



# “Doc, my bowels just don’t seem to be working right!”



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## Monica’s case

### History

Monica, a 53-year-old tourist, presents to the ED with a 3-day history of “constipation,” bloating and abdominal cramps. She denies vomiting, fever or urinary symptoms.

A review of systems reveals an intentional 9 lb weight loss over several months and is otherwise unremarkable.

Her past medical history includes an abdominal hysterectomy with bilateral oophorectomies 10 years prior. She has a niece with breast cancer and no family history of colon cancer.

### Examination

On examination, her vital signs are within normal limits. Her abdomen is distended, although soft to palpation. Her bowel sounds appear normal. Rectal examination reveals an empty rectum. An abdominal x-ray series is ordered (Figure 1 and 2).

## Questions & Answers

### 1. *What is going on?*

The abdominal x-ray findings of dilated loops of bowel and air fluid levels suggests an acute bowel obstruction. Categories of bowel obstruction include:

- Large bowel obstruction
- Small bowel obstruction
- Pseudo-obstruction (*e.g.*, Paralytic Ileus, Ogilvie’s syndrome)

In this case, air fluid levels at both the hepatic and splenic flexures of the colon, dilation of the hepatic flexure to a diameter of 7.3 cm and multiple air fluid levels of both small and large bowel suggest a large bowel obstruction.

The features used to differentiate large from small bowel obstruction are listed in Table 1.

Air in the rectum does not “rule out” bowel obstruction, which may be partial, allowing some gas through, or acute, showing gas that passed before the obstruction occurred that is yet to be expelled. Similarly, as gas in the bowel will eventually become resorbed, the absence of bowel gas on x-ray should not be used to “rule out” obstruction, especially if symptoms have been prolonged. CT is often used to determine the level, cause and grade of obstruction.

### 2. *What are the common causes of this condition and what is likely in this case?*

Common causes of large bowel obstruction include:

- Colorectal cancer (number one cause)
- Diverticulitis—strictures from repeated attacks
- Volvulus—sigmoid more common than cecum

Table 1

## Features used to differentiate large from small bowel obstruction

Evidence of large bowel obstruction on abdominal x-ray	Abdominal radiographic evidence of small bowel obstruction
Dilation of colon proximal to the obstruction (colon > 6 cm and cecum > 9 cm)	Dilated loops of small bowel > 3 cm and decompressed colon (radiologically visible small bowel gas is abnormal, but if the loops are < 3 cm, the finding is non-specific)
Colon distal to the obstruction is devoid of gas or decompressed	Multiple air fluid levels at different heights
Small bowel distension may occur as well in the case of an incompetent ileocecal valve	Loops of dilated small bowel may appear like a step ladder, or stack of coins. Bowel that looks like a bent finger is usually small bowel
Annular constriction of the colon, "apple core lesion"	"String of pearls" sign as a result of small gas collections trapped between folds of dilated small bowel



Figure 1. Supine abdominal x-ray showing large bowel dilation with a paucity of air in the distal colon and rectum.



Figure 2. Erect abdominal x-ray showing air fluid levels at the hepatic and splenic flexures, several small bowel air fluid levels and a round mass in the right lung base.

- Other less common causes include: compression from metastatic disease, strictures secondary to inflammatory bowel disease, incarcerated hernias, fecal impaction and adhesions

With reference to Monica's case, the erect abdominal view (Figure 2) shows a 3.6 cm round mass in the right lung base, confirmed on chest x-ray (Figure 3), apparently in the right middle lobe. This makes us suspicious for a metastatic deposit in the lung from a primary bowel malignancy (or, less likely, *vice versa*).

### 3. What are the next steps?

Immediate steps include IV fluid rehydration and adequate pain and nausea control. Start with a 1 L bolus of normal saline followed by ongoing IV therapy at a rate dictated by urine output and frequent reassessment of hydration. Gastric decompression with a nasogastric tube may be helpful in cases of vomiting or when there is evidence of significant fluid or gas build-up in the small intestine. No additional fluid or solids should be administered by mouth. General surgery should be consulted. Investigations to consider include:

- Laboratory investigations (complete blood count, electrolytes, blood urea nitrogen and creatinine—these are important to assess for anemia, severity of dehydration and electrolyte imbalance)

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Figure 3. Chest x-ray confirming mass in right middle lobe (lateral not shown).



Figure 4. Water-soluble contrast enema showing "apple-core lesion" in the mid-descending colon.



Figure 5. CT of the chest showing the right middle lobe mass.

- Water soluble contrast enema radiography

If a patient deteriorates or develops fever and tachycardia, ischemic bowel or perforation should be suspected. In this event, aggressive fluid rehydration and antibiotics that include Gram-negative and anaerobic organisms coverage should be initiated and, if not already in place, nasogastric tube insertion should be instituted.

**Back to our patient**

An urgent water-soluble contrast enema (Figure 4) shows an "apple core lesion" in the mid-descending colon typical of adenocarcinoma of the colon. Chest CT (Figure 5) confirms a large heterogenous mass in the right middle lobe suspicious, in this setting, for secondary lung carcinoma.

She was referred to a general surgeon for left hemicolectomy and investigation of the lung mass.



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