

Portal hypertension

Clinic of Internal Medicine
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Definition

- Portal venous gradient of 12 mmHg or higher.

Anatomy

- Portal venous system
- Portocaval anastomoses:
 1. Esophageal
 2. + 4. Rectal
 3. Umbilical



Classification

- I. Complete
 - A. Prehepatic
 - B. Intrahepatic
 - C. Posthepatic
- II. Segmentary
 - A. Splenic
 - B. Mesenteric

Causes

A. Prehepatic:

- **Portal vein thrombosis**, splenic vein thrombosis, congenital atresia or stenosis of portal vein, **extrinsic compression**, splanchnic AV fistula

B. Intrahepatic

- Pre-sinusoidal: schistosomiasis (early), PBC (early), idiopathic (early), myeloproliferative diseases, polycystic disease, **metastases**, granulomatous diseases
- Sinusoidal and/or postsinusoidal: **cirrhosis**, acute alcoholic hepatitis, schistosomiasis (advanced), PBC (advanced), idiopathic (advanced), acute fulminant hepatitis, congenital hepatic fibrosis, vitamin A toxicity, peliosis hepatitis, venoocclusive disease, Budd-Chiari syndrome

C. Posthepatic

- IVC obstruction, **right heart failure**, constrictive pericarditis, tricuspid regurgitation, Budd-Chiari syndrome, increased liver blood flow, increased splenic flow

Signs and symptoms

1. Signs and symptoms of portal venous congestion
 - Ascites, splenomegaly, indigestion, weight loss.
2. Signs of collateral formation
 - Caput medusae, dilated veins, rectal hemorrhoids
 - GI bleeding – variceal, congestion-caused, hemorrhoidal.
3. Signs of liver disease
 - Jaundice, etc.
4. Signs of systemic hyperdynamic circulation
 - Bounding pulses, hypotension, warm extremities

Diagnostics

- History – risk factors, causes, signs, symptoms
- Physical – signs of portal hypertension
- Lab studies – liver tests, PT, CBC, albumin, viral hepatitis serology, autoantibodies, iron, copper, alpha-1-antitrypsin, ethanol, CDT, D-dimer, ammonia,
- Imaging – Ultrasonography (duplex-Doppler), CT, MR (MRA), angiography
- Endoscopy – gastroscopy, EUS
- Invasive – portal pressure measurement (HVPG=OHVP-FHVP), liver biopsy

Treatment

- Treatment of the underlying disease
 - Thrombolysis, anticoagulation
 - Liver transplantation
 - Antiparazitics etc.
- Reducing portal pressure
 - Pharmacologic – beta-blockers, nitrates
 - Endovascular – TIPS
 - Surgical – shunt operations
- Treatment of complications
 - Ascites, varices, encephalopathy, ...

Varices

- Esophageal / gastric (fundal)
- Endoscopic description – localization, grading, signs of bleeding, bleeding risk
- Primary prophylaxis of bleeding
- Repeated upper endoscopy
- Follow up

Variceal bleeding:

- Presentation: hematemesis, melena, hematochezia
- History: risk factors, alcohol, liver disease
- Mortality: 30 %; Re-bleeding rate: 40% in 6 weeks
- Therapy: urgent, elective, primary prophylaxis

Varices – treatment

1. Pharmacologic – non-selective beta-blockers (propranolol, nadolol), nitrates (ISMN).
2. Endoscopic – ligation, injection sclerotherapy, acrylate glue, (hemoclips, heat probe)
3. Balloon tube tamponade – Sengstaken-Blakemoore tube, Minnesota tube, ...
4. Invasive radiology – TIPS, embolization
5. Surgery
 - a) devascularization: resection, transection, splenectomy
 - b) decompressive shunts – total / partial / selective
 - c) Liver transplantation

Ascites

Etiology: portal hypertension, hypalbuminemia (nephrotic syndrome, protein-losing enteropathy, malnutrition), malignant, chylous, tuberculous, pancreatic, bile.

Diagnostics: history, physical, lab studies, imaging, paracentesis (CBC+diff, protein, albumin, amylase, LD, Cl, culture, cytology).

Treatment: treatment of underlying disease, sodium (and water) restriction, diuretics, paracentesis, TIPS, surgical shunt.

Hepatic encephalopathy

- Def: Neuropsychiatric abnormalities, liver disease, no other disease.
- Pathogenesis: 1. liver disease, 2. collateral blood flow.
 - a) Neurotoxic substances: ammonia, manganese, SCFA, mercaptans, false neurotransmitters, .
 - b) Astrocyte dysfunction – blood-brain barrier
 - c) Cerebral edema – brain herniation
 - d) Gene expression changes – impaired neurotransmission
- Signs: personality changes, intellectual impairment, depressed level of consciousness
- Nomenclature:
 - Type A – ALF
 - Type B – portal hypertension, shunt surgery
 - Type C – cirrhosis

Hepatic encephalopathy II

- Grading: West Haven classification system
 - 0 – Minimal (“subclinical”)
 - 1 – lack of awareness, sleep inversion, counting impairment, euphoria, depression,...
 - 2 – Lethargy, apathy, disorientation, slurred speech, asterixis.
 - 3 – somnolence, disorientation, confusion, amnesia, incomprehensible speech
 - 4 – coma
- Diagnosis: clinical, ammonia, EEG, brain CT / MRI
- Management: .
 - low-protein diet??? (x malnutrition!)
 - Lactulose
 - Antibiotics – rifaximin, neomycin,
 - Increasing ammonia clearance – L-ornithin L-aspartate, Zinc, Sodium-benzoate,