# Cholelithiasis


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# Cholelithiasis - definition

- Cholecystolithiasis – the presence of one or more gallstones in the gallbladder
- Choledocholithiasis – the presence of gallstones in the common bile duct

# Incidence

- women have 2-3xhigher risk than men
- incidence increases with age (over 50y)
- Close relatives have higher risk comparing to population

# Czech republic

- High incidence of cholelithiasis - 12-21%
- Frequent cause of morbidity

# Types of gallstones

- Cholesterol gallstone – are composed mainly of cholesterol and calcium salts - 80-90% of all gallstones
- Black pigment gallstones – are composed of calcium bilirubinate /cirrhosis, hemolytic anemia/
- Brown pigment gallstones – composed of unconjugated bilirubin, cholesterol and proteins /infections of BD/

# Pathogenesis of gallstone formation

- Genesis of saturated bile
- Nucleation
- Crystal growth

# Genesis of saturated bile

- Cholesterol – in water insoluble – has to be maintained in solution by forming micelles, or phospholipid vesicles /unstable/
- Micelles – formed by cholesterol, bile salts and phospholipids
- Disturbance of proportion: cholesterol/ phospholipids/bile salts leads to genesis of saturated bile

# Nucleation

- Increase of promoters of nucleation – hypersecretion of gallbladder mucus
- Increased level of calcium in bile
- Decrease of inhibitors of nucleation - apolipoprotein A-I, A-II

# Gallstones growth

- Primary condition – moderation of bile flow off
- Gallbladder hypomobility – mostly consequence of deterriorated neuro-regulation of emtying, deterriorated response to cholecytokinin stimulation

# Risk factors of genesis of cholesterol gallstones

- Age /cholesterol +, bile salts -/
- Female gender /cholesterol +/
- Obesity /cholesterol +/
- Weight loss /cholesterol+,gallbladder hypomotility/
- Pregnancy /dtto/
- Drugs
- Genetic predisposition /cholesterol +/
- Diseases of term. ileum, hyperlipoproteinemia IIb,IV

# Cholelithiasis staging

- Stage asymptomatic /60-80%/
- Stage symptomatic without complications
- Stage symptomatic with complications

# Asymptomatic concrements generally stay asymptomatic henceforth

- /1% conversion per year/

# Symptomatic stage

- 30% patients have complications /within 20y/
- 3% patients develop cholecystitis /within 1 year/

# Symptomatic cholelithiasis

- Biliary colic – paroxysmal pain - lasts 30 min up to few hours
- Provoking moment – dietary mistake,exercise
- Principle – gallstone impaction in the cystic duct – spasm of smooth muscle

# Symptomatic cholelithiasis

- Episodic pain /biliar colic/
- - if pain doesn’t last more than 1 hour, course of the disease is mostly without complications
- -if pain lasts more than 5 hours –risk of  cholecystitis

# Clinical findings in patients with cholecystitis

- Tenderness during palpation in the right subcostal region while deep breath- Murphy’s sign
- Abdominal bloating, may be fever

# Laboratory studies

- Usualy normal
- May be elevated : ALP,GMT, eventually mildly ALT, AST, bilirubin, mild leukocytosis /up to 12 000/
- Leukocytosis 12 000 and more – suspicion of cholecystitis, need to exclude cholangitis
- Elevation of ALT,AST, bilirubin – suspicion of choledocholithiasis
- +fever+leukocytosis – susp. of cholangitis

# Imaging studies

- Abdominal x-ray /low sensitivity and specificity/
- Ultrasonography
- Magnetic resonance
- Endoscopic retrograde cholangiopancreatography /ERCP/

# Ultrasonography

- Sensitivity 90 - 95%
- Specificity 95 - 100%

# Magnetic resonance

- Non-invasive imaging modality which will have more importace in diagnostics in the future.
- At the present time there are limitations caused by low availability.

# Endoskopic retrograde cholangiopancreatography

- Diagnosis and therapy of choledocholithiasis
- Indicated when is suspicion of choledocholithiasis

# Differential Diagnosis

- Right-sided renal colic
- Peptic ulcer
- Acute pancreatitis
- Chronic pancreatitis
- Appendicitis
- Myocardial infarction /inferior wall of the heart!!/
- Right-sided pneumonitis
- Reflux esophagitis

# Treatment

- The primary aim of treatment is to improve symptoms and to prevent complications with minimal morbidity.

# Nonsurgical therapy

- Expektace
- Dissolution therapy

# Expektace

- 60 - 80% patients with lithiasis
- Exception is porcelain gallbladder - indicated cholecystektomy

# Dissolution therapy /bile acids/ /the use is exceptional/

- Indication:patients with symptoms without complications
- Functional gallbladder
- Presence of lucent stones with lower density than 100 HU in the CT
- Stone diameter less than 10 mm
- Efficiency 20 - 70%

# Surgical therapy of cholelithiasis -the treatment of choice

- Laparoskopic cholecystektomy
- Standart cholecystektomy

# Indication to cholecystectomy

- Symptomatic cholelithiasis
- Complicated cholelithiasis /cholecystitis,choledocholithiasis, gallbladder perforation/
- Porcelain gallbladder,gallbladder adenomyomatosis etc.

# Laparoskopic cholecystectomy -relative contraindication

- Abdominal surgical intervention in the past
- Biliary peritonitis,chronic cholecystitis with pericholecystitis
- Liver cirrhosis with portal  hypertension
- Choledocholithiasis,biliary pankreatitis /ERCP in the first place is necessary/
- Acute cholecystitis older than 3 days

# Laparoskopic cholecystectomy absolute contraindication

- Gallbladder tumor
- Pacient with grave disease unable to undergo  general anaesthesia

# Conclusion
# what is necessary to do:

- Attentively analyse the symptoms together with patient
- Determine the diagnosis according to ultrasonography
- Exclude another disease with similar symptoms
- Do the staging
- According to staging- choose the therapy