



الطب والجراحة  
لجنة

# Surgical Jaundice

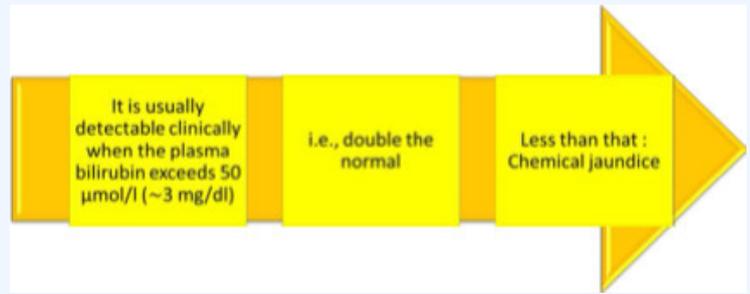
**Dr. Mohammad Nofal**

**Done by:  
Bayan Mahmoud**

**Corrected by:  
Hala Abu Azzah**

## Definition

Jaundice		
From the French <i>jaune</i> (yellow),	Synonymous: Icterus from Greek <i>ikteros</i>	The yellow-orange discoloration of the skin, conjunctivae, and mucous membranes that results from elevated concentrations of bilirubin in plasma



“Bilirubin attached to highest elastins tissue in the body like sclera and frenulum of the tongue “

☒The presence of scleral icterus indicates a serum bilirubin of at least 51  $\mu\text{mol/L}$  (3 mg/dL).

☒If the examiner suspects scleral icterus, a second place to examine is underneath the tongue.

- If the process is long-standing : oxidation of bilirubin to biliverdin will give **green** color

“The cause of jaundice divided into :

1. Prehepatic : as a result of destruction of RBCs (G6PD - RBCs hemolysis)
2. hepatic (intra-hepatic e.g: hepatitis—> patient come with gastroenrtitis symptoms + pain + jaundice )
3. Post Hepatic (Surgical Jaundice) : **Obstruction of The Biliary tree**

### Intrinsic (Biliary Disease

- Cholelithiasis
- Choledocholithiasis
- Benign and malignant biliary strictures
- Cholangiocarcinoma
- Cholangitis
- Papillary disorders
- Complication of surgery

### Extrinsic (Pancreatic Disorders)

- Pancreatitis
- Pseudocysts
- Malignancies
- Complication of surgery

## HISTORY

• A complete medical history is perhaps the single most important part of the evaluation of the patient with unexplained jaundice.

• It is nearly always possible to differentiate between conjugated and unconjugated hyperbilirubinemia on clinical grounds alone:

**conjugated hyperbilirubinemia”OJ”**

- Is associated with dark urine and pale feces
- And itching**

**unconjugated hyperbilirubinemia**

**“due to medical causes “**

- Not associated
- Almost prehepatic**

## Conjugated Jaundice History Tips

History	Suggests
• RUQ Pain (“Painful Jaundice”)	• Obstructive jaundice (malignancy or CBD stones)
• abdominal discomfort	• Hepatitis “the pt comes w gastroenteritis pain and jaundice “ “acute one like hepatitis A ‘AST,ALT around thousands 10x”
• RUQPain+ Fever+leukocytosis(lab)	• Cholecystitis “ the acute one “ usually doesn’t come w OJ” / when it does , it is a Mirizzi syndrome / less dangerous than cholangitis ( we can delay a little bit the operation) • Pancreatitis” may ass w cholangitis which is called biliary pancreatitis (stone in ampulla of vater → increasing liver enzymes )
•RUQ Pain +Fever+ jaundice <i>most imp</i>	• Cholangitis “ may cause septic shock and mortality , More dangerous than acute cholecystitis so we can’t delay the operation
• Weight loss	• Malignancy
• Pruritus	• obstructive jaundice (malignancy or gallstone)
• Medications	• Common medications associated with cholestatic jaundice include: “symptoms like OJ” Chlorpromazine, ciprofloxacin, phenytoin, erythromycin, cloxacillin, amoxicillin-clavulanic acid, cimetidine, estrogen, enalapril and captopril
• Transfusions/injections	• Hepatitis
• Contacts	• Contact with jaundiced patient suggests hepatitis
• Alcohol intake	• Liver cirrhosis

## PHYSICAL EXAMINATION

### General Assessment

Nutritional status “ like vitamin K deficiency  
cause most common sign which is ecchymosis of  
the skin / bleeding tendency

Muscle wasting”in pancreatic tumor “

Pancreatic cancer “any liver metz cause jaundice “

Cirrhosis

• Stigmata of chronic liver disease  
spider telangiectasia , palmer  
erythema , gynecomastia , testicular  
atrophy

# Cholelithiasis

## Epidemiology and Risk Factor

• **Age**— Age is a major risk factor for the gallstones. Gallstones are exceedingly rare in children except in the presence of hemolytic states (**black color stones**); in addition, less than 5 percent of all cholecystectomies are performed in children. Age 40 appears to represent the cutoff between relatively low and high rates of cholecystectomies.

“ **pt with asymptomatic gall bladder stone , aren't indicated for cholecystectomy except if there is a risk of malignancy like : porcelain GB , GB polyp , huge GBSs.**

**80% of GB stones are a symptomatic**

**1-2% per year symptomatic**

**CBD stones are usually symptomatic**

• **Sex** — As noted above, a higher prevalence of gallstones has been observed in women in all age groups . The difference between women and men is particularly striking in young adults. One study found a female-to-male ratio of 2.9 between the ages of 30 to 39 years; the ratio narrowed to 1.6 between the ages of 40 to 49 years and 1.2 between the ages of 50 to 59 years . The higher rates in young women is almost certainly a result of pregnancy and sex steroids.

• **Pregnancy**— Pregnancy is a major risk factor for the development of cholesterol gallstones. The risk is related to both the frequency and number of pregnancies. In one report, for example, the prevalence of gallstones increased from 1.3 percent in nulliparous females to 12.2 percent in multiparous females. Another study recruited 272 women in the first trimester of pregnancy . The incidence of new biliary sludge and gallstones was 31 and 2 percent, respectively.

• Oral contraceptives and estrogen replacement therapy

• Family history and genetics

• Obesity

• Rapid weight loss

• Diabetes mellitus

• Serum lipids

• Cirrhosis

• Drugs ( ceftriaxone )

• Crohn disease

• Hemolysis

• Recurrent Biliary Infection .

• Large bile ducts and periampullary diverticular are at elevated risk for the formation of primary bile duct stones

### GBS :

1. **mixed MC (50-90% cholesterol)**

2. **cholesterol (cholesterol percentage above 90%)**

3. **pigmented :**

• **black : indicate hemolysis**

• **brown: biliary tree infection**

## Protective Factors

- ☒ Statins
- ☒ Ascorbic acid
- ☒ Coffee
- ☒ Vegetables
- ☒ Poly- and monounsaturated fats.

## Clinical Manifestations

• Most patients with choledocholithiasis are symptomatic, although occasional patients are asymptomatic.

• The most common cause of painless obstructive jaundice is CBD stones.

**painless jaundice: either stones or malignancy**

## Physical examination

• Patients with choledocholithiasis often have right upper quadrant or epigastric tenderness and may also appear jaundiced.

• Courvoisier's sign (a palpable gallbladder on physical examination "enlargement") may be seen when gallbladder dilation develops because of an obstruction of the common bile duct.

• Courvoisier's L

**"gall bladder enlargement (gradual) +may be painless+ jaundice ~> tumor**

## Laboratory Investigation

• Serum ALT and AST concentrations are typically elevated early during biliary obstruction.

• Later, liver tests are typically elevated in a cholestatic pattern, with increases in serum bilirubin (15-20% is high), alkaline phosphatase, and (GGT) exceeding the elevations in serum ALT and AST.

**In OJ, ALP and gamma GT are elevated more than AST /ALT**

**and usually AST is higher than ALT**

• An elevation in serum bilirubin had a sensitivity of 69 percent and a specificity of 88 percent for diagnosing a common bile duct stone. For elevations in serum alkaline phosphatase, the values were 57 and 86 percent, respectively.

• Normal liver tests play a greater role in excluding choledocholithiasis than elevated liver tests play in diagnosing stones

## Complicated Choledocholithiasis

• The two major complications associated with choledocholithiasis are **pancreatitis** and **acute cholangitis**.

• Patients with acute cholangitis often present with Charcot's triad (fever, right upper quadrant pain, and jaundice) and leukocytosis.

• In severe cases, bacteremia and sepsis may lead to hypotension and altered mental status (Reynolds' pentad)

- Long-standing biliary obstruction from various causes, including common bile duct stones, may result in liver disease that may progress to cirrhosis, a phenomenon referred to as **secondary biliary cirrhosis**. “ indicate prolonged biliary obstruction “

## Diagnosis

- Patients are stratified according to laboratory tests and transabdominal ultrasound to stratify a patient as high risk, intermediate risk, or low risk for having choledocholithiasis.
- Subsequent management varies depending on the patient's level of risk whether low , Intermediate and high .

## Risk Assessment

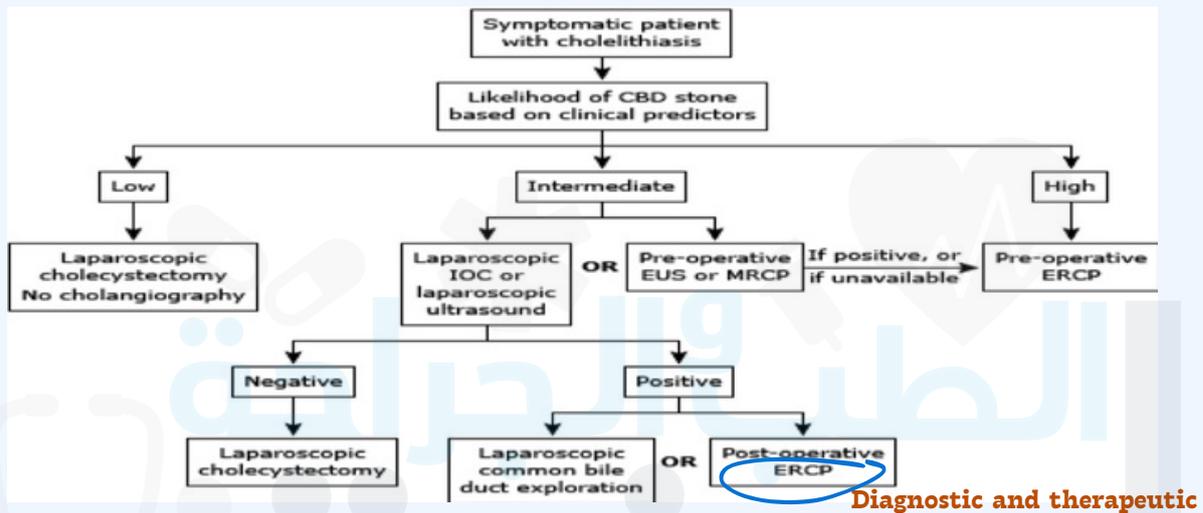
### The American Society For Gastrointestinal Endoscopy (ASGE)

- **Very strong" predictors**
  - The presence of a common bile duct stone on transabdominal ultrasound
  - Clinical acute cholangitis
  - A serum bilirubin greater than 4 mg/dL .
- **"Strong" predictors**
  - A dilated common bile duct on ultrasound (more than 6 mm in a patient with a gallbladder in situ)
  - A serum bilirubin of 1.8 to 4 mg/dL
- **Moderate" predictors**
  - Abnormal liver biochemical test other than bilirubin
  - Age older than 55 years
  - Clinical gallstone pancreatitis
- **High risk**
  - At least one very strong predictor **and/or**
  - Both strong predictors
- **Intermediate risk**
  - One strong predictor **and/or**
  - At least one moderate predictor
- **Low risk**
  - No predictors

## Investigations

- MRCP is preferred for many patients because it is noninvasive. However, the sensitivity of MRCP may be lower for small stones (<6 mml]), and biliary sludge can be detected by EUS, but generally not by MRCP.
- As a result, EUS “**endoscopic ultrasound**” should be considered in patients in whom the suspicion for choledocholithiasis remains moderate to high despite a negative MRCP.

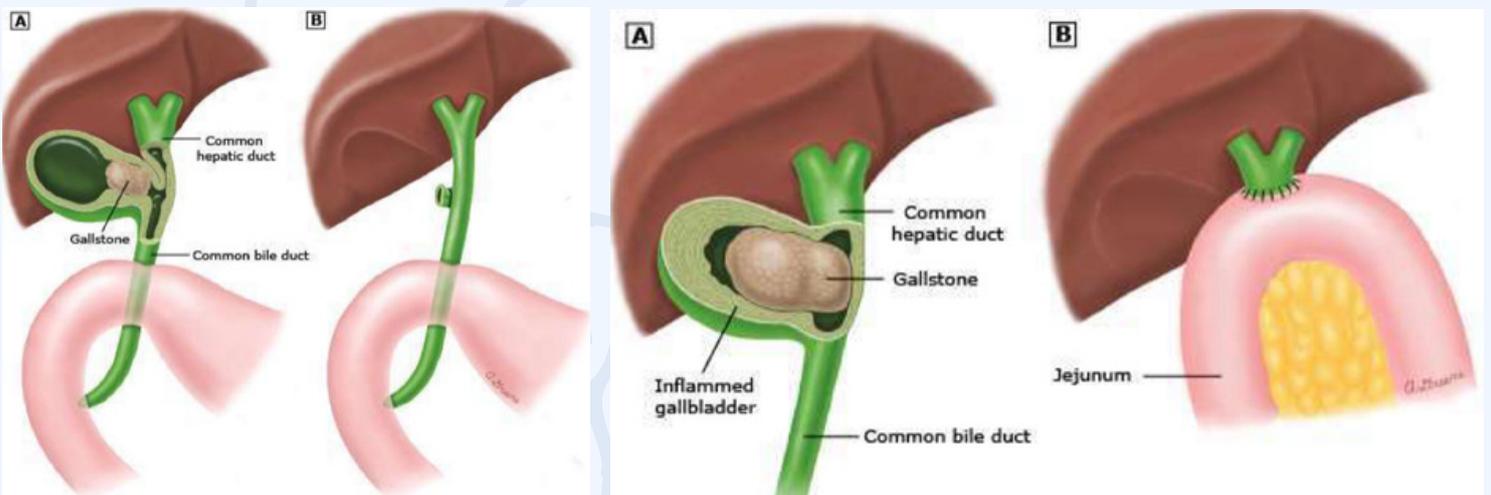
## Management Of Choledocholithiasis



## Mirizzi Syndrome **benign**

- Defined as common hepatic duct obstruction caused by an extrinsic compression from an impacted stone in the cystic duct or Hartmann's pouch of the gallbladder.
- Mirizzi syndrome has been associated with gallbladder cancer . It has been hypothesized that recurrent inflammation and biliary stasis may predispose to both conditions.

**Gall bladder stones are not associated w jaundice except in Mirizzi syndrome or when the stone moves to biliary tree .**



## malignancy causes of jaundice”OJ”

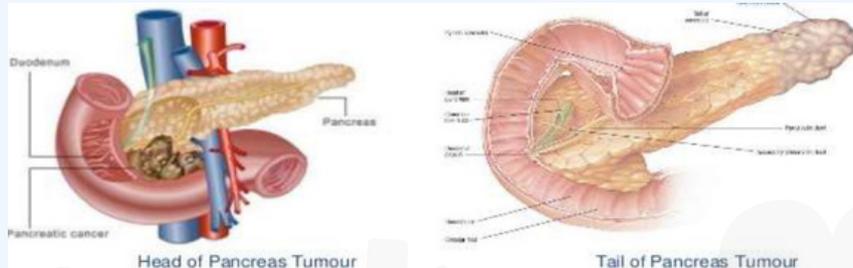
in malignant causes of jaundice, the jaundice is painless and progressive.

Malignancy causing complete blockage of bile can result in significant itching due to accumulation of bile pigments within the skin, and malnutrition as bile is part of the digestive system

“external compression on biliary tree or tumor of ampulla of Vater”

### Pancreatic Adenocarcinoma

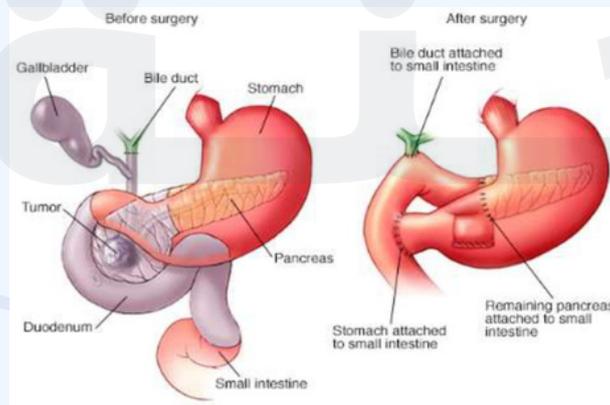
Occurs in head of pancreas



About **two-thirds** of pancreatic adenocarcinomas arise within the head or uncinete process of the pancreas; 15% are in the body, and 10% in the tail

☒ For potentially resectable pancreatic head cancer, the standard operation is **pancreaticoduodenectomy (the Whipple procedure)**

**Pancreatic tumor**  
**5-10% 5 year survival**



### Cholangiocarcinoma “bile duct cancer”

is an adenocarcinoma of the bile ducts; it forms in the biliary epithelial cells

About two thirds are located at **the hepatic duct bifurcation**.(klatzkin tumor) “ 2/3 of BD tumor , comes with PAINLESS jaundice “ bad prognosis .. the more proximal the worse the prognosis

**Painless jaundice** is the most common presentation.

Pruritus, mild right upper quadrant abdominal pain, anorexia, fatigue, and weight loss also may be present.

Diagnosis : CT and MRI

Risk factors

primary sclerosing cholangitis, choledochal cysts, ulcerative colitis, hepatolithiasis, biliary-enteric anastomosis, and biliary tract infections.

Other risk factors: dietary nitrosamines, thorotrast, and exposure to dioxin.

Surgical resection offers the only chance for cure; however, many patients have advanced disease at the time of diagnosis.

Most patients with unresectable disease die within 1 year of diagnosis. -- palliative care not surgical

Adjuvant therapy: chemo/radiotherapy post op

neoadjuvant therapy : chemo/radiotherapy pre op to shrink the mass

## Periampullary tumor

is a cancer that forms around The ampulla of Vater ( a small opening that enters into the duodenum)

### Membranous structure

the most common presenting symptom is intermittent obstructive jaundice (80%) (or fluctuant jaundice which is overgrowth of the tumor inside CBD exceeding blood supply → central ischemia → sluffing , jaundice improves but not completely with blood in stool), caused by compression of the distal bile duct by the tumor. (pancreatic , duodenal or biliary)

Additional symptoms may include diarrhea due to fat malabsorption (steatorrhea), mild weight loss, and fatigue

**ERCP** is the single most useful endoscopic study for diagnosing ampullary carcinoma because it permits identification of the tumor, biopsy, and decompression, if needed.

**Whipple procedure** (pancreaticoduodenectomy) the curative surgery

## Bile duct strictures

☒ Benign causes :

☒ **operative injury**, most commonly by laparoscopic cholecystectomy

☒ fibrosis due to chronic pancreatitis, common bile duct stones, acute cholangitis, biliary obstruction due to cholelithiasis (Mirizzi's syndrome), sclerosing cholangitis " narrowing of CBD and bilirubin elevation "

☒ Malignant causes :

☒ cholangiocarcinoma, adenocarcinoma of the pancreas and ampullary tumors

- most commonly present with episodes of cholangitis
- An ultrasound or a CT scan will show dilated bile ducts proximal to the stricture, as well as provide some information about the level of the stenosis.

Treatment depends on the location and the cause of the stricture.

**Roux-en-Y choledochojejunostomy or hepaticojejunostomy** (according to the level ; low or high) is the standard of care with good or excellent results in 80% to 90% of patients

**Percutaneous or endoscopic dilatation and/or stent placement**

## Choledocal cyst

The classic triad in adults is abdominal pain , jaundice, and palpable RUQ abdominal mass (10%) "triad"

All cysts should be resected and bile flow should be restored.