



Research Article

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Evaluation of Recent Surgical Updates Regarding Diagnosis and Management of Intestinal Obstruction

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ABSTRACT

Background: Intestinal obstruction is a painful abdominal condition that is ultimately managed by surgical methods. Proximal intestinal obstructions usually present clinically with pain, while distal obstructions have pronounced vomiting and absolute constipation. The junior surgeon should take careful note of anamnesis, as the obstruction is mainly a clinical diagnosis. **Objectives:** We focus in this paper on intestinal obstruction, diagnostic approach, and surgical interventions, and only relevant studies are discussed. **Methodology:** PubMed database was used for articles selection, and papers on intestinal obstruction and pseudo-obstruction were obtained and reviewed. **Conclusion:** In summary, certain factors increase the vulnerability of patients and developing intestinal obstruction, most notably including adhesions, neoplasms, and abdominal herniation. Exploratory laparotomy is indicated when patients do not improve within 48 hours of conservative therapy, or perforated bowels are seen on radiography (as air-under-the-diaphragm). Colonoscopy is valuable in ruling out mechanical obstruction and decompressing a distended bowel. Team effort is needed to avoid non-urgent operation, and to identify and treat current dehydration and correct depleted electrolytes, while also preventing systemic inflammation, ischemia, and sepsis.

Key words: Intestinal obstruction, pseudo-obstruction, post-operative ileus .

INTRODUCTION

A variety of diseases such as superior mesenteric artery are eventually complicated by causing intestinal obstruction [1]. It is therefore clinically important to recognize them through their pathophysiological mechanism and clinical manifestation. In addition, not all causes of obstruction are mechanical i.e. palpable and could be a defect in bodily nervous system function or otherwise. One aberrant example is pseudo-obstruction: an abrupt distension of the large intestines, most often on the right side, with no overt mechanical obstruction. Another one is ileus no identifiable mechanical causation is found, yet the paralysis extends to both small and large intestines.

Detailed history is of immense importance in cases of intestinal obstruction, which not only affects diagnosis but even directs the management plan in some patients.

In addition, for obtaining full history for the symptoms, especially pain, constipation and flatulence, inquiring about the patient's medical history is a great starting point to establish the most probable cause of the obstruction. For example, early vomiting would present more commonly with upper small intestinal obstruction. The junior surgeon should be alert to a possible intestinal obstruction, the strongest indication would be a history of absolute constipation, with visible peristalsis on abdominal examination. With so many diseases under this acute condition, the management options vary as well and as a clinician understanding each option is vital to provide the optimum plan for your patients. In this paper, we reviewed pathophysiology, clinical features, diagnosis, and management aspects of intestinal obstruction.

METHODOLOGY

PubMed database was used for articles selection, and the following keys were used in the mesh ("Intestinal Obstruction"[Mesh] and "Surgery" [Mesh] or "Physiotherapy" [Mesh]). In regards to the inclusion criteria, the articles were selected based on the inclusion of one of the following topics; intestinal obstruction, pseudo-obstruction, surgical management of obstruction, non-operative care, and other non-operative modalities of treatment. Exclusion criteria were all other articles that did not have one of these topics as their primary endpoint.

DISCUSSION

When approaching a possible intestinal obstruction case, there are important items in history, which may indicate some specific problems, like an acute onset of symptoms, an obstructive event like cecal or sigmoid volvulus, or a longer chronic history of constipation, or catheter use indicating diverticulitis or carcinoma. The physician shall ask about the change in the character of the stool or weight loss that both may indicate a probable neoplastic obstruction, a recurrent lower left abdominal quadrant pain may indicate diverticular disease and even previous surgeries like aortic surgeries (ischemic stricture) holds a great value. Even though both of them are under the same diagnosis umbrella, partial and complete obstruction may present in a patient in a day and night difference. With complete obstruction usually easier to pick up clinically with the hallmarks we talked about, the partial obstruction with passing some gas or stool becomes more vague and harder to diagnose. To recognize that, the obstipated patient with less passage of the stool and flatus has a partial obstruction, requires a high clinical suspicion threshold, and even though this diagnosis is less urgent, it is important to diagnose it early in such cases. A diagnosis of obstruction is mainly clinical, and the physician shall have a high suspicion level for such complaints and signs that are easily seen in such patients. However, other labs shall be done to establish the baseline status of the patient, starting from CBC, electrolytes, up to liver and kidney functions. These tests are important to identify any ongoing disease which may lead to such condition, and for the possibility of surgery as a management option, which we will be talking more about later on. Another point that a lot of physicians miss during evaluation is the possibility of drug-induced symptoms that mimic these diseases, and while ideally this is asked in the history further, evaluation of this still can be done with the lab values. The main drugs that may induce obstruction-like symptoms include pretty common used drugs, such as, opioids, tricyclic antidepressants, anti-cholinergic agents, and anti-Parkinsonian agents [2].

The clinical features in the small bowel (proximal) obstruction can be more pronounced without treatment, and the pain can switch from cramp and intermittent to a sharper, located, and/or continuous pain. This process may indicate a more serious complication of the disease such as bowel perforation, strangulation, and/or ischemia. Therefore, a detailed history and clinical-oriented approach are vital to early identify and intervene in such cases and do not be deceived by the change of symptoms. Even though most studies report that absence of flatus and/or feces passage along with vomiting is the most common reported symptom in this disease, other studies suggested that abdominal pain is the most presenting symptom. Some studies reported the symptom usually seen and in percentage, with 60 to 80% of patients presenting with nausea and vomiting which can be bilious, and the cessation of feces and flatus in 80 to 90% of patients. Abdominal distention was seen in almost two-thirds of patients (60%), with fever and tachycardia and hypotension presenting as a late sign and usually indicating a complication. Several risk factors predispose the individual to a probable obstruction, and these include adhesions, neoplastic disease, and hernias. Adhesions alone may cause up to two-thirds of intestinal obstruction [3]; therefore, a history of operative intervention should alert the surgeon to this possibility when combined with clinical features. Other

conditions may also lead to intestinal obstructive diseases such as Crohn's, ulcerative colitis, intussusception, abdominal abscesses, and volvulus [4].

On the other hand, when we compare this with a large bowel the vomiting and pain become less dominant and constipation and absence of flatus are more seen. Another main symptom that becomes more notable is abdominal distention. However, the other symptoms of nausea and vomiting might be there but of a different character that may contain fecal material.

Detailed history is of importance in this case, with not only affecting diagnosis but even directing the management plan in some patients. In addition to obtaining full history for the symptoms, especially pain, constipation, and flatulence, inquiring about the patient medical history are a great starting point to establish the most probable cause of the obstruction. Some points in history may indicate some specific problems, like an acute onset of symptoms may indicate an obstructive event like cecal or sigmoid volvulus, or a longer chronic history of constipation, or catheter use indicating diverticulitis or carcinoma. The physician shall ask about like change in the character of the stool, or weight loss that both may indicate a probable neoplastic obstruction, a recurrent lower left abdominal quadrant pain may indicate diverticular disease and even previous surgeries like aortic surgeries (ischemic stricture) holds a great value. If there are readings of elevated white blood cells, then inflammation (and possibly sepsis) should be prioritized and dealt with immediately. An incrementing lactate level combined with metabolic acidosis should alert the surgeon of an impending intestinal ischemia. Therefore, it is advisable to collect a full blood count with metabolic readings. If the patient is continuously vomiting, then, it is expected for potassium and chloride levels to drop, presenting with a clinical picture with metabolic alkalosis [4].

Constipation is considered relative when there is the passage of flatus. This occurs in partial intestinal obstruction and other conditions such as gallstone ileus, obstructive mesenteric ischemia, and Richter's hernia.

Table 1: Summary of Clinical Features in Intestinal Obstruction.

	High small bowel	Low small bowel	Large bowel
Vomiting	Severe early	Moderate	Late
Abdominal Distension	Mild	Central	Early and pronounced
Pain	Colicky pain	Central abdominal pain	Relatively mild
Constipation	Late	Varies in appearance	Early
Dehydration	Severe	Moderate	Mild

With complete obstruction usually easier to pick up clinically with the hallmarks we discussed, the partial obstruction with passing some gas or stool becomes vaguer and harder to diagnose. To recognize that the obstipated patient, with less passage of the stool and flatus, has a partial obstruction, requires a high clinical suspicion threshold, and even though this diagnosis is less urgent, it is important to diagnose it early in such cases. Approaching an overtly unstable patient should be guided by radiographs and, if necessary, a computerized tomographic (CT) scan. These modalities are sensitive for detecting perforation and intraperitoneal air entrapment; in cases of vascular compromise or suspected perforated bowels, an exploratory laparotomy should be the initial intervention [4]. If the patient has an obstruction (Complete or partial.), then management should focus on preventing gastrointestinal stress by withholding oral intake, decompression through nasogastric tube, and intravenous re-hydration [4]. When the obstruction does not resolve during the next 48 hours, they should undergo an exploratory laparotomy [4]. However, if resolution does occur, then switching to an advanced diet would be the next best step.

Radiological modalities are very important tools available for the clinician to establish a full picture of the case, and the main aim is ruling out any mechanical causes of bowel obstruction, and identifying any possible complications. The main modalities that are used include plain X-ray and abdominal computed tomography [2]. Abdominal X-ray is necessary in the assessment of a patient suspected clinically of intestinal obstruction; diagnostic ability of radiographs in such scenarios may reach up to 60% [5]. In general, a plain film of the abdomen shows valvulae conniventes in jejunal (proximal) obstruction, a featureless bowel pattern in distal ileal obstruction, and haustra in colon obstruction. When assessing an abdominal radiograph, it would be important to look for and identify any free air under the diaphragm as this narrows down an intestinal perforation diagnosis.

Radiology may assist in diagnosing intestinal obstruction, with high-grade cases having a positive-predictive value of ~80% [6]. A colon obstruction would show dilated large bowels with normal appearing small intestines; combined with loss of flatulence and faeces should alert the physician to a mechanical obstruction. Furthermore, in the event of a highly clinical suspicious obstruction with a contradicting normal radiograph, a non-contrast CT is warranted [7]. Computerized tomography is highly sensitive in detecting intraperitoneal air and diagnosing perforation [7, 8], and also superior to ultrasonographic and radiographic modalities in determining causation of obstruction [8]. In one study, CT had a 100% sensitivity and specificity; and was extremely valuable in differentiating postoperative ileus and mechanical intestinal obstruction [9].

Another modality of investigation and diagnosis is upper GI endoscopy, which is highly accurate to exclude any mechanical occlusion of the proximal part of the small intestine, and help in acquiring duodenal biopsies when an underlying disease is suspected e.g. celiac disease [10]. Colonoscopy as well can be done to rule out mechanical obstructions; however, it may carry a therapeutic effect and help in decompressing the large intestines in some selected patients, even though the long-term effect of such maneuver has been questionable to induce a satisfactory result [11]. Some other maneuvers that is suggested in the course of management is GI manometer (a wireless motility capsule) which provides measurements of intraluminal pH, temperature and pressure. These values sound very helpful theoretically, however, this technique has not been proven clinically to induce an effect. Moreover, it may be dangerous to use in patients where mechanical cause was not ruled out [12].

Intestinal pseudo-obstruction is caused by neuromuscular problems, progressively preventing peristaltic motion; patients would present with cramps, abdominal pain and bloating, vomiting, constipation that is occasionally mixed with diarrhea. Managing patients with chronic pseudo-intestinal obstructions is (as challenging as diagnosis), especially when dealing with special populations as in children and the elderly. The management is not usually carried on by a single physician and would necessitate a multidisciplinary team's effort. The main goals for treatment should compromise avoiding any unnecessary surgeries, identifying and treating any dehydration noted mainly regarding fluids and electrolytes, and preventing and/or treating complications such as sepsis, bowel ischemia and perforation. Excessive surgical intervention is unproductive because it will increase the possibility of future recurrence (especially in adhesion caused obstruction). Other goals of therapy include, maintaining an adequate caloric intake, and promoting a coordinated intestinal motility in these patients. Before the recent breakthroughs in management, a lot of patients used to not benefit from therapeutic approaches, however there are newly established nutritional, pharmacological, and surgical interventions with evidence based effect reported by studies [13-15].

Operative management of intestinal obstruction varies according to causation. In colorectal carcinoma with obstruction, bowel preparations are not possible, therefore the surgeon would preferably do Hartmann's procedure, or segmental colonic resection with primary anastomosis, or total colectomy or palliative with a stent placement as a bridge to surgery. Other surgeons may opt for an on-table bowel preparation. If there are adhesions within the bowel causing the obstruction, then surgery is relatively contraindicated, unless there was a strangulation, as occurs commonly with femoral hernias. Therefore, the clinician must diligently examine the hernial orifices to look for ischemic hernias and signs of peritonism [16-18].

CONCLUSION

Intestinal obstruction presents with abdominal pain, accompanied by symptoms and signs that would aid in the clinical diagnosis and differentiation between small and large bowel obstruction. Lab investigations and radiological modalities are helpful in determining the causation behind it. Adhesion is often the underlying culprit, noted especially in patients with an operative history. Approaching management in these patients relies on restricting oral diet, suctioning by nasogastric tube and rehydration of depleted fluids. In patients not responding to conservative therapy and those with complicated obstruction, taking the patient to the theatre for exploration laparotomy would be essential. Further options and diagnosis approaches may prove more impactful clinically, but further studies with larger sample sizes and longer follow up periods is essential to establish the full clinical significance of such methods.

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