

**Gastrointestinal Radiology
In-Training Test Questions
for Diagnostic Radiology Residents**



QUALITY IS OUR IMAGE

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Sponsored by:

Commission on Education

Committee on Residency Training in Diagnostic Radiology

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1. An image from a contrast-enhanced CT (Figure 1) of the abdomen is shown. What is the MOST likely diagnosis?
- A. **Gastric diverticulum**
 - B. Adrenal adenoma
 - C. Lymphadenopathy
 - D. Adrenal metastasis



Figure 1

Rationale:

- A. Correct. Gastric diverticula can mimic adrenal masses because most arise from the posterior fundus. The presence of the air bubble excludes the other diagnoses.
- B. Incorrect. Although the diverticulum is low density similar to a fat-containing adenoma, the air bubble excludes this diagnosis.
- C. Incorrect. Lymphomatous involvement of the adrenals can take many forms and is often bilateral. Again, the bubble excludes this diagnosis.
- D. Incorrect. Metastases are typically not low density and are more irregular in shape.

Reference:

None

2. You are shown contrast-enhanced CT images (Figures 2A and 2B) of the abdomen in a 72-year-old man with headache, diarrhea, nausea, and vomiting. What is the MOST likely diagnosis?
- A. Desmoid tumor
 - B. Lymphoma
 - C. **Carcinoid**
 - D. Adenocarcinoma



Figure 2.A

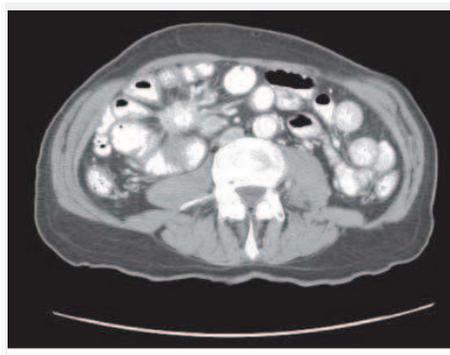


Figure 2.B

Rationale:

- A. Incorrect. Desmoid tumors are locally invasive forms of fibromatosis, which appear as soft-tissue masses in the mesentery. The margins may appear irregular, but because of its benignity, liver metastases do not occur.
- B. Incorrect. Lymphomas result in bowel wall thickening and lymph node masses in the mesentery supplying the involved segment. The marked desmoplastic reaction seen above is not characteristic.
- C. Correct. Carcinoid is the most common primary small bowel neoplasm and arises from neuroendocrine cells accounting for the neuroendocrine symptoms. The primary tumor is often too small to be seen by CT. The metastatic mesenteric lymph node mass seen has spiculation and adjacent fibrotic reaction. Systemic symptoms are produced by metastatic disease in the liver synthesizing vasoactive amines that induce the carcinoid syndrome.
- D. Incorrect. Primary small bowel adenocarcinoma is rare. Findings include focal wall thickening, narrowing of the lumen, and proximal dilatation.

Reference:

None

3. You are shown a spot film (Figure 3) of the transverse colon from a double contrast barium enema examination. What is the MOST likely diagnosis?
- A. Familial adenomatous polyposis syndrome
 - B. Fecal debris
 - C. **Ulcerative colitis**
 - D. Schistosomiasis infection

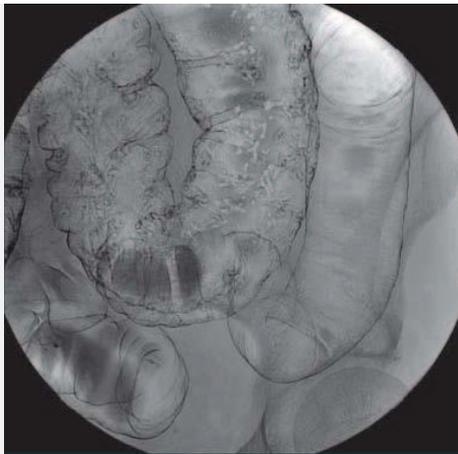


Figure 3

Rationale:

- A. Incorrect. The polyps in familial adenomatous polyposis syndrome (FAPS) are adenomas and do not have a filiform appearance.
- B. Incorrect. These are filiform polyps, not retained feces.
- C. Correct. The filiform polyps are a chronic change from inflammatory bowel disease, most commonly ulcerative colitis. These pseudopolyps represent mounds of residual mucosa and submucosa among interconnecting areas of mucosal ulceration.
- D. Incorrect. Schistosomiasis is associated with postinflammatory polyps caused by a granulation reaction to the deposition of eggs in the bowel wall. It may produce focal polyp similar to an adenoma, but is not filiform in appearance.

Reference:

None

4. What is the MOST common site of sarcoid involvement in the gastrointestinal tract?
- A. Esophagus
 - B. **Stomach**
 - C. Duodenum
 - D. Ileum

Rationale:

- A. Incorrect. Sarcoid can involve this location, but less commonly than the stomach. B.
- B. Correct. The stomach is the most common site of gastrointestinal tract involvement with up to 10% of patients with sarcoid having asymptomatic gastric mucosal granulomas.
- C. Incorrect. Sarcoid can involve this location, but less commonly than the stomach.
- D. Incorrect. Sarcoid can involve this location, but less commonly than the stomach.

Reference:

None

5. You are shown a contrast-enhanced CT (Figures 6A through 6C) in a 46-year-old woman. What is the MOST LIKELY diagnosis?
- A. Metastatic ovarian carcinoma
 - B. Post-traumatic splenosis
 - C. **Polysplenia**
 - D. Lymphoma

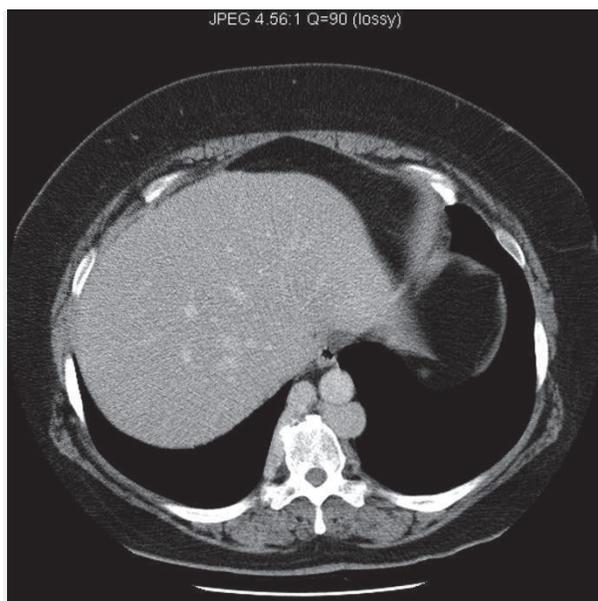


Figure 6.A

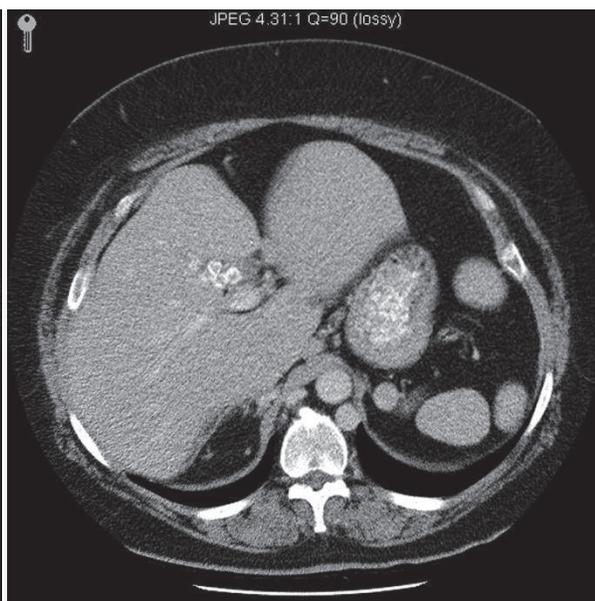


Figure 6.B

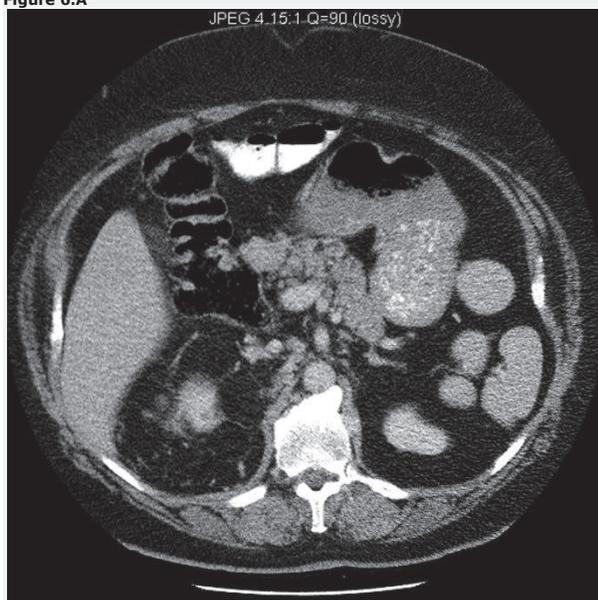


Figure 6.C

Rationale:

- A. Incorrect: The multiple masses could represent enhancing metastases but other findings make the diagnosis.
- B. Incorrect: There are too many splenic masses for splenules.
- C. Correct: Multiple splenic masses, no intrahepatic IVC and an enlarged azygous vein.
- D. Incorrect: There are no enlarged lymph nodes.

Reference:

Vanbeckevoort D, Verswijvel G, Van Hoe L. Congenital disorders of the spleen. In: DeSchepper AM and Vanhoenacker F, eds. Medical Imaging of the Spleen. Springer-Verlag Berlin Heidelberg, 2000:19-28.

6. Concerning gastrojejunostomy, which one of the following is TRUE?
- A. A Billroth I is a gastrojejunostomy.
 - B. A gastric stapling procedure incorporates a Roux-en-Y loop.
 - C. **Internal hernias occur in up to 5% of patients following gastric bypass for weight reduction.**
 - D. There is no increased risk for gastric cancer following partial gastrectomy for benign peptic ulcer disease.

Rationale:

- A. Incorrect: A Billroth I is an antrectomy with a gastroduodenostomy.
- B. Incorrect: Rationale: Answer B is incorrect. A gastric partitioning stapling does not use any type of gastro-jejunal anastomosis.
- C. Correct. Internal hernias have been reported in up to 5% of post gastric bypass operations.
- D. Incorrect. There is a 3 to 6 fold increased chance of developing gastric remnant adenocarcinoma 15 to 20 years following surgery for benign peptic ulcer disease.

Reference:

Smith CH and Gore RM. Postoperative stomach and duodenum. In: Gore RM, Levine MS, Laufer I, eds. Textbook of Gastrointestinal Radiology, Vol. 1, Second Edition. Philadelphia, PA: W.B. Saunders Company, 2000:682-697.

7. Concerning splenic trauma, which one is TRUE?
- A. The spleen is injured in 35% of penetrating abdominal trauma.
 - B. The spleen is the second most common solid organ injured in blunt trauma.
 - C. Grading splenic trauma is a reliable way to predict whether a patient will need splenectomy.
 - D. **Embolization techniques can be used to control splenic hemorrhage.**

Rationale:

- A. Incorrect: The spleen is injured less than 10%.
- B. Incorrect: The spleen is the most common solid organ injured.
- C. Incorrect: CT and surgical grading systems are not reliable methods to predict conservative vs. surgical management.
- D. Correct: Embolization techniques can be useful in controlling splenic hemorrhage and obviating splenectomy.

Reference:

Corthouts B, Degryse H. Trauma of the spleen. In: DeSchepper AM and Vanhoenacker F, eds. Medical Imaging of the Spleen. Springer-Verlag Berlin Heidelberg, 2000:81-88.

8. Concerning microcystic cystadenoma of the pancreas, which one is TRUE?
- A. Fluid aspirated from the cyst will contain mucin.
 - B. **They usually appear as a solid mass on ultrasound exam.**
 - C. They should be resected because they are potentially malignant.
 - D. They rarely calcify.

Rationale:

- A. Incorrect: Aspirate yields low viscosity fluid. The cysts are lined by glycogen-containing cells. Macrocystic cystadenomas and cystadenocarcinomas have mucinous fluid.
- B. Correct: They have this appearance because the small cysts are depicted only as acoustic interfaces.
- C. Incorrect: They are benign. Macrocystic adenomas are potentially malignant.
- D. Incorrect: Microcystic adenoma calcifies more than any other pancreatic tumor, with central calcifications seen in about one-third by conventional radiographs.

Reference:

Curry CA, et al. CT of primary cystic neoplasms: can CT be used for patient triage and treatment? AJR 2000;175:99-103. Atri M, Finnegan PW. The pancreas. In: Rumack CM, et al., eds. Diagnostic Ultrasound, Vol. 1. St. Louis, MO: Mosby Year Book, 1991:171-172. Balci NC, Semelka RC. Radiologic features of cystic, endocrine and other pancreatic neoplasms. Eur J Radiol 2001;38(2):113-119.

9. Concerning ADULT intussusception, which one is TRUE?
- A. **Most surgical cases are caused by a structural lesion.**
 - B. Carcinoid is the most common malignancy to cause a colocolic intussusception.
 - C. Symptomatic intussusception is more common in adults than children.
 - D. Asymptomatic small bowel intussusceptions commonly require surgery.

Rationale:

- A. Correct: In most adult cases, intussusception is associated with a bowel-related structural abnormality.
- B. Incorrect: About 40% of adult intussusceptions are caused by malignant neoplasms. In the colon, primary adenocarcinoma is the most common.
- C. Incorrect: Intussusception is most commonly a disease of childhood. Eighty-five to ninety-five percent of intussusceptions occur in children. Ninety-five percent of pediatric intussusceptions are idiopathic. However, there is some evidence to suggest that viral infection causing Peyer patch enlargement could be the underlying etiology in many cases.
- D. Incorrect: A short-segment, relatively asymptomatic or incidental enteroenteric intussusception is frequently noted with abdominal CT and MR in adults. These are not associated with significant small bowel obstruction, are usually self-limiting and transient, and do not require surgical intervention.

Reference:

Huang BY, Warshauer DM. Adult intussusception: diagnosis and clinical relevance. *Radiol Clin North Am* 2003;41:1137-1151. Coran AG. Intussusception in adults. *Am J Surg* 1969;117:735-738. Agha FP. Intussusception in adults. *AJR* 1986;146:527-531. Nagorney DM, Sarr MG, McIlrath DC. Surgical management of intussusception in the adult. *Ann Surg* 1981;193:230-236. Warshauer DM, Lee JK. Adult intussusception detected at CT or MR imaging: clinical - imaging correlation. *Radiology* 1999;212:853-860. Catalano O. Transient small bowel intussusception: CT findings in adults. *Br J Radiol* 1997;70:805-808.

10. Concerning Mirizzi syndrome, which one is TRUE?
- A. Mirizzi syndrome is caused by gallstone impaction in the common hepatic duct.
 - B. **Mirizzi syndrome is facilitated by an anatomic variant.**
 - C. Cholecystocolonic fistula can complicate Mirizzi syndrome.
 - D. Bile duct injury at surgery is less likely in cases of Mirizzi syndrome.

Rationale:

- A. Incorrect: Mirizzi syndrome is a complication of longstanding cholelithiasis. It is caused by impaction of a gallstone in the cystic duct or in the gallbladder neck. Extrinsic mass effect of the stone in the cystic duct on the common hepatic duct (CHD) or associated inflammatory changes extending to the CHD causes obstruction of the extrahepatic biliary tree.
- B. Correct: Mirizzi syndrome is defined as extrinsic obstruction of the common hepatic duct (CHD), usually caused by mass effect from a stone lodged in the adjacent cystic duct. CHD compression is more likely in patients with low cystic duct insertions, because the cystic duct runs more parallel and in closer proximity to the CHD when this variant anatomy is present. Inflammatory changes extending from the cystic duct or gallbladder neck can also cause narrowing of the bile duct.
- C. Incorrect: A cholecystocholedochal (not cholecystocolonic) fistula is a complication of Mirizzi syndrome in 9 - 39% of cases. Fistula repair is required at the time of surgery. This requires either choledochoplasty or hepaticojejunostomy.
- D. Incorrect: Because of adhesions, inflammation and variant bile duct anatomy, the surgical dissection is more difficult in Mirizzi syndrome. Inadvertent injury to the biliary tree or hepatic artery is more likely. Although laparoscopic cholecystectomy can be performed successfully in patients with Mirizzi syndrome, more require open cholecystectomy than in cases of uncomplicated cholecystitis.

Reference:

Bennett GL and Balthazar EJ. Ultrasound and CT evaluation of emergent gallbladder pathology. *Radiol Clin North Am* 2003;41:1203-1216. Koehler RE, Melson GL, Lee JKT, et al. Common hepatic duct obstruction by cystic duct stone: Mirizzi syndrome. *AJR* 1979;132:1007-1009. Presta L, Ragozzino A, Perrotti P, et al. Detection of Mirizzi syndrome with magnetic resonance cholangiopancreatography: laparoscopic or open approach? *Surg Endosc* 2002;16:1494-1495. Shah OJ, Dar MA, Wani MA, et al. Management of Mirizzi syndrome: a new surgical approach. *ANZ J Surg* 2001;71:423-427. Bagia JS, North L, Hunt DR. Mirizzi syndrome: an extra hazard for laparoscopic surgery. *ANZ J Surg* 2001;71:394-397. Johnson LW, Sehon JK, Lee WC, et al. Mirizzi's syndrome: experience from a multi-institutional review. *Am Surg* 2001;67:11-14.