"Doc, my belly really hurts!"

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A 50-year-old male presents to the emergency department (ED) after waking up with severe epigastric pain two hours prior. He states the pain has been severe since onset and he has vomited twice. Movement and deep breathing make the pain worse, and lying still seems to decrease it. He denies chest pain, shortness of breath, fever, chills, or urinary symptoms.

The patient has a history of gastroesophageal reflux disease (GERD) and alcohol abuse, and states his only medication is ranitidine.

On exam, the patient is in obvious discomfort on his stretcher. His vital signs are:

- Blood pressure: 180/110 mmHg
- Heart rate: 105 beats/minute
- Respiratory rate: 20 breaths/minute
- Temperature: 37.3 C
- Oxygen saturation: 98% on room air

Evaluation of his abdomen reveals severe tenderness and involuntary guarding in his epigastrium. No obvious masses are palpated and digital rectal exam is negative for occult blood.

Questions:

1. *What are the most common causes of peritonitis in the ED?*
2. *What is the approach to abdominal pain in the ED?*
3. *What is the best bedside test for peritonitis?*
4. *Does the absence of "free air" on the chest X-ray rule out a serious cause?*
5. *How should a patient with peritonitis be managed in the ED?*

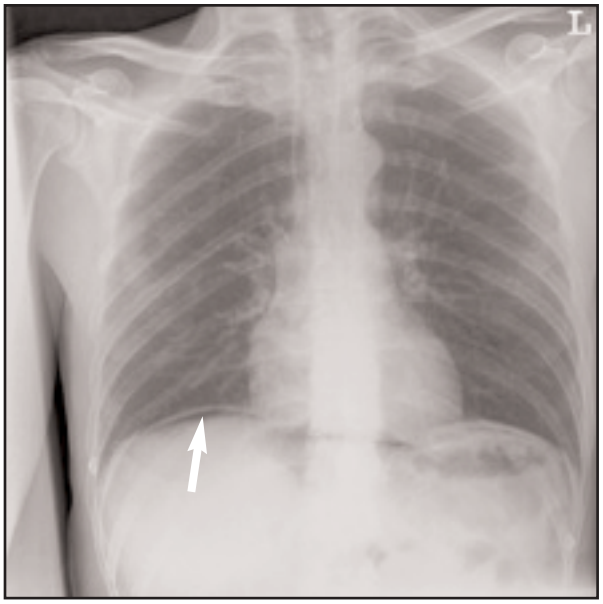

Figure 1. Upright chest X-ray demonstrating free subdiaphragmatic air (arrow).

Answers:

1. What are the most common causes of peritonitis in the ED?

Abdominal pain is a common complaint in patients presenting to an ED (Table 1). Patients found to have peritonitis require careful management. The most common causes of peritonitis presenting in the ED are acute appendicitis, perforated viscus, diverticulitis, pancreatitis, ischemic bowel, and bowel obstruction.

2. What is the approach to abdominal pain in the ED?

After rapid assessment of vital signs and general appearance to determine patient stability, the approach to abdominal pain in the ED is to first obtain a good history. A thorough assessment of the character of pain (location, timing, radiation,

Table 1
Common causes of abdominal pain in the emergency department

Most common
- Non-specific abdominal pain
- Acute appendicitis
- Biliary tract disease
- Ureteral colic
- Diverticulitis
- Peptic ulcer
- Acute gastroenteritis
- Acute gynecologic pain
- Cancer

Life-threatening
- Ruptured or leaking abdominal aortic aneurysm
- Perforated viscus
- Acute pancreatitis
- Intestinal obstruction
- Mesenteric ischemia

Table 2
Comparing voluntary and involuntary guarding

Voluntary	Involuntary
• Abdominal muscle spasm	• Abdominal muscle spasm
• Can be willfully suppressed	• Cannot be willfully suppressed
• Caused by a patient's nervousness toward palpation	• Caused by peritoneal inflammation

nature, aggravating and relieving factors) are important and can narrow the differential diagnosis. Time spent on a good clinical history can often eliminate the need for unnecessary diagnostic tests, such as plain radiographs, ultrasounds, and computed tomography (CT) scans.

If a patient has significant abdominal pain and there is a possibility of a perforated viscus, an upright chest X-ray should be performed.

Examination of patients with abdominal pain begins with a re-evaluation of vital signs and appearance, and moves through the classic sequence of inspection, auscultation, percussion, and palpation. A specific assessment of abdominal guarding should be performed. If present, differentiating voluntary from involuntary guarding is required (Table 2). If a patient has significant abdominal pain and there is a possibility of a perforated viscus, then an upright chest X-ray should be performed to look for subdiaphragmatic free air (Figure 1).

3. What is the best bedside test for peritonitis?

Peritonitis is a clinical assessment and can only be diagnosed by examining the patient's abdomen. Although rebound tenderness was thought to be an important test for diagnosing peritonitis, it has fallen from favour by many clinicians due to excessive patient discomfort. The diagnosis of peritonitis is likely when the patient reports severe discomfort exacerbated by movement or coughing, and has involuntary guarding with abdominal percussion. The presence of referred pain (pain that is referred to the site of maximum tenderness when palpating in a different quadrant) on clinical assessment is also suggestive of peritonitis.

4. Does the absence of "free air" on the chest X-ray rule out a serious cause?

Various intra-abdominal processes can cause free intraperitoneal gas. An upright chest X-ray will

demonstrate free air under the diaphragm if there is a sufficient volume of gas and the gas has had time to collect in the most superior part of the abdominal cavity. Therefore, free air may not be visible on a plain X-ray even in the presence of a perforated viscus. CT scans are more sensitive in demonstrating free intra-abdominal gas.

5. *How should a patient with peritonitis be managed in the ED?*

The goal of management of patients with peritonitis in the ED should be to minimize any delays to surgical assessment and laparotomy. Therefore, immediate referral to a surgeon is required. Management should focus on pain relief while ensuring adequate intravascular fluid status. The provision of analgesia is considered standard care, and physicians should not fear administrating opioid analgesics to patients with abdominal pain. In addition, empiric antibiotic coverage against anaerobe and facultative aerobic gram negative bacteria should be administered as soon as possible. Dx

This department covers selected points to avoid pitfalls and improve patient care by family physicians in the ED. Submissions and feedback can be sent to diagnosis@sta.ca.

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