

Tuesday, September 11, 2007

11:00 A.M. – 1:00 P.M.

M & CP

MICROSCOPIC LABORATORY

Microscopic Principles of Cell Injury

Slide 1: Appendix. Diagnosis _____ Acute appendicitis.

1. The changes in the appendix involve which portion or portions of the wall?
Transmural
2. Examine the serosa. Describe the major pathologic findings:
Fibrinous exudate, granulation tissue, neutrophils
3. What is the predominant inflammatory cell in the appendix in this case?
Neutrophils
4. What is the pathogenesis of this appendiceal condition?
Obstruction of the lumen of the appendix by a fecalith is most common (or, less often, lymphoid hyperplasia of Peyer's patches in infants and children). The obstruction leads to ischemia and bacterial overgrowth.
5. This condition is an example of: Acute Inflammation.

Slide 2: Liver Diagnosis: Infarct of liver due to hepatic artery thrombosis after liver transplantation

1. There are striking regional differences in the staining and other changes in this slide of liver. Describe them:
A broad area is pale and shows no stainable nuclei or cell membranes. This is necrotic, infarcted tissue. In other areas, the cells are stained and portal tracts as well as centrilobular regions can be discerned.
2. In the large area where hepatocytes are no longer visible, what pathologic process has occurred?

Infarction (necrosis) due to ischemia (lack of hepatic blood flow due to arterial thrombosis)

3. In light of the clinical history, particularly the evidence of hepatic artery thrombosis, describe the sequence of events that led to the pathologic changes in the liver:

(1) Post-op, the anastomosis of the donor liver artery to the recipient triggered local coagulation (2) Thrombus (platelets, fibrin and RBC's) formed in the hepatic artery (3) decreased blood flow to the transplanted liver (4) cell death of hepatocytes due to irreversible ischemic injury.

4. In the region of preserved liver parenchyma, what pathologic changes have occurred and what region(s) of the liver is (are) involved (i.e., centrilobular, midzonal, periportal)?

Midzone is generally spared. Centrilobular region shows necrosis with neutrophil infiltrates ("ischemic hepatitis"). Portal tracts contain lymphocytes, an expression of acute rejection (unrelated to the hepatic artery thrombus).

5. This case is an example of Cell death by necrosis, due to ischemia.

Slide 3: Liver Diagnosis: Cirrhosis with features of chronic hepatitis, consistent with Autoimmune hepatitis.

1. Examine the general architecture of the liver. Is it normal or has it been altered?

Normal lobular architecture has been converted to nodules surrounded by diffuse fibrosis (i.e., cirrhosis).

2. Inflammation is present in this case. State the predominant inflammatory cell and the location:

Lymphocytes, in portal tracts

3. What changes have occurred in the parenchymal cells (hepatocytes)?

Fatty change, ballooning degeneration, oncocytic change (mitochondrial hyperplasia)

4. What possible etiologic factors should be considered in the cause of this patient's liver disease?

The major causes of chronic hepatitis are hepatitis viruses (B & C) drugs, metabolic disorders (alpha-1-antitrypsin deficiency, Wilson's disease) and autoimmune liver disease.

5. This case is an example of Chronic inflammation leading to fibrosis and abnormal regeneration.

Slide 4: Ovarian tumor. Diagnosis: Benign cystic teratoma (dermoid cyst) of ovary

1. Can you identify normal ovarian tissue in this specimen?

No

2. What histologic tissues are present?

Squamous, gastrointestinal, smooth muscle, sebaceous glands, cartilage, nerve ganglia.

3. From the histologic features, is this a benign or a malignant tumor? What criteria should you use to make this decision?

Benign. All the tissues appear to be mature without cytologic atypia.

4. What types of tumors occur in the ovary?

Germ cell-derived tumors and stromal cell-derived tumors.

5. The best name for this tumor is:

Dermoid cyst. (Demonstrates tissues derived from all three germ cell lines: endoderm, ectoderm, mesoderm)

Slide 5: Lung-Pneumectomy. Diagnosis: Squamous cell carcinoma of the lung

1. What is the predominant tissue in the slide?

Squamous

Do you recognize some of the normal pulmonary tissue landmarks?

2. Is the tumor in this slide benign or malignant? Is it of epithelial or mesenchymal origin?

Malignant. Epithelial

3. What is the pathogenesis of this tumor?

Cigarette smoking-related damage to bronchial epithelium which undergoes a mutational event (or events) which leads to the outgrowth of a clone of malignant cells.

Slide 6: Gastric tumor — Intraperitoneal metastases.

Diagnosis: *Gastrointestinal Stromal Tumor (GIST) (Malignant)*

1. What are the cytologic features of the constituent cells of this tumor?

Spindle cells with ovoid, vesicular (pale) nucleoplasm, nuclei. Frequent mitotic figures. Poorly defined cell borders.

2. Based on these features, is the tumor of epithelial or mesenchymal origin?

Mesenchymal

3. Is the tumor benign or malignant? What criteria did you use to determine this?

Malignant: (1) Many mitoses, and (2) the tumor is now growing freely in the abdomen where it does not belong.

4. Which is the appropriate term for this tumor?

Gastro-intestinal stromal tumor

5. Since this tumor first arose in the stomach, what part of the stomach wall gave rise to the tumor? Is this a common or uncommon gastric tumor? What is the most common benign tumor? And malignant tumor?

(1) The GIST tumor arises from interstitial cells of Cajal that are located between muscle cells of the muscularis propria.

(2) This is not a common tumor, but it is not rare.

(3) Most common benign tumor of the stomach: Adenoma

(4) Most common malignant tumor of stomach: Adenocarcinoma