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Case Challenge

Complexities of the Microbiome: Jaundice in Patient With Ulcerative Colitis

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Abstract

Patients with jaundice and abdominal pain should be assessed immediately for biliary obstruction. The development of cholangitis, or an inflammation of the bile ducts, can lead to infection. A nurse practitioner must complete a thorough health history and physical examination to assist in differentiating potential causes of jaundice.

Introduction

R.W. is a 30-year-old man presenting to his family nurse practitioner (NP) with (1) worsening abdominal pain, (2) low-grade fever, (3) jaundice, and (4) generalized pruritus.

Case Presentation

The patient developed right upper quadrant abdominal pain and pruritus 2 days before his clinical visit. He reports taking one dosage of bismuth subsalicylate for the abdominal pain with minimal relief. The subsequent day he noticed the sclera of his eyes had turned yellow. His mother encouraged him to schedule a visit with his family NP for evaluation. The patient denies any recent changes in medications or health. He denies exposure to sick contacts and denies recent travel.

Past Medical History

The patient’s past medical history is notable for a diagnosis of ulcerative colitis at age 19. The patient was admitted to a local hospital with a chief complaint of hematochezia on first presentation. After evaluation and continued management, the patient’s condition has been stable. He is prescribed mesalamine (800 mg, 3 times per day). The patient’s last colonoscopy was 4 months prior with no significant changes or acute findings. He is seen by his gastroenterologist every 6 months and as needed. He has been immunized against measles, mumps and rubella, tetanus, and hepatitis A and B. The patient has no known drug allergies.

Social and Family History

R.W. works full time as a law clerk at a law firm in an urban city. He exercises regularly and participates in a local baseball league on the weekends. He denies any alcohol, tobacco, or illicit drug use. The patient’s grandparents are deceased. His mother is alive and well, age 55. His father is alive and well, age 60 with a diagnosis of hyperlipidemia. He has a brother, alive and well, age 23.

Review of Systems

General: The patient reports a low-grade fever ranging from 99°–101°F; generalized pruritus, and fatigue. He denies recent weight loss or gain.

Eyes: The patient reports “yellowing of my eyes.” He denies blurred vision.

Gastrointestinal: The patient reports nausea and early satiety. He reports worsening abdominal pain in the right upper quadrant. He reports acholic stools. He denies vomiting, constipation, diar-rhea, hemoptysis, melena, and hematochezia.

Genitourinary: The patient reports dark amber-colored urine. Integumentary, cardiovascular, respiratory, neurologic, musculoskeletal, and psychiatric examinations are unremarkable.

Physical Examination

The patient is a young-adult white man and appears stated age. Mild jaundice noted. The patient appears ill.

Vital signs: Body mass index, 19 kg/m²; blood pressure, 118/64 mm Hg; pulse, 99 beats/min; temperature, 100°F; respirations, 18 breaths/min; oxygen saturation on room air, 100%.

Scleral icterus. Mild hepatomegaly on examination. Abdominal pain on deep palpation that is worse in the right upper quadrant.
Regular rate and rhythm of the heart, no murmurs. Lungs clear to auscultation. Genitourinary: deferred.

Outpatient Clinical Visit

After completing a detailed history and physical assessment, the family NP advised the patient to seek emergency treatment for further evaluation at the nearby local hospital. The NP contacted the patient’s gastroenterologist, and R.W. was admitted to the medicine unit.

Initial Hospital Workup

Notable laboratory studies

- White blood cells, 14,000/μL; 76% neutrophils
- Creatinine, 1.1 mg/dL
- Aspartate aminotransferase, 33 U/L; alanine aminotransferase, 57 U/L; alkaline phosphatase, 390 U/L
- Total bilirubin, 4.2 mg/dL; conjugated (direct) bilirubin, 4.0 mg/dL
- γ-Glutamyl transpeptidase, 230 U/L

Blood cultures: no growth to date. Urinalysis and culture unremarkable. Respiratory swab negative. SARS CoV-2 (COVID-19) negative. Chest x-ray unremarkable.

Imaging studies

Ultrasound of the abdomen: Impression: Findings consistent with mild intrahepatic and extrahepatic biliary ductal dilatation.

Case Challenge Questions

1. Based on the current findings what is the most likely diagnosis for this patient?
2. What further testing should be ordered?
3. What are various contributing causes for patients with biliary ductal dilatation and a cholestatic laboratory workup?

If you believe you know the answers to the following questions, then test yourself and refer to page e135 for the answers.
Case Challenge

Complexities of the Microbiome: Jaundice in Patient With Ulcerative Colitis

(continued from page e134)

Case Challenge Questions and Answers

1. Based on the current findings what is the most likely diagnosis for this patient?

The patient’s most likely diagnosis is acute cholangitis, or an infection of the bile ducts with inflammation caused by an obstruction of the biliary tree.1 The patient’s serologic workup is consistent with a cholestasis, a condition where bile does not flow properly from the liver into the small intestine.1 The NP appropriately referred RW for urgent evaluation to assess for obstruction of the biliary tract.

2. What further testing should be ordered with ultrasound findings of biliary ductal dilatation?

The patient should undergo diagnostic cholangiography testing for evaluation of intrahepatic and extrahepatic biliary ductal dilatation (Figure).2,3 A magnetic resonance cholangiography (MRCP) enables the provider to assess the biliary tree. Endoscopic retrograde cholangiopancreatography and endoscopic intervention should be used to relieve biliary obstruction and directed for patients with evidence of cholangitis or biliary stricture.2,3

3. What are various contributing causes for patients with biliary ductal dilatation and a cholestatic laboratory workup?

The NP should consider all potential causes for a patient with cholangitis, including but not limited to medications, secondary sclerosing cholangitis, immunoglobulin G4 disease, cholelithiasis, biliary tumors, primary biliary cholangitis, and primary sclerosing cholangitis.1,2,4 Abdominal ultrasound imaging is necessary to exclude biliary obstruction and assess the hepatic vasculature.1

Conclusion

During R.W.’s admission, an MRCP with and without IV contrast was ordered by the clinical team. The study found abnormal biliary duct dilatation alternating with strictures. There was heterogeneous peribiliary enhancement of the liver, which likely represents cholangitis. No gallstones or intrahepatic biliary calculi were identified.

These imaging findings are consistent with primary sclerosing cholangitis, a progressive autoimmune cholestatic liver disease that leads to inflammation, strictures, and hepatic fibrosis (scarring).5 Presentation for patients with this disease can range from asymptomatic with abnormal liver tests to patients experiencing symptoms of acute cholangitis.6 The majority of patients with PSC over time will develop advanced fibrosis, cirrhosis, and complications of liver disease such as portal hypertension and hepatic decompensation.7 PSC patients with decompensated cirrhosis should be evaluated for liver transplantation. The patient’s history of ulcerative colitis is also notable in this case. Data has shown as high as 80% of patients with primary sclerosing cholangitis have inflammatory bowel disease, including ulcerative colitis in 70% to 80%, Crohn’s disease in 10% to 15%, and unspecified inflammatory bowel disease in 5% to 10%.8

OR

↑ Alkaline phosphatase

↑ GGT, ↑ serum 5’nucleosidase

Rule out secondary causes
* Medications (steroids, certain antibiotics, OCPs, fenofibrates, phenytoin)
* Secondary sclerosing cholangitis
* IgG4 disease
* Cholelithiasis
* Biliary tumors
* Pancreatitis

Abdominal Ultrasound

Extrahepatic AND/OR intrahepatic findings
OR
Non-diagnostic with patient with SXS

MRCP & AMA

Positive AMA
Consider PBC

Consider other etiologies of liver disease including AIH or PSC-AIH overlap syndrome

↑ Aminotransferases (AST, ALT) ≥ ↑ Alkaline phosphatase

Figure. Cholestatic profile algorithm.2,4 AIH = autoimmune hepatitis; ALT = alanine aminotransferase; AMA = antimitochondrial antibodies; AST = aspartate aminotransferase; ERC = endoscopic retrograde cholangiography; GGT = γ-glutamyl transferase; IgG = immunoglobulin G; MRCP = magnetic resonance cholangiopancreatography; OCP = oral contraceptive pill; PBC = primary biliary cholangitis; PSC = primary sclerosing cholangitis; SXS = symptoms.
Research suggests a link between the microbiome and liver disease in this unique patient population. There are 23 genome-wide risk loci that are thought to contribute to the pathogenesis of primary sclerosing cholangitis. In addition, associations with chromosome 6 and inflammatory bowel disease development has been shown, which may also play a role in primary sclerosing cholangitis development. There is ongoing research investigating this gut-microbiome link. In summary, for best clinical outcomes NPs should assess and screen patients with inflammatory bowel disease for liver disease during annual screenings and as needed depending on the patient’s symptoms and clinical presentation.

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