



Liver, Gallbladder, & Pancreatic Disorders- Chapter 35

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Liver Disorders

- Hepatitis- Inflammation of liver cells
- No symptoms to life threatening
- Caused by one of six viruses:
 - Hepatitis A (HAV)- infectious hepatitis
 - Hepatitis B (HBV)- serum hepatitis
 - Hepatitis C (HCV)- Non A, Non B
 - Hepatitis D (HDV)
 - Hepatitis E (HEV)
 - Hepatitis G (HGV)

Viral Hepatitis

- Hepatitis A-oral-fecal route
- Hepatitis B-Blood/body fluid
- Hepatitis C-Blood transfusions, IV drug use
- Hepatitis D- blood/body fluids
- Hepatitis E- Contaminated Water
- Hepatitis G- recently discovered (blood)

Prevention

- Hepatitis virus resistant to drying, heat, UV light, freezing, bleach
- 30 minutes in boiling water to die
- Cleanliness and use of vaccines to prevent
 - Immune serum globulins (ISG) and HBV & HAV vaccinations
- In health care use standard precautions

Signs and Symptoms

- Three stages
 1. Prodromal/preicteric stage
1 week long with flu-like symptoms
 2. Icteric stage
Peaks at 2 weeks last 2-6 weeks
 3. Posticteric/convalescent
Lasts 2-6 weeks; full recovery in 6 months
- Reversible condition with compliance
 - Rest, proper diet, no alcohol or other liver toxic agents for 1 year AFTER LFTs are normal

Diagnosis

- Liver enzymes elevated(ALT,AST)
- Increased serum bilirubin and urobilinogen
- Increased ESR
- PT
- Serologic studies to determine virus type
 - Each virus has antigen markers, and degree of healing
- Abdominal Xray- reveals enlarged liver

Fulminant (Acute) Liver Failure

- Uncommon gravely serious complication
- High mortality rate = ~ 50%
- Sudden massive loss of liver tissue (necrosis/tissue damage)
 - Usually drug toxicity/ HBV with HDV present
- Outcome in 48-72 hours
 - May result in reversal, transplant need or death
- Prevention
 - Eliminate exposure of hepatotoxic or liver-damaging substances

Signs & Symptoms

- Rapid deterioration in a few hours
- May quickly progress from confusion to coma (encephalopathy)
- Rapid liver size reduction in hours
 - Typical sign of acute liver failure
- Sudden ↑ of liver enzymes, bilirubin and Prothrombin time

Diagnostic Tests

- ALT & AST – may rise in 1000's- 4000s
- Bilirubin - > 2.5 mg/dl
- Elevated urobilinogen
- K^+ - < 3.5 mEq/L
- Serum glucose - < 70 mg/dL
- PT > 25 seconds
- Abdominal x-ray - \downarrow liver size

Treatment

- Goal is to stop and reverse liver damage
- Liver rest
 - Complete bedrest
 - All drugs stopped
 - Dialysis – if due to overdose
 - ↑ calorie, ↓ NA, ↓ protein
- Meds- lactulose, neomycin, mag citrate, sorbitol to decrease ammonia levels

Complications

1. Metabolic alkalosis
2. Hypokalemia
3. Hyperglycemia
4. Blood clotting abnormalities
5. Possible sepsis

Chronic Liver Failure

- Synonyms
 - Laennec's cirrhosis (assoc w/ETOH use)
 - Portal liver disease
 - Nutritional liver disease
 - Alcoholic liver disease
- 4th leading cause of death in US age 35 to 55 yrs
- 10th overall leading cause of death
- More common in men

Etiology

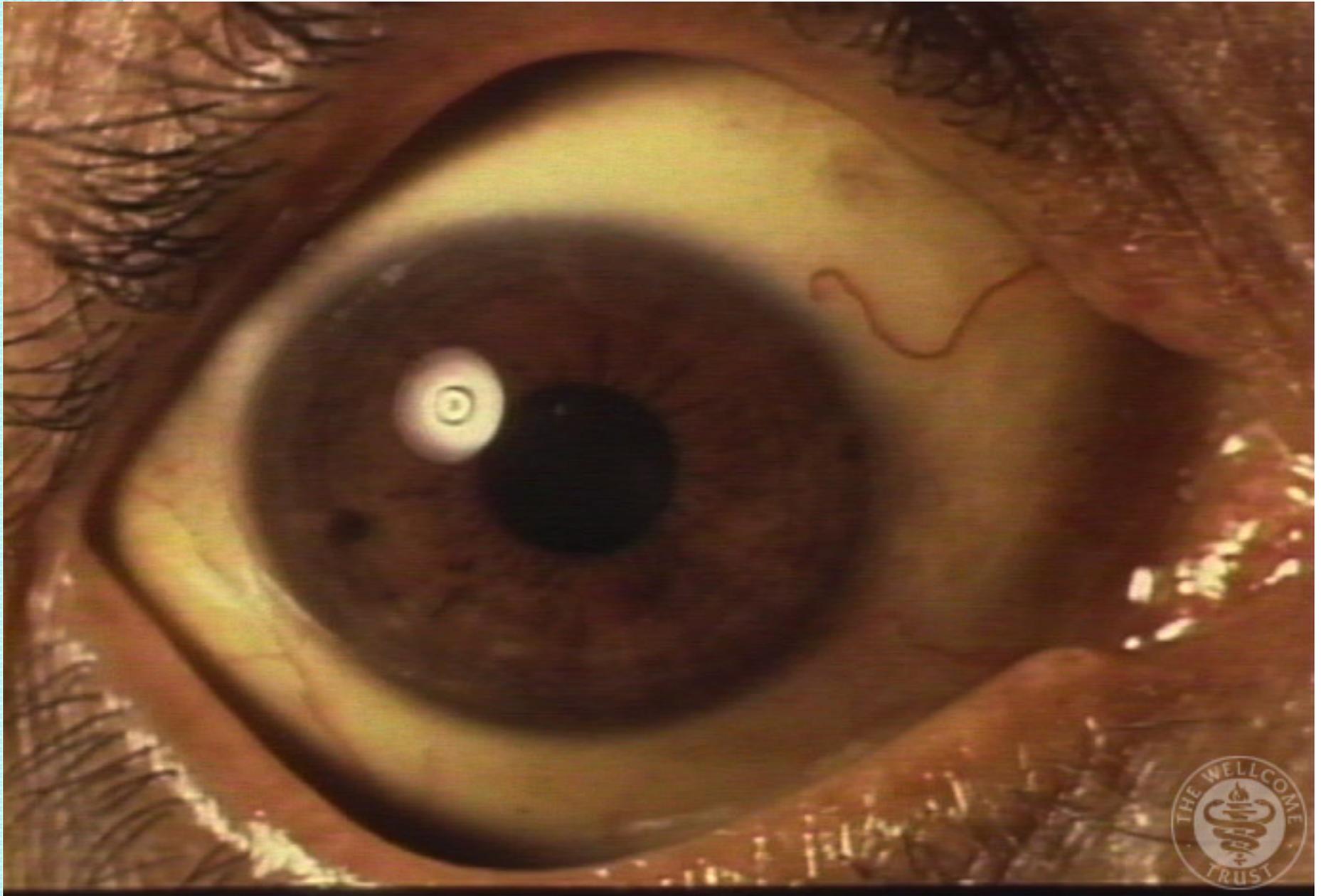
- **Chronic excessive ETOH ingestion**
 - Esp in combo w/lack of dietary protein
- **Post necrotic liver failure-**
 - massive exposure of hepatotoxins, viral hepatitis, or infection
- **Biliary liver failure-**
 - Chronic inflammation of gallbladder & bile ducts
- **Cardiac liver failure-**
 - Chronic severe liver congestion from heart failure

Pathophysiology

- Progressive disease
- Liver becomes inflamed in response to toxins
- Liver cells
 - Infiltrated with fat and WBCs then...
 - Replaced by fibrotic scar tissue
- Liver eventually becomes hardened with lumps

Signs & Symptoms

- Malaise
- Anorexia, indigestion, nausea
- Weight loss
- Diarrhea or constipation
- Dull, aching RUQ pain
- Hepatomegaly, firm, tender
- Easy bruising, bleeding gums, anemia
- Jaundice (Icterus)
- Lab values indicate progressive loss of liver fxn



Complications

1. Hepatorenal syndrome
2. Blood clotting defects
3. Ascites
4. Portal hypertension
5. Hepatic encephalopathy
 1. Stages
 1. Early-
subtle personality changes, fatigue, drowsiness changes in handwriting (best assessment)
 2. Stuporous-
belligerent, irritable, asterixis, twitching and marked confusion
 3. Comatose-
gradual loss of consciousness



Diagnostic Tests

1. Serum blood tests
(Williams & Hopper, Table 35.3, p. 726)
2. Abdominal x-rays, liver scans
3. UGI
4. Liver Scan
5. Esophagogastroduodenoscopy (EGD)
6. Liver biopsy

Liver function tests

1. Alanine aminotransferase (ALT)
2. Albumin
3. Ammonia
4. Bilirubin
5. Aspartate aminotransferase (AST)
6. Prothrombin time (PT)
7. Urobilinogen

Treatment

- Remove or treat underlying cause and complications
- Support liver regeneration
- Transjugular intrahepatic portosystemic shunt (TIPS)
 - Between portal & systemic venous systems
 - Helps relieve portal hypertension

Treatment (cont.)

- Treatment of bleeding varices
 1. Stop bleeding
 2. Treat fluid volume deficit
 3. Prevent further fluid loss
 4. Maintain fluid/electrolyte balance
 5. Vasoconstrictors
 6. Tamponade (Sengstaken-Blakemore Tube)
 7. Emergency sclerotherapy

Treatment of Hepatic Encephalopathy

- Removal of toxic waste
 1. NSS or MgSO₄ enemas
 2. Neomycin
 3. Lactulose
 4. Eliminating dietary protein
 5. Dialysis if severe

Liver Transplantation

- **Candidates**
 - Chronic liver failure due to hepatitis or biliary dx
 - Metabolic disorders
 - Hepatic vein obstruction
- **Poor candidates**
 - Liver cancer

Cancer of the Liver

- Usually due to metastasis from
 - Esophagus, lungs, breasts, stomach, colon, pancreas, kidney, bladder, or skin
- May be primary site

Symptoms

- Encephalopathy
- Abnormal bleeding
- Jaundice
- Ascites

Treatment

- Surgical removal of affected portion
- Chemotherapy
 - May be directed via hepatic artery into affected lobe
 - Less toxic to the remainder of body

Disorders of the Pancreas

- Pancreatitis
 - Inflammation of pancreas
 - Mild or severe
 - Two types
 - Acute
 - Chronic

Acute Pancreatitis

- Caused by autodigestion
 - Pancreatic enzymes start digesting pancreas itself
- More enzymes released by resultant inflamed cells
- Chemical Cascade occurs

Etiology

- Excessive alcohol consumption
- Biliary disease
 - Cholelithiasis (gallstones)
 - Cholangitis (bile duct inflammation)
- Blunt trauma
- Infections
- Drugs
- Hyperparathyroidism – excessive calcium

Signs & Symptoms

- Dull abdominal pain
- Guarding
- Rigid abdomen
- Hypotension
- Shock
- Respiratory distress
 - Due to ↑ fluid in retroperitoneal space

Complications

- Cardiovascular failure
- Pulmonary failure (ARDS)
- Renal failure
- Hemorrhage
 - Turner's sign – purplish discoloration of flanks
 - Cullen's sign – purplish discoloration around umbilicus
- Peripheral vascular collapse
- Infection



Diagnostic Tests

- Serum amylase/lipase
 - ↑ 5 – 40 X's normal
 - Usually drops within 3 days
- Urine amylase – stays ↑ longer
- ↑ glucose, bilirubin, alk phos, LDH, ALT, AST, cholesterol & potassium
- ↓ albumin, calcium, sodium, & magnesium
- Radiological testing

Treatment

- Maintenance of life support until inflammation subsides
 - IV fluids
 - Blood & blood products
- Anti-anxiety agents
- Oxygen
- Pain management
- Rest of GI tract
 - NG tube
 - H2 antagonist- decrease acid stimulation of pancreatic secretion
 - Antiemetics
 - NPO – may need TPN

Chronic Pancreatitis

- Usually following repeated episodes of acute pancreatitis
- Continued cellular damage
- ↓ pancreatic enzyme functioning

Pathophysiology

- Pancreatic tissue replaced with fibrotic scar tissue
 - Result of continuous inflammation
 - Toxins – usually from ETOH
 - Irritate pancreatic ducts
 - Obstruction » dilation » atrophy
 - Acinar cells ulcerate
 - Continued tissue damage/death
 - Cysts form – sacs filled w/pancreatic enzymes

Etiology

- Men
 - Excessive ETOH ingestion causing repeated episodes of acute pancreatitis
- Women
 - Chronic obstructive biliary disease
- Other causes
 - Prolonged malnutrition
 - Cancer of pancreas or duodenum
 - Prolonged enteral feedings – atrophy of pancreas

Signs & Symptoms

- Epigastric or RUQ pain
- Weight loss
- Anorexia
- Late s/s
 - Malabsorption and fat intolerance
 - Diabetes mellitus
 - Function of islet of Langerhans is often lost last

Complications

- Abscess or fistula development
- Pleural effusions
- Malabsorption syndrome
- Diabetes mellitus

Diagnostic Tests

- ↓ normal or normal amylase and lipase
- ↑ fecal fat
- CT & US
 - Characteristic structural Δ 's to pancreas
 - Masses
 - Duct calcification
 - Cysts
 - Changes in pancreas size
- ERCP
 - Can detect specific obstructions/ductal leaks

Treatment

- Pain management
- Nutrition
 - Replacement of pancreatic enzymes
 - Nutritional supplements
- Surgery
 - Repair fistulas, drain cysts
 - Repair of ducts/sphincters
 - Removal of part or all of pancreas

Pancreatic Cancer

- 4th leading cause of death for men
- 5th leading cause of death for women
- 32,000 new annual cases
- Most common between 65 & 79 yrs
- ~ 70 % occurs in the head
- ~ 30 % occurs in the body & tail

Pathophysiology

- Most tumors are ductal adenocarcinoma
 - Occur in exocrine parts of pancreas
- Tumors in head & body
 - Usually large
- Spreads rapidly by direct extension
 - Stomach, gallbladder and duodenum
- Metastasize thru lymphatic/vascular system
 - Distant organs and lymph nodes
- Secondary site

Etiology

- Not known
- Associated with:
 - Chemical carcinogens
 - High fat diets
 - Cigarette smoking
 - Diabetes mellitus
 - Excessive ETOH intake
 - Chronic pancreatitis
 - Metastasis from other sites

Signs & Symptoms

- Vague early in disease process
- Weight loss
- Abdominal pain – often worse at night
 - Gnawing or boring pain w/radiation to back
- Anorexia
- n/v – fullness after meals
- Weakness
- Fatigue, depression

Complications

- Pre surgical intervention
 - Malnutrition
 - Metastasis
 - Gastric/duodenal obstruction
- Post surgical intervention
 - Infection
 - Fistula formation
 - DM
 - Malabsorption syndrome

Diagnostic Tests

- ↑ alkaline phosphatase, glucose, bilirubin
- ↑ Amylase and lipase with secondary pancreatitis
- Altered coagulation tests
- ↑ Carcinoembryonic antigen (CEA)
 - Normal = <5 ng/mL
- Abdominal x-rays, CT & US
 - Size of pancreas and presence of masses
- ERCP
 - Visualize ducts/tissue samples

Treatment

- Depends on stage of cancer
- Early – aim is cure
- Late – palliative (decrease symptoms and ↑ comfort)
- Surgery
 - Pancreatectomy – part or all removed
 - Whipple procedure – for ca of the head
 - Removal of splanchnic nerve
 - Helps alleviate pain
- Chemotherapy/radiation
 - Palliative w/advanced stages
 - Association w/surgery

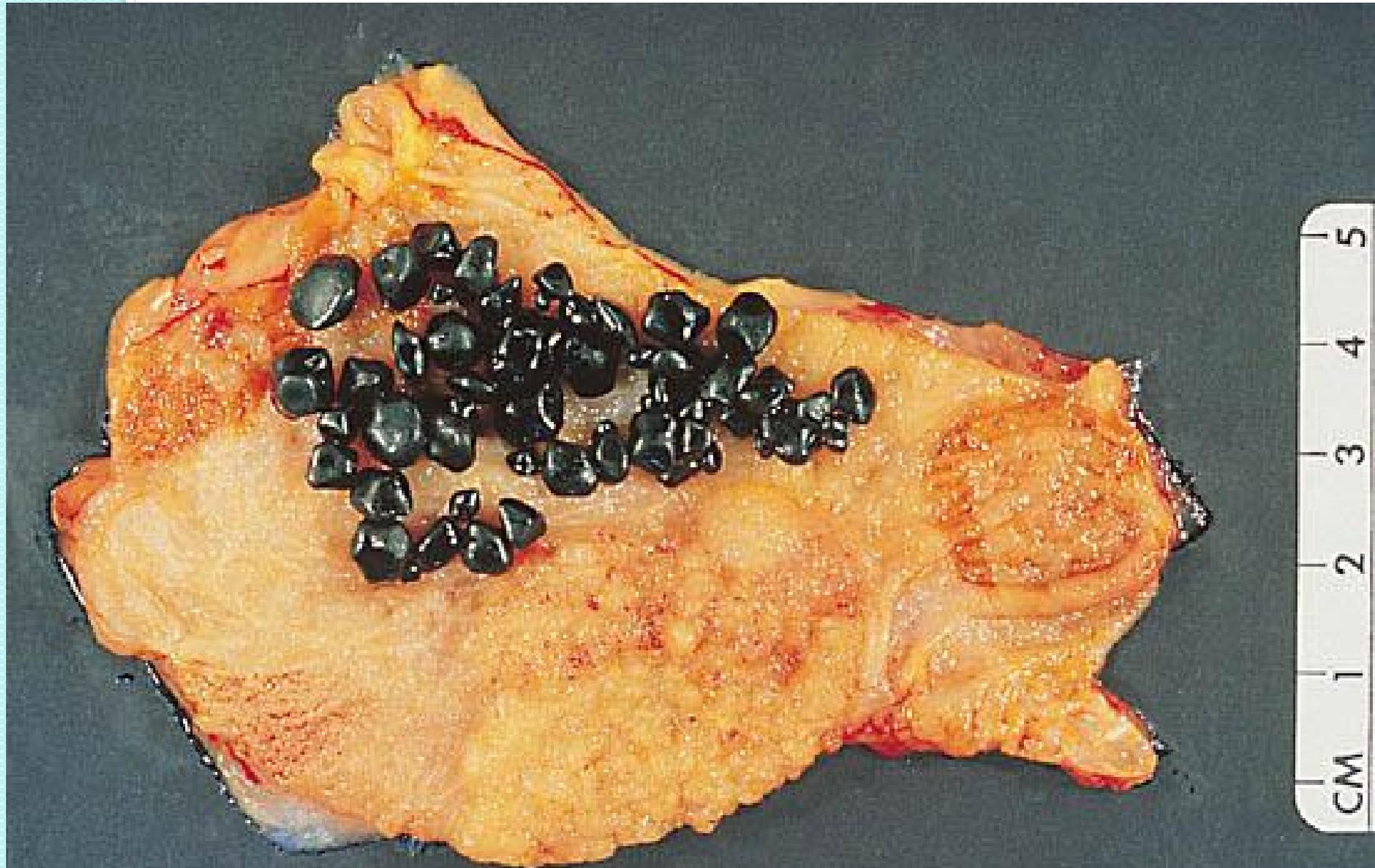
Gallbladder Disorders

- Cholecystitis
 - Inflammation of the gallbladder
 - Usually as a result of ductal obstruction
 - Bacterial invasion is common
 - Adds to inflammation/irritation
 - Can become chronic
 - Gallbladder becomes fibrotic & thickened
 - Does not empty as efficiently or not at all

Gallbladder Disorders (cont.)

- **Cholelithiasis**
 - Stones in gallbladder
 - Composed primarily of cholesterol
 - Others may be pigment stones
 - Calcium bilirubinate – result of free bilirubin combined with calcium
- **Choledocholithiasis**
 - Gallstones in the common bile duct

Cholesterol stones with surface layer of black pigment and adenocarcinoma in neck of gallbladder



Etiology

- Stasis or pooling of bile because of:
 - ↓ gallbladder emptying or
 - Partial common bile duct obstruction
- Excessive cholesterol intake
- Sedentary lifestyle
- Family history
- Obesity, DM, pregnancy, hemolytic blood disorders & bowel disorders are assoc. w/ GB disease

Signs & Symptoms

- ↑ temp, pulse, respirations
- Nausea & vomiting, flatulence
- Jaundice
- Epigastric pain – biliary colic
- RUQ tenderness
- Indigestion especially after high fat foods
- + Murphy sign

Complications

- Cholangitis – inflammation of bile ducts
- Necrosis or perforation of gallbladder
- Empyema – collection of pus in gallbladder
- Fistulas
- Gallbladder adenocarcinoma
- Acute pancreatitis occurs when pancreatic duct is obstructed

Diagnostic Tests

1. ↑ WBC
2. ↑ amylase if pancreas is involved
3. Abdominal x-ray
 1. To determine type of stone
 2. Calcium stones < responsive to treatment
4. PIPIDA Scan
 1. IV radioactive isotope
 2. Camera traces path of isotope through biliary sys.
5. Sonograms
6. ERCP

Treatment

- Cholecystitis
 - Pain control
 - Prevention of infection
 - Maintenance of fluid & electrolyte balance
- Cholelithiasis
 - Surgery
 - Laparoscopic
 - Traditional
 - Cholecystotomy
 - Choledochoscopy
 - Extracorporeal shock-wave lithotripsy (ESWL)