

## Chronic Mesenteric Ischemia and Ileus of Older People in Surgical Ward

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**Submitted:** 21 May 2018; **Accepted:** 26 May 2018; **Published:** 12 June 2018**Key Points**

- Ileus is a common type of intestinal obstruction resulting from hypomotility of the gastrointestinal tract that is not mechanically obstructed.
- Paralytic ileus is usually multi-factorial and commonly complicates about 50% of patients who undergo major abdominal surgery.
- Mechanical intestinal obstruction can be caused by adhesions, foreign bodies, or neoplasms
- Mesenteric vascular ischemia is a common pathology associated with ileus in older people.
- Gallstone ileus is an infrequent type of mechanical obstruction of the small bowel.
- Management starts with correction of underlying medical conditions, electrolyte abnormalities, acid base abnormalities, and review of medications.
- Surgical intervention is considered in cases not responding to the initial medical management or when complications are suspected.

**Introduction**

Chronic mesenteric ischemia is a pathological condition and well known to be commoner in older people. With the advances of CT angiogram, signs of mesenteric stenosis occlusion became common changes in high proportion of scans of older people in surgical ward. Currently, there is no protocol or guideline to manage these incidental findings as far as it is not symptomatic in terms of weight loss or intestinal angina. However, during stress situation post-operatively, paralytic ileus as a commoner event in older people might be a manifestation of chronic mesenteric ischemia. This review might be a trigger to raise value of manage angioplastable lesions pre-operatively.

Ileus occurs from hypomotility of the gastrointestinal tract in the absence of mechanical bowel obstruction. Although the exact pathogenesis of ileus remains multifactorial and complex, the clinical picture appears to be transiently impaired propulsion of intestinal contents. Ileus frequently complicates major abdominal operations and not uncommon to be associated with mesenteric vascular disorders. Gallstone Ileus is an infrequent cause of mechanical bowel obstruction and is caused by an impaction of a gallstone in the terminal ileum by passing through a biliary-enteric fistula, often from duodenum. It occurs more frequently in women with average

age of 70 years. Initial management is usually based on correction of the underlying medical conditions, electrolyte abnormalities, acid base abnormalities, and review of medications. Surgery may be indicated in patients where the initial medical management does not resolve the obstruction.

**Types**

Although ileus has numerous causes, the postoperative state is the most common setting for the development of ileus and ileus is an expected consequence of abdominal surgery. Physiologic ileus spontaneously resolves within 2-3 days, after sigmoid motility returns to normal. However, ileus that persists for more than 3 days following surgery is termed postoperative a dynamic ileus [1]. However, paralytic ileus can also result from certain drugs and from various injuries and illnesses, such as acute pancreatitis. Mechanical intestinal obstruction is less common and can be caused by adhesions, foreign bodies, or neoplasms. Gall stone is an infrequent cause of mechanical intestinal obstruction and it is usually called "Gallstone ileus".

**Paralytic ileus**

Paralytic ileus is a common type of intestinal obstruction. A dynamic ileus is the failure of passage of enteric contents through small bowel and colon that is not mechanically obstructed. Essentially it represents the paralysis of intestinal motility. The exact pathogenesis of ileus remains unclear, but it is usually multi-factorial and complex. The postoperative state is the most common setting for the development of ileus and it is an expected consequence of abdominal surgery. Frequently, ileus occurs after major abdominal operations, but it may also occur after retroperitoneal and extra-abdominal surgery, as well as general anesthesia alone. The longest duration of ileus is noted to occur after colon and rectal surgery [2,3]. Laparoscopic colon resection has been associated with shorter periods of ileus than open colon and rectal resection [4]. Postoperatively, physiologic ileus spontaneously resolves within 2-3 days and it will be termed postoperative a dynamic ileus or paralytic ileus if it persists [1]. It is due alteration of the intestinal equilibrium, resulting in disorganized electrical activity and paralysis of intestinal segments. This lack of coordinated propulsive action leads to the accumulation of gas and fluids within the bowel. Postoperative ileus occurs in approximately 50% of patients who undergo major abdominal surgery [5]. Most cases of ileus occur after intra-abdominal operations, but other causes of a dynamic ileus may include sepsis (systemic or retroperitoneal),

medications (opioids, psychotropics, anticholinergics, and/or amitriptyline), endocrine disorders (diabetes, hypothyroidism), metabolic disorders (low potassium, magnesium, or sodium levels; anaemia) and intra-abdominal inflammation or peritonitis. Mesenteric venous thrombosis, intra-mural hemorrhage and chronic decrease of mesenteric arterial flow are all commonly associated and have been highlighted in the pathogenesis [5]. Clinically, the abdomen may be distended and tympanic, depending on the degree of abdominal and bowel distention, and may be tender. A distinguishing feature is absent or hypoactive bowel sounds, in contrast to the high-pitched sound of mechanical obstruction. The silent abdomen of ileus reveals no discernible peristalsis or “succession splash”.

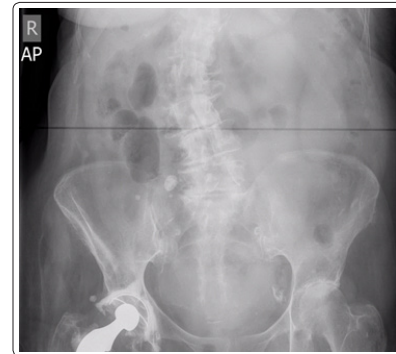
### Mechanical obstruction with gallstone Ileus

Gallstone ileus is a less frequent form of small bowel obstruction caused by an impaction of a gallstone within the lumen of the small intestine. Such a gallstone is hypothesized to enter the gut lumen via cholecysto-enteric fistula. The biliary enteric fistula complicates 2 to 3 percent of all cases of cholelithiasis with associated episodes of cholecystitis. Sixty percent of the fistulas are cholecysto-duodenal fistulas, but cholecysto-colonic and cholecysto-gastric fistulas can also result in gallstone ileus [6]. Large stones, 2-3 cm in diameter, are thought to predispose to fistula formation by gradual erosion through the gallbladder fundus [7]. Most commonly, obstruction occurs at the distal ileum (i.e. ileocecal valve), but can occur at almost any other location in the GI tract [8]. Gallstone ileus is an unusual complication of cholelithiasis, occurring in less than 0.5 % of patients. It is responsible for approximately 1 to 4 % of all cases of mechanical obstruction and, in patients over age 65, accounts for 25 % of non-strangulated small bowel obstruction [9]. Thus, gallstone ileus should always be in the differential diagnosis when assessing an older person with intestinal obstruction. The average age of patients with gallstone ileus is 70 years and women are 3 to 16 times more likely to be affected [10,11]. Clinically, it presents as an episodic subacute obstruction in an older female with abdominal pain and vomiting which subside as the gallstone becomes disimpacted, and only recurs again as the progressively larger stone lodges in the more distal bowel lumen. Intermittent symptoms may be present for some days prior to clinical assessment. Haematemesis could occur as an occasional complication that is due to haemorrhage at the site of the biliary enteric fistula. The patient may become febrile and often appears dehydrated. Common abdominal signs include distension and increased bowel sounds. Jaundice is uncommon, occurring in less than 15% of cases.

### Diagnosis

The most important diagnostic test is abdominal plain film. Fig.(1). Abdominal radiography is an effective initial examination in patients with suspected intestinal obstruction. Radiography accurately diagnoses intestinal obstruction in approximately 60 percent of cases, and its positive predictive value approaches 80 percent in patients with high-grade intestinal obstruction [12,13]. However, plain abdominal films can appear normal in early obstruction and in high jejunal or duodenal obstruction. Therefore, when clinical suspicion for obstruction is high or persists despite negative initial radiography, non-contrast computed tomography (CT) should be considered [14]. Generally, CT scan is warranted when radiography indicates high-grade intestinal obstruction or is inconclusive Fig. (2). Computed tomography can reliably determine the cause of obstruction, and whether serious complications are present, in most patients with high-grade obstructions. CT angiography including

arterial and venous phases are of great help is of help to detect mesenteric circulation abnormalities [14]. Endoscopy and contrast imaging aid in the diagnosis of mechanical bowel obstruction. Laboratory studies and blood tests should focus on assessing the presence of any contributing factor such as sepsis, electrolytic imbalance, and metabolic derangements. Table 1 shows the main clinical and radiographic features of the different causes of intestinal obstruction.



**Figure 1:** Abdominal X-ray demonstrating gall stone as radio opaque shadow close to iliocaecal junction area.



**Figure 2:** CT-scan abdomen and pelvis showing dilated bowel loops with pneumobilia and a gallstone in a dilated bowel loop.

On plain abdominal radiographs, ileus appears as copious gas dilatation of the small intestine and colon. General features of intestinal obstruction on the radiographs include:

- Generalised, uniform, copious gas distension of the bowel, both large and small.
- Involvement of large bowel and lack of a transition point help distinguish it from small bowel obstruction
- When localised, there may be a sentinel loop
- With enteroclysis, the contrast medium in patients with paralytic ileus should reach the caecum within 4 hours; if the contrast medium remains stationary for longer than 4 hours, mechanical obstruction is suggested.

The diagnosis of gallstone ileus is made preoperatively in about one-half of cases. The radiographic findings of gallstone ileus are:

1. Signs of partial or complete intestinal obstruction
2. Air in the biliary tree (pneumo-bilia)
3. Direct visualization of the stone
4. Change in position of a previously located stone
5. Two adjacent small bowel air-fluid levels in the right upper quadrant

## Management

### General Treatment

Management of intestinal obstruction starts with correction of underlying medical conditions, electrolyte abnormalities, acid base abnormalities, and review of medications. In addition, correcting physiologic derangements caused by the obstruction, bowel rest, and removing the source of obstruction are all needed. The former is addressed by intravenous fluid resuscitation with isotonic fluid. The use of a bladder catheter to closely monitor urine output is the minimum requirement for gauging the adequacy of resuscitation. Gastrointestinal decompression using nasogastric tubes is important for the treatment of patients with bowel obstruction or prolonged ileus. Nasogastric decompression improves patient discomfort, minimizes or prevents recurrent vomiting, and serves as means to monitor the progress or resolution of these conditions [15]. Treatment of stable patients with intestinal obstruction and a history of abdominal surgery may present a challenge. Conservative management of a high-grade obstruction should be attempted initially, using intestinal intubation and decompression, aggressive intravenous rehydration, and sometimes antibiotics. Conservative management is successful in 40 to 70 percent of clinically stable patients, with a higher success rate in those with partial obstruction [16-18]. However, surgery may be needed to relieve the obstruction if the tube decompression and other conservative measures do not relieve the symptoms. In general, evidence of complication (e.g. perforation) or vascular compromise, or failure to resolve with adequate bowel decompression is an indication for surgical intervention [19].

### Management of Paralytic Ileus

The management of ileus may vary greatly depending on the nature of the disease and the surgical procedure. Most cases of postoperative ileus resolve with watchful waiting and supportive treatment. No single objective variable accurately predicts the resolution of ileus. Early postoperative small-bowel obstruction is safely and effectively managed by nasogastric decompression in most of cases, with low morbidity and no mortality. In general, re-exploration should be reserved for those patients whose symptoms do not resolve within six days of nasogastric decompression [20]. The clinician must assess the overall status of the patient and evaluate for adequate oral intake and good bowel function. A patient's report of flatus, bowel sounds, or stool passage may prove misleading; therefore, clinicians must not rely solely on self-reporting. Surgical intervention, including Hartmann procedure, is indicated in patients not responding to the initial conservative management. The Hartmann procedure involves resection of the distal colon with creation of a proximal end colostomy or ileostomy. It is usually the procedure of choice when other, more extensive operations are contraindicated. If surgery is indicated, postoperative restoration of bowel function following a Hartmann procedure using a laparoscopic approach is not only safe and effective but also may result in significantly faster recovery time and fewer post-procedure complications compared to the open approach; therefore, it may be a viable alternative to open Hartmann reversal [21]. Laparoscopic Hartmann procedure reversal (LHPR) is a challenging operation involving the closure of a colostomy following formation of colorectal anastomosis in order to restore continuity of the bowels.

### Management of Gallstone Ileus

The main objective of gallstone ileus management, as in any type of bowel obstruction, is to relieve intestinal obstruction after adequate fluid repletion. The options are entero-lithotomy, cholecystectomy,

and fistula division, with or without common bile duct exploration (one-stage procedure), with definitive repair performed at a second operation (two-stage procedure). The treatment of choice is the entero-lithotomy which involves localizing and extracting the gallstone. Often the cholecystectomy is contraindicated by comorbidities and the general state of the patient. More recently, since gallstone ileus constitutes a form of mechanical small bowel obstruction, it can be a surgical emergency and requires laparoscopic removal or propulsion of impacted stone [22].

### Conclusion

Paralytic ileus is usually multi-factorial and commonly complicates major abdominal surgery. Management of uncomplicated bowel obstructions includes fluid resuscitation with correction of metabolic derangements, intestinal decompression, and bowel rest. Considering the observation of high association with mesenteric atherosclerotic disease, we think that angioplasty of those lesion pre-operatively may improve post-operative course and associated paralytic ileus.

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