

A 45 YOW has a 3 days history of nausea and crampy abdominal pain followed by vomiting and abdominal distension. She has had no bowel movements in the past 3 days. She has no other significant history except for a previous appendectomy.

On physical examination, mild tachycardia and mild orthostatic hypotension are present. The patient is otherwise normal except for the abdomen which is distended, tympanitic, and mildly tender throughout but without rebound or localized tenderness. The bowel sounds are hyperactive with periods of hyperactivity and periods of silence, there is no stool in the rectum. White blood cell count is $14,000/\text{mm}^3$, and hematocrit is 44%.

What is the most likely diagnosis?

Small bowel obstruction is the most likely diagnosis, although a number of other problems such as ileus could have a similar picture.

If vomiting and/or abdominal distension are associated with intermittent abdominal pain and increased bowel sounds the obstruction is mechanical; if there is no pain and the bowel sounds are absent, the obstruction is paralytic.

An important variant is vomiting and/or abdominal distension but no bowel sounds. This combination suggests that strangulation is complicating mechanical obstruction.

In most cases the answer is straight forward, at least in the mechanical obstruction. The characteristic features are anorexia; nausea and vomiting; abdominal distension; increased bowel sounds; intermittent (colicky) abdominal pain; and absolute constipation for flatus, beyond what the patient and his doctor consider normal.

Point to remember that the typical colicky abdominal pain is absent in cases of paralytic intestinal obstruction. Again, anorexia, nausea and vomiting may be inconspicuous in low (distal) obstruction and distension may be absent in very high (proximal) obstruction. Finally, constipation may be difficult to assess if the

obstruction is very acute, so that there has been no time for the absolute constipation to declare itself, or if the obstruction is partial, in which case some flatus may still be being passed.

How you explain the development of the symptoms and signs of intestinal obstruction?

The amount of exocrine secretions in upper part of GIT is 8-12 liters each 24 hours. The loss of water in faeces is normally less than 0.5 litre daily. Most of secreted water is reabsorbed by the lower part GIT and to some extent by the large bowel, but mostly by the distal 1 m of the ileum. If obstruction is placed distally in the large bowel, there is little disturbance of the water reabsorption and so vomiting is not a prominent feature; however, swallowed air is still prevented from reaching the anal canal and builds up in gut, so absolute constipation and abdominal distension are accentuated features. By contrast, if the obstruction is very high in the alimentary tract (stomach and duodenum), the salivary, esophageal and gastric secretions collect in and distend the stomach until copious vomiting rapidly occurs, and no swallowed gas or alimentary secretion passes to intestine to produce abdominal distension.

The safe rule on the difficult case is that if the abdomen is distended with gas, or if vomiting is intractable, the whether or not absolute constipation or intermittent abdominal pain are present, x-ray studies of the abdomen are essential

What abdominal radiograph is warranted?

An obstructive series, which includes an upright posterior-anterior and lateral CXR, and a flat, lateral decubitus and upright AXR is necessary. (Fig. 1, 2, 3)

Figure 1. Supine view of the abdomen in a patient with intestinal obstruction. Dilated loops of small bowel are visible.

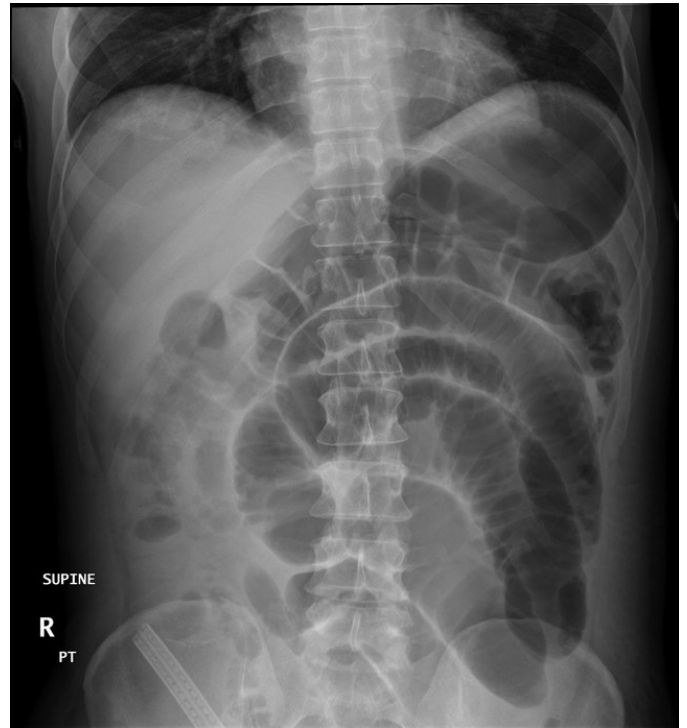


Figure 2. Lateral decubitus view of the abdomen, showing air-fluid levels consistent with intestinal obstruction

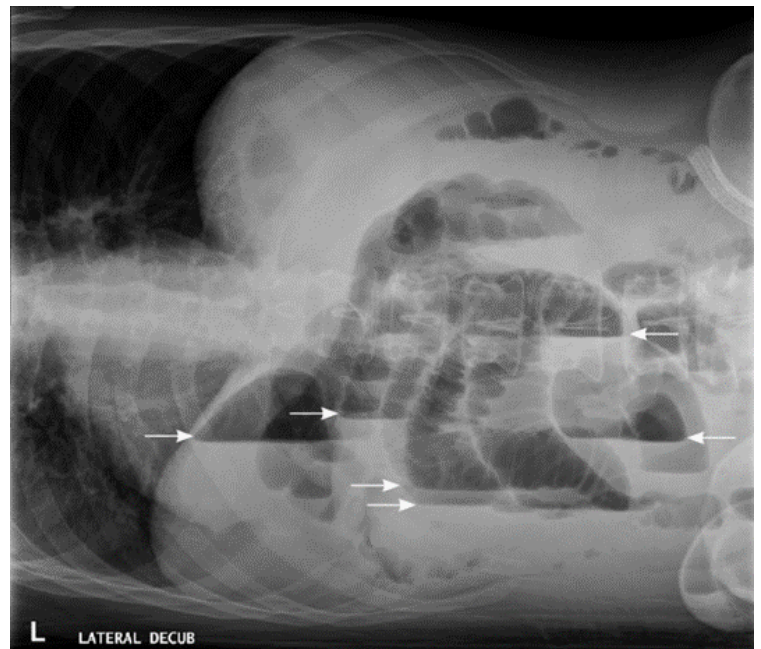


Figure 3. Upright view of the abdomen
Showing air-fluid levels



The most important means of distinguishing small from large bowel obstruction (and both of these from paralytic ileus) is plain radiology of the abdomen in the erect and supine positions. The diagnostic features are the gas shadows in the intestinal lumen, best seen in the supine film, and horizontal levels between gas and liquid contents in the erect film. Gas in the GIT is mainly swallowed air, although a small portion is derived from fermentation. There is normally a gas bubble in the fundus of the stomach, separated by a horizontal level from the liquid of the resting gastric contents. The quantities of gas in the normal small intestine are too small, and too broken up by the churning movements of the bowel, to show on a plain x-ray, but as the water is absorbed and the fecal content of the bowel becomes solid and discrete, so does the likelihood of seeing distinct shadows of gas in the lumen increase. It is normal to see large gas shadows throughout the large bowel, including the rectum and sigmoid colon.

In small bowel mechanical obstruction, the small bowel proximal to the block becomes distended with intestinal secretions and swallowed gas, and the typical appearance of loops of small bowel distended with gas in the supine film, and of

multiple gas/fluid levels in the erect film, result. The gas shadows in small bowel obstruction tend to be centrally placed in the abdomen. Disposed in a step-ladder pattern, and the valvulae conniventes are represented by straight lines that tend to cross the whole lumen of the bowel, and meet the bowel wall on each side at a right angle without indenting the bowel wall at the junction. Distal to the block, any gas originally present is quite soon expelled per anum. Any fluid is absorbed in the normal way, and the large bowel significantly contains no gas shadows.

In large bowel obstruction, once the ileocecal valve becomes incompetent, the raised pressure of the large bowel proximal to the block is transmitted to the small bowel, and the radiological evidence of small bowel distension with gas and liquid appears. The important distinction, however, is that distended large bowel as shadows and gas/fluid levels are also present in the large bowel proximal to the obstruction. The gas shadows in the large bowel tend to lie peripherally (though any redundancy of the transverse colon or of the sigmoid obscures this feature), and the segmentation effect of haustration draws in the line of the wall but does not extend across the whole bowel lumen to the opposite wall is a particularly helpful feature. Beyond the obstruction, there is no gas in the large bowel including the rectum.

In paralytic ileus. All regions of the bowel are distended and contain gas and gas/fluid levels: this applies in the large bowel right down to the rectum, thereby distinguishing paralytic ileus from mechanical large bowel obstruction with an incompetent ileocecal valve.

