

MRS.MALAR

LECTURER

ICON

ACUTE INTESTINAL OBSTRUCTION

1. INTRODUCTION:

Bowel obstruction (or intestinal obstruction) is a mechanical or functional obstruction of the intestines, preventing the normal transit of the products of digestion. It can occur at any level distal to the duodenum of the small intestine and is a medical emergency. The condition is often treated conservatively over a period of 2-5 days with the patient's progress regularly monitored by an assigned physician. Surgical procedures are performed on occasion however in life-threatening cases, such as when the root cause is a fully lodged foreign object or malignant tumor.

2. DEFINITION:

Intestinal obstruction is an interruption in the normal flow of intestinal contents along the intestinal tract. The block may occur in the small or large intestine, may be complete or incomplete, may be mechanical or paralytic, and may or may not compromise the vascular supply. Obstruction most frequently occurs in the young and the old.

3. CLASSIFICATION:

By cause:

Two types of processes can impede this flow.

❖ *Dynamic or Mechanical obstruction:* where peristalsis is working against a mechanical obstruction. The obstructing lesions may be intraluminal obstruction or a mural (intra and extra mural) obstruction from pressure on the intestinal walls occurs. Examples are intussusception, polypoid tumors and neoplasms, stenosis, strictures, adhesions, hernias, and abscesses.

❖ *Adynamic or Functional obstruction: this can occur in two forms*

(i) The intestinal musculature cannot propel the contents along the bowel. Examples are amyloidosis, muscular dystrophy, endocrine disorders such as diabetes mellitus, or neurologic disorders such as Parkinson's disease. The blockage also can be temporary and the result of the manipulation of the bowel during surgery.

(ii) *Paralytic (adynamic, neurogenic) ileus*

- Peristalsis is ineffective (diminished motor activity perhaps because of toxic or traumatic disturbance of the autonomic nervous system).
- There is no physical obstruction and no interrupted blood supply.
- Disappears spontaneously after 2 to 3 days.

In both the types mechanical element is absent.

By structure:

The obstruction can be partial or complete. Its severity depends on the region of bowel affected, the degree to which the lumen is occluded, and especially the degree to which the vascular supply to the bowel wall is disturbed.

Most bowel obstructions occur in the small intestine. Adhesions are the most common cause of small bowel obstruction, followed by hernias and neoplasms. Other causes include intussusception, volvulus (ie, twisting of the bowel), and paralytic ileus.

About 15% of intestinal obstructions occur in the large bowel; most of these are found in the sigmoid colon (Wolfe, 2000). The most common causes are carcinoma, diverticulitis, inflammatory bowel disorders, and benign tumors.

Strangulation—obstruction compromises blood supply, leading to gangrene of the intestinal wall. Caused by prolonged mechanical obstruction

Obstruction may be classified clinically into two types:

- ❖ Small bowel obstruction – high or low
- ❖ Large bowel obstruction

In high small bowel obstruction vomiting occurs early and is profuse with rapid dehydration. Distension is minimal with little evidence of fluid levels on abdominal radiography.

In low small bowel obstruction pain is predominant with central distension. Vomiting is delayed. Multiple central fluid levels are seen on radiography.

In large bowel obstruction distension is early and pronounced. Pain is mild and vomiting and dehydration is late. The proximal colon and caecum are distended on an abdominal radiography.

The nature of presentation will also be influenced by whether the presentation is:

- ❖ Acute – usually occurs in small bowel with sudden onset of severe colicky central abdominal pain, distension, with early vomiting and constipation.
- ❖ Chronic – usually seen in large bowel obstruction with lower abdominal colic and absolute constipation, followed by distension.
- ❖ Acute on chronic – there is a short history of distension and vomiting against a background of pain and constipation.
- ❖ Subacute – implies an incomplete obstruction.

Presentation will be further influenced by whether the obstruction is

- ❖ Simple – where the blood supply is intact;
- ❖ Strangulated – where there is direct interference to blood flow, usually by hernial rings or intraperitoneal adhesions or bands.

4. CAUSES:

- Mechanical obstruction - Causes include:
 - Extrinsic—adhesions from surgery, hernia, wound dehiscence, masses, volvulus (twisted loop of intestine).
Up to 70% of small bowel obstructions are caused by adhesions.
 - Intrinsic—hematoma, tumor, intussusception (telescoping of intestinal wall into itself), stricture or stenosis, congenital (atresia, imperforate

anus), trauma, inflammatory diseases (Crohn's, diverticulitis, ulcerative colitis).

- Intraluminal—foreign body, fecal or barium impaction, polyp, gallstones, meconium in infants.
- In postoperative patients, approximately 90% of mechanical obstructions are due to adhesions. In nonsurgical patients, hernia (most often inguinal) is the most common cause of mechanical obstruction.
- Paralytic ileus - Causes include:
 - Spinal cord injuries; vertebral fractures.
 - Postoperatively after any abdominal surgery.
 - Peritonitis, pneumonia.
 - Wound dehiscence (breakdown).
 - GI tract surgery.

Table 38-5 • Mechanical Causes of Intestinal Obstruction

CAUSE	COURSE OF EVENTS	RESULT
Adhesions	Loops of intestine become adherent to areas that heal slowly or scar after abdominal surgery.	After surgery, adhesions produce a kinking of an intestinal loop.
Intussusception	One part of the intestine slips into another part located below it (like a telescope shortening).	The intestinal lumen becomes narrowed.
Volvulus	Bowel twists and turns on itself.	Intestinal lumen becomes obstructed. Gas and fluid accumulate in the trapped bowel.
Hernia	Protrusion of intestine through a weakened area in the abdominal muscle or wall.	Intestinal flow may be completely obstructed. Blood flow to the area may be obstructed as well.
Tumor	A tumor that exists within the wall of the intestine extends into the intestinal lumen, or a tumor outside the intestine causes pressure on the wall of the intestine.	Intestinal lumen becomes partially obstructed; if the tumor is not removed, complete obstruction results.

Causes of Intestinal Obstruction

Location	Cause
Colon	Tumors (usually in left colon),

	diverticulitis (usually in sigmoid), volvulus of sigmoid or cecum, fecal impaction, Hirschsprung's disease
Duodenum	
Adults	Cancer of the duodenum or head of pancreas, ulcer disease
Neonates	Atresia, volvulus, bands, annular pancreas
Jejunum and ileum	
Adults	Hernias, adhesions (common), tumors, foreign body, Meckel's diverticulum, Crohn's disease (uncommon), Ascaris infestation, midgut volvulus, intussusception by tumor (rare)
Neonates	Meconium ileus, volvulus of a malrotated gut, atresia, intussusception

Small bowel obstruction:

Causes of small bowel obstruction include:

- Adhesions from previous abdominal surgery
- Hernias containing bowel
- Crohn's disease causing adhesions or inflammatory strictures
- Neoplasms, benign or malignant
- Intussusception in children
- Volvulus
- Superior mesenteric artery syndrome, a compression of the duodenum by the superior mesenteric artery and the abdominal aorta
- Ischaemic strictures
- Foreign bodies (e.g. gallstones in gallstone ileus, swallowed objects)
- Intestinal atresia
- Carcinoid rare, preferred location: ileum

Large bowel obstruction

Causes of large bowel obstruction include:

- Neoplasms
- Hernias
- Inflammatory bowel disease
- Colonic volvulus (sigmoid, caecal, transverse colon)
- Adhesion (medicine)
- Constipation
- Fecal impaction
- Fecaloma
- Colon atresia
- Intestinal pseudoobstruction
- Benign strictures (diverticular disease)
- Endometriosis

Differential diagnosis:

Differential diagnoses of bowel obstruction include:

- Ileus
- Intra-abdominal sepsis
- Pneumonia or other systemic illness.

5. PATHOPHYSIOLOGY:

5.1. SMALL BOWEL OBSTRUCTION:

Intestinal contents, fluid, and gas accumulate above the intestinal obstruction. The abdominal distention and retention of fluid reduce the absorption of fluids and stimulate more gastric secretion. With increasing distention, pressure within the intestinal lumen increases, causing a decrease in venous and arteriolar capillary pressure. This causes edema, congestion, necrosis, and eventual rupture or perforation of the intestinal wall, with resultant peritonitis.

Reflux vomiting may be caused by abdominal distention.

Vomiting results in a loss of hydrogen ions and potassium from the stomach, leading to a reduction of chlorides and potassium in the blood and to metabolic alkalosis. Dehydration and acidosis develop from loss of water and sodium. With acute fluid losses, hypovolemic shock may occur.

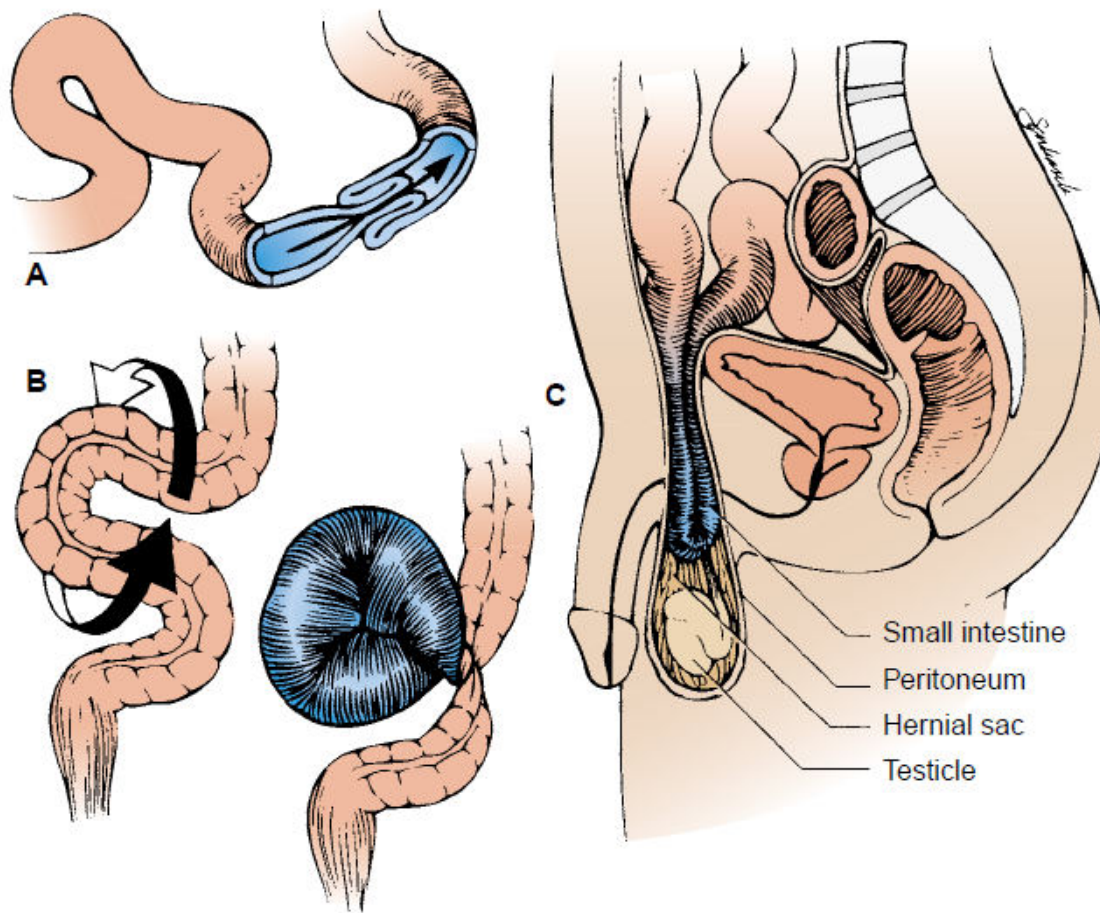


FIGURE 38-6 Three causes of intestinal obstruction. (A) Intussusception invagination or shortening of the colon caused by the movement of one segment of bowel into another. (B) Volvulus of the sigmoid colon; the twist is counterclockwise in most cases. Note the edematous bowel. (C) Hernia (inguinal). The sac of the hernia is a continuation of the peritoneum of the abdomen. The hernial contents are intestine, omentum, or other abdominal contents that pass through the hernial opening into the hernial sac.

5.2. LARGE BOWEL OBSTRUCTION:

As in small bowel obstruction, large bowel obstruction results in an accumulation of intestinal contents, fluid, and gas proximal to the obstruction. Obstruction in the large bowel can lead to severe distention and perforation unless some gas and fluid can flow back through the ileal valve. Large bowel obstruction, even if complete, may be undramatic if the blood supply to the colon is not disturbed. If the blood supply is cut off, however, intestinal strangulation and necrosis (ie, tissue death) occur; this condition is life threatening. In the large intestine, dehydration occurs more slowly than in the small intestine because the colon can absorb its fluid contents and can distend to a size considerably beyond its normal full capacity.

In simple mechanical obstruction, blockage occurs without vascular compromise. Ingested fluid and food, digestive secretions, and gas accumulate above the obstruction. The proximal bowel distends, and the distal segment collapses. The normal secretory and absorptive functions of the mucosa are depressed, and the bowel wall becomes edematous and congested. Severe intestinal distention is self-perpetuating and progressive, intensifying the peristaltic and secretory derangements and increasing the risks of dehydration and progression to strangulating obstruction.

Strangulating obstruction is obstruction with compromised blood flow; it occurs in nearly 25% of patients with small-bowel obstruction. It is usually associated with hernia, volvulus, and intussusception. Strangulating obstruction can progress to infarction and gangrene in as little as 6 h. Venous obstruction occurs first, followed by arterial occlusion, resulting in rapid ischemia of the bowel wall. The ischemic bowel becomes edematous and infarcts, leading to gangrene and perforation. In large-bowel obstruction, strangulation is rare (except with volvulus).

Perforation may occur in an ischemic segment (typically small bowel) or when marked dilation occurs. The risk is high if the cecum is dilated to a diameter ≥ 13 cm. Perforation of a tumor or a diverticulum may also occur at the obstruction site.

The distension proximal to an obstruction is produced by two factors:

Gas – regardless of the level of obstruction, there is the significant outgrowth of both aerobic and anaerobic organisms resulting in considerable gas production.

Following the reabsorption of oxygen and carbon dioxide, the majority is made up of with nitrogen (90%) and hydrogen sulphide.

Fluid – this is made up of the various digestive juices. Following obstruction, fluid accumulates within the bowel wall and any excess is secreted into the lumen, whilst absorption from the gut is retarded. Dehydration and electrolyte loss are due to:

- ❖ Reduced oral intake
- ❖ Defective intestinal absorption
- ❖ Losses due to vomiting
- ❖ Sequestration in the bowel lumen.

Altered Physiology:

- Increased peristalsis, distention by fluid and gas, and increased bacterial growth proximal to obstruction. The intestine empties distally.
- Increased secretions into the intestine are associated with diminution in the bowel's absorptive capacity.
- The accumulation of gases, secretions, and oral intake above the obstruction causes increasing intraluminal pressure.
- Venous pressure in the affected area increases, and circulatory stasis and edema result.
- Bowel necrosis may occur because of anoxia and compression of the terminal branches of the mesenteric artery.
- Bacteria and toxins pass across the intestinal membranes into the abdominal cavity, thereby leading to peritonitis.
- “*Closed-loop*” obstruction is a condition in which the intestinal segment is occluded at both ends, preventing either the downward passage or the regurgitation of intestinal contents.

6. CLINICAL FEATURES:

Fever, peritoneal irritation, increased WBC count, toxicity, and shock may develop with all types of intestinal obstruction.

- Simple mechanical—high small-bowel: colic (cramps), mid- to upper abdomen, some distention, early bilious vomiting, increased bowel sounds (high-pitched tinkling heard at brief intervals), minimal diffuse tenderness.
- Simple mechanical—low small-bowel: significant colic (cramps), midabdominal, considerable distention, vomiting slight or absent, later feculent, increased bowel sounds and “hush” sounds, minimal diffuse tenderness.
- Simple mechanical—colon: cramps (mid- to lower abdomen), later-appearing distention, then vomiting may develop (feculent), increase in bowel sounds, minimal diffuse tenderness.
- Partial chronic mechanical obstruction—may occur with granulomatous bowel in Crohn's disease. Symptoms are cramping, abdominal pain, mild distention, and diarrhea.
- Strangulation symptoms are initially those of mechanical obstruction, but progress rapidly—pain is severe, continuous, and localized. There is moderate distention, persistent vomiting, usually decreased bowel sounds and marked localized tenderness. Stools or vomitus become bloody or contain occult blood.

Obstruction of the small bowel causes symptoms shortly after onset:

- ❖ abdominal cramps centered around the umbilicus or in the epigastrium, vomiting, and—in patients with complete obstruction—obstipation.
- ❖ Patients with partial obstruction may develop diarrhea.
- ❖ Severe, steady pain suggests that strangulation has occurred. In the absence of strangulation, the abdomen is not tender.
- ❖ Hyperactive, high-pitched peristalsis with rushes coinciding with cramps is typical. Sometimes, dilated loops of bowel are palpable.
- ❖ With infarction, the abdomen becomes tender and auscultation reveals a silent abdomen or minimal peristalsis.
- ❖ Shock and oliguria are serious signs that indicate either late simple obstruction or strangulation.

Obstruction of the large bowel usually causes milder symptoms that develop more gradually than those caused by small-bowel obstruction. Increasing constipation leads to

obstipation and abdominal distention. Vomiting may occur (usually several hours after onset of other symptoms) but is not common. Lower abdominal cramps unproductive of feces occur. Physical examination typically shows a distended abdomen with loud borborygmi. There is no tenderness, and the rectum is usually empty. A mass corresponding to the site of an obstructing tumor may be palpable. Systemic symptoms are relatively mild, and fluid and electrolyte deficits are uncommon.



Volvulus often has an abrupt onset. Pain is continuous, sometimes with superimposed waves of colicky pain.

Depending on the level of obstruction, bowel obstruction can present with abdominal pain, abdominal distension, vomiting, fecal vomiting, and constipation.

Bowel obstruction may be complicated by dehydration and electrolyte abnormalities due to vomiting; respiratory compromise from pressure on the diaphragm by a distended abdomen, or aspiration of vomitus; bowel ischaemia or perforation from prolonged distension or pressure from a foreign body.

In small bowel obstruction the pain tends to be colicky (cramping and intermittent) in nature, with spasms lasting a few minutes. The pain tends to be central and mid-abdominal. Vomiting occurs before constipation.

In large bowel obstruction the pain is felt lower in the abdomen and the spasms last longer. Constipation occurs earlier and vomiting may be less prominent. Proximal obstruction of the large bowel may present as small bowel obstruction.

7. DIAGNOSTIC EVALUATION:



Upright abdominal X-ray demonstrating a small bowel obstruction. Note multiple air fluid levels.



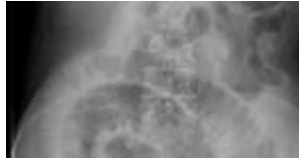
Upright abdominal X-ray of a patient with a large bowel obstruction showing multiple air fluid levels and dilated loops of bowel.

❖ Abdominal series

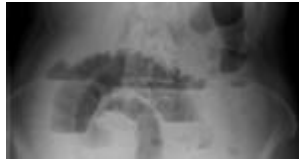
Supine and upright abdominal x-rays should be taken and are usually adequate to diagnose obstruction. Although only laparotomy can definitively diagnose strangulation, careful serial clinical examination may provide early warning. Elevated WBCs and acidosis may indicate that strangulation has already occurred.



Small-Bowel
Obstruction (Supine)



Small-Bowel
Obstruction (Upright)



On plain x-rays, a ladderlike series of distended small-bowel loops is typical of small-bowel obstruction but may also occur with obstruction of the right colon. Fluid levels in the bowel can be seen in upright views. Similar, although perhaps less dramatic, x-ray findings and symptoms occur in ileus (paralysis of the intestine without obstruction—see *Acute Abdomen and Surgical Gastroenterology: Ileus*); differentiation can be difficult. Distended loops and fluid levels may be absent with an obstruction of the upper jejunum or with closed-loop strangulating obstructions (as may occur with volvulus). Infarcted bowel may produce a mass effect on x-ray. Gas in the bowel wall (pneumatosis intestinalis) indicates gangrene.

In large-bowel obstruction, abdominal x-ray shows distention of the colon proximal to the obstruction. In cecal volvulus, there may be a large gas bubble in the mid-abdomen or left upper quadrant. With both cecal and sigmoidal volvulus, a contrast enema shows the site of obstruction by a typical “bird-beak” deformity at the site of the twist; the procedure may actually reduce a sigmoid volvulus. If contrast enema is not done, colonoscopy can be used to decompress a sigmoid volvulus but rarely works with a cecal volvulus.



A small bowel obstruction as seen on CT

The main diagnostic tools are blood tests, X-rays of the abdomen, CT scanning and/or ultrasound. If a mass is identified, biopsy may determine the nature of the mass.

Radiological signs of bowel obstruction include bowel distension and the presence of multiple (more than six) gas-fluid levels on supine and erect abdominal radiographs.

Contrast enema or small bowel series or CT scan can be used to define the level of obstruction, whether the obstruction is partial or complete, and to help define the cause of the obstruction.

According to a meta-analysis of prospective studies by the Cochrane Collaboration, the appearance of water-soluble contrast in the cecum on an abdominal radiograph within 24 hours of oral administration predicts resolution of an adhesive small bowel obstruction with a pooled sensitivity of 96% and specificity of 96%. PMID 15674958

Colonoscopy, small bowel investigation with ingested camera or push endoscopy, and laparoscopy are other diagnostic options.

8. MANAGEMENT:

8.1. Non surgical Management:

- Correction of fluid and electrolyte imbalances with normal saline or Ringer's solution with potassium as required.

- NG suction to decompress bowel.
- Treatment of shock and peritonitis.
- TPN may be necessary to correct protein deficiency from chronic obstruction, paralytic ileus, or infection.
- Analgesics and sedatives, avoiding opiates due to GI motility inhibition.
- Antibiotics to prevent or treat infection.
- Ambulation for patients with paralytic ileus to encourage return of peristalsis.

Some causes of bowel obstruction may resolve spontaneously; many require operative treatment.

In adults, frequently the surgical intervention and the treatment of the causative lesion are required. In malignant large bowel obstruction, endoscopically placed self-expanding metal stents may be used to temporarily relieve the obstruction as a bridge to surgery, or as palliation.

Small bowel obstruction:

In the management of small bowel obstructions it is often said that "[n]ever let the sun rise or set on small-bowel obstruction"^[1] because they are sometimes fatal if treatment is delayed. This traditional surgical canon is no longer followed, largely because of improvements in radiologic imaging of small bowel obstruction, which allow confident distinction between simple obstructions, that can be treated conservatively, and obstructions associated with surgical emergencies (volvulus, closed-loop obstructions, ischemic bowel, incarcerated hernias, etc.).

A small flexible tube may be inserted from the nose into the stomach to help decompress the dilated bowel. This tube is uncomfortable but does relieve the abdominal cramps, distension and vomiting. Intravenous therapy is utilized and the urine output is monitored with a catheter in the bladder.

Most people with SBO are initially managed conservatively because in many cases, the bowel will open up. Some adhesions loosen up and the obstruction resolves.

However, when conservative management is undertaken, the patient is examined several times a day and X - rays are obtained to ensure that the individual is not getting clinically worse.

Conservative treatment involves insertion of a nasogastric tube, correction of dehydration and electrolyte abnormalities. Opioid pain relievers may be used for patients with severe pain. Antiemetics may be administered if the patient is vomiting. Adhesive obstructions often settle without surgery. If obstruction is complete a surgery is required.

Most patients do improve with conservative care in 2–5 days. However, in some occasions, the cause of obstruction may be a cancer and in such cases, surgery is the only treatment. These individuals undergo surgery where the cause of SBO is removed. Individuals who have bowel resection or lysis of adhesions usually stay in the hospital a few more days until they are able to eat and walk.

Small bowel obstruction caused by Crohn's disease, peritoneal carcinomatosis, sclerosing peritonitis, radiation enteritis and postpartum bowel obstruction are typically treated conservatively, i.e. without surgery. Conversely, a small bowel obstruction in a "virgin abdomen" (an abdomen that has not seen an operation) is almost never treated conservatively.

If a gallstone is the cause of obstruction, it is removed through an enterotomy, and cholecystectomy need not be done. Procedures to prevent recurrence should be done, including repair of hernias, removal of foreign bodies, and lysis of the offending adhesions. In some patients with early postoperative obstruction or repeated obstruction caused by adhesions, simple intubation with a long intestinal tube (many consider a standard NGT to be equally effective), rather than surgery, may be attempted in the absence of peritoneal signs.

Disseminated intraperitoneal cancer obstructing the small bowel is a major cause of death in adult patients with GI tract cancer. Bypassing the obstruction, either surgically or with endoscopically placed stents, may palliate symptoms briefly.

Obstructing colon cancers can often be treated by a single-stage resection and anastomosis. Other options include a diverting ileostomy and distal anastomosis. Occasionally, a diverting colostomy with delayed resection is required.

When diverticulitis causes obstruction, perforation is often present. Removal of the involved area may be very difficult but is indicated if perforation and general peritonitis are present. Resection and colostomy are done, and anastomosis is postponed. Fecal impaction usually occurs in the rectum and can be removed digitally and with enemas. However, a fecal concretion alone or in a mixture (ie, with barium or antacids) that causes complete obstruction (usually in the sigmoid) requires laparotomy.

Treatment of cecal volvulus consists of resection and anastomosis of the involved segment or fixation of the cecum in its normal position by cecostomy in the frail patient. In sigmoidal volvulus, an endoscope or a long rectal tube can often decompress the loop, and resection and anastomosis may be deferred for a few days. Without a resection, recurrence is almost inevitable.

In children:

Fetal and neonatal bowel obstructions are often caused by an intestinal atresia, where there is a narrowing or absence of a part of the intestine. These atresias are often discovered before birth via a sonogram, and treated with using laparotomy after birth. If the area affected is small, then the surgeon may be able to remove the damaged portion and join the intestine back together. In instances where the narrowing is longer, or the area is damaged and cannot be used for a period of time, a temporary stoma may be placed.

8.2. Surgical management:

Options include:

- Closed bowel procedures: lysis of adhesions, reduction of volvulus, intussusception, or incarcerated hernia
- Enterotomy for removal of foreign bodies or bezoars

- Resection of bowel for obstructing lesions, or strangulated bowel with end-to-end anastomosis
- Intestinal bypass around obstruction
- Temporary ostomy may be indicated

9. COMPLICATIONS:

- Dehydration due to loss of water, sodium, and chloride
- Peritonitis
- Shock due to loss of electrolytes and dehydration
- Death due to shock

10. NURSING MANAGEMENT:

Nursing Assessment:

- Assess the nature and location of the patient's pain, the presence or absence of distention, flatus, defecation, emesis, obstipation.
- Listen for high-pitched bowel sounds, peristaltic rushes, or absence of bowel sounds.
- Assess vital signs.
- Fluid collects in dependent bowel loops.
- Peristalsis is too weak to push fluid “uphill.”
- Obstruction primarily occurs in the large bowel.
- Conduct frequent checks of the patient's level of responsiveness; decreasing responsiveness may offer a clue to an increasing electrolyte imbalance or impending shock.

Nursing Diagnoses:

- Acute Pain related to obstruction, distention, and strangulation
- Risk for Deficient Fluid Volume related to impaired fluid intake, vomiting, and diarrhea from intestinal obstruction

- Diarrhea related to obstruction
- Ineffective Breathing Pattern related to abdominal distention, interfering with normal lung expansion
- Risk for Injury related to complications and severity of illness
- Fear related to life-threatening symptoms of intestinal obstruction

Nursing Interventions:

Achieving Pain Relief

- Administer prescribed analgesics.
- Provide supportive care during NG intubation to assist with discomfort.
- To relieve air-fluid lock syndrome, turn the patient from supine to prone position every 10 minutes until enough flatus is passed to decompress the abdomen. A rectal tube may be indicated.

Maintaining Electrolyte and Fluid Balance

- Measure and record all intake and output.
- Administer I.V. fluids and parenteral nutrition as prescribed.
- Monitor electrolytes, urinalysis, hemoglobin, and blood cell counts, and report any abnormalities.
- Monitor urine output to assess renal function and to detect urine retention due to bladder compressions by the distended intestine.
- Monitor vital signs; a drop in BP may indicate decreased circulatory volume due to blood loss from strangulated hernia.

Maintaining Normal Bowel Elimination

- Collect stool samples to test for occult blood if ordered.
- Maintain adequate fluid balance.
- Record amount and consistency of stools.
- Maintain NG tube as prescribed to decompress bowel.

Maintaining Proper Lung Ventilation

- Keep the patient in Fowler's position to promote ventilation and relieve abdominal distention.
- Monitor ABG levels for oxygenation levels if ordered.

Preventing Injury Due to Complications

- Prevent infarction by carefully assessing the patient's status; pain that increases in intensity or becomes localized or continuous may herald strangulation.
- Detect early signs of peritonitis, such as rigidity and tenderness, in an effort to minimize this complication.
- Avoid enemas, which may distort an X-ray or make a partial obstruction worse.
- Observe for signs of shock—pallor, tachycardia, hypotension.
- Watch for signs of:
 - Metabolic alkalosis (slow, shallow respirations; changes in sensorium; tetany).
 - Metabolic acidosis (disorientation; deep, rapid breathing; weakness; and shortness of breath on exertion).

Relieving Fears

- Recognize the patient's concerns, and initiate measures to provide emotional support.
- Encourage presence of support person.

Patient Education and Health Maintenance

- Explain the rationale for NG suction, NPO status, and I.V. fluids initially. Advise the patient to progress diet slowly as tolerated once home.
- Advise plenty of rest and slow progression of activity as directed by surgeon or other health care provider.
- Teach wound care if indicated.

- Encourage the patient to follow-up as directed and to call surgeon or health care provider if increasing abdominal pain, vomiting, or fever occur prior to follow-up.

Evaluation: Expected Outcomes:

- Maintains position of comfort, states pain decreased to 3 or 4 level on 0-to-10 scale
- Urine output greater than 30 mL/hour; vital signs stable
- Passed flatus and small, formed brown stool, negative occult blood
- Respirations 24 breaths per minute and unlabored with head of bed elevated 45 degrees
- Alert, lucid, vital signs stable, abdomen firm, not rigid
- Appears relaxed and reports feeling better

11. PROGNOSIS:

The prognosis for most cases of SBO is excellent. Most non cancerous causes of SBO do well. However, when cancer is the cause of SBO, patients are generally worked up to ensure that there has been no spread. If the cancer is localized to the small bowel, the patient will do well. If the cancer has spread, then the individual may require radiation or chemotherapy.

12. BIBLIOGRAPHY:

1. Black. Joyce. M, Jane Hokanson Hawksetal, “Medical Surgical Nursing,clinical management for positive outcomes”, vol 2,2001,W.B Saunder’s company ,Philadelphia, 2001
2. Lewis Heitkemper Dirksen , “Medical Surgical Nursing, Assessment & Management of clinical problems”,6th edition, Mosby Missouri, 2000
3. Smeltzer. Suzanne, Bareg, Brenda, Hinkle I.Janice etal, “Textbook of Medical Surgical Nursing”, 11th ed,vol11,lippincott Williams & Wilkins, New Delhi, 2008

4. Linton, (2008), "Medical Surgical Nursing" Lippincott Williams & Wilkins, New Delhi
5. Cassmeyer, l., p., (1993), *Medical Surgical Nursing*, 3rd edition, mosby publications: USA.
6. Black, m, j., (1999), *Medical Surgical Nursing*, 5th edition, w.b. saunders publications:USA.
7. Lippincott manual, (2001), manual of nursing practice, 7th edition, lippincott Williams and wilkins publication:Philadelphia
8. "Manual of Nursing Practice" (2006), 8th edition, Jaypee brothers: New Delhi
9. Dlaune sue .c & Ladner Patricia .k, (2002), Fundamentals of Nursing, 3rd edition, Canada: Thompson delmar publication.
10. Perry potter, (1997) Fundamentals of Nursing, 4th edition, America: Mosby Publication

