

Bowel obstruction

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James talks to Dr Rewa Keegan about bowel obstruction, a common surgical presentation.

Rewa Keegan is a general surgeon and is currently working as the surgical superintendent at Royal Prince Alfred Hospital. She completed her intern and resident years at Royal Prince Alfred, and commenced general surgical training in 2010, successfully gaining her fellowship in 2014. Rewa loves clinical teaching from a medical student to registrar level, particularly in the areas of surgical simulation and working with aspiring surgeons on developing their career plans. She is very interested in surgical education, and has undertaken a number of research projects looking at how registrars perceive their experience in surgical training. Rewa plans to undertake further training in oncoplastic breast surgery, and she and her husband ultimately plan to settle in a regional coastal centre after completing fellowships overseas.

Bowel obstruction

With Dr Rewa Keegan, General Surgeon and Surgical Superintendent at Royal Prince Alfred Hospital, New South Wales, Australia

Introduction

Bowel obstruction is a common surgical presentation. It can be categorised into small and large bowel obstruction, with key implications for management.

Case 1 – It is 10pm and you are a covering an after hours shift on a medical ward. You are asked to see a 77 year old man admitted with community acquired pneumonia. The nurse looking after the patient tells you that he has not opened his bowels in 4 days and is now complaining of some abdominal pain and nausea.

1. Initial questions over the phone?

- Does this patient look sick or unstable? What are their vital signs?
- How significant is the patient's pain (e.g. requiring opioids)?
- Is the patient passing flatus?
- A quick overview of the patient's general health

2. Outline your assessment approach by the bedside

- **History:**
 - SOCRATES-type pain history
 - Is this patient constipated (not passing stool) or obstipated (not passing flatus or stool)?
 - Has the patient vomited?
 - Has the patient had previous abdominal surgery or have any known hernias?
 - Has the patient had recent changes in bowel movements, and any investigations to that aim e.g. colonoscopies, previous abdominal imaging
- **Examination:**
 - Examine the observation chart for any recent changes e.g. dehydration resulting in tachycardia and hypotension, fever is concerning (not a normal sign of constipation)
 - Examine the medication chart for any recent changes to medications e.g. commencement of opioids, anticholinergics
 - Overview of the patient
 - Abdominal examination (tenderness, peritonism) including a per rectal exam (for masses, faecal loading, empty rectum)

3. What are the differential diagnoses for constipation?

- **Ileus**
 - History: occurs after abdominal surgery or infection (it does not occur in absence of these pathologies), bilious vomiting
 - Examination: abdomen grossly distended and non-tender, absent or reduced bowel sounds
- **Bowel obstruction**
 - History: colicky abdominal pain, nausea with bilious vomiting and obstipation; prior history of surgery or hernias
 - Examination: tympanic abdominal distension, high-pitched tinkling bowel sounds
- **Constipation**
 - History: abdominal pain is rare (although may be uncomfortable), passing flatus, some nausea but uncommon to vomit; precipitating

causes include dehydration, recent medication changes

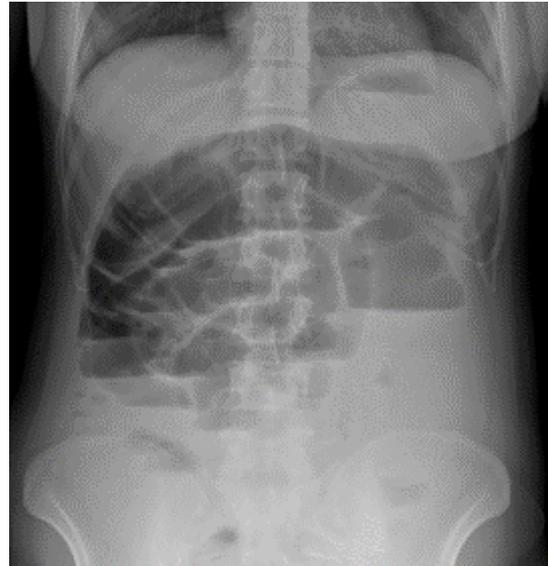
- Examination: distension without tenderness, per rectal exam to rule out impaction

4. Investigations for bowel obstruction

- Plain abdominal x-ray (supine and erect - important to rule out pneumoperitoneum)
 - SBO: centrally-located and multiple dilated loops of bowel with visible valvulae conniventes, evidence previous surgery (clips), ≥ 3 air-fluid levels
 - LBO: peripheral haustral markings which do not extend across the whole bowel, dilated colon to the point of obstruction, usually little or no gas in the small bowel



SBO: case courtesy of Dr Ian Bickle, Radiopaedia.org, rID: 34633



LBO: case courtesy of Dr Varun Babu, Radiopaedia.org, rID: 18015

- Depending on how unwell the patient is, he or she may require blood investigations (FBC, EUC, CMP; also consider coagulation studies if they are likely to head to theatre)
- Consider ABG with lactate if patient is unstable

5. Management of bowel obstruction

- Initial management: NBM until ruled out an obstruction

- IV fluid resuscitation - review EUC (may require aggressive K+ replacement)
 - Fluid balance chart to account for losses (may require insertion of an indwelling catheter)
 - Remember to review medication chart for any medications that may need to be charted IV as oral absorption is poor in these patients
- NGT if obstruction confirmed
- Analgesia
- Indications for a surgical review:
 - Obstruction confirmed
 - Abdominal pain or tenderness
 - Raised inflammatory markers
 - Abnormal features on imaging
 - Patients diagnosed with constipation and treated adequately but without good result
- Indications for surgical management
 - Indicated where patient has complicated obstruction (e.g. closed loop obstruction - a segment of bowel is obstructed in two places, strangulated, ischaemic or necrotic bowel)
- Ischaemic or necrotic bowel is more likely in patients with high fevers, metabolic acidosis, leukocytosis, tachycardia or worsening pain with a SIRS response)
 - Surgery is not required in 80% of cases (self-resolve in 2-5 days)
 - Gastrograffin challenge: undiluted gastrograffin given through NGT and abdominal x-ray taken at 8 hours and 24 hours post-challenge
- Both diagnostic (can show the point of obstruction) and can also help to resolve obstruction (osmotic effect of drawing fluid in to the bowel lumen and therefore decreasing bowel wall oedema and stimulating peristalsis)
- If no gastrograffin gets to caecum at 24 hours, more likely that the patient will require intervention

6. What are the common causes of bowel obstruction?

- Small bowel obstruction
 - Most common cause in the Western world is adhesions (due to previous surgery)
 - Hernia
 - Volvulus from malrotation
 - Benign and malignant tumours of the small bowel
 - Strictures from inflammatory bowel disease and NSAID use
 - Intussusception
- Large bowel obstruction
 - Malignancy (colorectal cancers, as well as extra-luminal compression from other pelvic malignancies)

- Sigmoid volvulus (more common in the elderly)
- Strictures (especially in those patients with diverticular disease or previous irradiation)
- Hernias
- Severe faecal impaction

Case 2 - You are the surgical intern on the ward during the day. You are asked to review a patient who is day 4 post-appendectomy but hasn't yet opened their bowels. They are describing some colicky abdominal pain associated with nausea and vomiting.

7. How does the post-operative status of the patient change your approach?

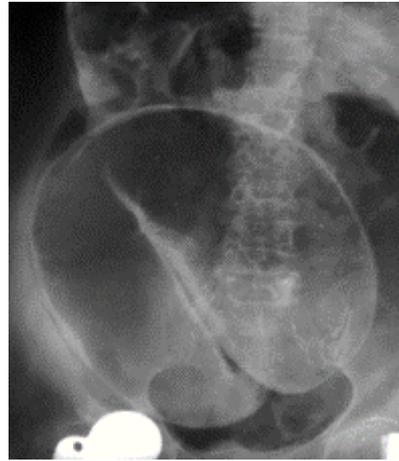
- Ileus is more likely in the post-op patient (can occur in 10-20% of abdominal surgery patients)
 - Examination: abdomen distended but non-tender, absent bowel sounds
 - Abdominal x-ray: multiple dilated bowel loops the whole length of the small bowel, air in the colon and rectum and lack of a clear transition point
- Consider a more serious pathology if ileus is prolonged (> 10 days) or patient becomes progressively unwell e.g. obstruction, anastomotic leak, haematoma, collection or abscess
 - Investigations: CT abdomen is usually indicated for a prolonged ileus
 - If patient remains unwell, further exploration in theatre may be indicated

Case 3 - an 88 year old man from a nursing home presents to the Emergency Department with a history of constipation and abdominal pain. Past history of stroke and COPD. On examination, he is tachycardic but afebrile. His abdomen is distended and tender, predominately on the left-side. PR reveals an empty rectum.

8. What is your approach in this patient?

- Likely to be large bowel obstruction with signs of complications
 - Differential diagnoses: sigmoid volvulus (more common in elderly patient), malignancy, diverticular disease with phlegmon or stricture or pseudo-obstruction secondary to faecal impaction
- Abdominal x-ray: gaseous distension; important to measure the diameter of the bowel to determine whether it is abnormally dilated

- Diameter of caecum should be \leq 9cm, rest of colon \leq 6cm
- If absence of gas in rectum, suggestive of complete obstruction with high risk of perforation
- Look for a transition point (tapering off of bowel gas - often in the rectosigmoid area)
- Sigmoid volvulus: look for 'coffee bean'/'bent inner tube' appearance with apex in the right upper quadrant and left iliac fossa (see example to right)
- To further delineate whether there is a complete or mechanical obstruction, usually order a CT with rectal contrast



Case courtesy of Dr Wael Nemattalla,
Radiopaedia.org, rID: 10633

- What is the management of a LBO?
 - This is a surgical emergency - most patients will require surgery
 - Fluid resuscitation and aggressive electrolyte replacement
 - NG tube if patient vomiting
 - Analgesia
 - Consider IV antibiotics
 - Surgical review
 - Exceptions: sigmoid volvulus (managed with decompression with sigmoidoscope) and pseudo-obstruction (managed with a flatus tube)

Take home messages

- Important to recognise the difference between SBO and LBO as this has an important impact on patient management

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