



Large Bowel Obstruction in Obese Patients

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11.1 Introduction

Large bowel obstruction can be mechanical or adynamic. Colorectal cancer is the single most common cause of mechanical obstruction. In the United States approximately 2–5% of patients with colorectal cancer present with complete obstruction. Other causes of colorectal obstruction include diverticulitis, Crohn's disease, schistosomiasis, intussusception, anastomotic stricture, fecal impaction and foreign bodies.

Extraluminal causes include adhesions (more frequent in small bowel obstruction but rare in colonic obstruction), tumors in adjacent organs and volvulus.

Obesity has been recognized as a worldwide problem and it is associated with many co-morbidities such as coronary artery disease, diabetes mellitus, dyslipidemia and sleep apnea. Several large bowel conditions, such as diverticulosis and colorectal cancer, have been reported to have higher incidence in the obese patient. However, some authors concluded that comorbidities such as obesity, hypertension, diabetes and smoking did not correlate with the rate of bowel obstruction [1].

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11.2 Diagnosis

Rapid evaluation beginning with a focused history and physical examination should occur in patients presenting with symptoms of a large bowel obstruction. It is important to elicit a history of chronic constipation or diarrhea, malignancy, and any prior surgery.

Physical examination findings include abdominal distension and tympany. Other findings are palpable abdominal masses, point tenderness, or peritonitis. A digital rectal examination also should be performed to assess for a possible rectal mass or blood.

Basic labs should be obtained including a complete blood cell count for assessment of anemia or elevated white blood cell count, complete chemistry and evaluation of electrolyte imbalances. A lactate also should be included if there is any suspicion of ischemia.

Typical radiographic findings in large bowel obstruction include air/fluid levels within dilated loops of colon, failure of contrast to pass distally, and luminal caliber change and may demonstrate characteristic findings of volvulus [2–4], or pneumoperitoneum. Computed tomography (CT) scan accurately distinguishes between true colonic obstruction and pseudo-obstruction, can accurately diagnose intraluminal, intrinsic, and extrinsic causes [5–7] and sigmoid volvulus. CT is also useful in distinguishing between sigmoid and cecal volvulus, which is important, since the initial treatment may differ because of the different endoscopic success rates [8]. Colonoscopy is not usually needed as an initial diagnostic modality for acute colorectal obstruction, but it can aid in the diagnosis of those patients with chronic symptoms for whom large bowel obstruction cannot be excluded on plain films or abdominal CT.

11.3 Management and Approach

The management is directly correlated to the etiology of the large bowel obstruction.

11.3.1 Preoperative Evaluation. Medical Risk Assessment

Major medical conditions should be identified and optimized before performing colon surgery. Evaluation of cardiac risk, cardiovascular diseases and diabetes mellitus are needed. Obesity has been associated with increased risk, but whether the preoperative approach to obese patients should differ from that in the general population is uncertain [9].

In the presence of large bowel obstruction, any type of bowel preparation is contraindicated but this fact is **not** a contraindication to primary anastomosis [10]. On the other hand, preoperative bowel preparation should be given to patients who have been stented as a bridge to surgery, especially when planning a colocolonic (instead of an ileocolonic) anastomosis [11].

11.3.2 Supportive Care

Initial management of the patient with colorectal obstruction consists of supportive care that includes gastrointestinal decompression and intravenous fluid therapy with correction of electrolyte abnormalities.

Flexible sigmoidoscopy is generally suggested to initially decompress the colon and may be the only treatment in high-risk patients. However elective resection during the same hospital stay is recommended for sigmoid volvulus because of the high rate of recurrence (up to 50%) with endoscopic decompression alone [12].

In patients with acute malignant mechanical obstruction colonic stenting could be used as a bridge to surgery. This provides a window of time prior to surgery to correct fluid depletion and electrolytes, and allow for mechanical bowel preparation, thereby performing surgery under elective, rather than emergent, circumstances [13]. The benefit of this approach is to potentially allow for resection and primary anastomosis (one-stage operation) rather than two-stage operation. Up to 50% of patients with neoplastic large bowel obstruction are not candidates for curative resection [14]. For these patients stenting is a successful alternative in over 90% [15] and palliative chemotherapy can be immediately started [16].

11.3.3 Surgical Management

Acute complete or near complete colorectal obstruction is an urgent surgical problem that accounts for up to 4% of surgical urgent abdominal admissions. The toughest decision facing the surgeon is whether or not to perform a primary reanastomosis at the operation and this decision is determined by weighing the perceived risk of anastomotic leakage against the morbidity of performing a stoma.

Whether to choose a staged procedure depends upon the location of the obstructing lesion, condition of the proximal colon, medical comorbidities of the patient, and presence of proximal perforation [17]. If a stoma is a likely event, an evaluation of its most appropriate location should be done preoperatively by the enterostomal nurse. This is especially true in obese patients, due to the challenges of large pannus.

11.3.4 Technical Considerations in the Obese Patient

The obese patient poses specific considerations and challenges. An adequate operating room table has to be available. Proper position and padding can reduce the incidence of peripheral nerve damage and skin breakdowns. Particular challenges can be faced in positioning the patient in a lithotomy or prone jack-knife position. It is safe to use strapping to secure the patient to the table to avoid shifts and potential falls during surgery. This is particularly important if a laparoscopic procedure is planned, where steep Trendelenburg and reverse Trendelenburg positions with side rotations are necessary to improve exposure. In fact, the frequent presence of heavy omentum, mesentery and thick abdominal wall usually makes surgical exposure

challenging. Trocar placement in laparoscopy has to take into consideration the thickness of the pannus and the subsequent limited mobility. In general ports should be placed with minimal angles and extralong and additional trocars might be necessary. Access to the abdominal cavity can be safely achieved with gasless optical techniques either in the paraumbilical area or at Palmer's point in the left upper quadrant, and care must be taken in the presence of distended bowel. Exposure deep in the pelvis is usually achieved by steep Trendelenburg positions, and patient strapping, body securing and padding are paramount.

For open procedures, generous incisions are usually necessary. The use of lighted retractors and head lamps aid in the visualization of deep and narrow pelvis. Another challenge is the maturation of ostomies through a thick pannus and is achieved by moving the ostomy site more cephalad and medially. Obesity increases exponentially the ostomy complications such as ischemia, retraction in the acute phase, and prolapse and parastomal hernias chronically.

11.3.5 Procedures to Manage Colorectal Obstruction

Whenever possible, a primary anastomosis (one-stage procedure) is the preferred treatment for right- or left-sided colon obstruction [18, 19], but very frequently a diverting ileostomy is advisable. If the local situation requires, the classic Hartmann's operation (two-stage procedure) could be the best solution.

11.3.6 Perioperative Considerations

Besides the usual perioperative care with aspiration prevention and fluid management, the obese patient poses unique challenges. Venous thromboembolic events (VTE) are significantly more prevalent in the obese population and preoperative evaluations for hypercoagulability and presence of acute and chronic thrombosis should be completed. Perioperative deep vein thrombosis (DVT) prophylaxis should include both mechanical and pharmacological methods. Conflicting evidence exists on the best pharmacological agent, dose and duration. In general, the prophylaxis is started prior to induction of anesthesia and maintained until patient discharge. In the presence of particular risk factors (immobility, prior VTE, hypercoagulable states, malignancy) extended use of pharmacologic agents should be considered, although the evidence in the literature is controversial. Early patient mobilization is a key element of VTE prevention with the availability of physical therapist and supporting staff. The use of appropriate beds can reduce the development of pressure ulcers. Fluid resuscitation should be adequate for the body weight and tailored to the fluid losses and urine output. In the immediate postoperative period and for the next 48–72 h respiratory complications related to sleep apnea, atelectasis and pneumonia should be carefully monitored. Continuous pulse oximetry and telemetry are necessary in patients with a history of obstructive sleep apnea. The use of positive pressure machines should be implemented early. Adequate pulmonary toilet and breathing exercises can minimize postoperative atelectasis. Obese patients are at risk for postoperative cardiovascular

events, so close cardiac monitoring, fluid balance and pain control are important. Specific cardiac medications should be restarted as soon as possible, and specific ones, such as beta blockers, should never be discontinued. A solid body of evidence exists on the advantages of continuing certain antiplatelet medications (aspirin) in the perioperative period, with lack of increased bleeding risks. Patients on chronic anticoagulation should be carefully monitored, not only for bleeding complications but also because of the higher risk of perioperative VTE events.

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