SYSTEMIC PATHOLOGY II
VPM 222

PATHOLOGY OF LIVER & PANCREAS

Lab 3

Enrique Aburto

Winter 2011
Which microscopic changes are seen in **acute** toxic-induced liver disease?
*Hydropic degeneration, steatosis & necrosis of hepatocytes, often centrilobular*

Which morphologic changes are seen in **chronic** toxic-induced liver disease?
*Fibrosis, biliary hyperplasia and regeneration (nodular)*

Which toxic agents are most commonly associated with **acute** toxic-induced liver disease?
*Amanita phalloides, blue-green algae (microcystin), phosphorus, cresols, CCl₄, Cu in sheep, Fe in piglets*

Which toxic agents are most commonly associated with **chronic** toxic-induced liver disease?
*Pyrrolizidine alkaloids, cycads (cycasin), alsike clover, aflatoxins, sporidesmin, phomopsin, anticonvulsant drugs*
Quiz (hepatotoxins)

Which toxic agents produce small (fibrotic), finely nodular livers and megalocytosis?

Pyrrolizidine alkaloids, cycads (cycasin), aflatoxins, phomopsin,

Which toxic agents (or conditions) produce massive necrosis?

Amanita phalloides, blue-green algae (microcystin), cresols, Fe in piglets, Hepatosis dietetica

Which toxic agents produce periportal necrosis?

Phosphorus, aflatoxins (ducklings), Alsike clover (colangiohepatitis & fibrosis)

Which toxic agents produce photosensitization?

Alsike clover, sporidesmin (facial eczema), phomopsin

Which toxic agents produce cholestasis?

Sporidesmin (necrosis of biliary epithelium / cholangiohepatitis), Alsike clover
12.2.3 Gallbladder distension

- Common result of fasting
- *Lantana camara* toxicosis
  - Toxic metabolite: Lantadene A
  - Cholestasis, icterus, photosensitization
- Secondary to biliary obstruction

Gallbladder distension (*top*) due to *Lantana camara* (*bottom*) toxicosis, liver, sheep.

The colors of some flower of *Lantana camara* are recall the flag of which country?

Answer: **Spain**
10.3 Lymphocytic portal hepatitis

- Cats older than 10 years
- Aging change or subclinical form of disease
- Slow progression to portal fibrosis/bile duct hyperplasia
- Lymphoplasmacytic inflammation
- No cholangitis, no neutrophils, no periportal extension
- Immune mediated disorder?
- No assoc with IBD or pancreatitis

Feline lymphocytic cholangitis, liver, cat. Large numbers of lymphocytes (L) surrounding bile ducts (b) and biliary hyperplasia (arrows) in portal areas are the hallmarks of this disease.

Pathologic Basis of Veterinary Disease(2006), 4th ed., Mosby-Elsevier,
Lymphocytic cholangitis (Feline progressive lymphocytic cholangitis /cholangiohepatitis)

- Important in UK
- Cats 4 years and under (Persian)
- **Ascitis**, icterus, hypergammaglobulinemia

**Active stage:**
- Lymphocytic inflammation within and around bile ducts
- Extension to periportal parenchyma

**Chronic stage:**
- ↓ of lymphocytes
- Bridging fibrosis → biliary cirrhosis

**Etiology:**
- No concurrent pancreatitis
- Immune-mediated disorder?

---

Feline lymphocytic cholangitis, liver, cat. **Histo:**
Large numbers of lymphocytes surrounding and infiltrating bile ducts, and biliary hyperplasia (arrows).
Regenerative nodules: A diffuse change, areas of retraction (fibrosis), hepatocellular necrosis and/or inflammation.

Hepatocellular nodular hyperplasia: Usually focal, no fibrosis, no previous necrosis or inflammation.
**Hepatocellular nodular hyperplasia**: Usually single lesion, no fibrous capsule, vacuolar change is common.

**Regenerative nodules**: Nodule surrounded by thick bands of fibrous tissue.
11.2.1 Hepatocellular adenoma

- Benign neoplasm of hepatocytes
- Young ruminants
- Single, unencapsulated, red to brown nodule, which may be pedunculated.
- Composed of well differentiated hepatocytes
- **No portal tracts and bile ducts**
- Not easy to differentiate from nodular hyperplasia in old dogs
11.2.2 Hepatocellular carcinoma

- Syn: Hepatocarcinoma
- Malignant
- Most often seen in dogs
- Must differentiate from hyperplasia and adenoma

- Gross
  - Solitary and involves an entire lobe
  - Cut surface is multilobulated and grey-white to yellow-brown

- Histo
  - Cells arranged in a trabecular pattern (3 or more cells thick),
  - Individual hepatocytes exhibit atypical and bizarre forms

Hepatocellular carcinoma, liver, dog (top) and chimpanzee (bottom). Single, large, lobulated, pale mass involving more that one lobe. Histo: Irregular trabecuæ of atypical hepatocytes showing marked anisokaryosis, karyomegaly (k) and mitotic figures (arrow).
11.2.3 Cholangiocellular adenoma
- Benign tumour arising from the bile ducts
- Often cystic

11.2.4 Cholangiocellular carcinoma
- Relatively common (described in all species)
- Multilobulated, firm, central areas of depression/necrosis (umbilicated).

Cholangiocellular carcinoma, liver. dog. Multiple nodules of tumor, some of which are umbilicated (arrows). *Histo*: Tubular structures of neoplastic bile duct epithelial cells (N) are invading the adjacent normal hepatic parenchyma (H).
12.2.9 Cystic hyperplasia of the gallbladder

- Cystic proliferation of the mucus-producing glands
- Gallbladder and bile ducts
- **Old dogs**, pigs and cats
- Associated with mucocele

Cystic hyperplasia of the gall bladder mucosa, liver, gallbladder opened, dog. Multiple green and pale yellow cystic nodules in the mucosa.

http://w3.vet.cornell.edu/nst/nst.asp
12.2.4 Gallbladder mucocele

- Gallbladder dilation with accumulation of mucoid secretion
- Small breeds of dogs
- Cause?
  - Decreased gall bladder motility
  - Bile stasis
  - Abnormal bile composition
  - Cystic mucinous hyperplasia of mucosa
- Sequelae
  - Extrahepatic biliary obstruction
  - Ischemic necrosis and rupture of the gallbladder

Mucocele, gallbladder, dog. Accumulation of bile-tinged mucoid material
Dog with acute abdominal pain and vomiting. Give the most likely morphologic diagnosis: 

Acute pancreatitis, hemorrhagic diffuse (top) (or fibrinous, multifocal (bottom):

Abdominal fat necrosis (steatonecrosis), multifocal
Pancreatic nodular (exocrine) hyperplasia, (consider chronic interstitial pancreatitis an underlying process)
1.2 Pancreatic hypoplasia

- sporadic in dogs and calves
- defect of acinar tissue (endocrine tissue often normal)

Pancreatic hypoplasia, dog. Virtually no pancreatic tissue is present. Pancreatic remnants are indicated by arrows.

http://w3.vet.cornell.edu
Pancreatic hypoplasia

- in dogs (Juvenile pancreatic atrophy)
- hypoplasia / atrophy?
- German shepherds, 6-12 months
- steatorrhea/diarrhea, emaciation
- gross: ↓ amount of tissue except main ducts
- micro: few normal lobules, ongoing degeneration of ducts / acini

Pancreatic hypoplasia, dogs. Virtually no pancreatic tissue is present. Pancreatic remnants are indicated by arrows.
BEST WISHES IN THE MIDTERM