Overview

- Acute Liver Failure
- Chronic Liver Failure
- Acute GI Hemorrhage
- Bowel Infarction, Obstruction, Perforation
- GI Surgeries
- Pancreatitis

Etiology of Cirrhosis

- Alcoholic liver disease - most common cause in the U. S. A.
- Chronic viral hepatitis B, C and D
- Chronic autoimmune hepatitis
- Inherited metabolic diseases (e.g., hemochromatosis, Wilson disease)
- Chronic bile duct diseases (e.g., primary biliary cirrhosis)
- Chronic heart failure
- Parasitic infections (e.g., schistosomiasis)
- Nonalcoholic steatohepatitis (NASH)
- Long term exposure to toxins or drugs
- Cryptogenic

Acute Liver Failure

- Definition:
- Altered mental status and coagulopathy occurring within 26 weeks of onset of illness
- Fulminant Hepatic Failure – same only develops within 8 weeks of onset of symptoms
Cirrhosis facts

• Cirrhosis results from damage to liver cells from toxins, inflammation, metabolic derangements and other causes
• Damaged and dead liver cells are replaced by fibrous tissue.
• Decreased blood flow to the liver and blood back up in the portal veins and portal circulation drive complications
• Platelet counts fall R/T splenic sequestration.

Cirrhosis facts

• Decreased bilirubin secretion
• Serum albumin concentration falls
• Insulin resistance and diabetes mellitus
• Later stages or in severe liver failure, hypoglycemia
• Hepatic encephalopathy

Diagnosis

• Labs:
  – Albumin level
  – PTT
  – Bilirubin levels
  – Transaminase level
  – Platelet count
• Ultrasound
• EGD
• Liver Biopsy

Complications of Cirrhosis

• Respiratory Compromise
• Variceal Hemorrhage
• Spontaneous Bacterial Peritonitis
• Hepatic Encephalopathy
Hypoglycemia

- No gluconeogenesis
- Monitor blood sugar

Cerebral Edema

- ICP monitoring
  - ICP < 20 mmHg
  - CPP 60-100 mmHg
- Sedated on ventilator
- EEG monitoring

Hepatic Encephalopathy

- Caused by ammonia and other by-products of protein digestion that are not cleared by the liver from the bloodstream
- Asterixis

Hepatic Encephalopathy Treatments

- Identify and correct precipitant
- Restrict dietary protein (short-term)
- Correction of hypokalemia
- Liver transplant
- Reduction in Protein load:
  - UGI bleed: NGT lavage to clear
- Avoid constipation
- Administer lactulose

Supportive Treatments

- Protect airway
- Antidote if indicated
- Correct coagulopathy
- Lactulose
- Dialysis
- ICP monitoring and Mannitol
- Cautious use of sedatives
**Treatment**

- Low sodium diets
- Diuretics
- Beta blockers
- Paracentesis
- Shunts
- Antibiotics

**Upper GI Bleeding Etiologies**

- Esophageal / gastric varices
- Ulcers
- Foreign bodies
- Esophagitis
- Carcinoma

**Acute GI Bleed - Blood Loss**

- **< 15% Blood Loss**
  - Normal HR, UO, BP - orthostatic hypotension

- **15-30% Blood Loss**
  - HR > 100
  - UO 25-30cc/hr
  - BP Normal - narrowing pulse pressure

- **30-40% Blood Loss**
  - HR > 120
  - UO < 30cc/hr
  - BP below baseline

**Variceal Bleeding**

- Hemorrhage is the most common cause of death (50%) in cirrhosis patients
- A medical emergency
- Results from impaired clotting and portal hypertension
**Clinical Findings**

- Sudden onset of hematemesis
- Anxiety and fear
- Painless
- Abdominal distention
- Hyperactive bowel sounds
- Vital sign changes

**Diagnosis**

- Labs
- Endoscopy
- Angiography

**Variceal Bleeding Management**

- Early Intubation / oxygen
- NG decompression / lavage
- Blood / fluid resuscitation
- Pharmacologic treatment
- Endoscopy
- Transjugular Intrahepatic Portosystemic Shunt
- Balloon tamponade
- Surgical intervention

**Pharmacologic Treatment**

- Somatostatin
- Vasopressin
- Octreotide
Endoscopy

• Diagnostic to identify site of bleeding
• Therapeutic Interventions:
  – Sclerotherapy
  – Band Ligation
  – Epi Injection

TIPS

• Transjugular Intrahepatic Portosystemic Shunt
• Used in acute bleeding not controlled by endoscopy
• Can be a bridge to transplant

Minnesota & Sengstaken - Blakemore Tubes

TIPS

• Ruptured esophagus
• Asphyxia
• Aspiration
• Erosion of gastric wall
**Peptic Ulcers**

- Too much acid or loss of protection of mucosa from digestive enzymes
- Ulcers occur in stomach or duodenum

**Etiologies**

- Helicobacter pylori
- Drugs, alcohol, caffeine, smoking
- High emotional stress
- High physiologic stress
  - ARDS, Sepsis, MI, etc
  - Burns – Curling’s ulcers
  - Cerebral trauma – Cushing’s ulcers

**Clinical Findings**

- Abdominal / Epigastric pain
- Hematemesis / Coffee grounds
- Melena / Hematochezia
- Restlessness
- Hemodynamic changes
- Orthostatic changes

**Diagnosis**

- Labs
- X-ray
- Endoscopy
- Angiography
Peptic Ulcer Management

- NG decompression
- Gastric lavage
- Blood products / fluid resuscitation
- Early intubation
- Pharmacologic treatment
- Endoscopy
- Surgical intervention

Pharmacologic Treatment

- Histamine blockers
- Proton pump inhibitors
- Antibiotic therapy

Overall Treatment Priorities of Upper GI Bleeding

- Airway protection
- Identify location of bleeding
- Achieve hemostasis

Lower GI Bleeding Etiologies

- Rectal varices
- Neoplasms
- Diverticulosis
- Inflammatory bowel disease
**Diagnosis / Treatment**

- Barium enema
- Colonoscopy
- Arteriography
- Surgical intervention
- Treatment is similar to other types of GI bleeding

**Abdominal Emergencies**

- Bowel infarction
- Bowel obstruction
- Bowel perforation

**Bowel Infarction**

- Necrosis of the intestinal wall resulting from ischemia
- Etiologies:
  - Atherosclerosis
  - Aortic clamping
  - Hypercoagulability
  - Thrombus / emboli

**Clinical Findings**

- Severe acute abdominal pain
- Rigid, board-like abdomen - maybe
- Rebound tenderness - maybe
- Hypoactive or absent bowel sounds
- N/V, dehydration
- Urgent and bloody bowel movements
- Fever, septic vital signs
- Anorexia
- Leukocytosis
- Dehydration
- Hypothermia
### Diagnosis

- Differential diagnosis is complex
- Labs: H/H, BUN, amylase, WBC
- Stool guaiac +
- Angiography
- Sigmoidoscopy

### Treatment

- Fluid and electrolyte replacement
- NG decompression
- Surgical intervention
  - Thrombectomy
  - Embolectomy
  - Resection of infarcted intestine

### Bowel Obstruction

- Functional or paralytic obstruction - caused by loss of peristalsis – also called paralytic ileus
- Mechanical obstruction caused by factors that occlude lumen of intestine

### Mechanical Obstruction

- **Etiologies SB:**
  - Adhesions
  - Hernias
  - Volvulus
  - Foreign body
  - Tumors
- **Etiologies LB:**
  - Tumor
  - Stricture
  - Intussusception
  - Fecal impaction
  - Diverticulitis
Paralytic Obstruction

• **Etiologies:**
  – Abdominal surgery
  – Peritonitis
  – Ischemia
  – Sepsis
  – Narcotics
  – Pneumonia

Clinical Findings

• Depends on location of obstruction

• **Upper**
  – Crampy epigastric pain
  – Vomiting

• **Lower**
  – Vague crampy diffuse pain
  – Late vomiting
  – Distended, increased tinkling sounds
  – Dehydrated

Diagnosis

• **Small Bowel**
  – Labs
  – Upper GI
  – X-ray

• **Large Bowel**
  – Labs
  – Stool
  – X-ray
  – Colonoscopy

Treatment

• Fluid and electrolyte replacement
• NG decompression
• Surgical Intervention
Bowel Perforation

• Spillage of intestinal contents into peritoneum

• Etiologies:
  — Peptic ulcers
  — Bowel obstruction
  — Appendicitis
  — Penetrating abdominal wound

Clinical Findings

• Abrupt severe abdominal pain
• Rigid, board-like abdomen
• Absent dull liver d/t free air
• Abdominal tenderness
• Bowel sounds – usually absent
• Fever, septic vital signs
• Presence of free air on x-ray

Diagnosis

• WBC’s elevated
• X-ray – free air
• Upper GI contraindicated

Treatment

• Surgical intervention
• Fluid and electrolyte replacement
• Antibiotics
• NG decompression
GI Surgeries
- Esophagus
- Stomach
- Pancreas

• Complications:
  - Anastomotic leaks
  - Aspiration

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Gastric Bypass
- Roux En Y
- Elective
- Rarely in ICU

• Complications:
  - Pulmonary embolus
  - Anastomotic leaks
  - Wound infections

• Often done laparoscopically

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Pancreateoduodenectomy
- Pancreatic CA
- AKA: Whipple procedure
- Removal of the pancreatic head and duodenum
- Technically difficult

• Complications:
  - Hemorrhage
  - Anastomotic leak

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Pancreatitis
- Diffuse inflammation, and autodigestion of the pancreas

• Results from premature release of exocrine enzymes from the pancreas

• Alcoholism most common cause

• Gallstones causing obstruction of pancreatic ducts is next most common etiology
Forms of Acute Pancreatitis

- **Interstitial pancreatitis**
  - 95% of cases, 5% mortality
- **Necrotizing (hemorrhagic) pancreatitis**
  - 5% of cases, 50% mortality

Clinical Findings

- Severe, stabbing, midepigastic pain
- Pain radiates to back in 50% of patients
- Pain increases and becomes more diffuse if hemorrhage is present
- N/V, Hypocalcemia

Clinical Findings

- Fever, diaphoresis, anorexia, dehydration
- Severe pain, restlessness
- Abdomen distended, tender
- Jaundice
- Urine dark and foamy
- Stool – steatorrhea – pale, foul smelling