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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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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

- R. hepatic d.
- L. hepatic d.
- Common hepatic d.
- Cystic d.
- Common bile d.
- Distal common bile d.
Biliary System: Aqueducts and Tunnels to Drain Bile
The Microscopic Structure of the Liver

Diagram showing:
- Bile ducts
- Portal vein
- Hepatic artery
- Central vein
Microscopic Liver

- Hepatic artery
- Bile duct
- Portal vein
- Connective tissue of portal area
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)
PSC: Intrahepatic Duct Disease
PSC: Dominant Stricture
PSC: Diffuse PSC with pruning
Normal MRCP

http://www.hitachi-medical-systems.ch
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 years?
- 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