

Case. 74 yo F with a h/o breast cancer s/p mastectomy, s/p cholecystectomy, hysterectomy, and multiple hernia repairs was admitted to the hospital with 3 days of nausea and vomiting. Upon further questioning, she had experienced no BM's or flatus in the last 48 hours. On admission, she was afebrile, BP=79/49, P=132, RR=16 on room air. Initial WBC=6.4, BUN/Cr=17/1.5, up from her baseline 10/1.0. Her K=3.2. Acute abdominal series xrays showed air-fluid levels with distended loops of small bowel.

Small Bowel Obstruction

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Definition. Intestinal obstruction may be categorized according to: the degree of obstruction, termed partial vs. complete; the absence or presence of intestinal ischemia, termed simple vs. strangulated; and the site of the obstruction, small intestinal vs. colonic. A closed loop obstruction is a mechanical obstruction in which both the proximal and distal parts of the involved intestinal segment are occluded.

Clinical Presentation. Crampy abdominal pain, nausea, vomiting, abdominal distention, +/- obstipation (a partial or a new complete can still pass flatus). A more distal obstruction will produce more feculent emesis, where a more proximal one will cause less abdominal distention and its emesis will be more bilious.

Ddx. SBO, paralytic ileus, Ogilvie's syndrome (intestinal pseudo-obstruction where chronically dilated colon loops over on itself causing an effective obstruction, treated with decompression, with either NG tube or colonoscopy).

Causes of obstruction.

- A) Extrinsic
 - Adhesions (most common), volvulus, hernias
- B) Intrinsic
 - Tumors, strictures, atresia, stenosis, congenital malformations
- C) Gunk inside the lumen
 - Bezoars, fecal matter, intussusception, gallstones.

Physical Exam. Vital signs - check for fever, which is consistent with ischemia; hypotension and tachycardia are consistent with dehydration often seen in SBO. Bowel sounds can be "high tinkling" or hypoactive. With prolonged obstruction, motility of bowel slows and bowel sounds can slow/disappear. Look for: hernias; scars from prior abdominal surgeries; and abdominal masses, seen in the setting of a volvulus or tumor. Abdomen can be tender or nontender in the presence of a mass. Look for tympany which is c/w an air filled bowel. Perform a rectal exam to evaluate a mass or blood (seen in tumors, intussusception, ischemia). Serial abdominal exams should be performed while the patient is in the hospital.

Diagnosis. Usually made based on history and PE, but the following can also be used:

- **Labs.** Not very helpful in SBO except that you can get labs to assess dehydration, and a metabolic alkalosis can be seen with nausea and vomiting. Elevated WBC, metabolic acidosis, and elevated lactate level can be c/w ischemia/strangulation. Serial labs recommended.
- **Imaging studies.** CXR to r/o free air; upright and supine abdominal films, aka acute abdominal series, to look for multiple air-fluid levels with distended loops of small bowel seen in SBO, but they can occasionally be seen in a paralytic ileus as well. Complete obstruction > 24 hours

usually won't have gas in the colon or rectum. CT is a good adjunct test if x-rays indeterminate; can show different calibers in small bowel proximal and distal to the obstruction, the transition point or zone, which is where the bowel transitions from being dilated to collapsed and helps to localize the site of obstruction. A closed loop can appear as a distended, fluid-filled 'U' or 'C' shape. Advanced strangulation can show intestinal pneumatosis or hemorrhagic mesenteric changes. CT cannot show adhesions, therefore most sources of obstruction are not seen. Radiologists have been known to differ on whether they use oral contrast, but IV contrast is almost universally used. A barium study such as an enteroclysis is recommended in patients with a h/o recurring obstruction or a low-grade mechanical obstruction to define the precise location and degree of the obstruction.

How do I know this isn't just an ileus? While the clinical presentation may be very similar to SBO, paralytic ileus does not have a source of obstruction. Ileus will show gas in the colon and rectum on xrays, CT's show no source of obstruction. Ileus has abdominal distention, but not usually crampy pain. +/- bowel sounds present. Look for secondary causes, e.g. post-op, narcotics, infection, inflammatory.

Treatment. IVF, nasogastric tube - to prevent aspiration and decompress. Correct any metabolic abnormalities, be aggressive about K+ replacement. Nonoperative management is more likely to be successful in patients with partial compared to complete SBO.

What kind of antiemetics can I give? Metoclopramide and other prokinetics are contraindicated in obstruction, and antiemetics in general have not been shown to be effective in ileus or SBO. If you think ileus is secondary to narcotics, tx nausea with po naloxone, 10 mg qid.

When can I d/c the NG tube? Once bowel function returns, first put the tube to gravity. If no n/v after a trial of gravity, the tube can be removed.

STRANGULATION/ISCHEMIA

- Strangulation is usually seen only in complete obstruction, also seen in Richter's hernia where 1 side of the bowel pokes through a defect where that segment can be strangulated without causing obstruction
- 10% of SBO's progress to strangulation
- No specific sign or symptom that declares a patient as 'strangulated' or a surgical emergency, but fever, elevated WBC with left shift, elevated lactate level & tachycardia can be associated with it. Pain progressing from crampy to constant is also a source of concern. The physical exam early in ischemia may not change, but as it progresses, the patient will show signs of peritonitis, e.g. localized tenderness, rebound, guarding.

When do I call the surgeons?

- Roughly 1/2 to 3/4 of patients admitted for SBO require operation, involving a laparotomy or occasionally a laparoscopy. Surgeries can include a lysis of adhesions, freeing of hernias, removal of sick gut, decompression of bowel and bypassing of lesions.
- The risks are that as the small bowel dilates, blood flow can be compromised, causing strangulation, which can lead to necrosis, sepsis, or perforation.
- Call if:
 - A) Patient not responding to conservative management after 48-72 hours
 - B) Patient has a closed loop obstruction
 - C) Signs of strangulation are present
 - D) Patient has a complete obstruction
- Some surgeons will recommend pre-operative broad spectrum antibiotics.

Case follow-up. The patient was initially treated conservatively with IVF, NG tube. Her labs and clinical status improved and she had flatus. The next day she stopped having flatus and had emesis even with the NG tube connected to suction. CT scan with IV and oral contrast was performed, showing complete obstruction, and she was taken to the O.R. that night. She did well post-operatively, recovering flatus and BM's.

Clinical Pearls.

- Continuously monitor SBO's for signs of ischemia with serial vitals, labs, and physical exams
- Call surgeons immediately if ischemia, closed loop, or complete obstruction present, or if patient not improving after 48-72 hours of conservative management.
- Avoid prokinetic agents in SBO
- Be aggressive with rehydration and electrolyte replacement

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