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Review Article

**MANAGEMENT OF GASTROINTESTINAL OBSTRUCTION**

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**Abstract:**

**Introduction:** Intestinal obstruction is one of the most common surgical emergencies. Up to date, intestinal obstruction remains a global surgical problem and only a few problems in surgical physiology have earned greater attention than those associated with intestinal obstruction (IO)/Bowel obstruction (BO) with various management option continued to be debated with more focus on how to avoid bowel strangulation and its detection as early as possible. Intestinal obstruction occurs due to an interruption in the forward flow of intestinal contents and can occur at any point along the length of the gastrointestinal tract. The symptoms vary based on the level of obstruction, so as the management. Most common causes are intra-abdominal adhesion, malignancy or intestinal herniation. Management becomes even more challenging with advanced age; hence decision making is an essential part of management.

**The aim of work:** The review aimed to study various factors affecting the type of management- conservative or operative, different surgical procedures and outcome about etiological factors of patients of intestinal obstruction.

**Methodology:** We conducted this review using a comprehensive search of MEDLINE, PubMed, and EMBASE, January 1985, through February 2017. The following search terms were used: intestinal obstruction, small intestinal obstruction, large intestinal obstruction, diagnosis of obstruction, management of obstruction

**Conclusion:** It is observed that early diagnosis, sufficient preoperative hydration, prompt investigation, early detection, and operative intervention can improve the survival of a patient with intestinal obstruction. With the improvement in preoperative preparation and more skillful anesthetic management, the mortality rate decreases in intestinal obstruction.

**Keywords:** Adhesive obstruction, non-adhesive obstruction, intestinal obstruction, the timing of surgery.

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**INTRODUCTION:**

Intestinal obstruction can either be mechanical or functional in the small or large intestine and occurs when the lumen of intestine becomes either partially or completely blocked which in turn prevents the normal movement of digestive products. Obstruction in the small intestine is more common than large intestine. Mechanical small intestine obstruction can be: Luminal (Gallstone ileus, Neoplasm) Mural (Meckel's diverticulum, Crohn's disease, Neoplasm, Intussusception, Volvulus, Radiation enteritis, hematoma, and strictures) Extramural (Adhesion, External hernia, Metastatic neoplasm, Phlegmon) The most common symptoms are abdominal pain, nausea, vomiting, constipation to obstipation and distention. The obstructions can be classified as a partial, complete or closed loop (complete obstruction distally and proximally in the given segment of intestine. [1-3]

**METHODOLOGY:****• Data Sources and Search terms**

We conducted this review using a comprehensive search of MEDLINE, PubMed, and EMBASE, January 1985, through February 2017. The following search terms were used: intestinal obstruction, small intestinal obstruction, large intestinal obstruction, diagnosis of obstruction, management of obstruction

**• Data Extraction**

Two reviewers have independently reviewed the studies, abstracted data, and disagreements were resolved by consensus. Studies were evaluated for quality and a review protocol was followed

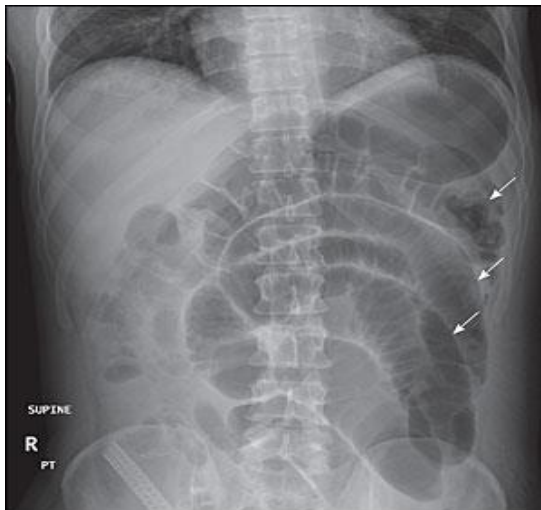
The study was approved by the ethical board of King Abdulaziz University Hospital

**DIAGNOSTIC TESTING AND IMAGING:****Laboratory evaluation:**

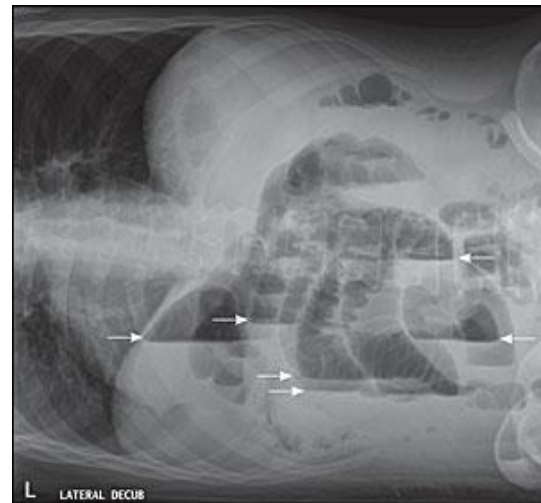
- Complete blood count and metabolic panel
- Ruling out Hypokalemia, Hyperchloremic metabolic alkalosis in patients with severe emesis
- Elevated blood urea nitrogen level with consistent dehydration.
- Increased hemoglobin and hematocrit levels.
- It is increased in white blood cell count due to translocation of bacteria in the bloodstream.
- Increased serum lactate with the development of metabolic acidosis may be indicative of bowel ischemia.

**RADIOGRAPHY:**

About 60% of intestinal obstruction cases can be diagnosed accurately from plain upright abdominal radiography. It is useful in determining intestinal perforation and free air above the liver. Patient with small intestinal obstruction, supine view shows dilation and multiple loops of small bowel with paucity in the large bowel. Dilation of colon maybe suggestive of large intestinal obstruction with the compressed small intestine. Laddering air-fluid level is seen in upright or lateral decubitus films (**Fig.1**), these findings along with lack of air and stool in the distal segment of colon and rectum is suggestive of mechanical obstruction. [4]



(A)



(B)

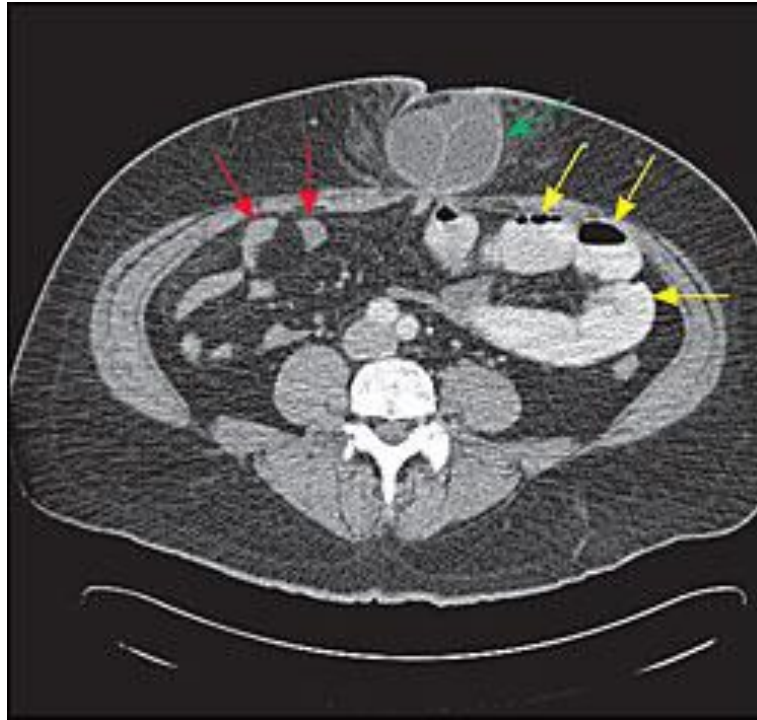
throughout.

**Figure.1** showing (A) Dilated loops of small bowel in supine position (B) Air-fluid level [18]

**COMPUTED TOMOGRAPHY:**

In early obstruction and high jejuna or duodenal obstruction, plain abdominal radiographs may appear normal. Therefore, with strong clinical symptoms and negative initial radiography, non-contrast computed tomography is recommended. [5] The benefits of CT over radiography is that it is sensitive for the detection of a high-grade obstruction, defining the

cause and level of obstruction and emergent causes of obstruction such as volvulus or intestinal strangulation. The absence of contrast material in rectum suggests complete obstruction, thickened intestinal wall and poor flow of contrast suggests bowel ischemia, pneumatosis intestinalis, free-peritoneal air, and mesenteric fat stranding suggests necrosis and perforation. [6,7]



**Figure.2** CT scan showing dilated contrast filled loops of bowel (yellow arrows), Decompressed distal small bowel (red arrows) and incarcerated an umbilical hernia (green arrow).[18]

**CONTRAST FLUOROSCOPY:**

Contrast fluoroscopy can be helpful in the diagnosis of partial intestinal obstruction in a clinically stable patient in whom initial conservative management was not effective. It may also help in determining the need for surgery.

**ULTRASONOGRAPHY:**

In patients with high-grade obstruction, ultrasound evaluation has high sensitivity for intestinal obstruction. It is widely replaced by CT but is the first line of investigation in unstable patients, and that radiation exposure is contraindicated such as pregnant women. [8]

**MAGNETIC RESONANCE IMAGING (MRI):**

MRI is more sensitive than CT scan in the evaluation of intestinal obstruction. It involves intubation of duodenum and infusion of contrast material into small bowel to determine the location of the obstruction. However, because of CT abdomen being at ease and more cost-effective, MRI remains as adjunct imaging modality. [9]

**CONSERVATIVE AND SURGICAL MANAGEMENT:**

The first approach to management of bowel obstruction includes correction of physiological impairment. Measures include use of bladder catheter to monitor urine output, sufficient I.V. Access, arterial canalization, CVP monitoring, correction of hypovolemia and electrolyte depletion. After the

confirmed diagnosis the antibiotics should be started. Selection criteria of antibiotics depends on intestinal overgrowth of bacteria and their translocation across the intestinal wall. The main criteria of therapeutic management are to remove the obstacle while surgery remains the leading option. The choice of surgery depends on pathological findings. Clinical instability, diagnostic uncertainty, unexplained leucocytosis, metabolic acidosis, doubt of perforation or abdominal sepsis, strangulation occlusion and severe abdominal pain should prompt surgery. [10]

### SMALL INTESTINE OBSTRUCTION:

#### Adhesive small intestine obstruction

Surgical intervention is indicated in such cases when strangulation is suspected of developing during non-operative treatment or when the conservative treatment fails. Compromise of vascular content is recognized by bluish discoloration of the intestinal wall, loss of arterial pulsation, hemorrhage and lack of pulsation. Resection is avoided when intestine

loop pinks up, otherwise, resection is indicated. To further prevent adhesion formation, plication and stenting with long intestinal tubes are used as a mechanical method. Promethazine, antihistamines, and dextran -70 proved to reduce adhesion formation. [11]

#### Gallstone ileus

Gallstone ileus is often difficult to diagnose, and the majority of the patients are elder and multimorbid. The most common site of obstruction is distal ileum with the presence of single to multiple stones. Enterolithotomy is to relieve the obstruction. Cholecystectomy is often done with the closure of fistula with or without common bile duct exploration. [12,13]

#### Crohn's Disease

Steroids and parenteral nutrition are the first lines of treatment. Resection and stricturoplasty are indicated in recurring obstruction and a palpable mass. [14,15]

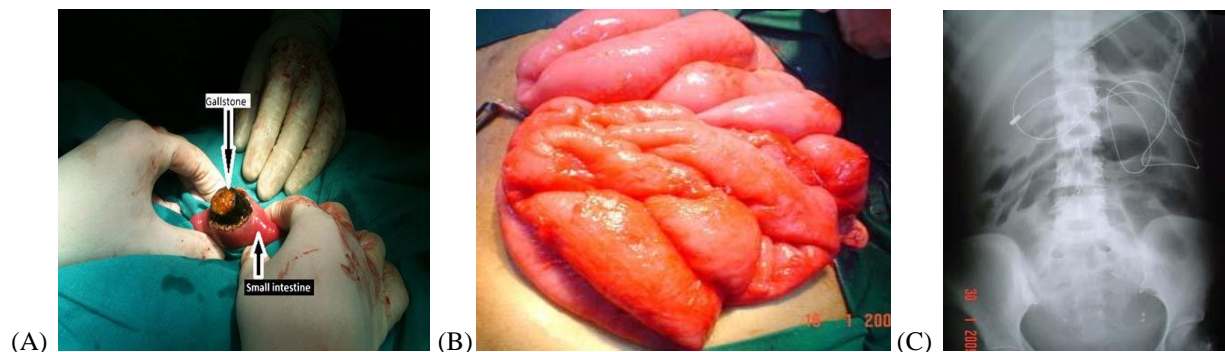


Figure.3 showing (A) Enterolithotomy gallstone ileus (B) Plicated bowel (C) stenting of the bowel. [16,17]

#### Radiation Enteritis

The small intestine is extremely sensitive to radiation damage and causes actinic damage to the intestinal mucosa. The final stage of damage includes perforation or stricture. Chances of improvement with conservative treatment are high although surgery is indicated in a severe case which includes manipulation of the bowel to the minimum and dissecting damaged bowel loops that are glued together by serositis and fibrosis. [19]

#### Malignant Bowel Obstruction

About 10 -30% patient will have relief of-of obstruction with non-operative management while 40% eventually requires surgery. Hence patient with known cancer should be treated as any other patient presenting intestinal obstruction. Surgical intervention is indicated if nasogastric decompression fails or if re-obstruction develops. Surgical procedure

selection, resection, bypass, gastrostomy or tube jejunostomy is based on the extent of disease. [19]

#### NSAID-induced Bowel Obstruction

Prolong chronic use of NSAIDs is widely associated with various pathology of stomach, small intestine, and colon. Enteropathy, perforation, ulceration and stricture formation are common conditions induced by NSAIDs in the intestine. Once identified the treatment is with intestinal resection or stricturoplasty, balloon dilation, and conventional laparotomy. [20]

#### Large Intestine Obstruction

##### Colostomy

Acutely ill patients with peritonitis or sepsis require an urgent operation. Surgical management of large intestine includes mandatory colostomy, either end colostomy with resection of distal obstruction or

more proximal loop colostomy. It is the most common procedure of choice in a patient with gross contamination of operative field from perforation, severe malnutrition, hemodynamic instability or immunocompromised state. [21]

### Segmental Colectomy

A segmental colectomy has been mostly used in right-sided obstruction than left-sided due reported cases of complication. Right-sided obstruction is treated with right hemicolectomy with ileocolic anastomosis. This may be approached laparoscopically if the surgeon is skillful in technique with hemodynamically stable patient and not overly dilated proximal bowel. According to recent survey, the on-table lavage seems to be preferred by many surgeons performing resection with primary anastomosis for left-sided obstruction while some other perform a stoma for decompression. [21]

### Subtotal Colectomy

This is another surgical intervention to avoid stoma creation in left-sided obstruction lesion in patients with ileosigmoidal or ileorectal anastomosis. Subtotal colectomy provides various advantages of removing compromised, dilated colon, avoiding size discrepancy in luminal diameter between the two ends of the bowel to be anastomosed, in malignancies, remove any proximal synchronous lesion. Drawbacks include frequent bowel movement than before operation and are at risk of dehydration, dietary restriction, and changes in general activity when compared to limited resection. [21]

### CONCLUSION:

The key to prevent the high mortality rate in patients with intestinal obstruction is an early diagnosis, resuscitation, and operative intervention. Proper emphasis on preoperative preparation, intravenous fluids, nutritional supplementation, blood investigation, X-ray and CT-SCAN is essential for diagnosis. Intestinal obstruction is a complex condition which can present a variety of symptoms from subtle to extreme. Obstruction etiology, status, and location are often the most significant determinant in the management process. Multiple methods exist ranging from conservative to surgical and endoscopic approaches. This gives the surgeon flexibility towards the treatment approach to achieve the best outcome for the individual patient.

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