A 47-Year-Old Woman With Acute Abdominal Pain

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What's The Take Home?

Volume 65 - Issue 3 - March 2025

Introduction: A previously healthy 47-year-old woman presents to an urgent care facility with chief complaint of acute abdominal pain.

Patient history: The patient noted that the pain (subchondral on the right side with a component of radiation to the back) is severe and awakened her overnight. There is a baseline steady component to the pain with occasional colicky exacerbations. She has also experienced several episodes of nausea and emesis. When questioned, she noted that she's had several similar episodes in recent weeks, although those instances were of much less intensity and with spontaneous resolution within several hours. The current episode is much more severe in intensity and unremitting overnight. There is no history of concomitant symptoms of diarrhea, melena, or hematemesis. No one else in the household has any known illnesses.

The patient's past medical history is unremarkable. She delivered three children vaginally without complications. She works in a clerical position and enjoys a glass of wine with meals several times a week. She continues to have normal and regular menses.

Physical examination. Her physical examination included a temperature of 100.6°F, pulse of 108/min, and blood pressure of 124/80. She is visibly uncomfortable from significant abdominal pain and wants to lie down on her right side in a semi-flexed position. Head, eyes, ears, nose, and throat examination is negative for jaundice. Heart and lung examinations are normal. Focusing on the abdomen, bowel sounds are diminished and there is marked tenderness to pressure palpation of the epigastrium, particularly in the right upper quadrant. There is some radiation into the back. Murphy's sign (increased tenderness into the right upper quadrant when taking a deep inspiration) is present.

Diagnostic testing. The patient's laboratory tests reveal hemoglobin and platelets within normal ranges, but a white blood cell count of 15,900 with a left shift. Her metabolic tests were within normal ranges, but her biochemical profile reveals slight elevations of aspartate transferase, alanine transaminase, and serum amylase levels. Both serum creatinine and creatinine clearance are normal within normal ranges.

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Correct answer: B. Abdominal ultrasound is the optimal initial imaging modality.

Discussion. The more things change the more things remain the same. And so, it is with acute onset of non-traumatic abdominal pain—known as "the acute abdomen"—one of the most common syndromes encountered currently and in previous decades. The scope of the "acute abdomen" is tremendous, as it remains one of the most common complaints seen in the emergency room (ER)/urgent care setting (5% to 10% of all ER visits.[1]) Still, the differential diagnosis is extremely broad, ranging from simple acute appendicitis through to bowel perforations, ischemia, and obstruction. Not to mention, differentials involving the stomach, pancreas, and biliary system.

Notably, the stakes are high. Many patients will require surgery, yet others will not. Crucially, delaying necessary surgery due to delays in diagnosis adds to morbidity, complication rate, and mortality. Yet so does performing surgery when not required.[1] Thus, strategies for accurate and timely diagnosis are critical.

Despite recent comprehensive reviews on approaches to patients with acute abdomen,[1] more than 100 years' passage of time, and technology advances in imaging and blood testing, clinicians generally rely on the core principles from *Cope's Early Diagnosis of the Acute Abdomen* by Zachary Cope MD, MS, a classic paper from 1921.[2] Indeed, a clinical diagnosis using detailed, accurate demographics (e.g. age of patient), patient history, and the human touch of the physical examination, are still the anchors of a timely and accurate diagnosis.

A good diagnostic framing involves: (1) Initial history and physical examination, which should provide an initial diagnostic likelihood; (2) the appropriate choice of modern-day imaging techniques which are often able to confirm a diagnosis, and (3), timely consultation with a surgeon who will often be the provider of definitive therapy.

These steps require efficiency without delays. This fact gets us back to the initial history and physical examination, which should come down the broad differential of "an acute abdomen." To address the role of analgesia in patients with acute abdomen, there is now a large body of good data that clearly shows that providing needed analgesia including opiates does not result in delay in diagnosis, increases in morbidity, or increased mortality in this patient population.[3] This renders answer A incorrect. We must not be afraid of relieving pain in these patients.

Using our presented case as an example, the presentation in a previously healthy 47-year-old, non-pregnant woman (pregnancy potential will be important when imaging is discussed) who was awakened with severe abdominal pain, fulfills the gross criteria for "acute abdomen." That there were lesser episodes in recent weeks is important because we must consider what sorts of pathophysiology can do trigger such episodes (e.g. biliary colic) and which cannot and can thus be excluded (e.g. perforations).

Using physical examination, the pain is located most predominantly in the right upper quadrant. A useful examination sign, Murphy's sign is increased pain with a deep inspiration, which brings the gall bladder down into contact with the examiner's hand. Its presence provides further evidence of biliary etiology close to 100% incidence and 90% specificity, respectively.[4]

The laboratory blood test results of leukocytosis and left shift are non-specific but do demonstrate an inflammatory component while the minimally elevated transaminases and amylase, though very non-specific and seen in many abdominal syndromes, are low enough to place pancreatitis or hepatitis lower into background considerations. Thus, there is adequate data that biliary tract pathology is most likely here.

The next phase is choosing the optimal imaging choice to confirm that diagnosis. From there, our knowledge assumption of optimal management requirements (e.g. surgery) and the prompt arrangements for that likelihood (e.g. availability and consultation with a surgeon) completes the paradigm of management of acute abdomen.

Once the initial evaluation has yielded some degree of focus in the differential, appropriate imaging can almost always provide a firm diagnosis. The days of "exploratory laparotomy" are over and most surgeries should show what history/physical examination and imaging studies predicted. The backbone imaging studies available today are ultrasound and contrast enhanced computed tomography (CT). The former is readily available and "easy" (these days, ER and surgical physicians carry portable models to the bedside). These advantages are negatively balanced by wide differences in operator experience, skill, and accuracy with a 30% difference between ultrasound and contrast CT.[5]

A recent guideline statement noted that ultrasound is the image of choice in cases where biliary disease is suspected.[5] Contrast enhanced CT is the imaging of choice when acute appendicitis, pancreatic disease, bowel ischemia or diverticulitis is suspected.[5] A special note of caution is whatever diagnosis is suspected, in a patient who in whom pregnancy is possible ultrasound is preferred to avoid radiation risk to the fetus.[5] It is likely wise to quickly employ ultrasound for any patient with acute abdomen, particularly when either acute appendicitis or biliary tract disease are suspected.[5]

Our patient's clinical scenario points to biliary disease as the pain is mainly right subchondral, Murphy's sign is present, and there is accompanying low-grade fever and significant leukocytosis. The minimally elevated transaminases and amylase are confounders but so minimal as to be non-specific changes that can be seen in any abdominal pain situation. Therefore, answer B, rather than answer C is correct. Answer D relates to another risk factor for contrast enhanced CT, namely renal damage. Although clearly a concern, experience and technique have demonstrated that this is somewhat of a minor issue in most patients, particularly so when baseline renal function falls within normal range, as was the case in this patient.

Patient follow-up. The urgent care attending suspected biliary tract disease based upon the history and physical findings. There was less probability for acute pancreatitis only because of the radiation to the patient's back, although this finding is not uncommon in acute cholecystitis. An abdominal ultrasound revealed gall bladder wall thickening to 4 mm (normal range = less than 3 mm), gall bladder distention to 50 mm (normal range = less than 40 mm), and the presence of multiple stones in the gall bladder. During this time, clinicians administered appropriate doses of opiate. The common bile duct was within normal diameter and did not contain gallstones. Thus, the diagnosis of acute calculus cholecystitis was confirmed.

The patient stayed on appropriate analgesics, and the low-grade fever resolved. The patient had documented gallstones causing symptoms (e.g., the milder self-resolving episodes that she noted in her patient history). Therefore, laparoscopic cholecystectomy was recommended and performed on day 4. The surgery was successful and without complications. The patient remains well at 6 months follow-up.

What's the take home? The "acute abdomen" remains a classic syndrome still responsible for 5% to 10% of all urgent care and ER visits.[1] The approach to these cases, even today, continues to follow the methods first formally described more than 100 years ago. The vital pillar that is required is a detailed, professionally obtained, history and similarly detailed human hands performing a professional physical examination. The quadrant method of geographically dividing the abdomen into quadrants for localization remains effective. A variety of blood testing is helpful but can be quite non-specific such that imaging techniques, especially ultrasonography and contrast enhanced CT scanning, are the current methods that are confirmatory. It needs be noted that there is good data that clinicians should not defer appropriate analgesia during the above process for fear of obfuscating symptoms and physical findings. Indeed, studies have demonstrated that such fears are unfounded.[3] Once the above paradigm has yielded a diagnosis, timely referral to an experienced set of consultants, usually with a surgeon in the lead, is the last and definitive phase of management, which will generally result in beneficial results in these cases.

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CITATION
Rubin RN. A 47-Year-Old Woman With Acute Abdominal Pain. *Consultant*. 2024;65(3):doi: 10.25270/con.2025.03.000002

DISCLOSURES

The author reports no relevant financial relationships.

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