

Vesalius SCALpel™ : Biliary (see also: biliary/pancreatic folios)

Physiology

95% of bile acids reabsorbed; colic and chenodeoxycolic primary bile acids
cholecystinin (CCK) major stimulus of gallbladder contraction
 hepatic branch of anterior vagus secondary stimulus of contraction
somatostatin & VIP inhibit Gb contraction, cause stasis
post-prandial Gb emptying 80% @ 2h
gallstone risk factors: obesity, rapid wt gain, exogenous estrogen
 mixed micelles no role in cholesterol stone formation
 black pigment stones in hemolysis, cirrhosis
 brown pigment stones stasis, infection

Prophylactic cholecystectomy

hemolytic disorders: sickle cell, thalassemia, spherocytosis
 if need to do splenectomy, remove Gb at same time
calcified (porcelain Gb): not as high incidence of cancer as once thought
large stone > 2.5cm, associated with increased risk of Ca
transplant patient: danger of cholecystitis with immunosuppression
diabetics with stones: get sicker, surgery not more complicated
gallstones increased in spinal injured pts, but severity same, no indication for prophylactic
 cholecystectomy
 pts can manifest Gb symptoms, not renal symptoms
contraindication: cirrhosis

Biliary colic

obstruction of the neck of the gallbladder by stone without inflammation or infection
visceral pain lasting up to hours
presenting symptom of gallstone disease in 80%
only 10-20% of patients with gallstones experience pain
1-2%/y risk of biliary colic in asymptomatic patients
multiple other causes of upper abdominal pain (e.g. ulcer, pancreatic disease) to be ruled out
 cholecystectomy may not relieve symptoms if other cause is operative

Cholecystitis

cystic duct obstruction leads to inflammation
 sterile/chemical or secondary bacterial infection
 easier surgery early (24-48h) due to serosal edema
 > 48-72h subacute, fibrosis/brawny edema more difficult
 if surgery contraindicated (eg MI), cholecystostomy (percutaneous most commonly)
adenomyomatosis may cause RUQ pain

Chronic acalculus cholecystitis

HIDA ejection fraction < 30%, late visualization
reproduction of pain on CCK injection most convincing of diagnosis and probability of relieving symptoms

Acute acalculus cholecystitis

sick, ICU patient commonly
post op, trauma, burn, hypovolemia, prolonged ileus, opiate, TPN, sepsis, starvation, low flow state
ischemia, stasis final common pathways; 38% positive culture
lap chole: 0.3% mort, 1% duct injury, 5% conversion (more in acute/subacute)

Cholangitis

choledocholithiasis highest incidence of positive bile culture (chronic cholecystitis lowest)
hematogenous via portal v most common source
cholangitis requires both obstruction and bacteria
serum concentration of antibiotics most important Rx factor
Charcot: fever, pain, jaundice
Reynolds pentad: add shock and mental status changes
decompress, relieve obstruction with stent
cover Gm- and anaerobes: e. coli > klebsiella > enterococcus > bacteroides in order of frequency

Gallstone ileus

female, ~70yo
75% fistula between Gb and duodenum (also stomach, colon, small bowel)
passage of large (>2.5cm) stone
50% of patients have hx of Gb disease
50% of patients have pneumobilia
intermittent obstruction over several days (tumbling)
Rx enterotomy proximal to obstruction, remove stone, examine proximal bowel for additional stone
interval cholecystectomy for symptomatic pts (30%)

Benign biliary stricture

85% iatrogenic: post-op, Endoscopic biliary manipulation (stone extraction, stent)
bile duct injury requiring reconstruction: laparoscopic equivalent to open
document extent and location with ERCP, percutaneous cholangiogram
repair with or without T-tube, Roux-Y if recognize injury immediately
late Roux-Y choledochojejunostomy; occasional success with dilatation and stent

unreconstructable, secondary biliary cirrhosis may require transplant

Gb polyps

most cholesterol, 8% malignant

risks malignancy: age > 50, size > 10mm, concomitant stones, solitary, symptomatic

< 10mm observe w US Q3-6mo, if changing or pt > 50 remove

> 10mm, symptomatic remove

< 18mm, most not through wall, do lap chole

> 18mm do open chole

Bile duct injury

most bile duct injuries occur during elective procedures: misidentify cystic/common

Bismuth classification:

1 > 2cm of duct left

2 < 2cm

3 injury in continuity at bifurcation

4 no continuity R & L hepatic ducts

Gb cancer

women > men, 1% of patients with stones

risks: older, chronic typhoid carriers, stone > 3cm, calcified gallbladder (10-60%)

90% adenocarcinoma, peritoneal spread

rarely diagnosed pre-op

asymmetric Gb wall without inflammation

>1cm Gb polyp suspicious, do open chole

percutaneous bx for suspected mets only, not for Gb

prognosis depends on depth:

stage I, mucosa only, 60% 5y survival

cholecystectomy alone for stage I

stage IV, all layers and N+ 7% 5y

extended cholecystectomy (en block resection segments IVb and V) plus lymph node

dissection (hepatoduodenal ligament and peripancreatic) for all but mucosal

lesion/stage I (usually incidental finding)

Primary sclerosing cholangitis

chronic progressive generalized stricture

F:M, 40:60%

50% of cases associated with inflammatory bowel disease (UC)

also associated w pancreatitis

no medical Rx

pre-malignant, 10% incidence of cholangiocarcinoma

symptoms: jaundice, pruritis, recurring cholangitis, fatigue, wt. loss

25% asymptomatic
dilatation not effective
surgical resection of dominant stricture rarely beneficial
may come to transplant

Choledochoceles

I diffuse fusiform common bile duct dilatation, 95% type I
RUQ mass, pain, jaundice, nausea and vomiting, fever, chills
resect
II diverticulum, resect
III intraduodenal: sphincterotomy, Whipple, Roux-Y
IV intra and extrahepatic
resect extrahepatic, dilate intrahepatic stricture
transplant
V multiple intrahepatic (Caroli's)
episodes cholangitis, jaundice
ultimately transplant
malignant potential, bypass not indicated

Choledochal cyst narrative:

http://vesalius.com/cfoli_frms.asp?VID=1410&StartFrame=1&tnVID=1411

Choledochal cyst discussion:

http://vesalius.com/graphics/cf_quicknotes/qn.asp?VID=1412

Cholangiocarcinoma

60-65yo, M>F
risks: cystic dilatation of ducts, hepatolithiasis, primary sclerosing cholangitis, chlonorchis
35% distal common bile duct, 30% common hepatic, 20% bifurcation (Klatskin),
diffuse 15%
90% present with jaundice
resection only Rx
obstruction: maximum bilirubin 30
higher = renal, hemolysis, hepatocellular disease
hypotension, bile acidemia, endotoxemia cause renal failure with obstruction

Hemobilia

iatrogenic 50%: biliary drainage, liver bx
trauma: blunt > penetrating
abdominal pain, UGI bleed, jaundice; all 3 in 22%
blood loss, occlusive clots in the biliary tree
major bleed: melena 90%, hematemesis 60%, biliary colic 70%, jaundice 60%

EGD, R/O other sources, 10% diagnostic
Dx: angio, therapeutic embolization 80-100% success
surgery if embolization fails: ligate vessel, excise aneurysm, hepatic a ligation, resection

References:

Massarweh N. Role of intraoperative cholangiography in avoiding bile duct injury. JACS, 204(4), April '07: 656-664.