

CLINICAL PRESENTATION AND RADIOLOGY QUIZ QUESTION

An 80 year old woman in a nursing home developed nausea and stopped eating and drinking. She had no fevers, diarrhea, or burning with urination and no chest pain, shortness of breath, palpitations, or headache. On physical examination she had normal bowel sounds and a soft, nontender abdomen. She was admitted to the hospital for hydration with a diagnosis of gastro-enteritis. However, over the ensuing hours, she became progressively distended and began vomiting. Further history indicated that the patient had a recent coughing episode where she felt something “snap” in her groin. She states that she had remote bilateral inguinal hernia repairs during childhood.

Which imaging study is most appropriate for this patient?

- (a) upper gastrointestinal (GI) study performed with barium
- (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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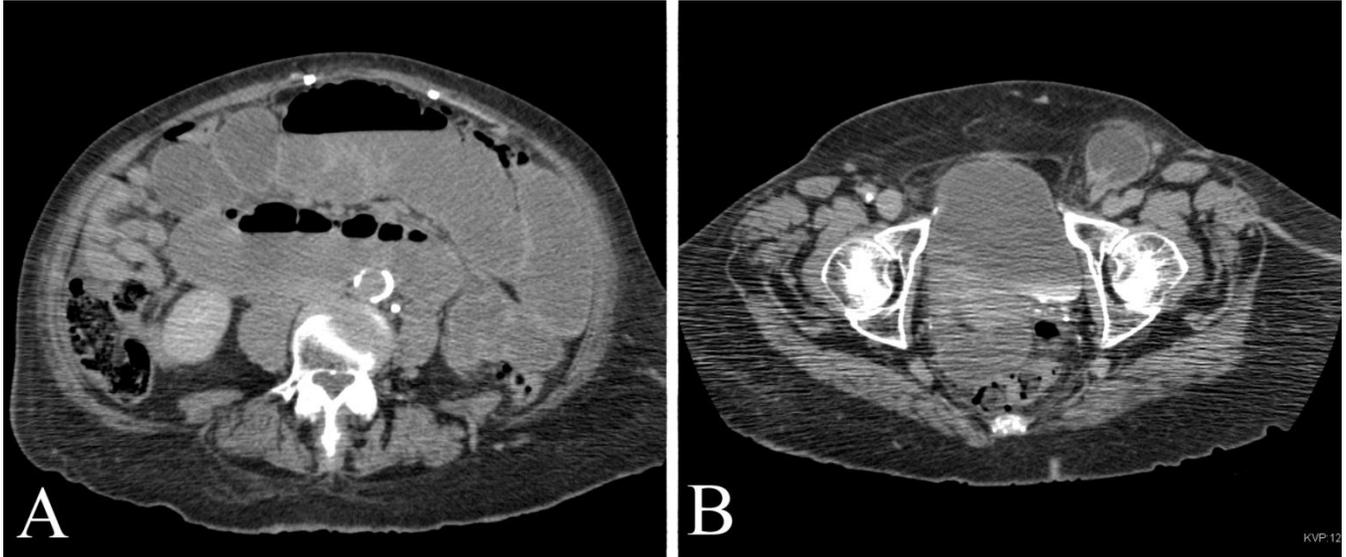
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Answer: (c), computed tomography of the abdomen and pelvis, is the correct answer. CT examination is the study of choice for “abdomen pain plus” where the “plus” represents inflammation (fever, elevated white count, rebound tenderness, peritoneal signs), suspected obstruction (distension with nausea/vomiting), or weight loss.

Upper gastrointestinal (GI) study performed with barium was, many years ago, a popular examination for evaluation of epigastric or upper abdominal pain of unknown cause. While the examination could and did show ulcers, masses, and other abnormalities, it has been largely supplanted by endoscopy. Furthermore, it is not appropriate in this case of suspected obstruction, and the patient would likely simply vomit up any administered barium anyway. Therefore, (a) is incorrect. Ultrasound of the abdomen is the study of choice for suspected biliary colic/right upper quadrant pain, but ultrasound of the abdomen is not effective in diagnosing obstruction, or the various causes of obstruction, 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.

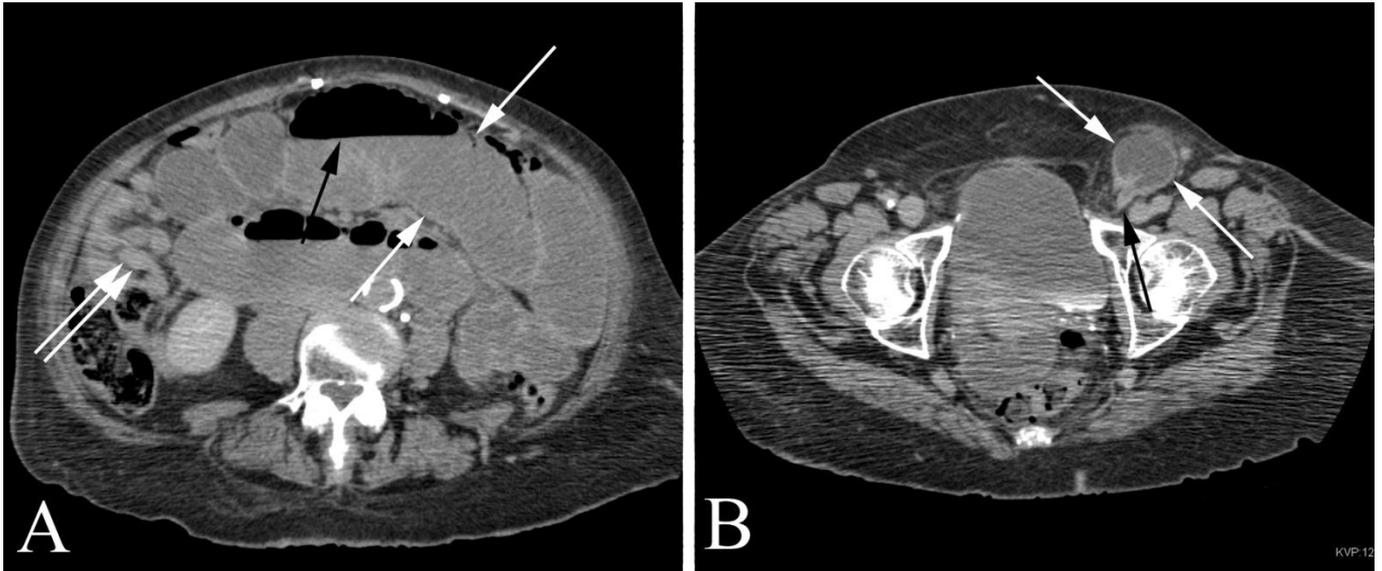
IMAGING STUDY AND QUESTIONS



Imaging questions:

- 1) What type of study is shown in the figures?
- 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



Answers to imaging questions:

- 1) What type of study is shown in the figures? CT study of the abdomen and pelvis
- 2) Are there any abnormalities? Yes. In the upper abdomen (A), there are multiple distended small bowel loops, as indicated, between the single white arrows. There are multiple air-fluid levels within these loops, as indicated by the single black arrow. There are also collapsed small bowel loops, as indicated by the double white arrows. At the level of the pelvis (B), there is a loop of bowel herniated into the inguinal region, between the white arrows. A constricted segment of bowel is seen leading into and out of the hernia at the black arrow.
- 3) What is the most likely diagnosis? Small bowel obstruction secondary to an incarcerated left inguinal hernia.
- 4) What is the next step in management? Emergent surgical consultation.

PATIENT DISPOSITION, DIAGNOSIS, AND FOLLOW-UP
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Surgical consultation was obtained and the patient was taken emergently to the operating room where the inguinal hernia was reduced and the hernia site was repaired with a mesh plug. The patient tolerated the procedure well. The patient recovered and returned to the nursing home on her regular diet.

SUMMARY

Presenting symptom: Abdominal pain, nausea, and vomiting have several causes, including viral gastroenteritis and other self-limited benign causes. However, when these symptoms are accompanied by abdominal distension and lack of bowel movements or flatus, especially in the setting of prior abdominal surgery, obstruction needs to be considered as a possible cause.

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 the rule of performing CT for abdominal pain 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, and is discussed in detail in the second reference listed below.

Some authorities may list plain film evaluation as the initial examination of choice for abdominal pain with distension, when obstruction is suspected. Plain films may show distended small bowel loops supporting a diagnosis of obstruction if the bowel loops contain both air and fluid, but plain films may *not* show distended bowel loops if the loops are filled with only fluid. Furthermore, CT is far better at demonstration of the transition point between dilated and normal sized bowel. Identifying the transition point is the key to evaluating the possible cause of bowel obstruction, which is, in turn, critical information for the surgeon who will be caring for the patient. Therefore, in many instances it makes sense to proceed directly to CT rather than waste time and money on plain film evaluation.

Establishing the diagnosis: When bowel obstruction is caused by a hernia (as in this case), the diagnosis is established by surgical correction of the hernia and resolution of the obstruction.

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.com, accessed 7/6/09.

Renfrew, DL. “First Step” Imaging of Gastrointestinal Symptoms. Chapter 7 of *Symptom Based Radiology*, Symptom Based Radiology Publishing, Sturgeon Bay, WI, 2010, available for no charge at www.symptombasedradiology.com.

Silva AC et al. Small bowel obstruction: what to look for. *RadioGraphics* 2009; 29:423-439.