

CLINICAL PRESENTATION AND RADIOLOGY QUIZ QUESTION

A 53 year old man comes to the clinic with persistent abdominal pain for approximately eight weeks, which he describes as so severe at times that he chooses not to get out of bed for the day. He has little appetite, and despite being thin to start with, has gone from 130 lbs to 122 lbs. He had persistent nausea with occasional vomiting. The patient has mild epigastric tenderness to palpation without any rebound tenderness, guarding, or a positive Murphy's sign. There are no palpable masses. The patient states that he drinks at most three or four beers, once per week. The patient has a normal CBC and white count.

Which imaging study is most appropriate for this patient?

- (a) plain films of the abdomen
- (b) ultrasound of the abdomen
- (c) computed tomography of the abdomen and pelvis
- (d) magnetic resonance imaging of the abdomen and pelvis

RADIOLOGY QUIZ QUESTION, ANSWER, AND EXPLANATION

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Answer: (c), computed tomography of the abdomen and pelvis, is the correct answer. CT examination is the study of choice for "abdomen pain plus" where the "plus" represents inflammation (fever, elevated white count, rebound tenderness, peritoneal signs), suspected obstruction (distension with nausea/vomiting), and such constitutional symptoms as weight loss.

Plain films of the abdomen are generally of little utility in the evaluation of abdominal pain, with the possible exception of suspected obstruction. Even when obstruction is suspected, a plain film may be false-negative if the distended bowel loops are filled with fluid, and even if the plain film shows abnormal air-distended small bowel loops, a CT is often done to evaluate the location and cause of obstruction. Therefore, (a) is incorrect. Ultrasound of the abdomen is the study of choice for suspected biliary colic, but is not nearly as effective in diagnosing causes of abdominal pain originating in the other quadrants, or for evaluation of "abdominal pain plus" when the "plus" is a constitutional symptom such as weight loss, and (b) is incorrect. Magnetic resonance imaging of the abdomen is usually reserved for evaluation of problem patients when ultrasound or CT is nondiagnostic, and (d) is incorrect.

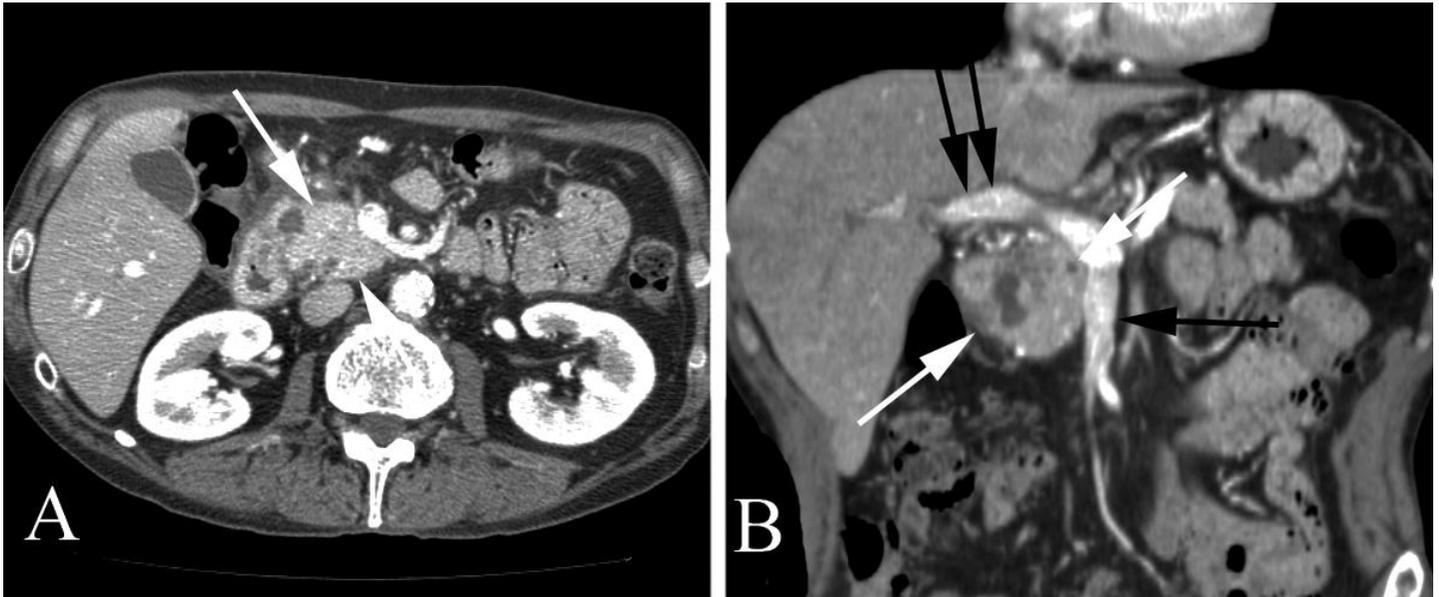
IMAGING STUDY AND QUESTIONS



Imaging questions:

- 1) What type of study is shown in the figure?
- 2) Are there any abnormalities?
- 3) What is the most likely diagnosis?
- 4) What is the next step in management?

IMAGING STUDY QUESTIONS AND ANSWERS



Imaging questions:

- 1) What type of study is shown in the figure? Axial (A) and coronal (B) CT scan of the abdomen performed with oral and intravenous contrast material.
- 2) Are there any abnormalities? Yes. The head of the pancreas (white arrows) appears swollen and shows heterogeneous contrast enhancement/density. It is challenging in this case (as it often is) to differentiate between the stomach/duodenum and adjacent pancreas on the basis of single static images, and the two are better appreciate at a workstation allowing dynamic display of multiple adjacent images. The superior mesenteric vein is delineated by a single black arrow in B, and the portal vein by a double black arrow in B.
- 3) What is the most likely diagnosis? Inflammation versus necrotic mass of the pancreatic head.
- 4) What is the next step in management? Correlation with serum laboratory markers for pancreatic disease and referral to a gastroenterologist for further evaluation including consideration for endoscopic retrograde cholangiopancreatography (ERCP) with biopsy versus endoscopic ultrasound with transmural biopsy.

PATIENT DISPOSITION, DIAGNOSIS, AND FOLLOW-UP
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After the CT was performed, the patient was referred to a gastroenterologist. The gastroenterologist performed esophagogastroduodenoscopy (EGD) and endoscopic retrograde cholangiopancreatography (ERCP) and took brushings of the pancreatic duct. The final diagnosis was duodenitis, with no malignant cells obtained on brushings and with a benign appearance of the ERCP. The patient was treated for duodenitis but continued to do poorly, with abdominal pain and nausea and vomiting. After four additional visits over the next two months, the patient underwent an additional CT scan which showed little change in the appearance of the pancreatic head, which continued to be enlarged and irregular. Because of the persistent abdominal complaints and the concern that the pancreatic lesion might still represent malignancy, the patient was referred to a surgeon, who performed a cholecystectomy and pancreatoduodenectomy with resection of a mass which involved the head of the pancreas. At pathologic examination, this proved to be chronic pancreatitis and associated fibromuscular thickening of the adjacent duodenal wall. After an uneventful recovery from the surgery, the patient's nausea and vomiting ceased, his abdominal pain markedly declined, and his appetite improved. His weight gradually increased in the weeks following surgery.

SUMMARY

Presenting symptom: Epigastric pain has multiple causes including gastroesophageal reflux disease, gastritis, duodenitis, and pancreatic disease. In many cases, patient may have already tried over the counter antacids or other medications by the time they present to the physician. In cases where the pain is ongoing and associated with significant weight loss, imaging should be considered.

Imaging work-up: As noted on page 2, CT examination is the study of choice for “abdomen pain plus” where the “plus” represents inflammation (fever, elevated white count, rebound tenderness, peritoneal signs), suspected obstruction (distension with nausea/vomiting), and weight loss. An exception to this rule is if the pain is in the right upper quadrant, in which case biliary colic should be suspected, and right upper quadrant ultrasound should be performed (see Radiology Quiz of the Week #23). Whether the CT is to be performed with or without oral contrast, and with or without (or both) intravenous contrast, will vary widely from institution to institution. In cases such as this one, where the patient had not only abdominal pain but nausea, vomiting, and weight loss, CT is the imaging study of choice, although it would probably be reasonable to perform endoscopy prior to imaging.

Establishing the diagnosis: The diagnosis of pancreatitis is generally made on the basis of a typical clinical pain pattern and supporting laboratory findings of elevated amylase and lipase, particularly in the setting of exposure to an appropriate substance (particularly alcohol). The patient repeatedly stated during clinic interviews that his alcohol consumption was limited to “3 or 4 beers, once a week” but when admitted to the hospital for surgery, he confessed to drinking up to 18 beers per week. He did not suffer withdrawal symptoms while in the hospital. CT is generally not required for evaluation of pancreatitis, although right upper quadrant ultrasound is advised in those cases where gallstones need to be excluded as a cause of pancreatitis.

Take-home message: CT examination is the study of choice for imaging “abdomen pain plus.”

FURTHER READING

Penner RM, Majumdar SR. Diagnostic approach to abdominal pain in adults. UpToDate, accessed 7/6/09.

Renfrew, DL. “First step” imaging of gastrointestinal symptoms. Chapter 6 of *Symptom Based Radiology*, Symptom Based Radiology Publishing, Sturgeon Bay, WI, 2010, available for no charge at www.symptombasedradiology.com.