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***“The Bile Ducts and the Liver
in Health and Disease”***

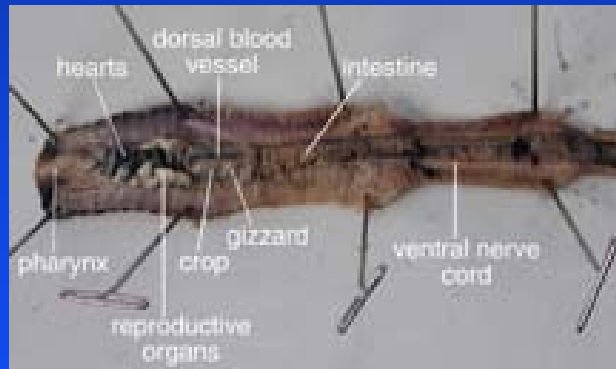
Describing Primary Sclerosing Cholangitis (PSC) to an Audience with a Range of Knowledge

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- **My mother's earthworm dissection in 8th Grade**

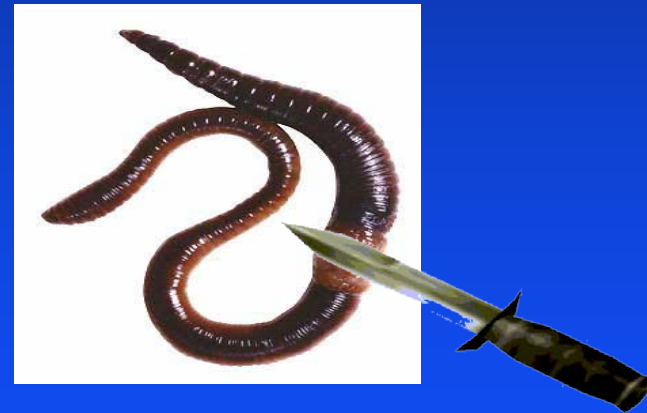
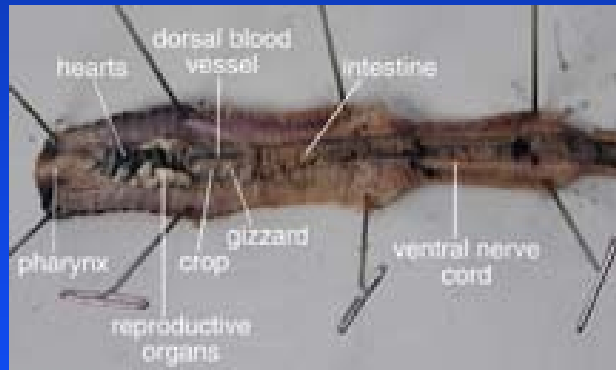
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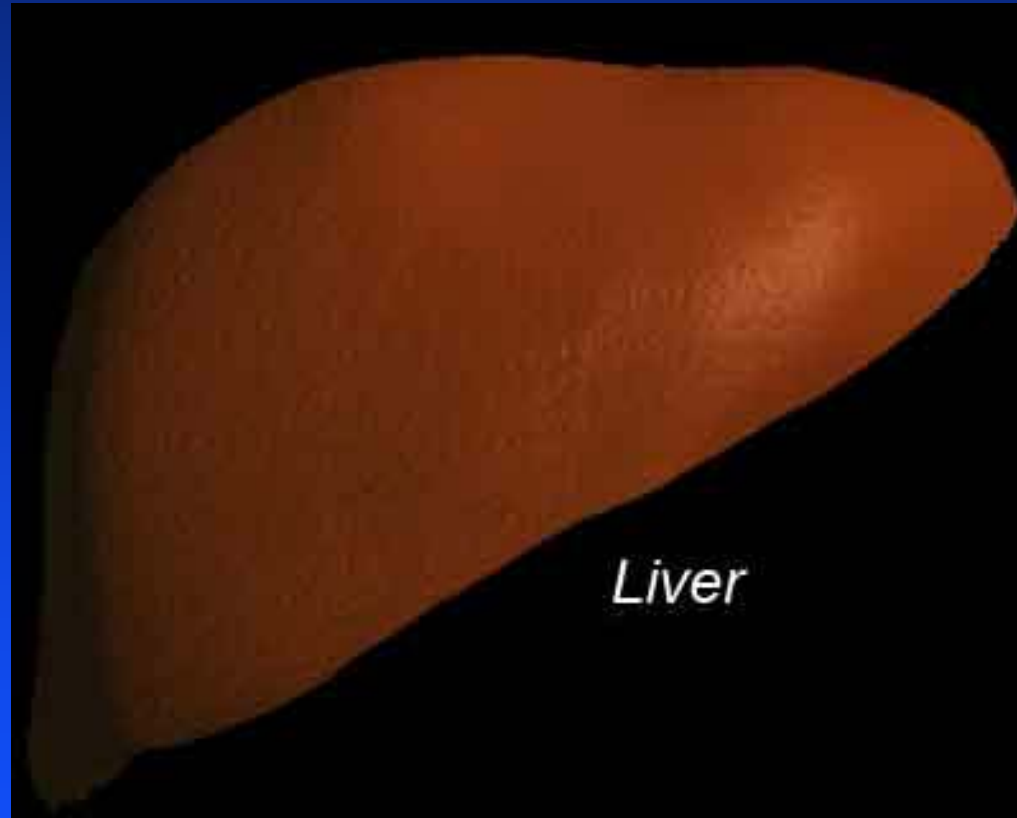


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Healthy Liver



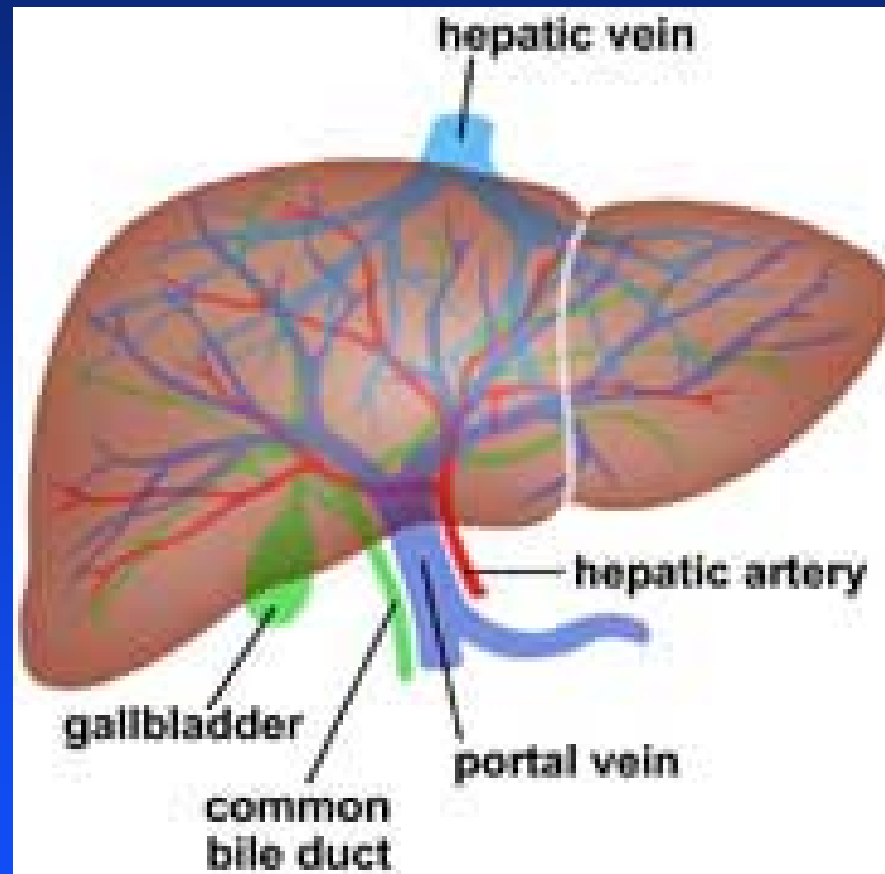
History of the Liver

- **3000 BC-** Mesopotamians used clay models of sheep liver for instruction in divination
- **1600 BC-** Ebers Papyrus recommends animal bile enemas and ox liver for treating visual disorders
- **500 BC-** Hippocrates defines disease based on yellow bile, black bile and phlegm
- **300 BC-** Aristotle determines that the liver is sweet, but demotes bile to a waste product
- **200 AD-** Galen affirms the dominance of the liver over other viscera
- **1801 AD-** Bichat suspects that the liver has more functions than bile secretion

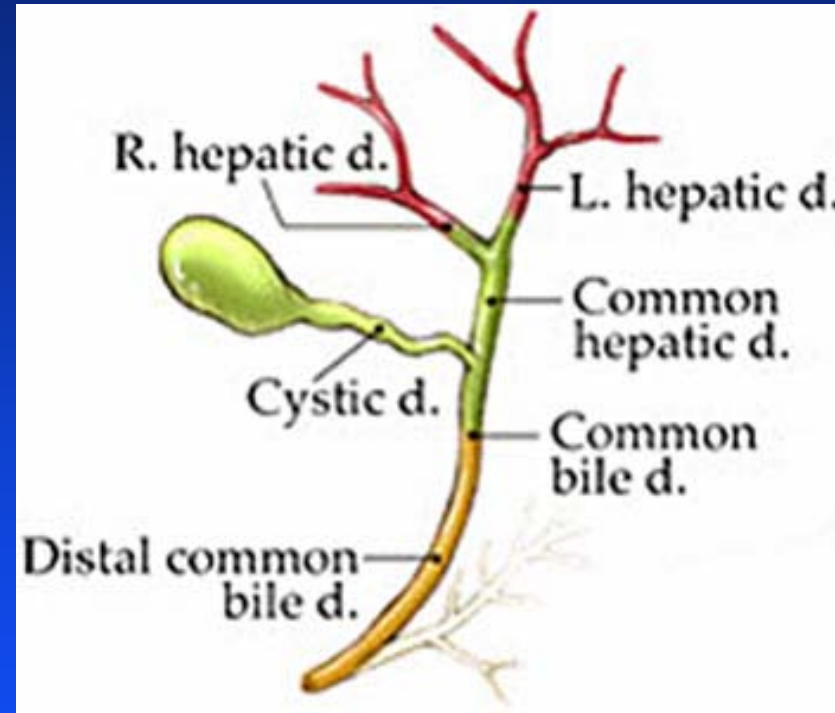
Functions of the Liver

- **Metabolism of carbohydrate, fat and protein**
- **Regulates blood sugar and lipid levels**
- **Regulates cholesterol levels**
- **Store fat soluble vitamins**
- **Detoxifies toxic substances**
- **Produces bile and secretes bilirubin**
- **Synthesizes serum proteins and coagulation factors**

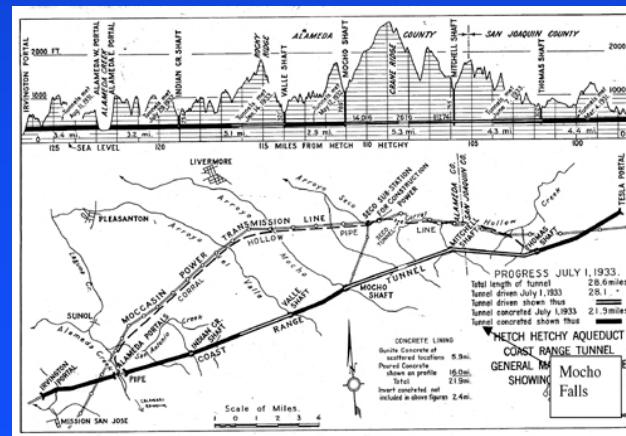
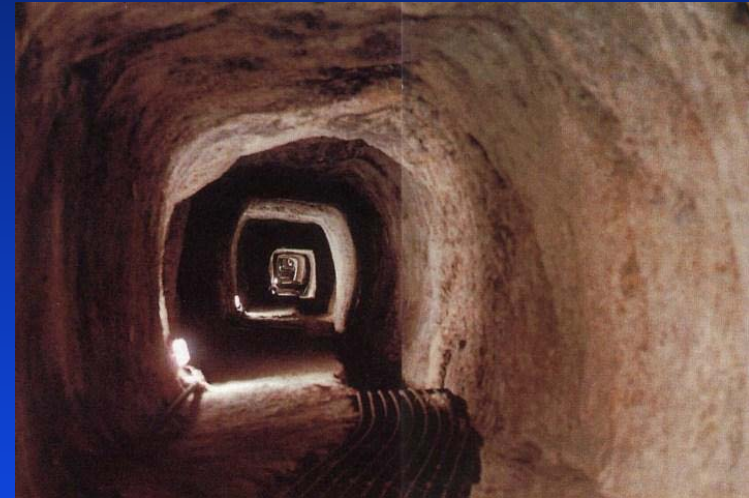
Liver



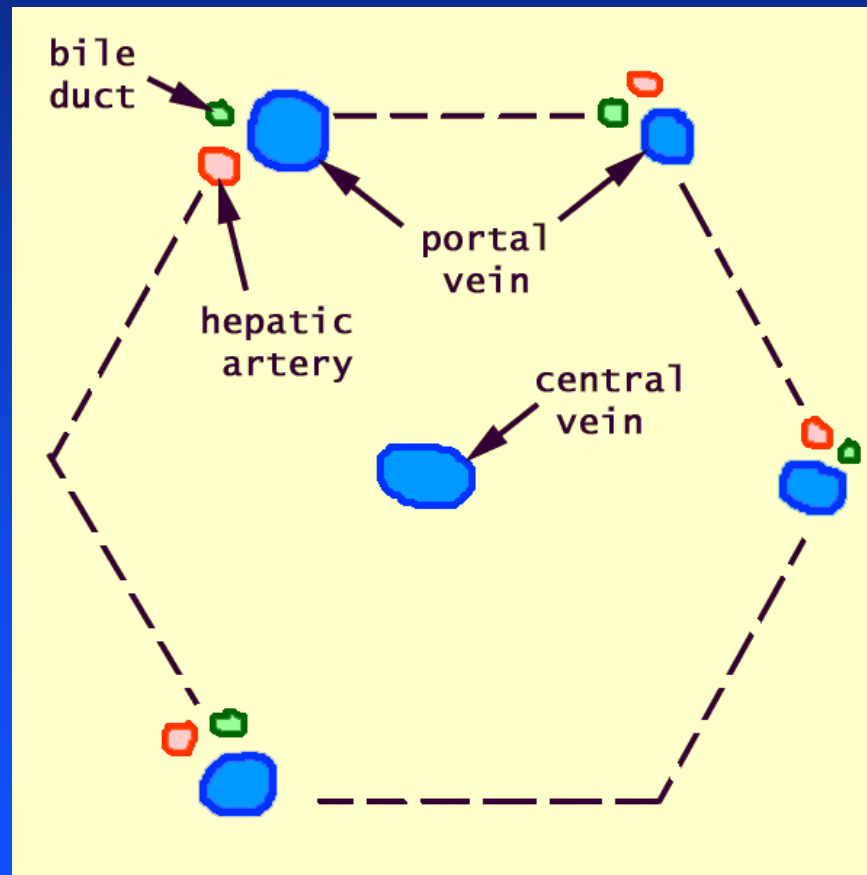
Biliary System



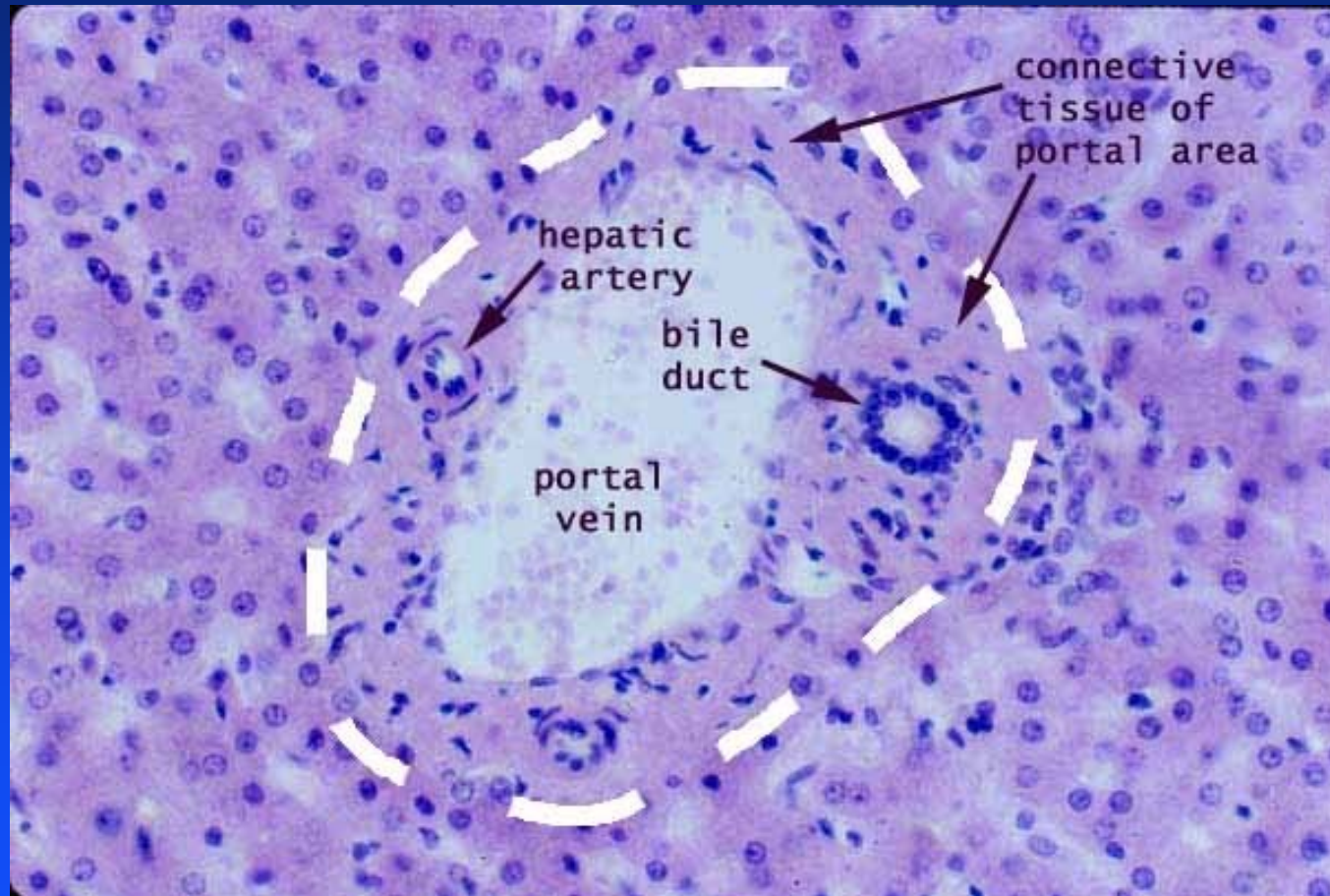
Biliary System: Aquaducts and Tunnels to Drain Bile



The Microscopic Structure of the Liver

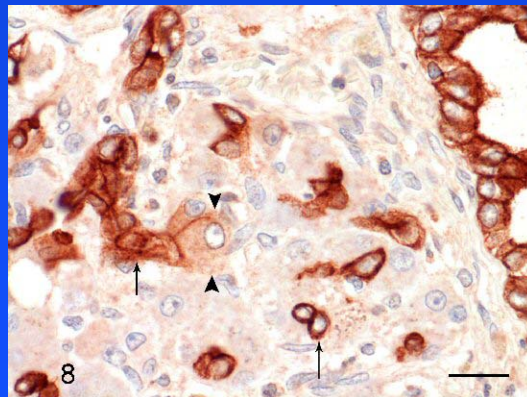


Microscopic Liver



Cholangiocytes: Bile Duct Cells

- Cells that make up all of the bile ducts in the liver
 - Large bile ducts
 - Small interlobular bile ducts
 - Ductules
- In the healthy liver, cholangiocytes contribute to bile secretion
- Several hormones and bile salts contribute to cholangiocyte health and function



Primary Sclerosing Cholangitis

- Disease of the “Large” bile ducts
 - Variants exist
- Male predominance (2:1)
- Median onset age 40 (range 1-90 years)
- ERCP or MRCP are useful for diagnosis
- Liver biopsy may be useful for staging and diagnosis
- Approximately 50% of patients have Inflammatory Bowel Disease (IBD)

Normal Bile Duct



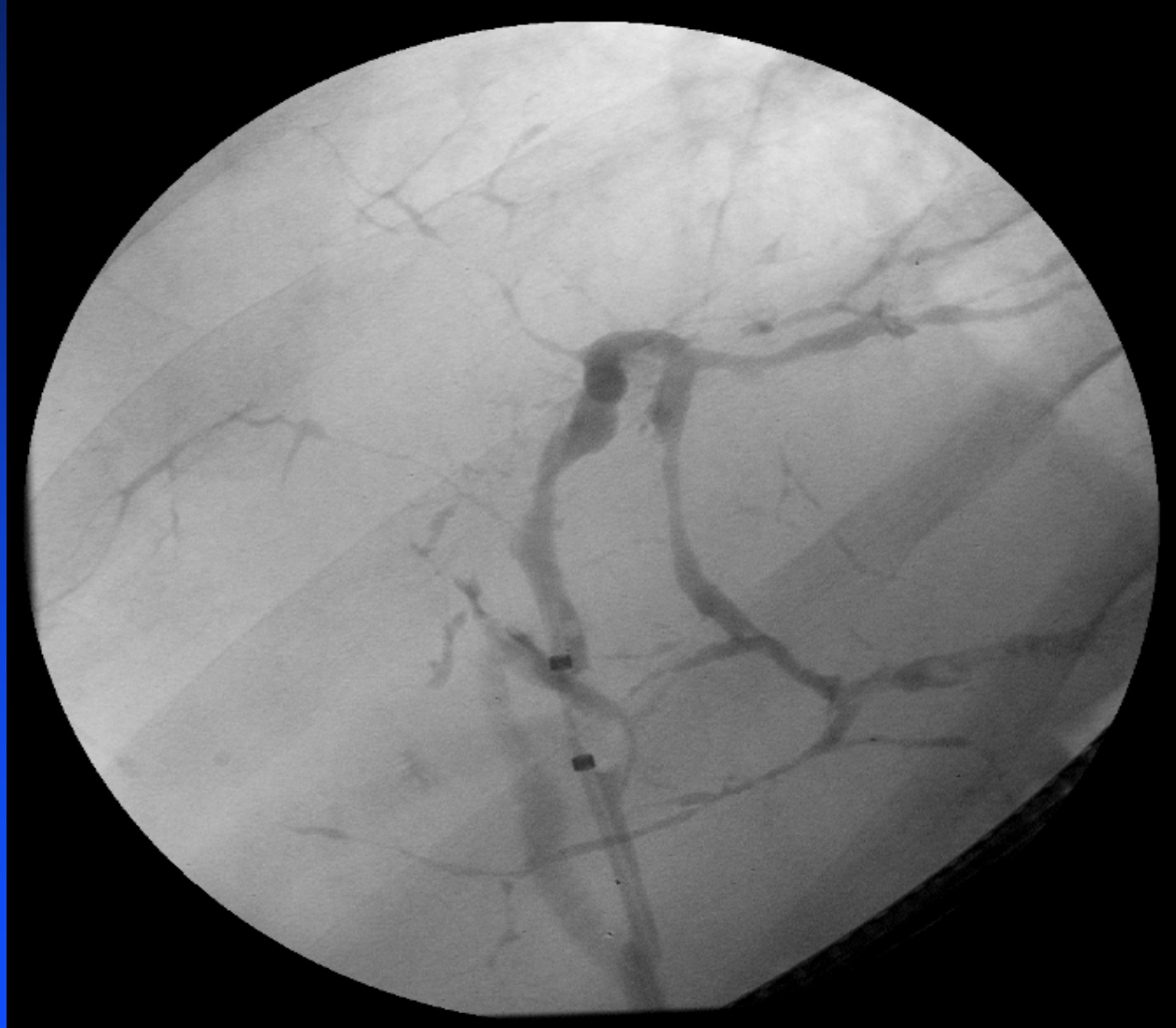
PSC: Intrahepatic Duct Disease



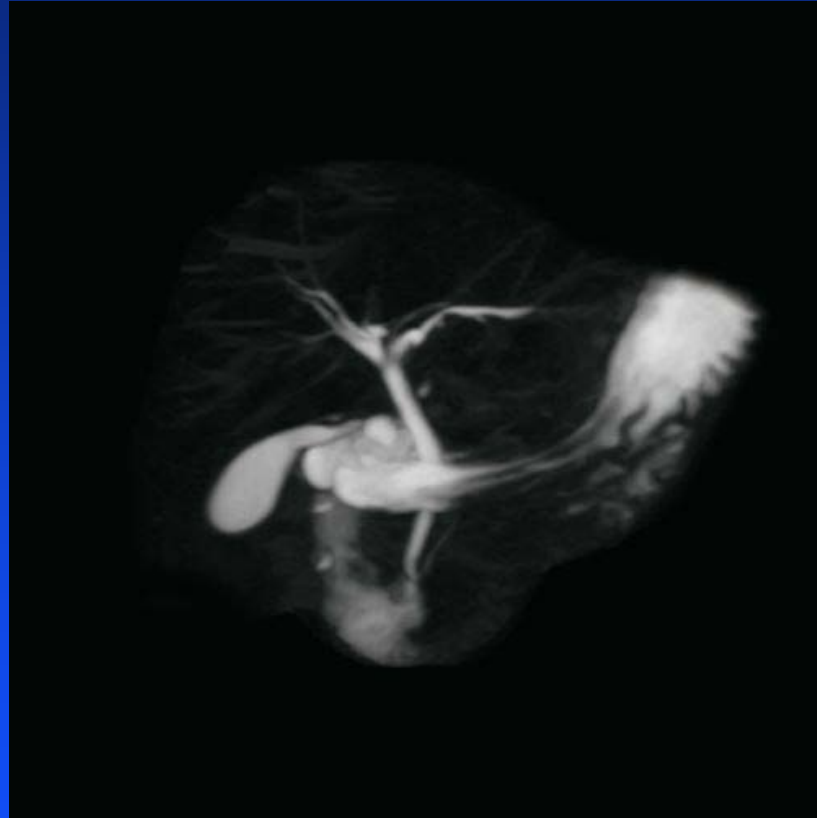
PSC: Dominant Stricture



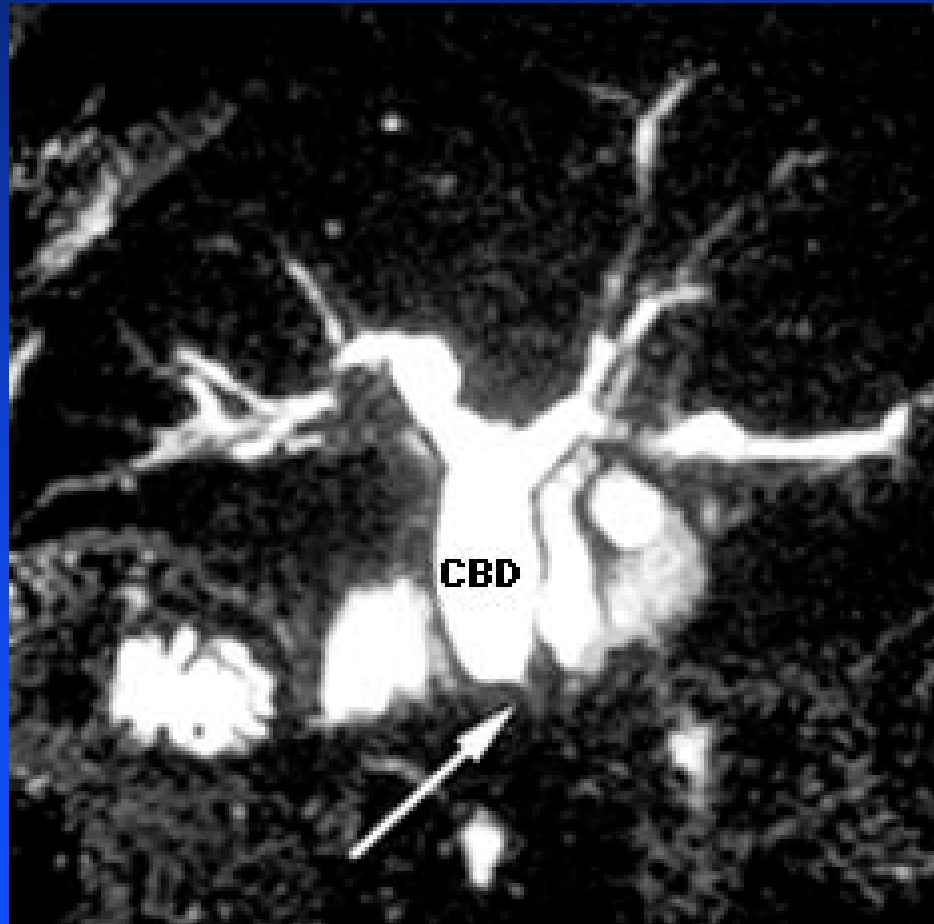
PSC: Diffuse PSC with pruning



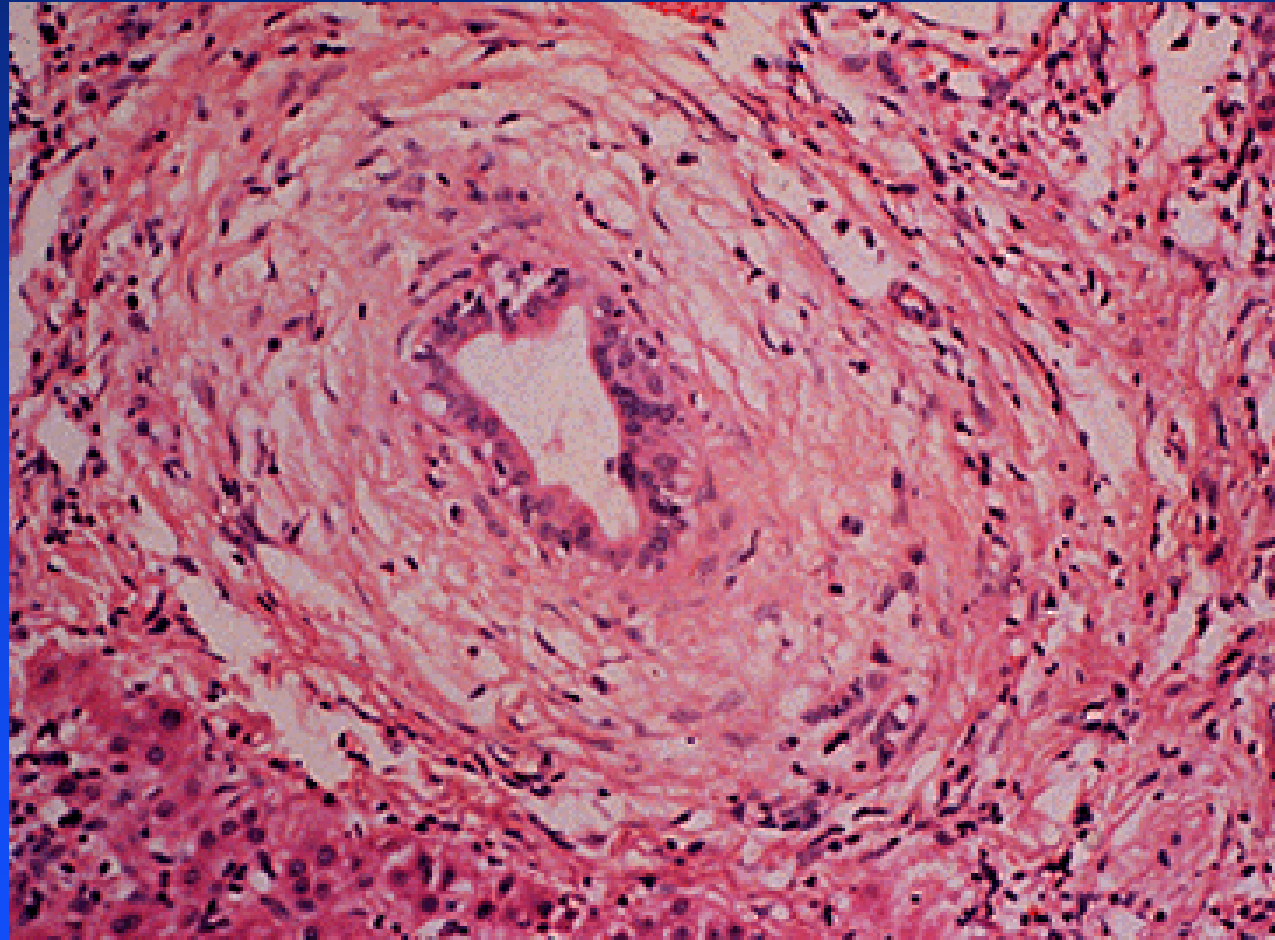
Normal MRCP



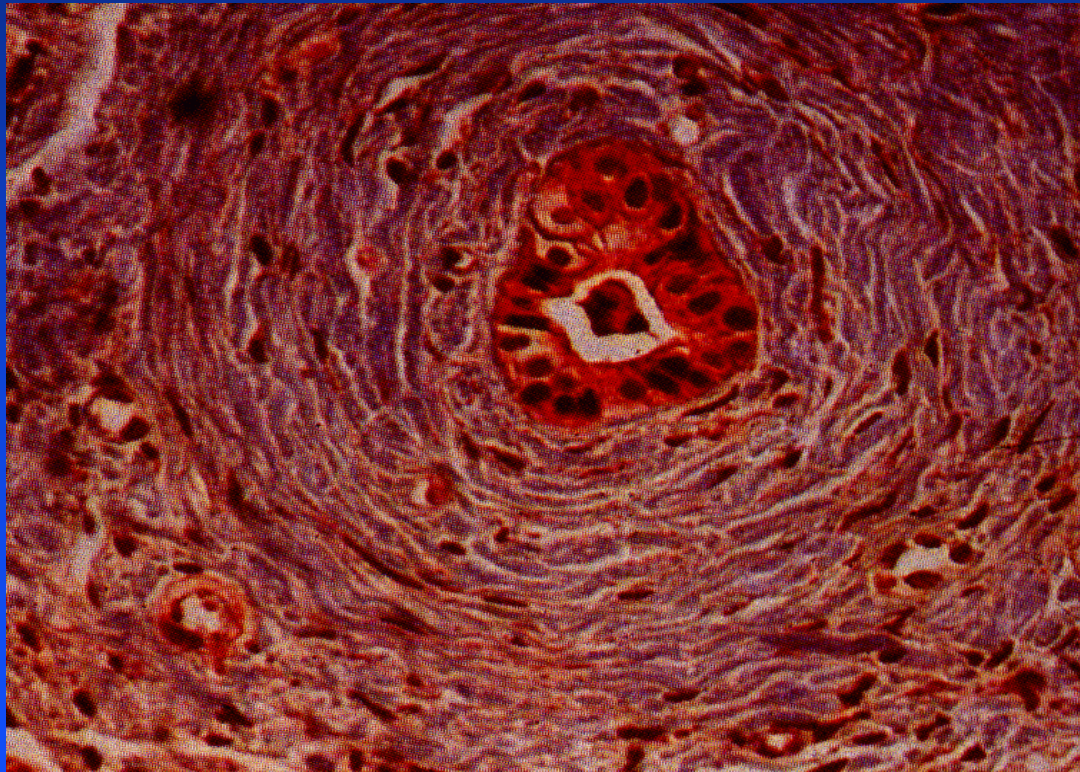
Primary Sclerosing Cholangitis: MRCP



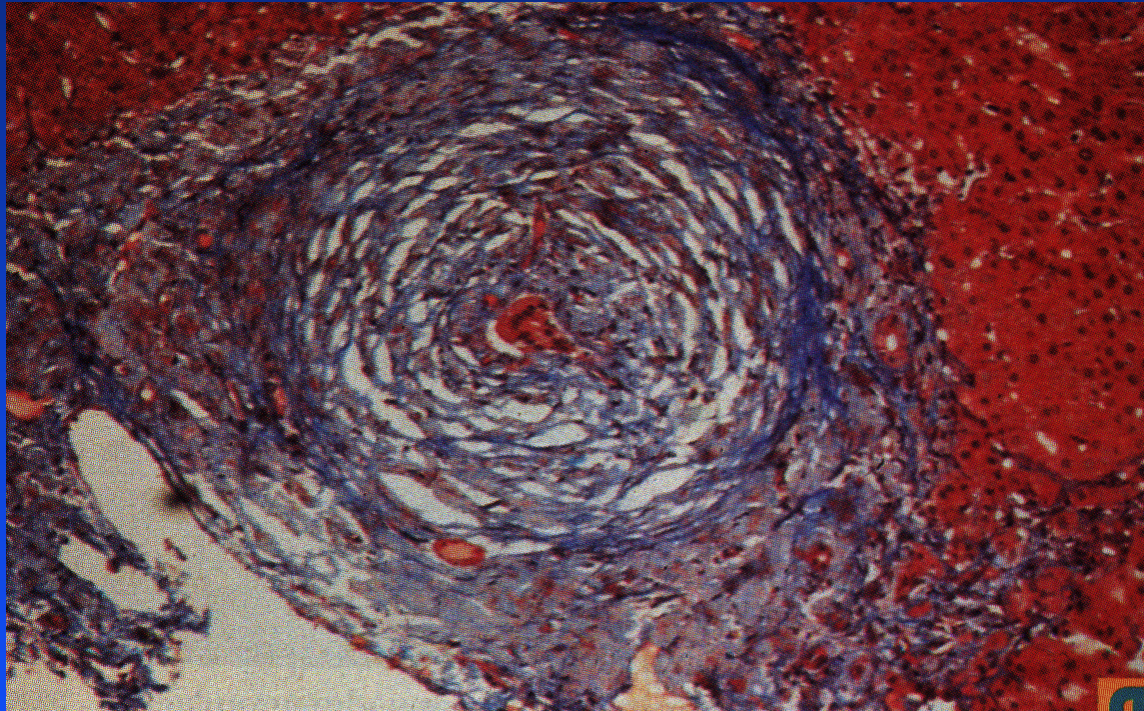
Primary Sclerosing Cholangitis: Periductal Sclerosis and Injured Bile Duct



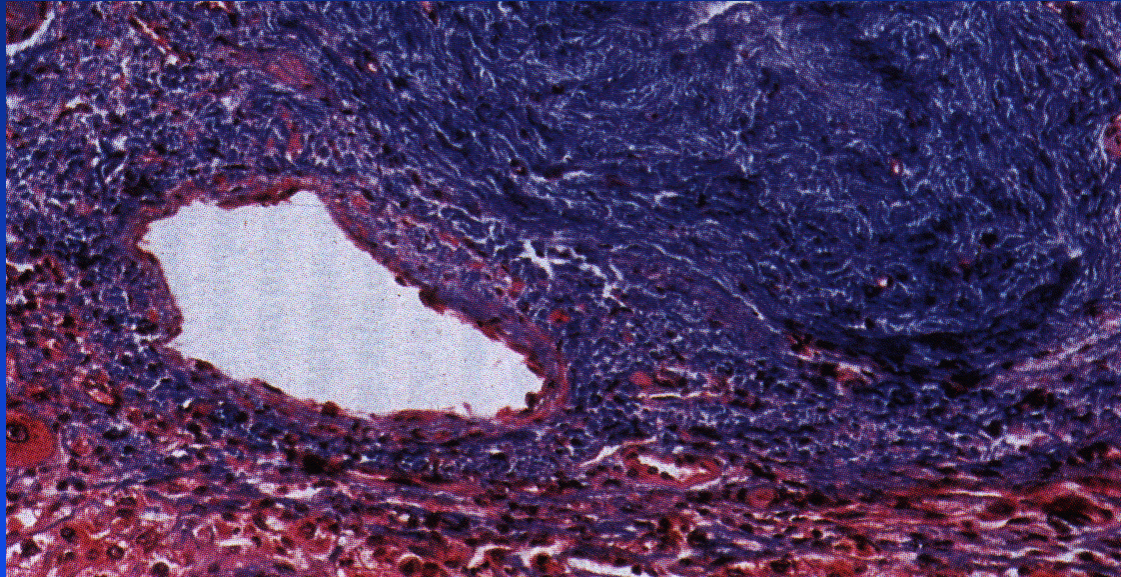
Primary Sclerosing Cholangitis: Bile Duct with Concentric Fibrosis



Primary Sclerosing Cholangitis: Necrotic Bile Duct and Scarred Portal Triad



Primary Sclerosing Cholangitis: Large Intrahepatic Bile Duct with Fibrosis



Purposes of the Conference

- Educate you about PSC
- Teach you what medical interventions or screening should or should not be performed
- Educate you about current and potentially future therapies for PSC
- Allow you to better deal with this chronic disease in order to live a normal life
- Have an open forum with an emphasis on the “Question & Answer Panel”

Primary Sclerosing Cholangitis: How can we treat the symptoms?

- Pruritis
- Fatigue
- Osteoporosis
- Steatorrhea
- Associated Diseases
 - Inflammatory Bowel Disease
 - Thyroid disease
- SICCA Syndrome
 - Dry eyes, mouth, nose

Primary Sclerosing Cholangitis: How can we treat the disease?

- **What therapies are available at the present time?**
- **What therapies are likely to become available in the next 10 year?**
- **What is the role of Ursodeoxycholic Acid (UDCA)**
- **Medical versus Endoscopic therapy**
- **Is there a role for immunosuppressive medications?**
- **Role of Liver Transplantation**

Treatment of Pruritis

- Topical therapy, antihistamines
- Ursodeoxycholic acid (UDCA)
- Bile salt binding resins
- Rifampin (PXR agonists)
- Metronidazole
- Opioid antagonists
- Grapefruit Juice
- Phototherapy
- Plasmapheresis/MARS
- Liver Transplantation

- **Dr. Jenny Heathcote: University of Toronto**
 - **“Looking Ten Years Ahead: Potential Therapies for PSC”**
- **Dr. Michael Abecassis: Northwestern University**
 - **“Live Donor Transplantation for PSC”**
- **Dr. John Martin: Northwestern University**
 - **“New Frontiers in Imaging Techniques and Tissue Acquisition in PSC”**
- **Dr. Terry Barrett: Northwestern University**
 - **“IBD and PSC”**
- **Dr. Laurie Keefer: Northwestern University**
 - **“Behavioral Strategies for Coping with PSC/IBD”**
- **Dr. Konstantinos Lazaridis: Mayo Clinic College of Medicine**
 - **“PROGRESS: PSC Resource of Genetic, Risk, Environment, and Synergy Studies”**
- **Jennifer Jaff, Esq. Advocacy for Patients with Chronic Illness, Inc.**
 - **“Know Your Rights- An Overview of Health Insurance and Federal Disability Law”**

Primary Sclerosing Cholangitis: Cholangiocarcinoma

- Prevalence 4-20% of PSC patients
- Annual incidence of approximately 1%
- Long-term studies indicate that it may occur in one-third of PSC patients
- Autopsy prevalence is higher (30-42%)
- Difficult to diagnose