

AMSER Case of the Month

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26-year-old male with RUQ pain

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Patient Presentation

- 26 y/o M complains of acute onset RUQ that radiates to mid back.

HPI

- Presents to the ED after 5 days of RUQ burning pain that first began after eating fast food
- Unable to tolerate PO with many episodes of emesis
- Urine has been dark yellow, stools have been light in color

PMH: Obesity class II, tobacco use: 1 pack/day

Pertinent Labs

- WBC 19,500
 - AST 246
 - ALT 555
- Alk Phos 239
- Lipase 3434

What Imaging Should We Order?

Select the applicable ACR Appropriateness Criteria

Variant 1: Right upper quadrant pain. Suspected biliary disease. Initial imaging.

Procedure	Appropriateness Category	Relative Radiation Level
US abdomen	Usually Appropriate	○
CT abdomen with IV contrast	May Be Appropriate	☼☼☼
MRI abdomen without and with IV contrast with MRCP	May Be Appropriate	○
MRI abdomen without IV contrast with MRCP	May Be Appropriate	○
Nuclear medicine scan gallbladder	May Be Appropriate	☼☼
CT abdomen without IV contrast	May Be Appropriate	☼☼☼
CT abdomen without and with IV contrast	Usually Not Appropriate	☼☼☼☼

This imaging modality was ordered by the ER physician

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Findings (unlabeled)

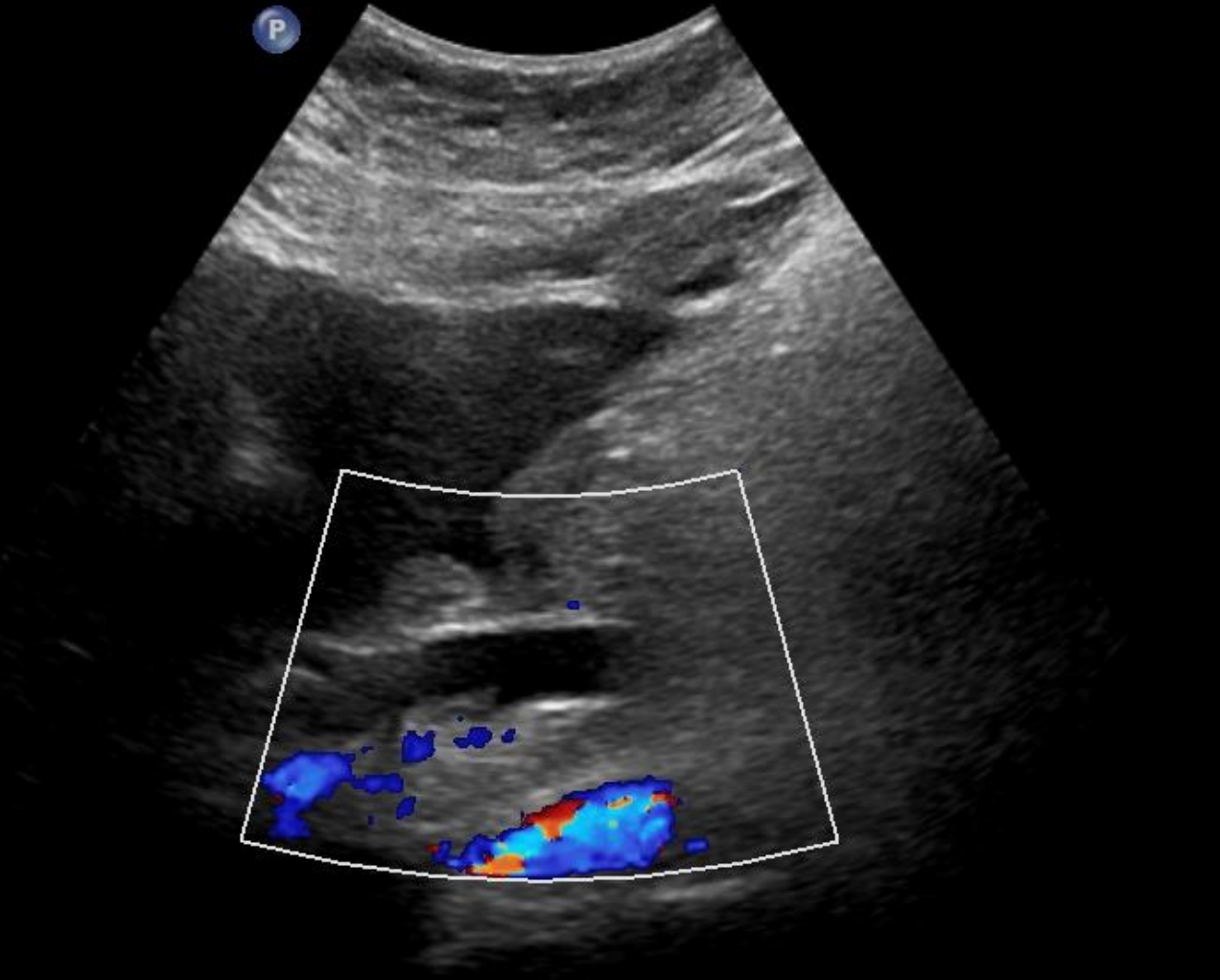


Findings (labeled)



Fig 1. Unenhanced CT of the abdomen/pelvis demonstrates pancreatic edema as well as peripancreatic fat stranding. Of note, no calcified gallstones were visualized on this exam.

Findings (unlabeled)



Findings (labeled)

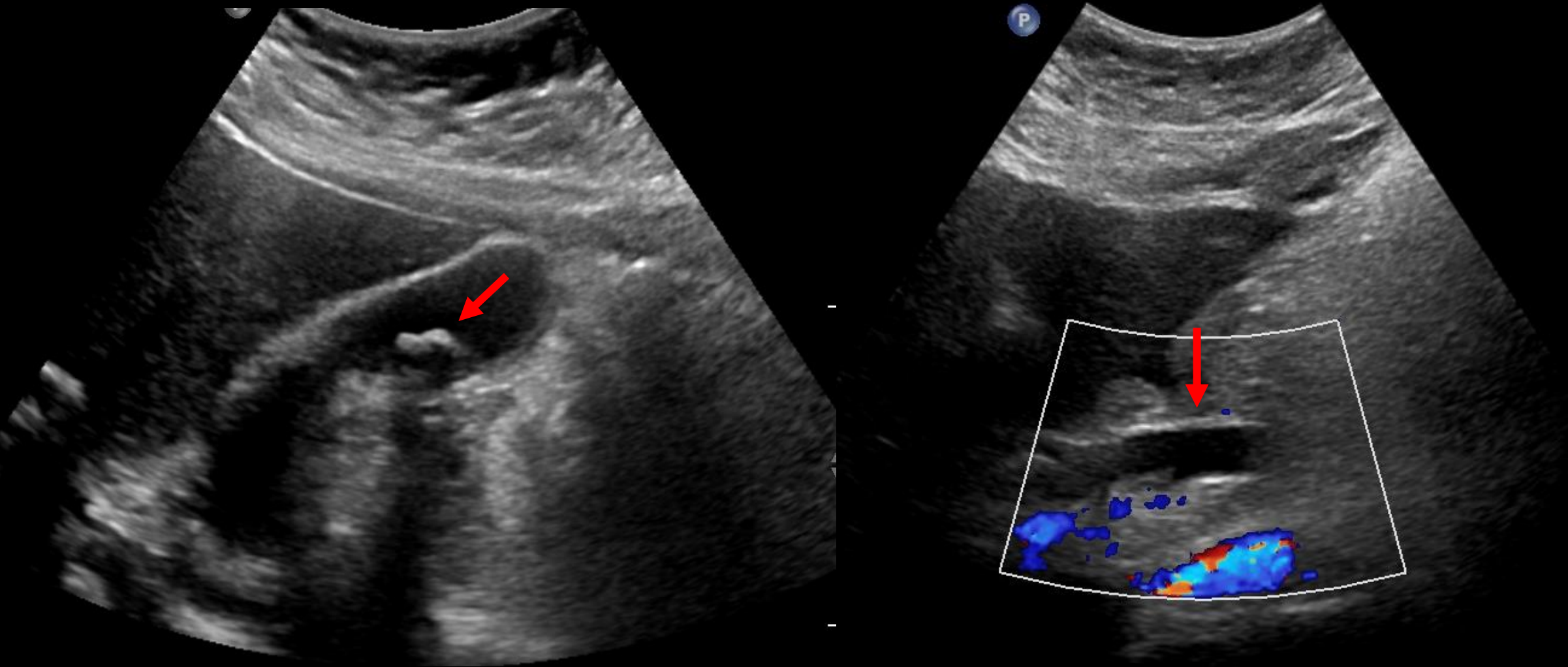


Fig 2. A. Ultrasound examination of the gallbladder demonstrates two echogenic, shadowing calculi within the dependent portions of the gallbladder. B. On the same examination, there is dilation of the CBD up to 1.0 cm.

Findings (unlabeled)

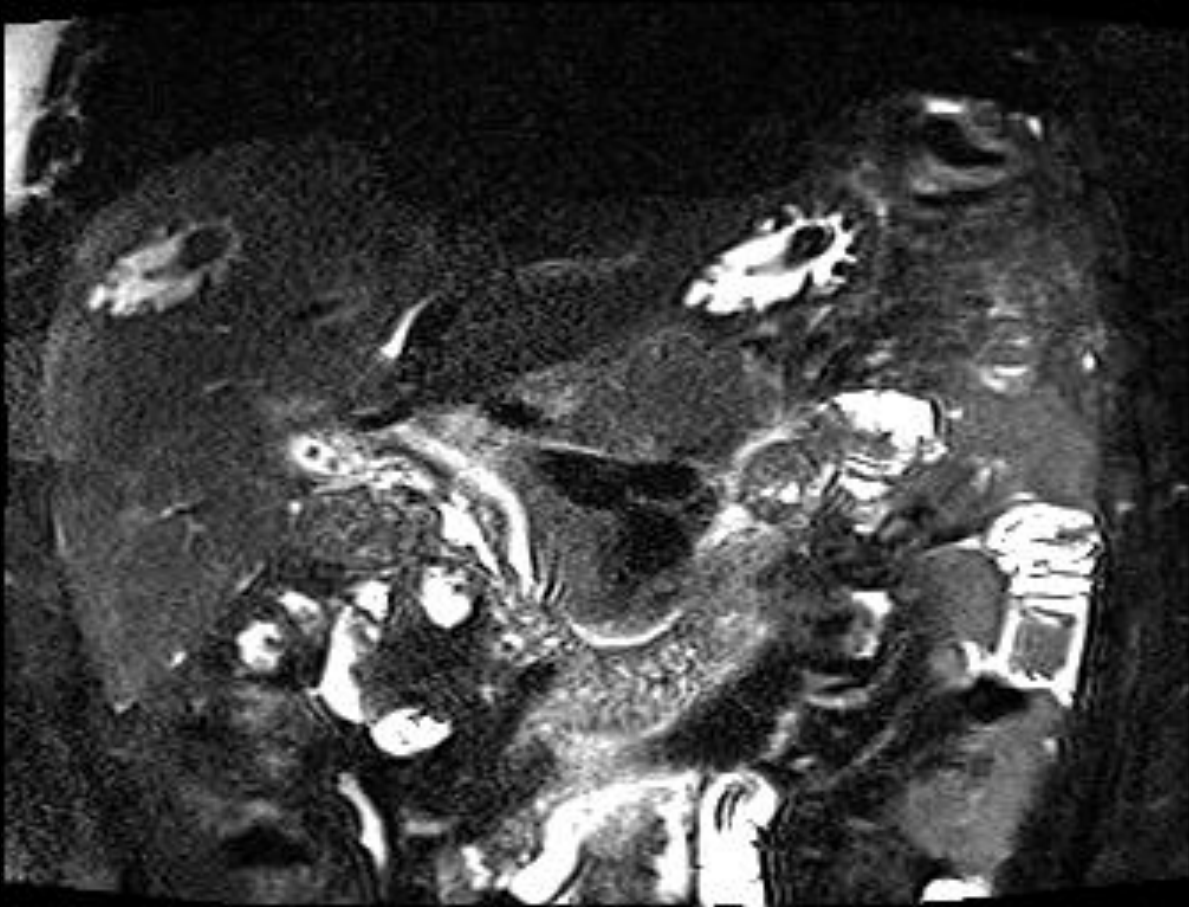


Fig 3. MRCP demonstrates presence of gallstones within the gallbladder neck/proximal cystic duct.

Findings (labeled)

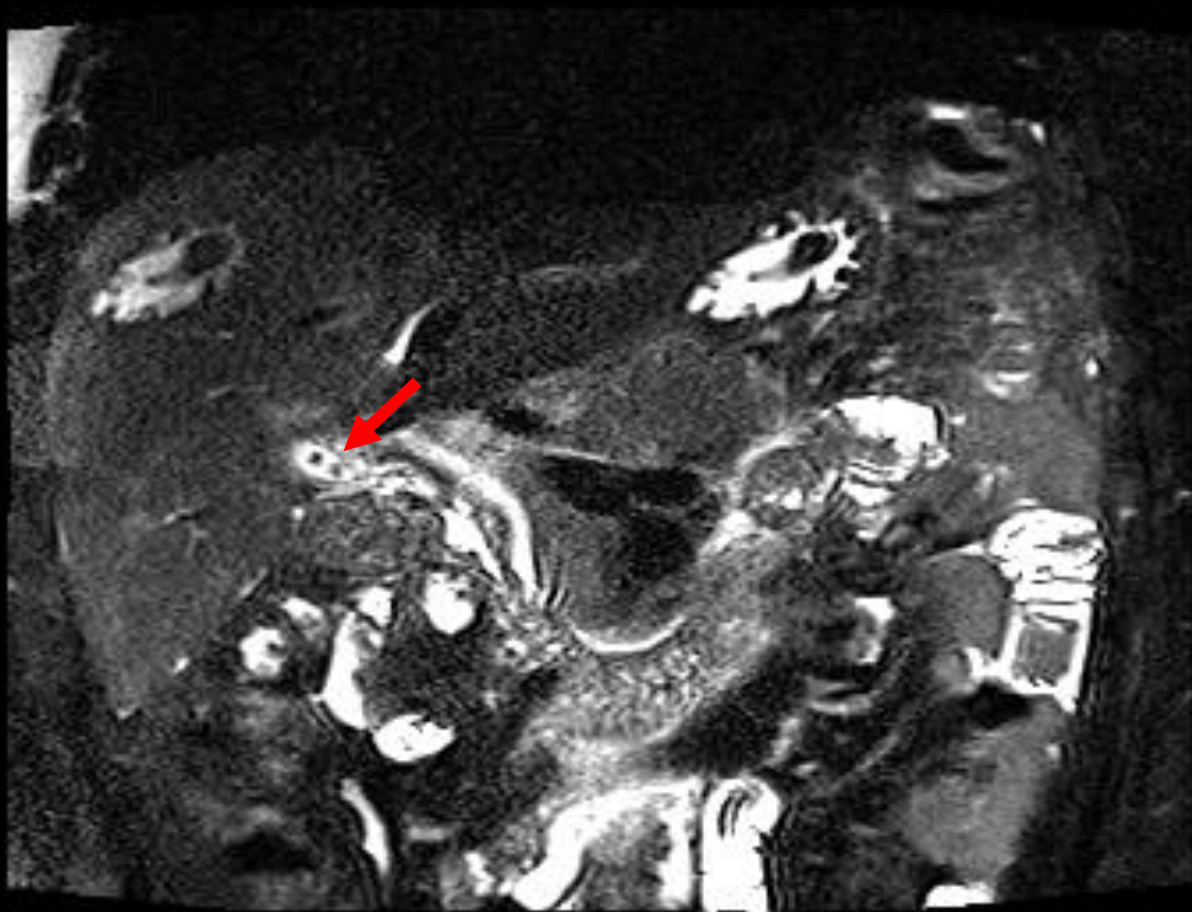


Fig 3. Coronal MRCP (a) and coronal T2 HASTE (b) sequences demonstrate the presence of filling defects within the gallbladder neck/cystic duct compatible with gallstones.

Final Dx:

Gallstone Pancreatitis

Gallstone Pancreatitis

- Inflammation of the pancreas due to obstruction by a gallstone.
- **Etiology:** Gallstones are formed due to stasis in the gallbladder and can be composed of cholesterol or bilirubin. Stones can travel through bile duct and obstruct the pancreatic duct or ampulla. Obstruction causes reflux of bile into pancreatic duct with subsequent inflammation of pancreas.
- **Risk Factors:** hx of gallstones, high fat diet, chronic hemolysis, obesity, female sex, pregnancy.
- **Clinical Presentation:** Sudden onset epigastric or RUQ pain that radiates to the back, fever, nausea, vomiting, tachycardia, and respiratory symptoms.

Gallstone Pancreatitis (contd.)

- **DDx:** Cholelithiasis, choledocholithiasis, cholangitis, peptic ulcer disease, bowel obstruction, hepatitis.
- US can establish the diagnosis and can identify stones in the gallbladder (including non-calcified stones) and bile duct dilatation. However, views of the pancreas can be limited by bowel gas or adynamic ileus.
- Abdominal CT can be useful for identifying etiology of abdominal pain when multiple etiologies are suspected, if lab results are equivocal, or complications are suspected.
- MRI/MRCP can help in the detection of biliary duct stones (choledocholithiasis) and can depict peripancreatic fluid collections in greater detail.

Gallstone Pancreatitis (contd.)

US findings may include

- Diffuse glandular enlargement
- Hypoechoic echotexture of the pancreas consistent with edema
- Cholelithiasis or sludge
- Biliary ductal dilatation
- Sonographic Murphy's sign

CT findings may include:

- Edematous pancreas with loss of clearly defined pancreatic architecture
- Fat stranding
- Peripancreatic fluid collection
- Gallbladder wall thickening

Gallstone Pancreatitis (contd.)

MRI/MRCP findings may include

- Enlarged pancreas with increased signal on T2WI (better seen with fat suppression) and abnormally low signal on T1W1.
- T2WI allows differentiation of simple fluid collections from collections with internal solid debris.
- MRCP can evaluate integrity of pancreatic duct as well as presence of choledocholithiasis.

Gallstone Pancreatitis (contd.)

Management

- Fluid replacement, PO feeding as tolerated, pain control with opioids, and abx if evidence of infection.
- Continued monitoring and evaluation for complications w/ repeat imaging. Common complications include pancreatic pseudocyst and necrotizing pancreatitis.
- Cholecystectomy is performed electively.

References:

American College of Radiology. ACR Appropriateness Criteria®. Available at <https://acsearch.acr.org/list>

Crockett, S., Wani, S., Gardner, T., Falck-Ytter, Y., Barkun, A. American Gastroenterological Association Institute Guideline on Initial Management of Acute Pancreatitis. *Gastroenterology*. 2018 Mar 1; 154 (4): 1096-1101. <https://doi.org/10.1053/j.gastro.2018.01.032>

Radiopaedia <https://radiopaedia.org/articles/gallstone-pancreatitis>

Sekimoto, M., Takada, T., Kawarada, Y. *et al.* JPN Guidelines for the management of acute pancreatitis: epidemiology, etiology, natural history, and outcome predictors in acute pancreatitis. *J Hepatobiliary Pancreat Surg* **13**, 10–24 (2006). <https://doi.org/10.1007/s00534-005-1047-3>

Wang GJ, Gao CF, Wei D, Wang C, Ding SQ. Acute pancreatitis: etiology and common pathogenesis. *World J Gastroenterol*. 2009;15(12):1427-1430. doi:10.3748/wjg.15.1427