---LIVER---

Basics

8 lobes divided according to blood supply
Covered by Glisson's capsule
Can reproduce entire liver in 50 days
Kupffer cells = macrophages, make up 80-90% of body's fixed mcphgs

Benign tumors

1. Cavernous hemangioma
    - #1 benign liver tumor – 8% pop'n
    - Most pts asx
    - Spont rupture extremely rare
    - U/S shows focal hyperechoic abnormality
    - Occasionally if large, may cz pain: resect
    - May thrombose, causing transient pain and ↑ LFTs
2. Hepatic adenoma
    - 30-50 yo females on OCPs
    - Rarely regresses w/ d/c of OCP
    - 25% pts p/w pain, shock d/t rupture
    - Solitary mass w/ no capsule
    - Histo: no bile ducts
    - CT: solid, hypodense lesion
    - Technetium/sulfa scan: filling defect d/t lack of Kupffer cells
    - HCC risk increased, esp if >5cm
    - Rx: d/c OCPs, avoid pregnancy, resect if safe
3. Focal nodular hyperplasia (FNH)
    - Completely benign w/ no rupture risk
    - Difficult to dx
    - CT: central stellate scar
    - Agram: spoke wheel pattern
    - Bx doesn't differentiate from adenoma
    - Histo: bile ducts throughout
    - Rx: resect (d/t uncertainty of dx) if pt is good surgical candidate
    - May observe if dx is certain or pt poor surg candidate

Malignant tumors

HCC:
- 90% of all primary liver malignancies
- Most pts have underlying liver dz (10% HCC risk in cirrhosis pts)
- p/w jaundice, encephalopathy, increasing ascites
- Dx: AFP >500mg/dl
- Invades portal system – satellitosis (multifocal tumor)
- Rx: resect, but usu not poss d/t cirrhosis; transplant but 50% recur
- Px: 1-4 mo w/o rx, 30% 5 yr surv w/ resxn
- Mets to lung, bone
- Blood supply 85% arterial: chemoembolization poss
- Rx: chemoemb + transplant
- Fibrolamellar HCC variant: younger pts w/o cirrhosis, NL AFP, better px

Metastatic lesions
- #1 liver malignancy overall, usu from GI (colon>lung>breast)
- w/ colon cancer, 5 yr surv rates w/ resxn of mets = 30-40%

Better px if: LN neg, <3 lesions, mets >1yr s/p colon resxn
60-70% pts have recurrence of colon ca, usu in liver

Hepatic cysts

1. Simple cyst
   - 10% of pop'n, usu asx
   - non-comm w/ biliary system
   - If painful: Rx = unroof and allow to drain into peritoneum
2. Polycystic liver dz
   - Autosomal dominant
   - Innumerable cysts that progressively enlarge
   - Rarely affect hepatic fxn
   - Pts often have polycystic kidney dz also; may resect liver cysts if develop ESRD
3. Cystic neoplasms
   - Cystadenoma/cystadenocarcinoma
   - Thick walls w/ mult septa +/- calcifications (more com if malignant)
   - Usu in mid age females
   - Rx: resect
4. Hydatid cyst
   - Echinococcus granulosis – from dog feces
   - Large (10-20cm), unilocular cysts containing protoscolices
   - NO bx or aspiration; czs anaphylaxis
   - Rx: Albendazole/Flagyl: if unsuccessful, need open exploration
     Hypertonic saline (scolecidal agent) used to wall off cyst
     Cyst contents removed carefully – avoid spillage (czs recurrence in abd)

Hepatic abscesses

Pyogenic
- Usu GI source (diverticulitis, biliary tract)
- RUQ pain, ↑WBC, ↑ALK P
- Rx: perc drainage, find and rx source, ABX if blood cxs +

Amebic
- Common in Central and South America
- Liver abscess in 10% of infected pts
- Dx: sterile, anchovy paste fluid on aspiration
- Rx: metronidazole (dramatic response); no drainage req'd

Portal HTN

90% d/t cirrhosis (70% from EtOH)
Other czs: schistosomiasis, portal v thrombosis, splenic v thromb (pancreatitis, tumor), Budd-Chiari synd (hep v occlusion), AV fistula (↑ inflow)
Cxs: 1. ascites 2. encephalopathy 3. variceal bleeding

1. Ascites

↑ hydrostatic P / ↓ oncotic P
DDx: low protein, ESRD, carcinomatosis
Dx: diagnostic paracentesis
Cx: Enlargement of hernias
ARF d/t overly aggressive diuresis (in combo w/ ↓ECV)

Spont bacterial peritonitis (SBP): 10% pts
Ascites fluid: >500 WBCs/ml, ↑PMNs
High mortality, need aggressive ABX

Rx: ↓ fluid/salt intake
Spironolactone; may add lasix carefully if needed
Therapeutic paracentesis (if resp is limited):
8-10L can be removed, but give salt poor albumin infusion
Peritoneal-venous shunt (ascites→ IJV) if other Rxs fail
Cx: infxn, occlusion, CHF
Portosystemic shunt (TIPS): trade ascites for encephalopathy

2. Hepatic encephalopathy

Sx: confusion, obtundation, tremor, asterixis, fetor hepaticus
r/o other czs (CNS, intoxication)
Rx: ↓ protein intake
Lactulose: alters colon pH, inhibiting bacterial NH4 production
ABX (neomycin): ↓bact = ↓NH4

3. Variceal bleed

30% of pts w/ varices bleed (70% DON'T)
Esoph varices: drain short gastric & left gastric veins
Rupture risk ↑ w/ ↑intraluminal pressure
20% of pts w/ bleed die per admission
Dx/Rx: IVF: replace volume loss but also ↑pressure = ↑bleed
F/U H/H, coags
50% of UGI bleeds in cirrhotics d/t peptic ulcer or Mallory Weiss tear
Gastric lavage (warm fluids)
Endoscopy w/ sclerotherapy or banding
Somatostatin IV: splanchnic vasoconstriction, ↓ bleed in 50% (avoid in CAD pts)
Use vasopressin + nitroglycerin in CAD pts
Luminal tamponade: Sengstaken-Blakemore tube
Controls 90% of bleeds
Use only for 24-36 hours to prevent necrosis
Cx: aspiration, asphyxiation, esoph rupture
TIPS: high success

Prevention of recurrent variceal bleeding

2nd bleed occurs in 70% of pts
Child's classification for estimation of liver reserve (class A, B, or C)
Albumin, bilirubin, encephalop, ascites, nutrition (A BEAN)
B blocker (adjunct) to decrease portal v inflow
Long term survival equivalent for TIPS and endoscopic rx
Endoscopic Rx: eliminate all esoph varices in several sessions
Cx: deveolop gastric varices, which are diff to rx
30% long term failure
60% rebleed, less severe than primary bleed (less rebleeds w/ TIPS)
TIPS: For Child's class A or B
30% encephalop rate (less enceph w/ endoscopic rx)

High rate of thrombosis (50% at 1 yr) d/t intimal hyperplasia
Must monitor every few months w/ U/S or angio

Surgical shunts
Portosystemic: connect portal to systemic flow; cx = encephalop
Selective: small bore "partial" shunt, graft from portal v to IVC (splenorenal)
As effective as total shunt, but w/ less encephalop & better patency

Px: #1 indicator = functional reserve of liver
50% die by 5 yrs of variceal bleed (if not transplanted)

ESLD & liver transplant

Transplant indications: when 1-2 yr survival <50% with:

1. Chronic, progressive, advanced liver dz

Hep C: 80% of pts infected become chronically infected (C for chronic)
Slow progression; infxn 10-20 yrs before cx onset
Most develop reinfxn of transplant liver, but injury is minimal

Hep B: Most pts (95%) have complete recovery
When transplanted liver becomes infected, injury is significant
HBIgG given posttransplant in some centers

EtOH: Recidivism 10-15%
Continued EtOH use rarely leads to dz in graft

Autoimmune hepatitis: dz does not recur in graft

Hemochromatosis: Increased Fe absorption; Rx: serial phlebotomy
200 x increase in HCC risk
Liver transplant effective, but pts also have DM, cardiomyopathy

Wilson's Dz: ↓biliary Cu excretion, ↓ceruloplasmin = ↑Cu deposition; Rx: penicillamine
Metabolic defect is corrected with transplant

α1 antitrypsin def: post transplant pts hav nl α1 antitrypsin levels

PBC: mid age females; indolent course for 10 yrs; consider transplant w/ ↑bilirubin

PSC: IBD pts; risk of cholangiocarc, colon ca
Liver transp when jaundiced & uncorrectable stricture

2. Fulminant hepatic failure (5-10% of all liver transplants)

Massive hepatocyte necrosis

Cz: hepatotoxic meds (acetominophen, INH), viral infxn, mushroom poison

Liver dysfxn w/in 8-12 wks of sx onset, but most die w/in 2 wks w/o transplant

Pts develop coma, brainstem herniation w/o transplant

Absolute contraindications: sepsis, HIV, other malig, substance abuse, card/pulm dz