

EM CASE OF THE WEEK.

BROWARD HEALTH MEDICAL CENTER
DEPARTMENT OF EMERGENCY MEDICINE



Care Warriors

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Gallstone Pathology

A 35-year-old female with history of cholelithiasis presents to the Emergency Room complaining of a 2-day history of sharp, intermittent, right upper quadrant and epigastric abdominal which radiating to her back. She rates the pain 10/10, which improves with Advil, however worsened with eating. Patient also reports nausea, dark urine, subjective fever and chills. She described that she has had this type of pain in the past at which time she was diagnosed with acute cholecystitis and treated with antibiotics. She was instructed to follow up for elective cholecystectomy, however she failed to follow up.

On this admission, labs reveal WBC count of 6.26, H/H 12/38%, alkaline phosphatase 229, AST 730, ALT 540, and total bilirubin 3.2, direct bilirubin 1.8 and lipase of 6000. Which special test will best confirm the most likely diagnosis?

- A. US Gallbladder
- B. Abdominal CT
- C. HIDA
- D. MRCP

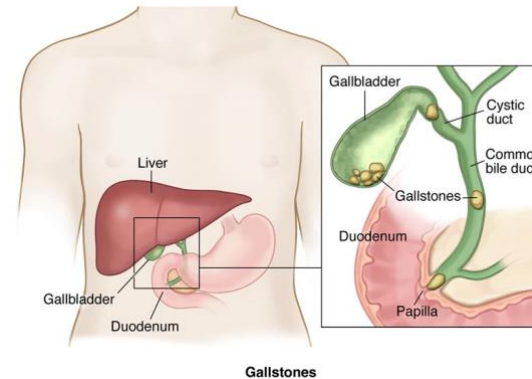


Fig.1. Sites of common gallstone obstruction

(via <https://www.kediamd.com/everything-you-want-to-know-about-bile-duct-stones/>)

Gallstones can cause obstruction at several sites along the biliary tree within the cystic duct and common bile duct. Resulting pathology depends on the specific site of obstruction.

(A) shows obstruction within the cystic duct (B) shows obstruction within the common bile duct proximal to the pancreas (C) shows obstruction of the common bile duct distal the pancreas

EM Case of the Week is a weekly "pop quiz" for ED staff.

The goal is to educate all ED personnel by sharing common pearls and pitfalls involving the care of ED patients. We intend on providing better patient care through better education for our nurses and staff.

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The correct answer is D. This patient with history of cholelithiasis is now presenting with abdominal pain, elevated LFTs and elevated lipase most likely has choledocholithiasis.

Choledocholithiasis is the term commonly used to describe obstruction of the common bile duct by a gallstone. Clinical findings of this pathological process depend on location of the gallstone. Stones proximal to the pancreas will result in painful jaundice and hepatitis, while stones distal to the pancreas may also include signs of pancreatitis. Mild inflammation present may result in fevers. Laboratory findings of choledocholithiasis may include leukocytosis, elevated total and direct bilirubin, elevated LFTs, as well as elevated lipase.

Discussion

Cholelithiasis, which is the formation of gallstones within the gallbladder, can lead a variety of pathological processes. The most commonly seen pathology related to cholelithiasis is acute cholecystitis, in which the gallstones become lodged within the cystic duct and cause inflammation isolated to the gallbladder. Clinical signs of acute cholecystitis include right upper quadrant abdominal pain, also an Murphy's sign. The patient may also have a low-grade fevers and mild leukocytosis.

Obstruction of the biliary tree past the cystic duct may cause involvement of surrounding organs and potentially more severe disease. Primary choledocholithiasis, involving the formation of stones within the common bile duct, is less commonly seen than secondary cholelithiasis in which stones are passed from the gallbladder and lodged into the common bile duct. While obstruction of the common bile duct may lead to painful jaundice, hepatitis, and pancreatitis as previously discussed, stagnant bile may also lead to ascending cholangitis and sepsis.

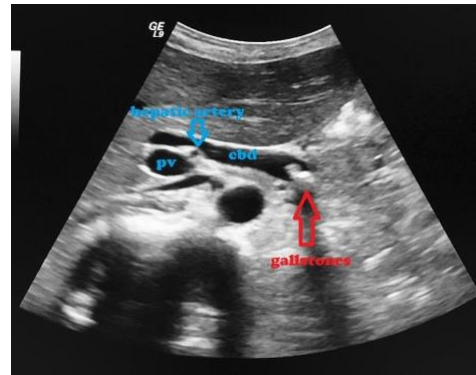


Fig. 2. Dilation of the CBD seen on ultrasound imaging

(via <https://step2.medbulletins.com/gastrointestinal/120164/choledocholithiasis>)

History and Physical

The most common complaint associated with choledocholithiasis is colicky, right upper quadrant pain. Yellowing of the sclera, pruritis, and vomiting may be seen in more advanced disease. Extravasation of conjugated bilirubin into the bloodstream may also result in clay-colored stools and dark urine. The combination of jaundice, fever, and right upper quadrant pain is pathognomonic and known as Charcot's Triad. Addition of shock and altered mental status, known as Reynold's pentad, is indicative of advancement of the disease to ascending cholangitis.¹

Evaluation

As previously discussed, abnormal laboratory values in a patient with choledocholithiasis include leukocytosis, elevated total bilirubin, direct bilirubin, LFTs and lipase. Gamma-glutamyl transpeptidase (GGT) may also be elevated and total bilirubin greater than 3-4 mg/dL is highly suggestive of choledocholithiasis. As with any other disease of the biliary tree, the first line imaging modality for suspected choledocholithiasis is transabdominal ultrasound. Dilation of the common bile duct on the ultrasound is suggestive of choledocholithiasis, as visualization of the stones themselves may be impeded due to surrounding gas. Magnetic Resonance Cholangiopancreatography (MRCP) is now favored over ERCP for visualization of the gallstones due to the risk of post-procedure pancreatitis commonly seen with Endoscopic Retrograde Cholangiopancreatography (ERCP).¹

For a list of educational lectures, grand rounds, workshops, and didactics please visit BrowardER.com and click on the "Conference" link.

All are welcome to attend!

Treatment

Treatment of choledocholithiasis involved the removal of the obstructing stones. An ERCP can be performed to both visualize the stone and remove it accordingly. This procedure is completed under general anesthesia, is more time-consuming than MRCP, and has greater side effects. During the procedure, a duodenoscope is inserted into the duodenum before a catheter and guidewire is advanced into the common bile duct. A sphincterotome is used to incise the Ampulla of Vater and widen the opening. This will often create an exit large enough for the stones to pass into the duodenum. A balloon catheter can be used to sweep any remaining stones. A stent may also be placed within the common bile duct to allow any sludge to drain and prevent formation of more stones within the duct.¹

In cases of secondary choledocholithiasis, cholecystectomy is typically recommended. This removes the source of gallstones and greatly decreases the chance that the patient will have recurrence of obstruction.

Consultations

While laboratory values and ultrasound imaging can be obtained in the emergency department, further management of choledocholithiasis is dependent on the medical specialists. Consultations may include Gastroenterology for endoscopy, and General Surgery. Infectious disease specialists may be included in the care for antibiotic

Take Home Points

- Formation of gallstones, known as cholelithiasis, can lead to a variety of pathological processes including acute cholecystitis, choledocholithiasis, and ascending cholangitis
- Ascending cholangitis should be suspected early in the encounter if patient has signs of Reynold's Pentad
- Workup of patients with suspected choledocholithiasis or ascending cholangitis includes CBC, CMP, LFTs, bilirubin, lipase, abdominal ultrasound, and MRCP for final diagnosis
- Mainstay of treatment for choledocholithiasis involves removal of obstructing stones via ERCP and prevention of recurring disease in the future with cholecystectomy



ABOUT THE AUTHOR

This month's case was written by Toria Gargano. Toria is a 4th year medical student from NSU-KPCOM. She did her emergency medicine rotation at BHMC in December 2020. Toria plans on pursuing a career in Surgery after graduation.

REFERENCES

1. McNicoll CF, Pastorino A, Farooq U, et al. Choledocholithiasis. [Updated 2020 Jun 18]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK441961/>