LAB 7: Clinical Cases for GASTROINTESTINAL AND HEPATOBILIARY SYSTEMS

The focus of this week’s lab will be pathology of the gastrointestinal and hepatobiliary systems. This section includes many different organs. Make sure that you know them and their basic functions, and it will help you understand what is occurring at the cellular level.

In general, the wall of the intestinal tract is comprised of three layers: 1) the mucosa, 2) the submucosa, and 3) the muscularis externa. Changes to these layers due to pressure, inflammation, or erosion can result in pathologic conditions.

The cases we will cover are:

A. Peptic Ulcer Disease Refer to virtual slide p217_Peptic Ulcer [https://med-vmicro.med.illinois.edu/v/604/]

B. Crohn’s Disease Refer to virtual slide p148_Crohns Disease [https://med-vmicro.med.illinois.edu/v/603/]

C. Ulcerative Colitis Refer to virtual slide p59_Ulcerative Colitis [https://med-vmicro.med.illinois.edu/v/608/]

D. Cirrhosis Refer to virtual slide p251_Liver Cirrhosis_Nutritional [https://med-vmicro.med.illinois.edu/v/606/]

A. PEPTIC ULCER DISEASE

CC/HPI: A 25 year old man complains of epigastric pain that usually begins one to two hours after eating and occasionally awakens him at night. The patient has been diagnosed with duodenal ulcers several times in the past, but his symptoms have consistently recurred even after therapy with histamine blockers, antacids, and sucralfate.

PE: Vital signs normal. Physical exam reveals pallor; epigastric tenderness on deep palpation.

Labs: CBC demonstrates normochromic, normocytic anemia. Stool positive for occult blood. UGI: ulcerations of antrum of stomach and duodenum; antral biopsy specimens yield positive urease test.

Pathology: Grossly round ulcer seen as sharply punched-out defect with relatively straight walls and slight overhanging of mucosal margin; smooth and clean ulcer base. No evidence of malignancy; antral biopsies reveal presence of chronic mucosal inflammation and necrotic tissue; organisms identified on methylene blue stain.

What are the three major layers of the gut wall?

Which layers are affected in this patient?
What organism is seen in the methylene blue stained image?

What enzyme is needed for this organism to survive in the acidic pH of the stomach? (Hint! What does the Urease test tell us?)

What is “triple therapy” that is used to treat this infection?

B. CROHN’S DISEASE

CC/HPI: A 21 year old woman complains of intermittent abdominal pain, mild, non-bloody diarrhea, and anorexia for the past two years. She states that the pain is almost always confined to the right lower abdomen and is cramping in nature.

PE: Physical exam reveals pallor; weight loss; abdominal mass in right iliac fossa (thickened bowel loop).

Labs/Imaging: CBC demonstrates megaloblastic anemia. Guaiac positive stool, but negative for parasites. BE: granulomatous colitis and regional enteritis involving multiple areas, most commonly ileum and ascending colon.
Why does this patient have megaloblastic anemia? (Hint! What vitamin deficiencies result in megaloblastic anemia? Can you guess which vitamin she is deficient in based on her symptoms?)

What area of the gastrointestinal tract is likely involved in this anemia?

Pathology: Terminal ileum shows lesions that have a “cobblestone” appearance; discontinuous areas of inflammation, edema, and fibrosis (“skip lesions”). Chronic transmural inflammation, manifested mainly by lymphocytic infiltration with associated lymphoid hyperplasia and formation of non-caseating granulomas.

What are the three major layers of the gut wall?

What layers of the intestinal wall are inflamed in this patient?

C. ULCERATIVE COLITIS

CC/HPI: A 31 year old man complains of having more than five bowel movements a day together with cramping abdominal pain and tenesmus. The patient adds that his stool consists of watery or pasty material with mucus and gross quantities of blood. He also complains of intermittent fatigue, fever, and an increased need for sleep.


What is the function of the colon?
**Labs/Imaging:** CBC: anemia, leukocytosis; hypoalbuminemia. Elevated ESR; stool exam reveals no parasites; no bacterial pathogen isolated in culture. P-ANCA positive; ASCA negative. BE: early mucosal granularity; later, rigidity and loss of haustrations (“lead pipe”), with ragged ulcerated mucosa and ulcerations. Colonoscopy: mucosal erythema and granularity with hemorrhaging and inflammatory pseudopolyps.

**What layer of the intestinal wall is disrupted in this patient?**

**What type of anemia(s) might this patient have? Why?**

**Pathology:** Scarring and coarse, granular mucosal surface indicating presence of microulcerations; mucosal surface is friable; lesions are continuous from anal to oral direction. Increased number of lymphocytes, plasma cells, and PMNs; atrophy of mucosal glands and presence of PMNs in crypts of Lieberkuhn; inflammatory changes confined to mucosa.

**What malignancy is associated with this condition?**

**What are other major complications of this condition?**

**D. CIRRHOSIS**

**CC/HPI:** A 50 year old man with a history of alcoholism is unresponsive to stimuli when brought by a neighbor to the emergency room. His neighbor states that he had vomited blood (hematemesis) three months ago but had received no treatment. The neighbor also reports that the patient got drunk three times a week for four years until approximately one year ago.

**PE:** Muscle wasting; icteric sclera; spider angiomata (due to increased levels of estrogen); nodular, hard hepatomegaly; caput medusa; loss of hair on chest and genitalia; ascites; gynecomastia; testicular atrophy; parotid enlargement; asterixis; palmar erythema; slight pitting edema in lower extremities.
Why are spider angiomata present in this patient?

Why is caput medusa present in this patient?

**Labs/Imaging:** CBC/CMP: slight thrombocytopenia; macrocytic anemia. Increased bilirubin; elevated serum transaminase and alkaline phosphatase; low serum albumin with increased globulins; prolonged PT; high blood ammonia. UGI: esophageal varices. EGD: esophageal varices confirmed. CT/US, abdomen: enlarged and fatty nodular liver; tortuous, dilated variceal vessels.

**Pathology:** Early: enlargement and fatty infiltration of liver; late: brownish discoloration, hardening, and atrophy of liver parenchyma. Necrosis of normal hepatocytes; diffuse replacement with fibrous connective tissue and lymphocyte infiltrate; regenerating nodules of liver lacking normal organization; eosinophilic Mallory bodies; bile congested ductules and proliferation of fibroblasts.

![Image of tissue](image_url)

What tissue is this?

What are the pink inclusions in the cells in the right picture called?

What is the nodule seen in the picture on the left?