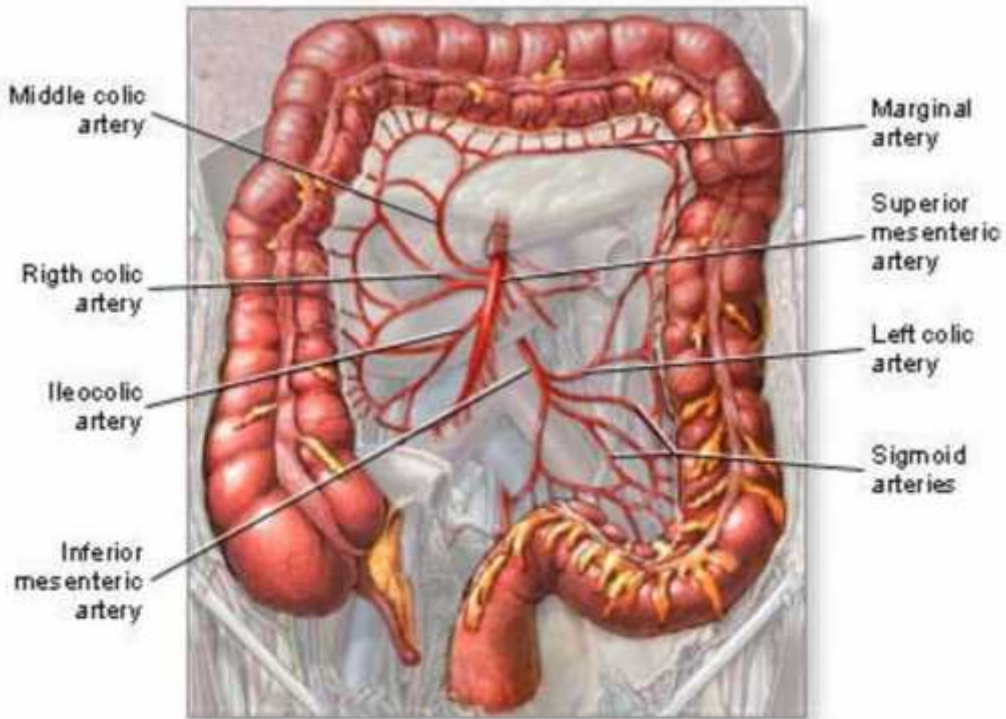
The large intestine extends from the Ileocaecal junction to the anus. It is about 135 cms – 150 cms long. (8)

It is divided into

- |                     |   |          |
|---------------------|---|----------|
| 1. Caecum           | - | 6 cms    |
| 2. Ascending colon  | - | 12.5 cms |
| 3. Transverse colon | - | 50 cms   |
| 4. Descending colon | - | 25 cms   |
| 5. Sigmoid solon    | - | 37.5 cms |
| 6. Rectum           | - | 12 cms   |
| 7. Anal canal       | - | 4 cms    |

In the angle between caecum and the terminal part of ileum there is a narrow diverticulum called vermiform appendix.

## LARGE INTESTINE BLOOD SUPPLY



The greater part of large intestine is fixed except for the appendix, transverse colon and sigmoid colon.

## **ARTERIAL SUPPLY**

Duodenum – Up to the level of the Bile duct opening the duodenum is supplied by the superior pancreatico duodenal artery and below it by the inferior pancreatico duodenal artery.

Ileum & Jejunum - Supplied by superior mesentric artery.

- ③ The caecum, Ascending colon, right two thirds of the transverse colon are supplied by superior mesentric artery
- ③ The Left one third of transverse colon, descending colon upto upper one third of rectum are supplied by the inferior mesenteric artery.
- ③ The middle rectal artery from anterior division of internal Iliac artery supplies the lower part of the rectum.
- ③ The part of the anal canal above the pectinate line is supplied by the superior rectal artery.
- ③ The part below the pectinate line is supplied by inferior rectal artery.

## **VENOUS DRAINAGE**

The venous drainage of duodenum is into the splenic, superior mesenteric and portal veins.

The Jejunum and ileum are drained by the superior mesenteric vein.

The caecum, Ascending colon, right two third of transverse colon are drained by the superior mesenteric vein.

The left one third of transverse colon, descending colon, sigmoid colon, and upper one third of rectum are drained by the inferior mesenteric vein.

The lower two third of the rectum is drained by the internal Iliac vein.

The Anal canal is drained by the superior and inferior rectal vein.

### **LYMPHATIC DRAINAGE OF SMALL INTESTINE**

Most of the Lymph vessels from the duodenum end in the pancreatico duodenal nodes. From here the Lymph passes partly to the hepatic nodes, and then to the coeliac nodes and partly to superior mesenteric nodes.

Lymph from Ileum and jejunum drains into numerous lymph nodes present in the mesentry, and along the superior mesenteric artery.

### **LYMPHATIC DRAINAGE OF LARGE INTESTINE**

The nodes are arranged on a plan common to all parts of the large and small intestine.

They are numerous and arranged in three groups.

(a) proximal



(b) intermediate

(c) distal

### **Proximal nodes**

These nodes are situated on the main blood vessels to the gut, (i.e) superior mesenteric, Ileocolic, right colic, left colic, middle colic, inferior mesenteric, superior rectal, sigmoid.

### **The Intermediate Nodes**

The intermediate nodes are situated along the larger branches of the above named vessels.

### **The Distal Nodes**

The distal nodes are situated near the gut between the numerous small vessels entering the gut.

## **ACUTE INTESTINAL OBSTRUCTION**

### **DEFINITION**

Impairment to the aboral passage of intestinal contents may result from either a mechanical obstruction or the failure of normal intestinal motility in the absence of an obstructing lesion (Ileus).

## **TYPES OF PRESENTATION:**

### A. Depending on onset:

Acute

Acute on Chronic

Sub acute

Chronic

### B. According to the degree of obstruction

Partial

Complete

### C. According to the absence or presence of Intestinal ischemia

Simple

Strangulated

### D. Depending on Site of obstruction:

Small bowel

Colonic

E. According to the Level of obstruction:

High small bowel obstruction

Low small bowel obstruction

LargeS bowel obstruction.

F. Depending on blockade at both ends of an intestinal loop

Open loop obstruction

Closed loop obstruction.

G. Depending on the cause

③ Dynamic

③ Adynamic

Peristalsis may be absent-eg: paralytic Ileus

Non Propulsive form of obstruction –

eg: mesenteric vascular occlusion (1)

## **AETIOLOGY:**

Mechanical small bowel obstruction is responsible for most cases that need surgical intervention. The causes of bowel obstruction can be

conveniently divided into intrinsic, extrinsic and intraluminal lesions.

## **CAUSES OF SMALL BOWEL OBSTRUCTION**

### 1. Intrinsic Bowel lesions:

#### Congenital

1. Atresia
2. Stenosis
3. Malrotation
4. Meckel's diverticulum

#### Inflammatory:

#### Tuberculosis

1. Infections – e.g:
2. Crohn's disease
3. Ischemia
4. Radiation Injury C.

#### Traumatic:

.Neoplastic:

1. Primary Neoplasms

2. Metastatic Neoplasms

3. Peutz Jeghers syndrome E.

Miscellaneous:

1. Intussusception

2. **Extrinsic Bowel Lesions:** A. Congenital bands

B. Adhesions

C. Hernias

D. Volvulus

E. Carcinomatosis

F. Abscess

3. **Intraluminal:**

A. Gallstone ileus

B. Enterolith

- C. Bezoar
- D. Swallowed foreign body
- E. Balloons of intestinal tubes
- F. Parasites e.g: Ascaris

## **CAUSES OF MECHANICAL LARGE BOWEL OBSTRUCTION**

### **I. Within the lumen: Faecal Impaction**

Inspissated barium

Gall stone

Foreign body

### **II. Within the wall:**

- i. Tumours especially carcinoma
- ii. Inflammation
  - i. Diverticulitis
  - ii. Crohn's disease
  - iii. Tuberculosis

- iii. Congenital causes
  - i. Adult Hirschsprung's disease
- iv. Ischaemia
- v. Radiation
- vi. Miscellaneous - Intussusception

### **III. Outside the wall:**

Bands and adhesions

External hernias

Internal hernias

Volvulus

Tumours in adjacent organs or lymph nodes.

Most common causes of small bowel obstruction are hernias, post operative intra abdominal adhesions and neoplasm.

#### **1. HERNIAS:**

Inguinal, Femoral and ventral hernias and less frequently internal hernias are one of the common causes of Acute Intestinal obstruction in our country.

**Relative Frequency of Specific types of Hernias Associated with small Intestinal obstruction in 4 series.**

<b>Types</b>	<b>STEWARDSON N= 57</b>	<b>MUCHA N= 47</b>	<b>MCENTEE N= 59</b>	<b>GREENE N= 106</b>
Inguinal	54%	26%	46%	54%
Femoral	14%	9%	37%	24%
Incisional	14%	21%	10%	7%
Umbilical	16%	8%	3%	9%
Internal	---	34%	---	4%

Mucha reported that strangulated obstruction occurred in one third of the cases due to hernias whereas only 8% of patients with adhesive obstruction had strangulated bowel.

Brolin and colleagues found that each of the 22 cases of intestinal obstruction due to hernias was complete, whereas only 38% of patients with obstruction due to intra abdominal adhesions was complete. (23)

The obliquity of the inguinal canal and the higher frequency of occurrence makes inguinal hernia the most frequent variety associated with small bowel obstruction. The rigid fascial defect through which the herniated intestine must protrude makes hernias a particularly common cause of strangulation.

The occurrence of Small bowel obstruction in a patient without prior laparotomy should suggest a hernia as the cause. If no hernia is discovered on physical examination, internal hernias such as paraduodenal and obturator hernias must also be considered.



Retro anastomotic and parastomal hernias are also important causes of intestinal obstruction in patients who have had operative procedures in which mesenteric defects may be present.

## 2 ADHESIONS

The most common etiology of small bowel obstruction is intra abdominal adhesions following laparotomy, accounting for about 66% to 75% of cases. (23)

### **Causes of intra peritoneal adhesions:**

- a Ischemic areas
- b Infections
- c Presence of Foreign bodies
- d Inflammatory disease
- e Radiation enteritis

Lower abdominal or pelvic procedures have a higher risk of post operative adhesive obstruction than do upper abdominal procedures.

### 3 NEOPLASMS:

In contrast to colonic obstruction, neoplasms are a relatively unusual cause of small bowel obstruction, accounting for about 10% of cases. Most commonly, the small intestine is obstructed by extrinsic compression or local invasion by advanced gastrointestinal (Pancreatic, colonic, gastric) or gynaecological (ovarian) malignancies. This mechanism accounted for 92% of neoplastic small bowel obstruction in a Mayo Clinic series. (23)

Hematogenous metastases from breast adenocarcinoma and melanoma may also involve the intestine with subsequent obstruction.

Primary neoplasms of the small intestine are the cause of obstruction in less than 3% of cases. Carcinoid tumors and adenocarcinoma have been variably reported as the most common malignancy of the small intestine. Adenocarcinoma of small intestine arises more frequently in the duodenum and jejunum than in ileum. (23)

## **SIGMOID VOLVULUS**

It is the commonest cause of large bowel obstruction in indigenous black Africans. The predisposing causes are long pelvic mesocolon, narrow attachment of pelvic mesocolon, overloaded pelvic colon, band of adhesions (peridiverticulitis), high residue diet and chronic constipation. Rotation nearly always occurs in an anticlockwise direction. The symptoms are of large bowel obstruction which may initially be intermittent, followed by the passage of large quantities of flatus and faeces. Constipation is absolute. Abdominal distension is an early and progressive sign. Vomiting occurs late. The classic appearance is of a dilated loop of bowel running diagonally across the abdomen from right to left with two fluid levels seen, one within each loop of bowel.

## **4. CROHN'S DISEASE**

In Crohn's disease, bowel obstruction usually occurs under two different conditions.

1. In the acute exacerbation of the disease, the bowel obstruction is the result of a reversible inflammatory process within the bowel wall that causes a narrowing of the intestinal lumen.

2. Small bowel obstruction may also be the result of a chronic stricture.

## **5. RADIATION ENTERITIS (ENTEROPATHY)**

Radiation injury to the bowel is a result of obliterative vasculitis and fibrosis consequent to radiation therapy. This progressive obliterative endarteritis is a dynamic, relentless process that may lead to a chronic recurrent low grade obstruction of the small intestine or cicatrization and bleeding in the colon and the rectum.

## **6. INTUSSUSCEPTION IN ADULTS**

One segment of intestine (the intussusceptum) telescopes within an adjacent segment (the intussusciens), resulting in obstruction and possibly ischemic injury to the intussuscepting segment. In most adult patients (up to 93%) there is an underlying pathologic process, most commonly a tumor (benign in 52% and malignant in 48%). Congenital lesions (e.g: meckel's diverticulum or small bowel duplications) or other localized abnormalities of the intestinal tract compose the remainder. Primary Idiopathic Intussusception accounts for only a small percentage of all instances in adults. (22)

## **7. OGILVIE'S SYNDROME (ACUTE COLONIC PSEUDO OBSTRUCTION)**

This is a common and potentially dangerous condition. It presents with signs and symptoms and radiological appearances of large bowel obstruction but without any apparent mechanical cause. If left untreated, it can lead to ischemic necrosis and colonic perforation. The pathogenesis of this syndrome is unknown, but current

evidence points towards an autonomic imbalance caused by Parasympathetic suppression. Motility enhancing drugs such as erythromycin have been effective in treating this condition. There are various reports of the success of neostigmine in achieving decompression.

## **PATHOPHYSIOLOGY**

### **Absorption and Secretion**

Intestinal obstruction has marked effects on intestinal absorption and secretion. In mechanical obstruction, intestinal fluid accumulates as the intestine distends, causing a major disruption in the orderly balance of secretion and reabsorption. In early intestinal obstruction (before 12 hrs) water and electrolytes accumulate in the lumen because of a decrease in absorption with little effect on intestinal secretion.

After 24 hrs intraluminal water and electrolytes accumulate more rapidly secondary to a further decrease in absorption with a commensurate increase in intestinal secretion.

If obstruction persists, the proximal intestine dilates, absorption decreases, secretion increases, and net effect is intraluminal fluid accumulation.

Intraluminal fluid sequestration initiates an inflammatory cascade by attracting and activating neutrophils. The subsequent release of oxygen, free radicals and oedema promoting peroxidation products, such as leukotriene B4 and interleukin-1 exacerbates the plasma extravasation and transudation, resulting in a net fluid secretion into the obstructed bowel.

### **Blood Flow**

When mechanical obstruction persists, intestinal distension increases, and intraluminal pressures increase, the effect on intestinal blood flow then becomes important, especially considering its association with strangulation obstruction.

Intestinal blood flow is related inversely to intraluminal pressures. When the intraluminal pressure is increased to 30 mm Hg, capillary streaming was interrupted; by 60 mm Hg, blood flow was interrupted in some vessels. (22)

As the obstruction persists other changes ensue. Reduced mucosal blood flow during small bowel obstruction leads to relative ischemia and hypoxia to villous tips. During this period, oxygen derived free radicals and their derivatives appear to play an essential role in the changes that follow the early phase.

### **Bacteriology**

Normally mucosa of the gastrointestinal tract maintains a barrier to prevent resident bacteria that normally exist within the gut lumen from entering the systemic circulation. Under certain conditions, this immunologic gut barrier may break down. So indigenous bacteria colonizing the gastrointestinal tract can cross the mucosal epithelium (translocation) to infect mesenteric lymph nodes and even systemic organs.

Therefore with established mechanical small bowel obstruction, pre operative antibiotic prophylaxis is indicated and peritoneal soiling by spillage of small intestinal content must be avoided.

### **Systemic pathophysiologic effects of intestinal obstruction**

Systemic response to intestinal obstruction involves an initial isotonic contraction dehydration secondary not only to the intestinal and peritoneal sequestration of extracellular fluid but also to the associated vomiting.

Hypokalemia is secondary to the persistent vomiting, intestinal secretion, and an increase in serum aldosterone concentration that occur in response to the hypovolemia. Cardiovascular effects manifest as tachycardia and relative hypotension secondary to hypovolemia.

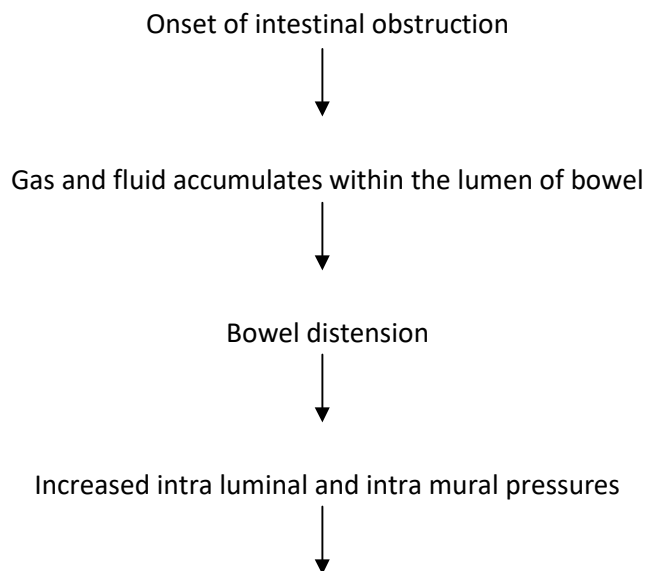
Respiratory compromise may occur with severe abdominal distension or secondary to aspiration of vomitus. Intestinal infarction may precipitate a metabolic acidosis and sepsis with associated vascular collapse. **Causes of bowel distension**

A. Gas : Originates from swallowed air produced within the intestine

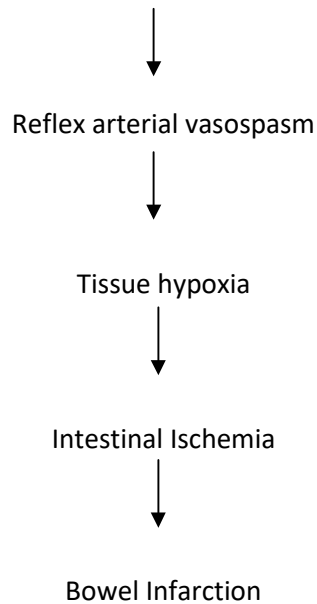
B. Fluid : This consists of swallowed liquids and gastro intestinal tract secretions.

#### **PATHOPHYSIOLOGY OF STRANGULATED BOWEL**

#### OBSTRUCTION



Venous obstruction result in vascular engorgement, oedema and local venous hypertension



The viability of the bowel is threatened by vascular compromise by

1. external compression (hernial orifices, adhesion, bands)
2. Interruption of the mesenteric flow (Volvulus, intussusception)
3. Primary obstruction of the intestinal circulation (mesenteric infarction)

Except in the case of mesenteric infarction, the venous return is affected before the arterial supply. The sudden increase in capillary pressure results in escape of intravascular fluid and diapedesis of red blood cells into the bowel wall, its lumen and the peritoneal cavity. The bowel wall becomes oedematous and haemorrhagic. The peritoneal exudates becomes blood stained. As the arterial supply becomes jeopardized haemorrhagic infarction sets in. The mortality depends on the age and the extent of infarction and any delay in institution of appropriate treatment.



## PARALYTIC OR ADYNAMIC ILEUS

Ileus refers to the failure of aboral passage of intestinal contents in the absence of mechanical obstruction.

### Causes:

1. Laparotomy

2. Electrolyte derangements:

e.g: Hypokalemia, Hyponatremia, Hypomagnesemia

3. Drugs:

Narcotics, Phenothiazines, Diltiazem, Anticholinergic agents

4. Intra abdominal inflammation:

Appendicitis, Diverticulitis, Perforated duodenal ulcer

5. Retroperitoneal inflammation or haemorrhage

Lumbar compression fracture, Acute Pancreatitis, Pyelonephritis 6.

Intestinal ischemia

Mesenteric arterial embolus (or) thrombosis, Mesenteric venous thrombosis,

Chronic mesenteric Ischemia

7. Thoracic diseases

Lower rib fractures, Lower lobe pneumonia, Myocardial infarction

## 8. Systemic Sepsis

Post operative Ileus is thought to result from the loss of normal coordination of intestinal contraction by the intrinsic electrical activity of the bowel. (23)

### **CLINICAL FEATURES**

The hallmark of intestinal obstruction is abdominal pain, vomiting, obstipation and abdominal distension.

The magnitude of symptoms depends on the degree of obstruction (i.e) complete or partial and the site and duration of obstruction.

**BOWEL OBSTRUCTION: CLINICAL PRESENTATION AND RADIOLOGICAL FINDINGS**

	<b>Features</b>	<b>High small bowel obstruction</b>	<b>Low small bowel obstruction</b>	<b>Large bowel obstruction</b>
1	Onset of symptoms	Sudden	Gradual	Insidious
2	Characteristics of pain	Epigastric, intense, colicky often relieved by vomiting, occasionally continuous	Periumbilical colic	Central or lower abdominal colic, possibly associated with generalised discomfort
3	Vomiting	Large volumes, bilious, frequent	Low volume and frequency; progressively faeculent with time	Intermittent, not frequent, faeculent
4	Tenderness	Epigastric or periumbilical usually mild unless strangulation is present	Diffuse and progressive	Diffuse
5	Distension	Absent	Diffuse and progressive	Diffuse
6	Obstipation	May or may not be present	Mild or moderate	Complete
7	Radiologic Findings	Abdomen may appear gasless or show distended proximal small bowel	Gaseous distension of small bowel, fluid levels on erect film	Gaseous distension of large bowel proximal to obstruction, small bowel may also show distension



## **CLINICAL PRESENTATION**

### **1. Abdominal pain:**

Pain is episodic, crampy and poorly localised. Simple obstruction provokes paroxysms of sharp pain, alternating with pain free intervals. If colicky pain becomes constant, strangulation or perforation may have developed. Unremitting pain, out of proportion to the physical findings is typical of mesenteric vascular ischemia.

### **2. Vomiting:**

Vomiting occurs early in high small bowel obstruction but may be absent or develop late in distal small bowel obstruction or colonic obstruction.

At first, the vomitus may contain altered food but later it becomes bile stained. Finally when the obstruction becomes complete and the dilated obstructed intestine allows bacteria to proliferate in the stagnant intestinal lumen the vomitus turns faeculent and foul smelling indicating late established intestinal obstruction.

### **3. Obstipation:**

Obstipation is a late feature. The failure to pass flatus or faeces, occurs after the bowel distal to the obstructed segment empties. Partial bowel obstruction often permits passage of small bouts of gas and faeces.

### **4. Abdominal distension:**

It is usually delayed with obstruction of the most proximal small bowel. Gross distension is obvious in sigmoid volvulus, Hirschprung's disease and low small bowel obstructions and caecal neoplasms.

## PHYSICAL EXAMINATION

1. Patients usually appear ill.
2. Signs of dehydration – sunken eyes, dry mucous membranes, loss of skin turgor, tachycardia and hypotension
3. Fever – suggests the possibility of strangulation or peritonitis.
4. Abdomen is usually distended.
5. Visible intestinal peristalsis, (or) colonic peristalsis are sometimes visible through the abdominal wall of these patients.
6. Surgical scars should be noted. Because of the etiologic implication of previous operations for e.g: the presence of adhesions, cancer or Crohn's disease.
7. Palpation of the abdomen in simple obstruction may reveal minimal tenderness.
8. Muscle guarding may be elicited during attacks of colic.
9. Marked tenderness, peritoneal signs, or a palpable mass suggests a closed loop obstruction or strangulation.
10. Per rectal examination – may reveal blood, a mass, or a Blummer shelf nodule.
11. Per Vaginal examination – might yield evidence of gynaecologic malignancy or an inflammatory lesion.
12. Auscultation:

- ③ High pitched tinkling bowel sounds (Borborygmi) heard in early obstruction.
  
- ③ Progressive distention in a late phase of obstruction inhibits the smooth muscle contraction, peristalsis ceases, and the abdomen becomes relatively quiet.
  
- ③ Strangulation and peritonitis are marked by a silent abdomen

13. In case of adynamic ileus, the abdomen is often distended, bowel sounds are scattered without peristaltic rushes and pain and tenderness are usually minimal. (4)

## **DIAGNOSIS**

### **Laboratory Test**

The diagnosis of bowel obstruction is not dependent on any set of laboratory findings. More over, blood tests are not helpful in differentiating simple from strangulated obstruction.

Leukocytosis of greater than 18,000 cells / cmm is suggestive but not confirmatory of strangulation which can also present with leucopenia.

Metabolic acidosis, amylase activity, serum phosphate level, creatine kinase, lactate dehydrogenase activity, liver enzyme activity and hematocrit are unreliable predictors of strangulation.

Elevated serum amylase activity may be due to

1. A reflux of pancreatic amylase resulting from back pressure from the duodenum.
  
2. Leakage of intraluminal amylase into the peritoneum with subsequent absorption.
  
3. Release of intestinal amylase from compromised bowel.

The presence of a significant metabolic acidosis is an ominous sign, yet its sensitivity as an indicator of strangulation is only 75%. Some patients with dead or dying bowel have no base deficit.

(4)

Creatine kinase determination may be somewhat useful, as it is elevated in 71% of patients with strangulated bowel. (4)

Initial fluid shift results in contraction of the extracellular fluid with antidiuresis, renal reabsorption of sodium, a rising blood urea nitrogen level and an increased urine specific gravity.

With progressive obstruction and vomiting patients tend to develop hyponatraemia, hypokalemia, metabolic acidosis, hypochloremia and uremia.(4)

## **RADIOGRAPHIC CONFIGURATIONS**

Usually the diagnosis of bowel obstruction is first suggested by the history and the physical examination. However, radiologic investigations are invaluable, not only in confirming or refuting the diagnosis, but also in determining if the obstruction is high or low, is partial or complete and involves small bowel or large bowel.

### **Plain Films**

On plain supine and upright radiographs of the abdomen, the cardinal findings that suggest the diagnosis of small bowel obstruction reflect the

1. Accumulation of air and fluid proximal to the point of obstruction.
2. Clearance or absence of fluid and air distal to the obstruction.
3. Dilated loops of small intestine.



Dilated loops of small intestine are defined as those larger than 3 cms in diameter. The proximal colon is considered dilated when the diameter reaches 8 to 10 cms and sigmoid colon 4 to 5 cms. (4)

The extent of intestinal dilatation is a function not only of the site of obstruction but also of the degree and duration of obstruction. Abdominal radiographs fail to show any abnormal findings in as many as 20% of patients with proximal intestinal obstruction, especially if the patient has recently vomited and emptied the stomach. (4)

Different parts of the bowel have characteristic features as follows:

Jejunum	-	Valvulae conniventes are seen Concertina / ladder effect
Ileum	-	Featureless (wangensteen)
Caecum	-	Rounded gas shadow in right iliac fossa
Large bowel	-	Haustral folds
Sigmoid volvulus	-	Bent inner tube appearance / coffee bean appearance

Small bowel pattern occupies the more central portions of the abdomen whereas the colonic shadow is on the periphery of the abdominal film or in the pelvis.

The plain radiograph may show air in the biliary tree (Pneumobilia) indicative of a biliary enteric fistula. When small bowel obstruction coexists this spectrum of findings is almost pathognomonic of gallstone Ileus.

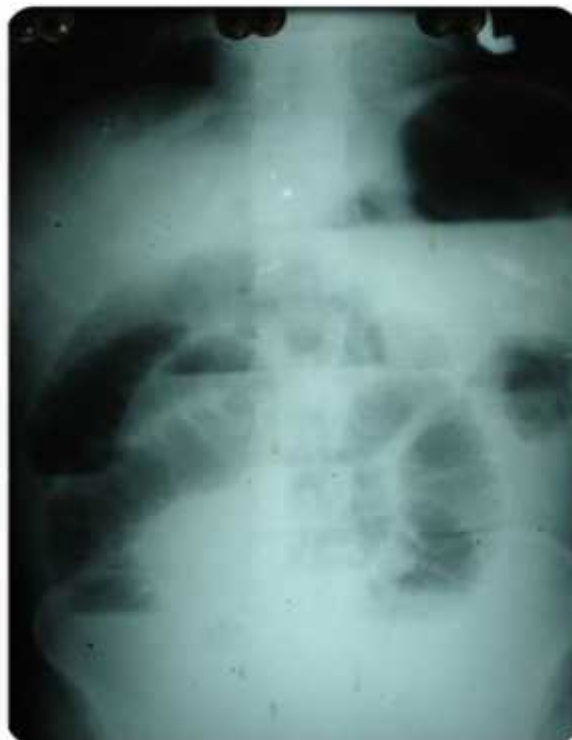
Signs of strangulation are

- (i) A fixed loop of bowel that remains stationary in sequential films.
- (ii) Pseudotumour sign: a fluid filled gangrenous loop appearing as a soft tissue mass.
- (iii) Pneumatosis Intestinalis.

**SIGMOID VOLVULUS**



**DILATED BOWEL LOOPS**



## **CONTRAST STUDIES**

Contrast studies of the gastro intestinal tract either from above, as with small bowel follow through or enteroclysis or from below with contrast enemas may be helpful.

These studies can provide specific localisation of the point of obstruction and may identify the nature of the underlying lesion. It can be useful in differentiating mechanical obstruction from adynamic ileus.

The most definitive studies are obtained by infusing barium through a tube in the distal duodenum, a procedure known as enteroclysis.

Barium is reported to cause impaction but does not occur in small bowel obstruction though it can convert obstruction in the colon. Barium provides better resolution and causes less cramping and vomiting. Water soluble contrast (gastrograffin) is used in case of perforation. It is hyperosmolar and inadvertent aspiration can be lethal.

Contrast enemas provide important information in large bowel obstruction where the exact site and cause of obstruction is unclear. Contrast enema performed under carefully controlled conditions (dilute barium, hydrostatic pressures of less than 80 mm Hg) may aid in planning therapy. Another situation in which a contrast enema is of potential benefit is very distal small bowel obstruction.

**MULTIPLE AIR FLUID LEVELS**



**ENTEROCLYSIS**



## **COMPUTED TOMOGRAPHY**

80-90% Sensitive

70-90% Specific

### 1. Finding of small bowel obstruction:

Discrete transition zone with dilatation of bowel proximally, decompression of bowel distally, intraluminal contrast that does not pass beyond the transition zone and a colon containing little gas or fluid.

2. Closed loop obstruction is suggested by the presence of a 'U' shaped or 'C' shaped dilated bowel loop associated with a radial distribution of mesenteric vessels converging towards a torsion point.

(22)

3. Bowel wall thickening, pneumatosis intestinales, inflammatory changes and haemorrhage in the mesentry and poor uptake of intra venous contrast into the wall of the affected bowel in cases of strangulation.

4. In-case of cancer, it is useful for staging the disease.

## **ULTRASONOGRAPHY**

Abdominal ultrasound has also been proposed as an aid in the diagnosis of obstruction of the small bowel and may identify both its location and etiology. Ultrasound can delineate extra luminal masses involved with areas of intestinal dilation, more over real time ultrasonography examining blood flow can aid in the diagnosis of strangulation obstruction, where its accuracy may be as high as 90%. (22)

## **SPECIAL PROCEDURES**

### **1. ENDOSCOPY:**

Can reveal obstructing lesions at both proximal and distal ends of the alimentary tract, but despite recent advances, enteroscopy is less efficient in the mesenteric small intestine.

### **2. PARACENTESIS:**

Paracentesis and assay of peritoneal fluid may be of value when the clinical picture is confusing. A finding of white blood cells or bacteria indicates strangulation and would support immediate laparotomy.

### **3. LAPAROSCOPY:**

Laparoscopy can differentiate simple from strangulated obstruction and can occasionally be therapeutic as well. When constricting adhesions are accessible and not too dense, laparoscopic lysis may be feasible.

Recent trends suggest that scanning techniques can be useful in detecting strangulation. In rabbits and dogs, radionuclide scanning with technetium diphosphonate showed increased uptake of Isotopes by the Ischemic bowel. Xenon – 133 also has been used to detect early strangulation induced in experimental animals. When instilled intraperitoneally, <sup>133</sup>Xe rapidly disappears from normal animals but there is a significant delay in strangulated obstruction. (4)

## **MANAGEMENT**

The fundamental principles involved in managing patients with obstruction are

1. Resuscitation by correction of hemodynamic and electrolyte imbalance.
2. Decompression of the gastro intestinal tract.
3. Timely surgical intervention.

All patients with suspected strangulation require emergency laparotomy: some patients with simple obstruction may, in certain circumstances be handled conservatively.

**(i) Fluid and electrolyte repletion:**

Fluid and electrolyte deficits should be rapidly restored in all patients, however when strangulation is suspected surgical intervention should not be delayed while awaiting complete normalisation. Surgical repair of the injury is resuscitating in itself. Fluids are lost not only externally but also by third space sequestration. The magnitude of these losses cannot be directly measured, and therefore, the adequacy of replacement must be assessed by clinical signs, assisted by central line monitoring, pulse rate, blood pressure and urine output.

In the elderly and in patients suspected of harbouring gangrenous bowel, a Swan Ganz catheter is essential to record pulmonary capillary wedge pressure, cardiac output, and mixed venous oxygen saturation. Changes in blood composition take much longer to correct than do volume losses. Profound hypokalaemia, may require up to 24 hours to reverse.

Serum electrolyte and acid base determinations help guide the choice of fluids to be administered. If gastric acid loss predominates, normal saline is used, but for most bowel obstructions, lactated Ringer's solution is more appropriate.

Intra vascular volume is restored with crystalloid solutions, the hematocrit can be expected to drop with strangulation. A significant amount of blood may be lost into the bowel and peritoneal cavity and this should be replaced by packed cell transfusion as needed.



**(ii) Intubation:**

All patients with obstruction require aspiration of gastro intestinal contents, through either a short or long tube.

The most popular tubes are nasogastric tubes.

Nasogastric tubes help by,

1. Decompressing the stomach and the most proximal intestine.
2. Preventing distension by swallowed air.
3. Minimizing the risk of aspiration during induction of anaesthesia.

Tubes are either long (e.g: miller abbot) or short (non vented Ryle's and vented salem). Long tubes like miller abbot are of the double type with a channel for aspiration and with a balloon at the other end for advancement.

Long tubes may be useful initially to treat small bowel obstruction, particularly when the nasogastric suction has failed; intra operatively to decompress more distal bowel and to identify points of intrinsic obstruction and postoperatively to stent the bowel.

**ANTIBIOTICS**

Antibiotics do not alter the course of simple obstruction but are administered preoperatively because of the possibility of inadvertent enterostomy and attendant peritoneal soilage, which might result in intra abdominal abscess or wound infection.

In cases of suspected or known strangulation, potentially pathogenic translocated bacteria and toxins can be life threatening and antibiotic therapy is essential.

Antibiotics selection should be from among those effective against both aerobic gram negative bacilli and anaerobes such as bacteroides. A reasonable choice in simple obstruction might be a second generation cephalosporin such as cefoxitin or cefotetan or a synthetic penicillin, in combination with  $\beta$  lactamase inhibitor (eg: ampicillin and sulbactam). Because of the life threatening sepsis that occurs in strangulation, it may be advisable to add an aminoglycoside, such as gentamicin.

Monoclonal antibodies directed against endotoxins from gram negative bacteria have been developed. HA-1A and E5 are examples of immunoglobulin M antibodies used in current trials in patients experiencing shock due to complicated bowel obstruction. (4)

## **ROLE OF EXPECTANT NON OPERATIVE MANAGEMENT**

Surgery may be delayed under certain circumstances.

### **1. Post operative obstruction**

Distension, vomiting and failure to pass flatus early after abdominal surgery are usually due to transient (physiologic) ileus, but mechanical obstruction can also follow intra abdominal operations. However overlooked strangulation remains a potential risk.

### **2. Later Post operative obstruction**

A special situation involves small bowel obstruction that develops 10 days to 4 weeks after a previous celiotomy. This window of time represents the most dangerous time for reoperation because the adhesions forming from the previous celiotomy can be extremely thick, intense and vascular. Strong consideration should be given to a primary non-operative approach with a planned gastric decompression for 3 to 6 months (by a percutaneous endoscopic gastrostomy or even a tube pharyngostomy) and parenteral

nutritional support. (22)

### **3. Intussusception**

Infants with ileocaecal intussusception usually respond to a controlled hydrostatic reduction of the intussusception, which avoids operation entirely.

### **4. Sigmoid Volvulus**

In patients with sigmoid volvulus sigmoidoscopy or colonoscopy can achieve decompression of the obstructed sigmoid loop.

### **5. Crohn's disease**

In patients with intestinal obstruction due to an acute exacerbation of crohn's disease, a period of conservative medical treatment with systemic steroids or other anti inflammatory agents may lead to resolution of the obstruction and prevent the need for operative intervention.

### **6. Partial Obstruction**

Patients with partial small bowel obstruction may be managed by less urgent operative treatment than patients with acute complete obstruction. If a patient has already undergone multiple operations for obstruction due to adhesions, further operation may carry little prospect of success and can be hazardous if the bowel is opened inadvertently.

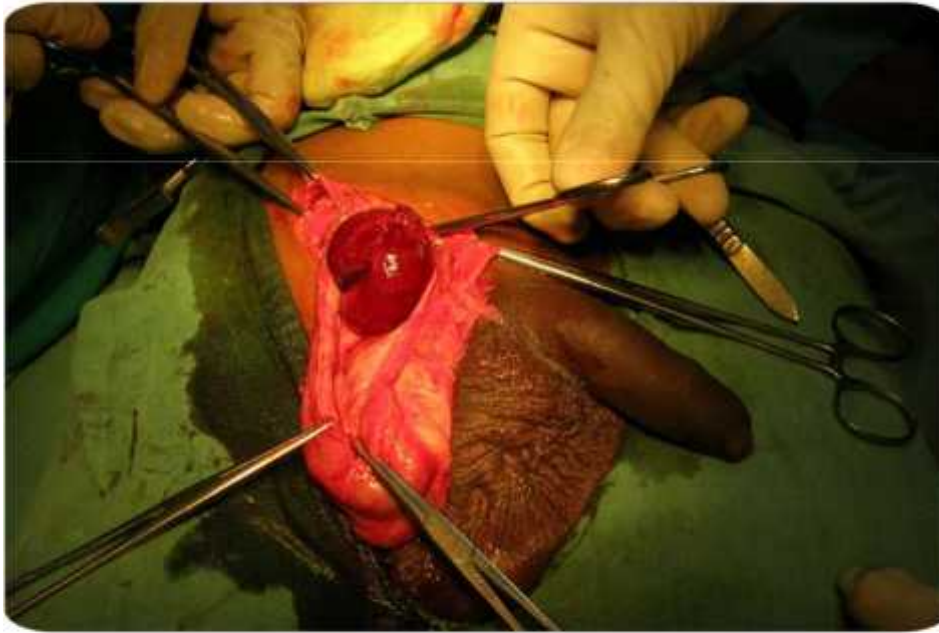
#### **Conservative Therapy is Contra Indicated in**

1. Suspected strangulation
2. Closed loop obstruction

3. hernia complicated by obstruction, Small bowel obstruction without an abdominal scar or hernia

### OPERATIVE PICTURES

#### OBSTRUCTED INGUINAL HERNIA



#### OBSTRUCTED FEMORAL HERNIA



## **SURGICAL MANAGEMENT**

The most critical decision in managing obstruction is distinguishing between simple and strangulated obstruction. A common saying is the “sun should never rise and set on a complete small bowel obstruction”.

There is no single clinical sign (or) diagnostic test that accurately diagnoses strangulation. Rarely does a patient exhibit all the signs of strangulation viz.,

Fever

Tachycardia

Localised abdominal pain

Rebound Tenderness

Guarding / rigidity

Leukocytosis

However, in the absence of all these signs, dead on dying bowel is found in less than 10% of cases. No improvement by 48 hours or clinical deterioration at any time mandates emergency surgery. (4)

When the exact cause of the obstruction is unknown, an appropriate incision, most often midline is essential. It is necessary to determine the

1. Site of obstruction
2. Nature of Obstruction
3. Bowel viability

The cecum is the best guide to the site of obstruction. If collapsed, the obstructive lesion lies proximally and if distended, then a colonic lesion is likely. From the ileocaecal junction the small bowel is traced upwards following the collapsed loop to the junction. With the distended loops where the obstructive lesions should lie.

The assessment of bowel viability may sometimes be difficult. The problem that the surgeon faces is,

1. determining the viability in borderline cases
2. delineating the extent of involvement. Obviously infarcted bowel is
  - a) greenish black in appearance
  - b) with no peristalsis and complete atony
  - c) with absence of bleeding from cut surfaces

## SMALL BOWEL GANGRENE



## RESECTION AND ANASTOMOSIS OF SMALL BOWEL



d) with absent pulsations in the vasa recta and mesenteric vessels.

Intra operative methods of determining the viability of the bowel include the use of Doppler flow to measure blood flow in the anti mesenteric border, and injecting intravenous fluorescein and examining the bowel with woods lamp.

When the bowel viability is undeterminable then it would be safer to exteriorize both ends. This allows daily inspection of the circulatory status of the exteriorized ends. When doubt remains regarding a segment of a bowel, a second look operation may be carried out 24 hours later. (4)

### **The nature of surgical procedure depends on the cause**

1. Adhesions – Adhesiolysis
2. Obstructed hernia – Reduction of the herniated bowel and closure of the defect.
3. Malignant tumour of small bowel: if feasible, primary resection and anastomosis can be done. Otherwise a simple bypass to relieve the obstruction as an emergency procedure.
4. Inflammatory bowel disease: Bowel resection and (or) stricturoplasty if non operative treatment fails.
5. Intra abdominal abscess: CT guided drainage is usually sufficient to relieve obstruction.
6. Radiation enteritis: Possible resection of irradiated bowel or bypass of the affected area
7. Intussusception:
  - < 24 hrs – hydrostatic reduction
  - > 24 hrs – Resection and anastomosis
8. Recurrent intestinal obstruction



It is usually due to adhesions. Adhesiolysis is difficult, hence Plication operation is indicated. Anti adhesive agents like 5% polyethylene glycol can be used.

9. Sigmoid Volvulus:

Sigmoidectomy. Intestinal continuity may be restored by end to end (or) end to side anastomosis using stapler or hand sewn technique.

## SIGMOID VOLVULUS



## COLOSTOMY



### 10. Caecal volvulus:

Caecopexy (Suturing the right colon to the right paracolic gutter) and caecostomy which has an added advantage of decompressing the bowel in addition to fixation.

If the bowel is gangrenous, resection in the form of right hemicolectomy is necessary.

## 11. Colonic cancer

### Right sided colonic obstruction

Obstructive right sided colonic tumours can be treated by a primary resection and anastomosis. Goligher and Smiddy were the pioneers who described right hemicolectomy as the procedure of choice for obstructing tumours of the right colon. Intestinal continuity may be restored by side to side stapled ileo transverse anastomosis using a linear cutter stapler (multifire GIA 80, Autosuture) or by handsewn technique.

When the colon is obstructed by a carcinoma of the splenic flexure, an extended right hemicolectomy is the procedure of choice with anastomosis between the ileum and descending colon.

### Left sided colonic obstruction

Left sided colonic obstructions were treated by three stage procedure consisting of a primary colostomy, subsequent definitive resection and finally reversal of the colostomy. This three stage procedure was gradually replaced by a two stage (Hartmann's procedure) and more recently by single stage procedure. In favourable circumstances a single stage procedure is a safe option in the management of malignant left sided colonic obstruction.

Single stage procedure either in the form of a subtotal colectomy with primary ileosigmoid or ileorectal anastomoses or an intra operative colonic lavage with immediate colo colonic or colo rectal anastomosis can be done.

The SCOTIA (subtotal colectomy versus on table irrigation with anastomosis) study group performed the first randomized trial comparing these techniques for the management of left sided malignant colonic obstruction. Hospital mortality rates were similar in the two groups, post operative morbidity was somewhat higher in the subtotal colectomy group.

The SCOTIA study group concluded that segmental resection following intra operative irrigation was the preferred option except in cases of perforation of the caecum when subtotal colectomy was more appropriate.

### **RECENT ADVANCES**

The use of self expandable metallic stents (SEMS) in relieving left sided colonic obstruction has become popular. The use of SEMS in colonic obstruction was first reported by Itabashi in 1993.

SEMS are effective in relieving colonic obstruction temporarily in preparation for subsequent surgery, hence avoiding an operation in the emergency setting. Patients can subsequently undergo a single staged operation and can avoid a stoma in favourable circumstances. SEMS also provide a good means of palliating unresectable obstructing tumours.

Tejero, in 1997, introduced a three staged procedure for the relief of malignant left sided colonic obstruction

1. resolution of the obstruction by means of a stent placed at the site of tumour
2. recovery of the general state of the patient.
3. elective and final surgery (if not suitable, the stent may be used as a definitive palliative treatment). (12)

## **ROLE OF LAPAROSCOPY IN THE MANAGEMENT OF BOWEL OBSTRUCTION**

Today, laparoscopy is being applied to a number of obstructing small bowel and colonic processes, such as relief of small bowel obstruction secondary to adhesions, foreign body removal, bypass procedures for malignant and benign disease causing intestinal obstruction, resection for appendicitis or a meckel's diverticulum causing intestinal obstruction and evaluation and resection for inflammatory bowel disease (ie. crohn's disease).

Laparoscopic treatment of small bowel obstruction if successful leads to a shorter hospital stay and quicker rehabilitation of the patient and has good long term results. With further experience, laparoscopic exploration is an excellent diagnostic modality in acute small bowel obstruction and may allow a fully laparoscopic adhesiolysis with relief of the intestinal obstruction.

Patients with complete and or distal small bowel obstruction are not candidates for laparoscopic management. (22)

## **Conclusion**

In conclusion, most of the recent advances in the management of bowel obstruction consist of developments in the imaging modalities available to assist in the diagnosis itself, particularly with regard to the distinction between partial and complete obstruction. Unfortunately little progress has been made to enable physicians to detect early reversible strangulation. Because of the inability to detect reversible ischemia, there is a substantial risk of progression to irreversible ischemia when surgery is delayed for an extended period of time, especially in the setting of suspected complete obstruction.

It is encouraging, that some advances have been made in understanding the patho physiology and prevention of adhesion formation. Research efforts in the future should continue to focus on these issues as well as on the development of methods to better recognize early signs of strangulation.

# ELIGIBILITY CRITERIA

All eligible patients who had undergone emergency surgery for intestinal obstruction were taken and analysed .

Patients who were treated conservatively & relieved were excluded from the study .

Similarly patients presenting with intestinal obstruction due to obstructed inguinal hernia with no evidence of strangulation that reduce spontaneously were also excluded .

## MATERIALS AND METHODS

This is a retrospective study of 40 patients with acute intestinal obstruction admitted in the Department of General Surgery at the Government Stanley Medical College and Hospital .

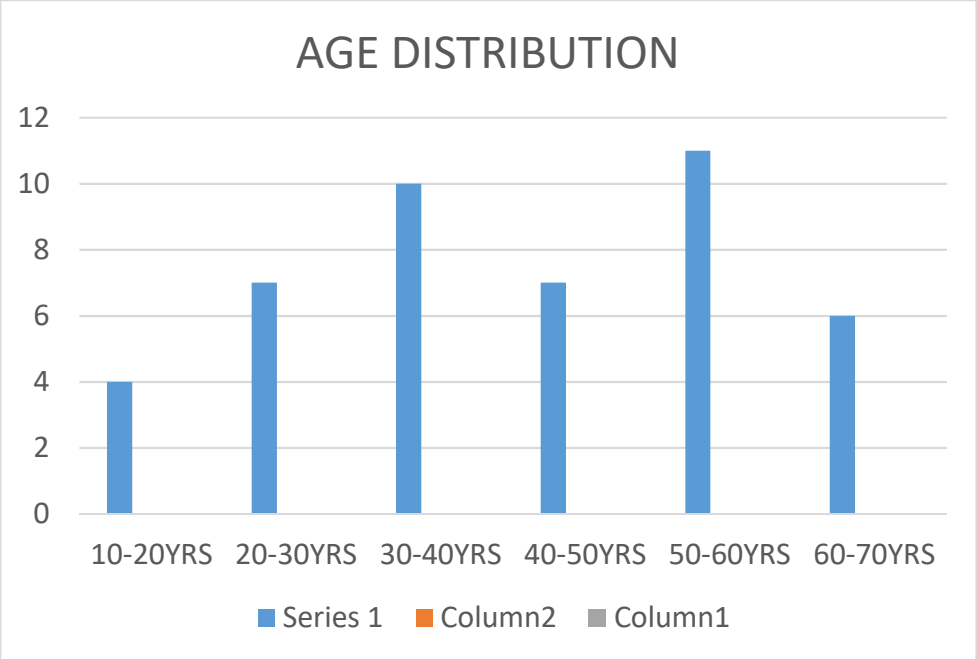
From the time of presentation the cases were followed up till the time of discharge / death. X ray abdomen erect was routinely taken for all patients.

The details of symptoms at presentation, the diagnosis entertained, investigations reports, type of surgery and outcome have all been recorded and tabulated in a master chart for reference and comparison. The final outcome has been sub grouped based on the degree of incapacitation to death.

The observations were compared with the current literature on acute intestinal obstruction and conclusions were drawn.

# OBSERVATIONS

A total of 40 cases of acute intestinal obstruction were included in the study , This was summarized into a master chart. The comparable tabulations permit certain statistical inferences to be made that are presented below.



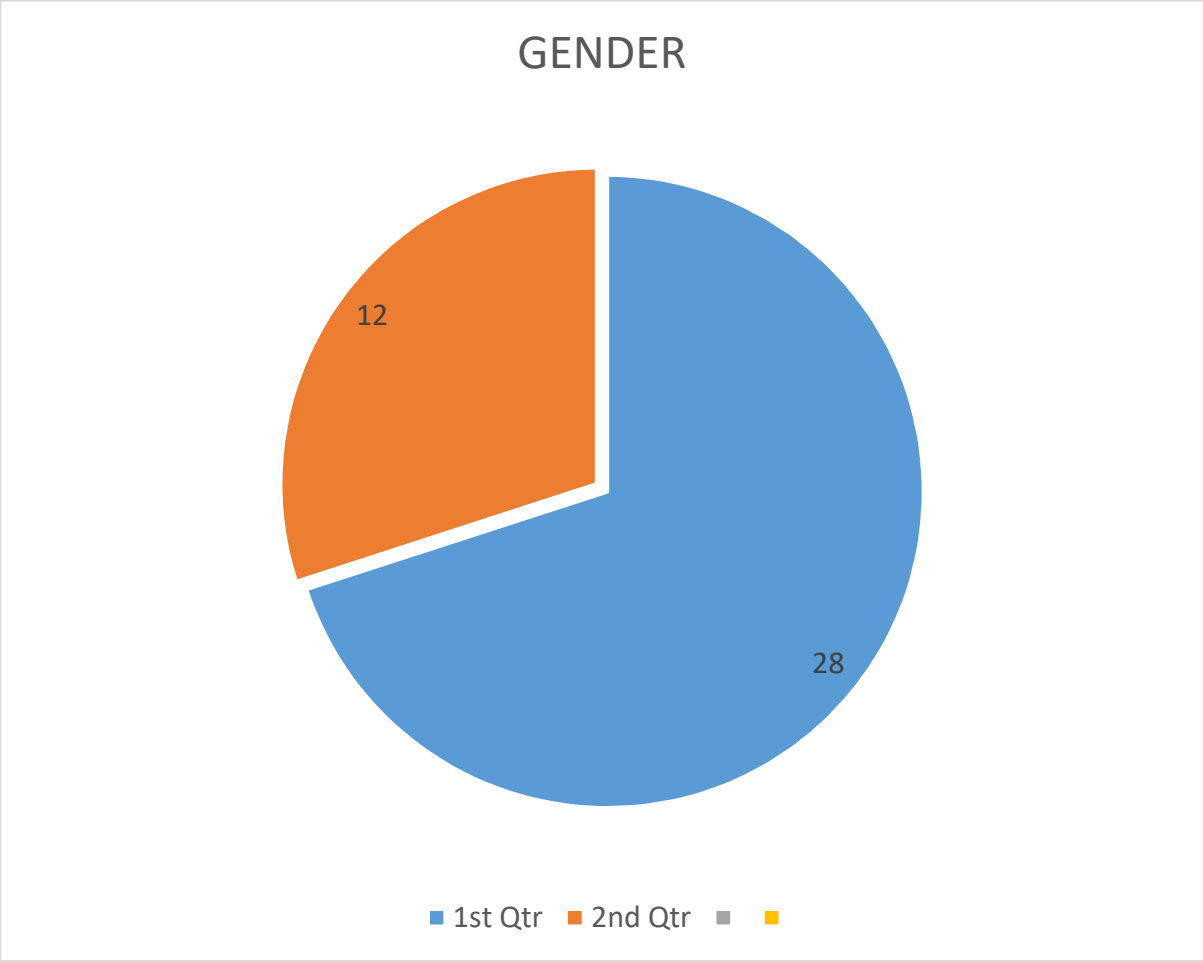
As far as age distribution is concerned the age range was 14- 72 YRS., Most common occurrence between 30 to 60 years.

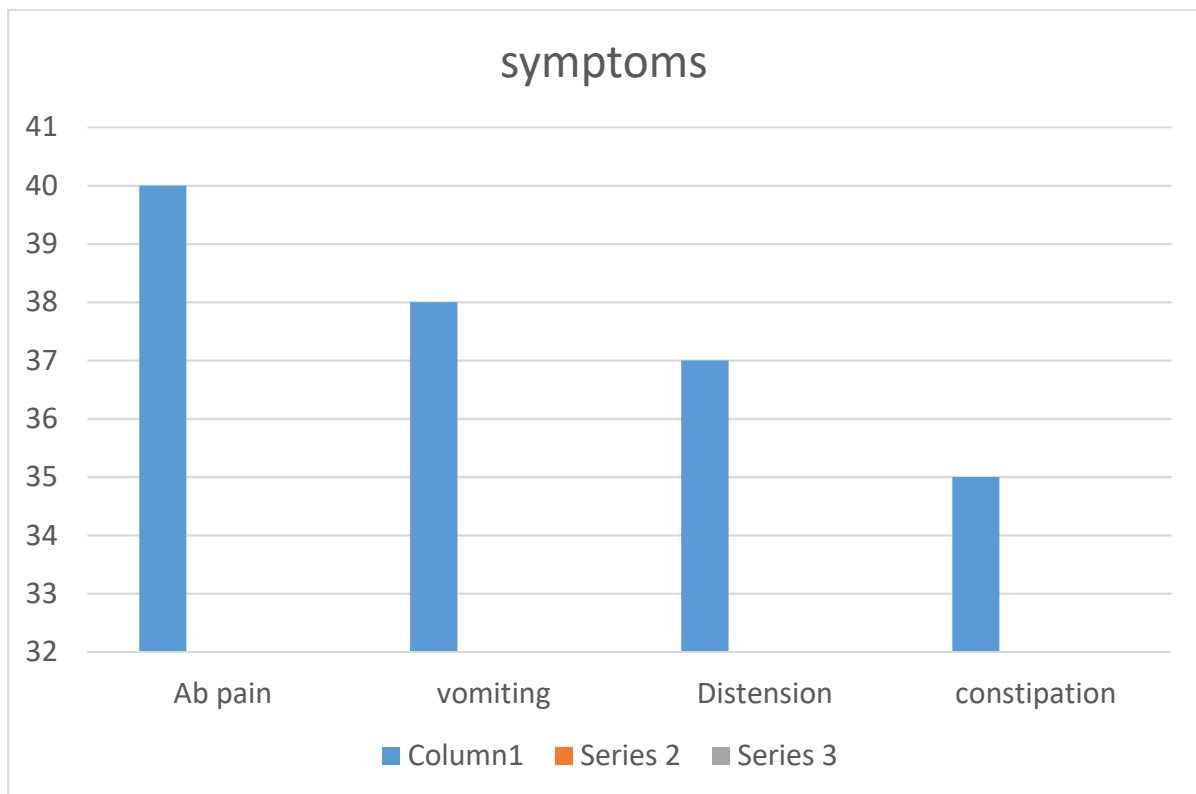


# GENDER

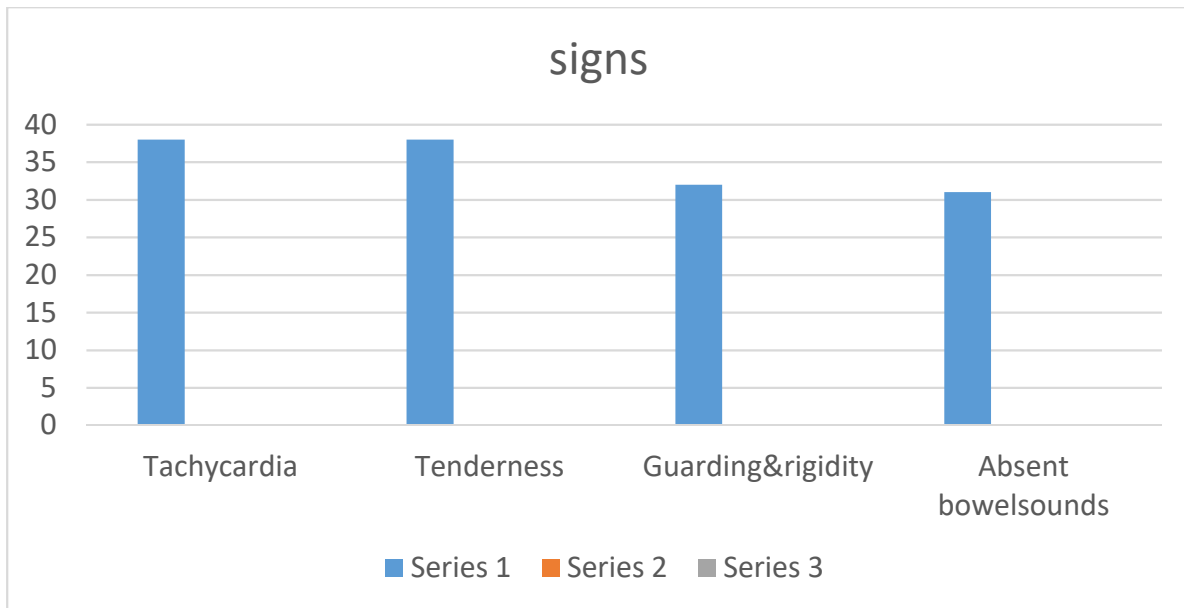
Males 28

Females 12

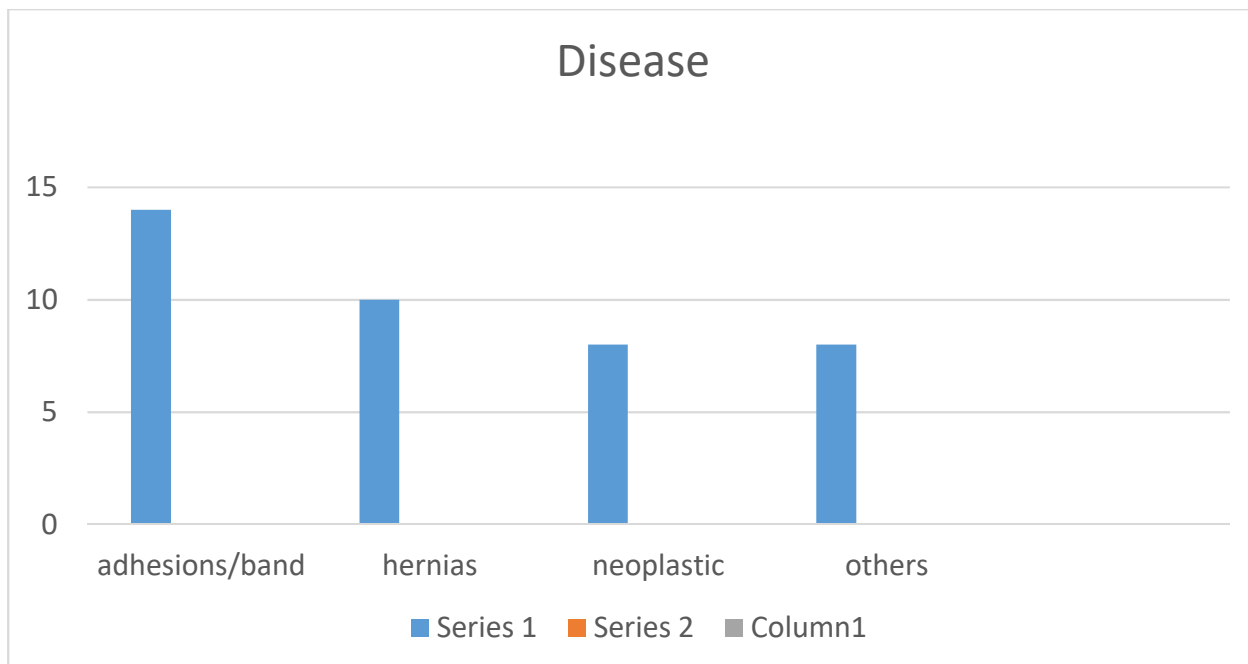




<b>SYMPTOMS</b>	<b>NO OF PATIENTS</b>	<b>PERCENTAGE</b>
ABDOMINAL PAIN	40	100%
VOMITING	38	96%
DISTENSION	37	94%
CONSTIPATION	35	90%

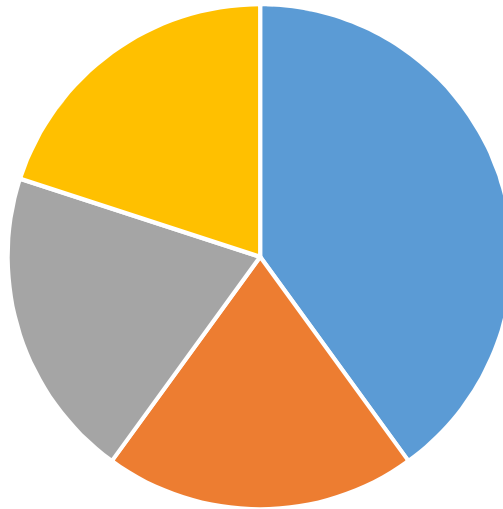


<b>SIGNS</b>	<b>NO OF PATIENTS</b>	<b>PERCENTAGE</b>
TACHYCARDIA	38	96%
TENDERNESS	38	96%
GUARDING & RIGIDITY	32	84%
ABSENT BOWEL SOUNDS	31	82%



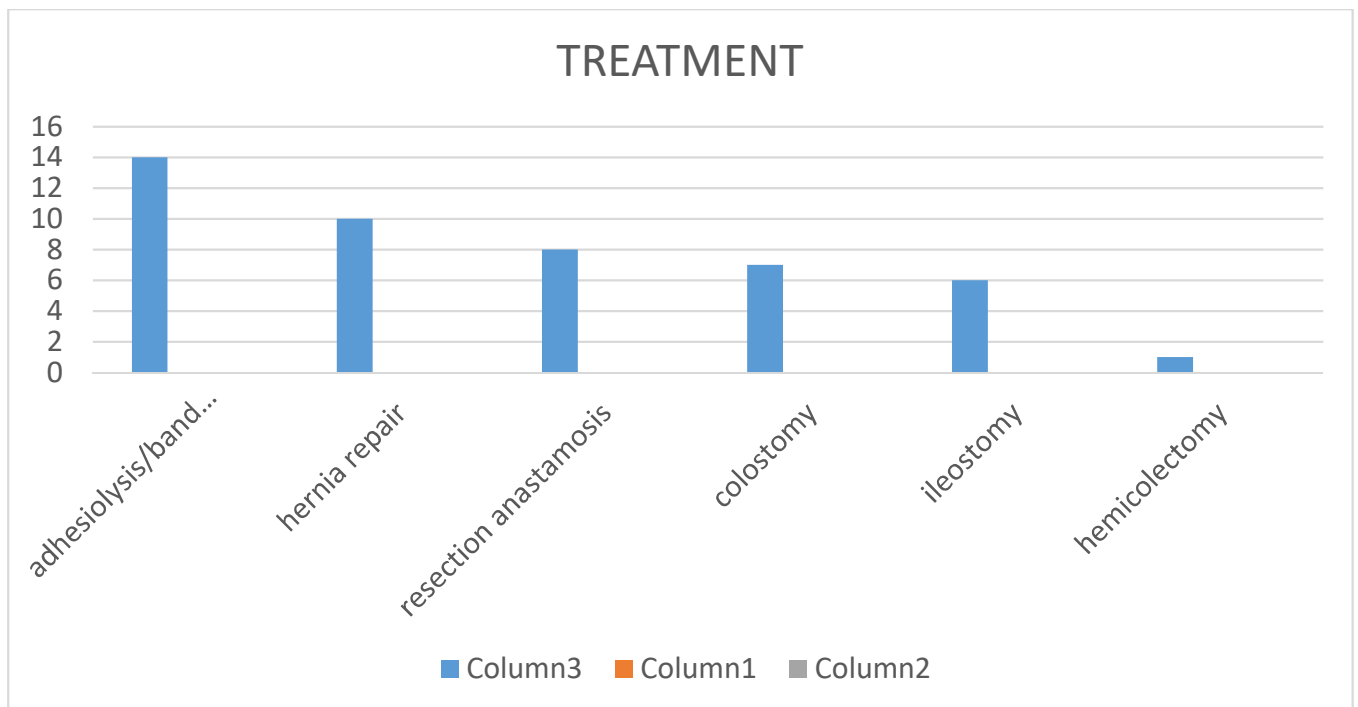
<b>S NO</b>	<b>DISEASE</b>	<b>NO OF PATIENTS</b>
1	ADHESIONS/BAND	14
2	HERNIAS	10
3	NEOPLASTIC	8
4	OTHERS	8

## OBSTRUCTED HERNIAS

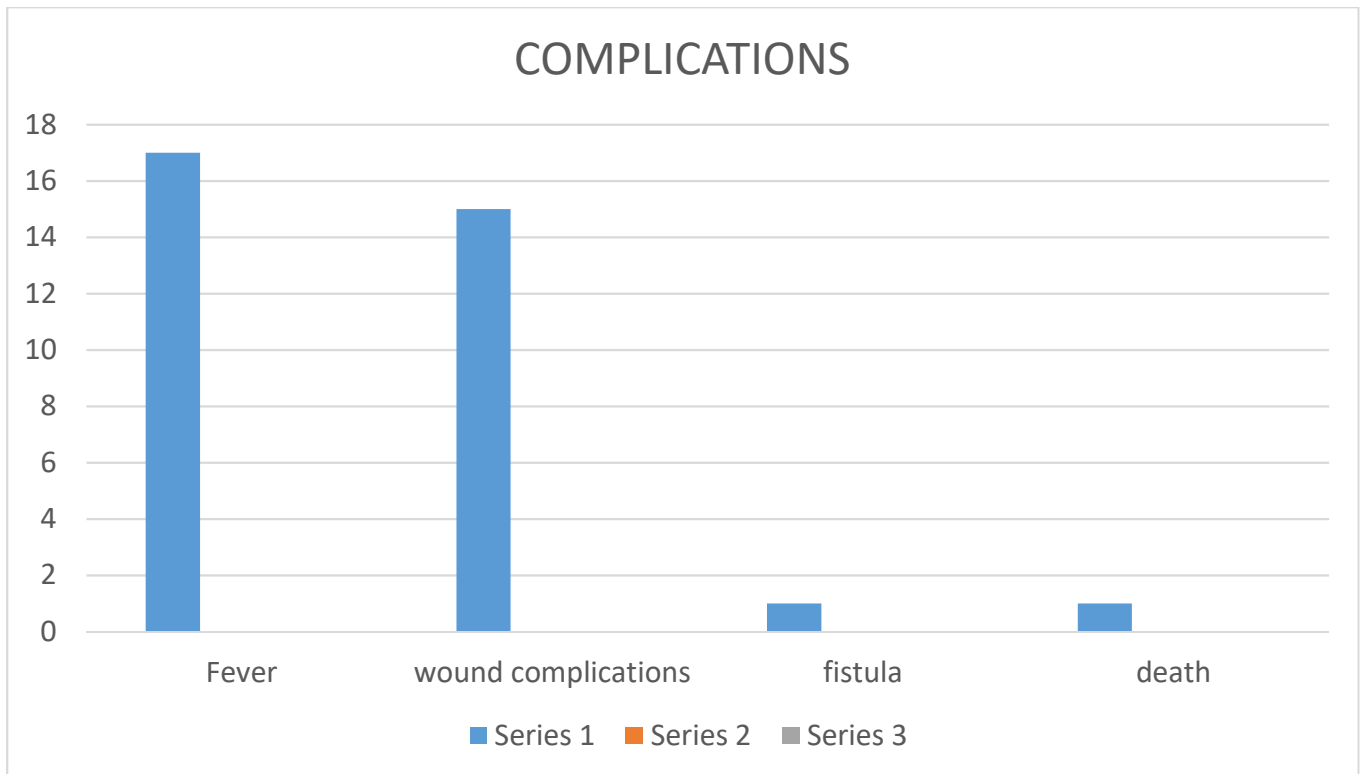


■ Inguinal hernia ■ Umbilical hernia ■ epigastric hernia ■ incisional hernia

S NO	HERNIAS	NO OF PATIENTS
1	INGUINAL HERNIA	4
2	UMBILICAL HERNIA	2
3	EPIGASTRIC HERNIA	2
4	INCISIONAL HERNIA	2



<b>S N O</b>	<b>TREATMENT</b>	<b>NO OF PATIEN TS</b>
1	ADHESIOLYSIS/ BANDRELEASE	14
2	HERNIAS(ing,umb,incisional,ep igastric)-HER REPAIR	10
3	RESECTION ANASTAMOSIS	8
4	COLOSTOMY	7
5	ILEOSTOMY	6
6	HEMICOLECTOMY	1



COMPLICATION	NO OF PATIENTS	PERCENTAGE
FEVER	17	34%
WOUND COMPLICATIONS	15	30%
FISTULA	1	2%
DEATH	1	2%

# DATA RESULTS

Intestinal obstruction though a common surgical presentation has a number of underlying causes responsible for it . in this study consisting of 40 cases requiring operative management presenting at Stanley hospital – Chennai

In our setup there is higher incidence of intestinal obstruction among males .  
28 – males , 12 – females

As far as age distribution is concerned the age range was 14- 72 YRS.,

Most common occurrence between 30 to 60 years

Most common cause of intestinal obstruction was band/adhesion . followed by irreducible hernias( inguinal/umbilical/incisional/epigastric)/malignancy etc.,

Commonest symptom in our study was pain followed by vomiting ,distension ,constipation .

Abdominal tenderness ,tachycardia ,with hyper dynamic or absent bowel sounds were the commonest signs .



In addition to routine investigations , plain abdominal x – ray being the leading investigation in diagnosis and management .

Thus in our study commonest postoperative complication encountered postoperative fever , and wound infection .

In our study mortality percenyage was 2 % .

## **DISCUSSION**

In the study of acute intestinal obstruction which was carried out f, in the Government Medical STANLEY College and Hospital, 40 cases of acute intestinal obstruction were studied based on clinical evaluation and radiographic evidence. All the patients case sheets and the relevant details were catalogued in the master chart for comparison and for drawing statistical inferences.

### **AGE AND SEX INCIDENCE**

As far as age distribution is concerned the age range was 14 – 72 years ., most common occurrence between 30 to 60 years .

### **CLINICAL SYMPTOMATOLOGY**

Abdominal pain is the most common presenting symptom (100%) followed by vomiting (96%) and distention of abdomen (94%).

The most common sign was tachycardia (96%) , tenderness which was present in (96%) of the cases, followed by guarding (84 %) & rigidity which was present in (82%) of patients.

### **DISEASE SPECTRUM**

Of the 40 cases the commonest cause of acute intestinal obstruction is adhesions/bands(14 cases ). hernias were present in 10 cases , and is the second commonest cause.

## **Investigational aids**

Plain X-Ray abdomen was taken for all the 40 cases of intestinal obstruction. The most common finding in the X-Ray was multiple fluid levels (>3) , dilatation of bowel loops proximal to intestinal obstruction was seen in some cases, one case had coffee bean appearance.

X-Rays were inconclusive in some cases.

Ultrasound abdomen was performed, it revealed dilated bowel loops , free fluid . and in majority of the patients the results were inconclusive. The ultrasound had little role to play in the diagnosis of intestinal obstruction.

## **Surgical Procedure adopted**

Adhesiolysis /band release was the most common surgical procedure performed accounting for 14 cases followed by hernia repair 10 cases.

Resection and anastomosis was done in 8 cases, colostomy in 7 cases ,ileostomy in 6 cases and other procedures were performed in the remaining patients.

## **The surgical outcome**

Majority of patients had an uneventful recovery. One patient died in the postoperative period.

## LITERATURE REVIEW

### 1. Acute intestinal obstruction in adults in “Kumasi Ghana” ohene yeboah

Adippah. E, Gyasi, Sarpong K. Department of Surgery, Komfo Anokye Teaching Hospital, Kwame, Kumasi, Ghana.

They conducted a prospective study, between 1998-2003 of 652 cases of intestinal obstruction of which 412 (63.2%) were due to strangulated external hernias and 176 (27.2%) were due to post operative adhesions which is comparable to our study. (18)

### 2. Hernias are the most common cause of strangulation in patient with small bowel obstruction.

Thedioha.Y, Alani A, Modak P, Chong P,

O’Dwyer PJ, University of department of surgery western infirmary Dumbarton road, GLASGOW.

Hernias remain the most frequent cause of strangulation in patients presenting with intestinal obstruction (11). This study is comparable with our study.

## **CONCLUSION**

The study of acute intestinal obstruction was aimed at identifying the etiological factors, mode of presentation, surgical procedures employed with relevant investigational procedures.

Acute intestinal obstruction is one of the most common emergencies requiring surgical intervention. A proper and complete bedside clinical examination by the surgeon is more superior than investigational procedures.

In my study Adhesions /bands were found to be the commonest cause for obstruction . A delay in diagnosis could be fatal. Adhering to the basic principles of preoperative preparation like nasogastric suctioning, correcting dehydration and electrolyte imbalances can significantly lower the morbidity and mortality. Surgical intervention remains the cornerstone of treatment. With timely management, most patients have an excellent prognosis.

## PROFORMA

Name:

Age:

Sex:

Inpatient No.:

Ward:

### I PRESENTING FEATURES

1. Abdominal pain
2. Vomiting
3. Obstipation
4. Abdominal distension

### II. PAST HISTORY

H/O PREVIOUS SURGERY

H/O TUBERCULOSIS

### III. MENSTRUAL AND OBSTETRIC HISTORY

### IV. FAMILY HISTORY

H/O TUBERCULOSIS

H/O MALIGNANCY

### V. GENERAL EXAMINATION

PULSE RATE - TACHYCARDIA

BLOOD PRESSURE – HYPOTENSION

SIGNS OF DEHYDRATION

ANAEMIA

## FEVER

### VI. EXAMINATION OF ABDOMEN

1. Surgical Scar
2. Visible intestinal peristalsis (or) Colonic peristalsis
3. Abdomen distension
4. Tenderness
5. Guarding
6. Rigidity
7. Mass Palpable
8. High pitched tinkling bowel sounds / silent abdomen
9. Hernial Orifices
10. PER RECTAL EXAMINATION – Roomy / empty rectum, blood, a mass or a blummer shelf nodule palpable
11. PER VAGINAL EXAMINATION – Evidence of gynaecological Malignancy (or) inflammatory lesion

### VII. EXAMINATION OF OTHER SYSTEMS

### VIII. INVESTIGATIONS

Hb%

Total count

Differential count

Erythrocyte sedimentation rate

Blood Urea

Blood sugar

Serum creatinine

Serum electrolytes

X-Ray abdomen erect

Chest X-Ray PA view

Ultrasonogram abdomen

#### IX. MANAGEMENT

1. Fluid and Electrolytes repletion
2. Decompression of gastro intestinal tract
3. Antibiotics
4. Timely surgical intervention

#### X. FOLLOW UP

### **BIBLIOGRAPHY**

1. Bailey and Love's Short practice of Surgery, 24<sup>th</sup> edition, 2004, page 1186-1202.
2. Baker R.J and Fischer J.E., Master of Surgery, 4<sup>th</sup> Edition 2001. page 1401-1407.
3. Bass KN, Jones B Bulkley GB, Duke University medical center, Durham, North Carolina, USA. current management of small bowel obstruction. Adv. Surg, 1997; 31: 1-34.
4. Bockus Gastro enterology, 5<sup>th</sup> edition volume 2, 1995, page 1235-1247.
5. Cuschieri A Essential surgical practice 4<sup>th</sup> edition 2002, 576-595.
6. Farquharson's Text book of surgery 8<sup>th</sup> edition 1995, page 460-71.
7. Garner JP, Haldipur N, Ravi K, Amarnath JS, Gupta R, colonic intussusception in Adults. Three cases and review of the literature, Indian J. Surg 2006; 68: 322-4.



8. Gray's Textbook of Anatomy – 39<sup>th</sup> edition, 2005; 1157-1205.
9. Hayanga AJ, Bass Wilkins K, Bulkley GB Johns Hopkins Hospital, Department of Surgery, Baltimore, Maryland, USA. current management of small bowel obstruction. *Adv. Surg.* 2005, 39: 1-33.
10. Hennekine-mucci S, juech JJ, Brehant O, Lermite E, Pessaux P, Lada p, hamy A, Arnaud JP, CHU – Angers, Department of visceral surgery Angers 49033. France Management of obstructed Left colon carcinoma, hepatogastro enterology. 2007 jun: 54 (76): 1098 – 101.
11. Ihedioha U, alani A, Modak P, Chong P, O'Dwyer P, University Department of Surgery, western infirmary. Glassgow, Hernias are the most common cause of strangulation in obstruction. *Hernia* 2006 Aug; 10 (4): 338 – 40. Epub 2006 Jun 8.
12. Johnson C.D, I. Taylor Recent Advances in surgery 25, large bowel obstruction, Maheshinder singh, John R.J. Monson page 117 – 133.
13. Keighley M RB and Norman S Williams surgery of the Anus, Rectum and colon, 2<sup>nd</sup> edition, Volume 2 1999. Page 2178 - 2219
14. Koperna T, Kissner m, Schulz F, Department of general surgery, hospital Lainz, Vienna, Austria, emergency surgery for colon cancer in the aged, *Arch surg* 1997 Sep: 132 (9) : 1032 - 7.
15. Lopez – Kostner. F, Graham R Hool, Ian C. Lavery, Management and causes of acute large bowel obstruction. *Surgical clinics of north America* 1997, 1267 – 1285.
16. Maingot's abdominal operations Tenth edition, second volume, 1997,

1159 – 1172; 1391 – 1408.

17. Martinez Santos C, Lobato RF, Fradija's JM, Pinto I, ortega-D eballon

P, Moreno – Azcoita M, Department of general surgery, Getafe University Hospital, Madrid, Spain. Self expandable stent before elective surgery Vs emergency surgery for the treatment of malignant colorectal obstructions, comparison of primary anastomosis and morbidity rates Dis colon rectum 2002 Mar; 45 (3) : 401 – 6.

18. ohene – Yeboah M, Adippah E, Gyasi – Sarpong K. department of surgery, Komfo Anokye Teaching hospital. Acute Intestinal obstruction in Adults Kumasi, Ghana. Ghana med 1. 2006, Jun; 40 (2): 50 – 4.

19. OXFORD TEXT BOOK OF SURGERY Second Edition, Second Volume, 2000 Yr, 1345 – 1348; 1511 – 1515.

20. Sabiston Text book of Surgery, 17<sup>th</sup> Edition, Second Volume, 2005 page: 1335 – 1342, 1422 – 1425.

21. Schwartz principles of surgery, 8<sup>th</sup> Edition, 2005, 1027 – 1031.

22. Shakelford's surgery of the Alimentary tract 5<sup>th</sup> edition – V volume, 2002, 317 – 338.

23. Sleisenger and Fordtran's Gastro intestinal and liver disease 7<sup>th</sup> edition volume II 2002 2112 – 2126.

24. Vakil. R, Kalra. S, Raul S, Palijor Y, Joseph S. Role of Water soluble contrast study in adhesive small bowel obstruction. A randomized controlled study. Indian J. Surgery 2007; 69: 47-51.



S N O	NAME	AGE/S EX	IP NO	SURGERY DONE	PAIN	VOMITI NG	DISTENS ION	CONSTIPA TION
1	KANDHAN	70/M	15603 15	IRREDUCIBLE ING HER RT- HERNIORRHAP HY	PRESE NT	PRESEN T	PRESENT	PRESENT
2	GOVINDHAN	40/M	15604 59	IRREDUCIBLE UMB HERNIA GANG BOWELL-REC ANAST ANAT REPAIR	PRESE NT	PRESEN T	PRESENT	PRESENT
3	MUNİYAMM AL	60/F	15608 81	SMALL BOWELL OBST- BAND RELEASE	PRESE NT	PRESEN T	PRESENT	PRESENT
4	VENKATESA N	39/M	15606 88	Ca STOMACH TRANS COLON INFILT OBST- TRAN LOOP COLOSTOMY	PRESE NT	PRESEN T	PRESENT	PRESENT
5	JOHN	68/M	15619 50	COLONIC GROWTH- DIVERSION COLOSTOMY	PRESE NT	PRESEN T	PRESENT	PRESENT
6	PERAMBAI	62/F	15604 81	OBST UMBILICAL HERNIA-ANAT CLOSURE	PRESE NT	PRESEN T	PRESENT	PRESENT
7	MURUGESA N	55/M	15626 42	SMALL BOWELL OBST- BAND RELEASE	PRESE NT	PRESEN T	PRESENT	PRESENT
8	MARY	68/F	15638 96	SMALL BOWELL OBSTRUCTION -ADHESIOLYSIS	PRESE NT	PRESEN T	PRESENT	PRESENT
9	SRINIVASAN	18/M	15644 43	SMALL BOWELL OBST- BAND RELEASE	PRESE NT	PRESEN T	PRESENT	PRESENT
1 0	PANCHALI	65/F	15645 90	RECTO SIGMOID COLON GROWTH- LOOP COLOSTOMY	PRESE NT	PRESEN T	PRESENT	PRESENT
1 1	JAILA	35/M	15661 20	IRREDUCIBLE ING HER RTHERNIORRH APHY	PRESE NT	PRESEN T	PRESENT	PRESENT
1 2	RANI	65/F	15650 49	INTESTINAL OBSTRUCTION	PRESE NT	PRESEN T	PRESENT	PRESENT

				-ADHESIO LYSIS				
1 3	ARULANAND HAN	30/F	15664 45	SMALL BOWELL OBS- ILEOSTOMY	PRESE NT	PRESEN T	PRESENT	PRESENT
1 4	AKSARALI	60/M	15685 00	SMALL BOWELL OBST- HEMICOLECTO MY	PRESE NT	PRESEN T	PRESENT	PRESENT
1 5	DANISH KUMAR	14/M	15691 18	IRREDUCIBLE ING HERNIA- HERNIOTOMY	PRESE NT	PRESEN T	PRESENT	PRESENT
1 6	CHELLAMUT HU	60/M	15960 5	INTESTINAL OBSTRUCTION BAND RELEASE	PRESE NT	PRESEN T	PRESENT	PRESENT
1 7	VELU	70/M	15692 80	INTESTINAL OBSTRUCTION -BAND RELEASE	PRESE NT	PRESEN T	PRESENT	PRESENT
1 8	KARIPANDIY AN	72/M	15691 17	TB ABDOMEN INTESTINAL OBSTRUCTION ILEOSTOMY	PRESE NT	PRESEN T	PRESENT	PRESENT
1 9	KANNAN	64/M	15711 33	INT OBST ADHESIOLYSIS	PRESE NT	PRESEN T	PRESENT	PRESENT
2 0	RAMAKRISH NAN	50/M	15711 48	INT OBST- BAND RELEASE	PRESE NT	PRESEN T	PRESENT	PRESENT
2 1	ANVALAGAN	55/M	15712 88	INCISIONAL HERNIA GANGRENE BOWEL RESEC ANAST	PRESE NT	PRESEN T	PRESENT	PRESENT
2 2	VASUDEVAN	58/M	15715 07	ANO RECTAL GROWTH OBS- DIVERSION	PRESE NT	PRESEN T	PRESENT	PRESENT
2 3	VASANTHI	30/F	15714 84	INTUSUSCEPTI ON-RESEC ANAST	PRESE NT	PRESEN T	PRESENT	PRESENT
2 4	INDHUMATH I	34/F	15716 91	INTS OBST- TRANS LOOP COLOSTOMY	PRESE NT	PRESEN T	PRESENT	PRESENT
2 5	KAIGUM	45/M	15697 97	INCISIONAL HERNIA GANG BOWELL - RESEC ANAST ANAT REPAIR	PRESE NT	PRESEN T	PRESENT	PRESENT
2 6	PANDIYAN	46/M	15906 06	SIGMOID GROWTH- COLOSTOMY	PRESE NT	PRESEN T	PRESENT	PRESENT
2 7	ARUN	61/M	15691 72	IRREDUCIBLE EPIGASTRIC	PRESE NT	PRESEN T	PRESENT	PRESENT

				HERNIA-ANAT REPAIR				
28	VASANTHI	55/F	1582650	INTEST OBSTRUCTION ADHESIOLYSIS	PRESENT	PRESENT	PRESENT	PRESENT
29	BABU	55/M	1591520	OBST UMBLICAL HERNIA ANAT REPAIR	PRESENT	PRESENT	PRESENT	PRESENT
30	NARASIYA	59/M	1607805	SMALL BOWELL GANGRENE ILEOSTOMY	PRESENT	PRESENT	PRESENT	PRESENT
31	RAMKUMAR	35/M	1592342	INT OBST-BAND RELEASE	PRESENT	PRESENT	PRESENT	PRESENT
32	SHARMILA	21/F	1594544	SIGMOID VOLVULUS-RESEC ANAST	PRESENT	PRESENT	PRESENT	PRESENT
33	SEKAR	40/M	1605298	ILEOCAECAL TB ILEOSTOMY	PRESENT	PRESENT	PRESENT	PRESENT
34	PADMAVATHY	64/M	1600420	INTES OBST - ADHESIOLYSIS	PRESENT	PRESENT	PRESENT	PRESENT
35	KULSIKA	57/M	1600540	IRREDUCIBLE VENTRAL HERNIA-ANAT REPAIR	PRESENT	PRESENT	PRESENT	PRESENT
36	SEETHARAMAN	60/M	1609392	SIGMOID COLON GROWTH COLOSTOMY	PRESENT	PRESENT	PRESENT	PRESENT
37	BABU	40/M	1611335	ILEAL GANGRENE RESECTION ILEOSTOMY	PRESENT	PRESENT	PRESENT	PRESENT
38	VELU	40/M	1602211	SMALL BOWELL GANG-ILEOSTOMY	PRESENT	PRESENT	PRESENT	PRESENT
39	VASANTHI	48/F	1602460	INTES OBSTRUCTION ADHESIOLYSIS	PRESENT	PRESENT	PRESENT	PRESENT
40	VENGAMMAL	65/F	1604981	INTES OBST - ADHESIOLYSIS	PRESENT	PRESENT	PRESENT	PRESENT



PRESENT	PRESENT	PRESENT	PRESENT	PRESENT	ABSENT	ABSENT
PRESENT	PRESENT	PRESENT	PRESENT	PRESENT	ABSENT	ABSENT
PRESENT	ABSENT	PRESENT	PRESENT	ABSENT	PRESENT	ABSENT
PRESENT	PRESENT	ABSENT	PRESENT	ABSENT	PRESENT	ABSENT
PRESENT	PRESENT	PRESENT	PRESENT	ABSENT	PRESENT	ABSENT
PRESENT	PRESENT	PRESENT	PRESENT	PRESENT	PRESENT	ABSENT
PRESENT	PRESENT	PRESENT	ABSENT	ABSENT	PRESENT	ABSENT