

Jawndice

5/19/20 

Treatment

- If the diagnosis is suspected during surgery, the treatment is radical cholecystectomy. This operation includes
 - Excision of the gall bladder.
 - Excision of a wedge of the underlying liver.
 - Clearance of lymph nodes overlying the bile duct.
- Usually the lesion is fairly advanced and inoperable. If there is jaundice, internal stenting may relieve it. The prognosis for this lesion is very poor.

Jaundice

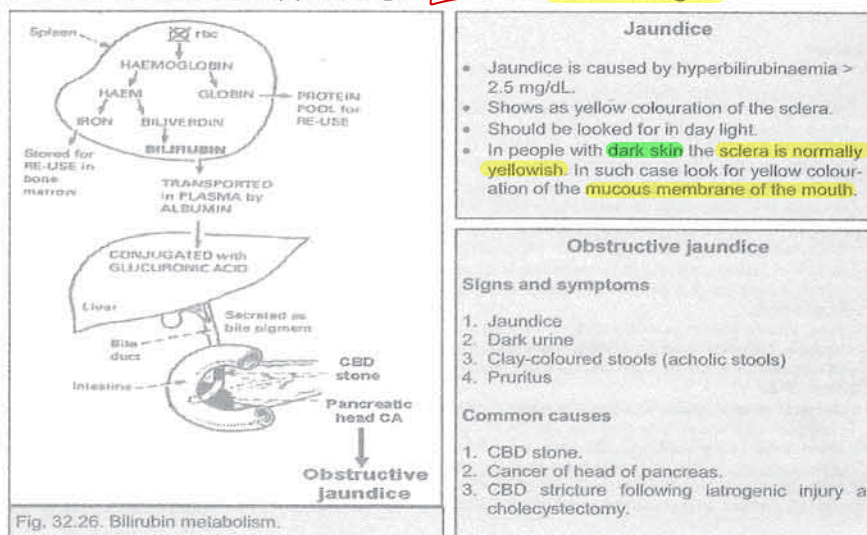
Definition

Jaundice is yellowish colouration of the body tissues and fluids (except the brain, CSF, tears, saliva and milk) which results from accumulation of bilirubin in blood. It becomes manifest when serum bilirubin exceeds 2.5 mg/dL.

> 2.5 mg/dL

Bilirubin metabolism (Fig. 32.26)

1. **RBCs destruction.** Old red blood corpuscles are phagocytosed by the reticuloendothelial cells all over the body but particularly in the bone marrow and the spleen.
2. **Breakdown of haemoglobin.** The liberated haemoglobin undergoes breakdown into globin and heme.
3. **Biliverdin and bilirubin formation.** Globin enters into the amino acid pool while heme is transformed into biliverdin which is reduced to bilirubin. The latter, being water insoluble, is transported in plasma bound to albumin and constitutes unconjugated bilirubin.
4. **Bilirubin conjugation.** In the liver bilirubin is conjugated with glucuronic acid to form bilirubin diglucuronide (conjugated bilirubin), which is water soluble. Conjugation of bilirubin in the liver is catalyzed by the bilirubin glucuronyl transferase enzyme. *BST*
5. **Bilirubin excretion.** Conjugated bilirubin is excreted via the biliary passages to the intestine.
6. **Changes in intestine and reabsorption.** In the terminal ileum and colon, conjugated bilirubin is converted by bacterial enzymes to stercobilinogen which is oxidized to stercobilin responsible for the normal colour of stools. Up to 20% of stercobilinogen is reabsorbed, and 90% of this is promptly reexcreted by the liver, with much of the remainder appearing in urine as urobilinogen.



HOT Liver—common causes of ↑ bilirubin level:

- Hemolysis
- Obstruction
- Tumor
- Liver disease

Classification

Causes

Direct

Indirect

Classification	Causes	Direct	Indirect
Prehepatic	Hemolysis, Gilbert's disease, Crigler-Najjar syndrome	Normal	High
Hepatic	Alcoholic cirrhosis, acute hepatitis, primary biliary cirrhosis	High	High
Posthepatic	Gallstones, tumor	High	Normal

Types and aetiology

According to the aetiology of the excess bilirubin, three types of jaundice are recognized.

1. **Haemolytic or prehepatic** jaundice is due to excessive destruction of red blood corpuscles which occurs in the various types of **haemolysis** (Chapter 34). **Unconjugated bilirubin** is elevated. Faecal **stercobilinogen** and urinary **urobilinogen** are increased. **Bile salts** do not accumulate in the serum.

2. **Hepatocellular or hepatic** jaundice is due to **liver dysfunction and inability** to transform **unconjugated bilirubin** to the **conjugated variety**. In addition, due to the presence of **intrahepatic cholestasis**, some conjugated bilirubin is reabsorbed to the blood. Blood levels of both **conjugated and unconjugated bilirubin** are elevated. **Bile salts** levels may also rise. Causes of hepatocellular jaundice include

- Viral hepatitis**.
- Decompensated **liver cirrhosis**. Bacterial infections as septicaemia and pyaemia.
- Drugs**. A growing number of drugs including **phenothiazine** compounds, certain diuretics, testosterone derivatives, **oral contraceptives**, **oral antidiabetic agents**, **halothane** and **arsenicals**, are known to injure the cellular excretion mechanism and **cause intrahepatic cholestasis**. A **sensitization reaction to the drug** is usually responsible.

3. **Obstructive or posthepatic** jaundice is due to **obstruction** somewhere in the biliary pathway. **Conjugated bilirubin** will be reabsorbed to the blood and will be excreted in urine. **Bile salts** will accumulate in the blood. Faecal **stercobilinogen** and urinary **urobilinogen** levels are low. Causes of obstructive jaundice include:

- Causes in the **lumen of the bile ducts**, e.g. **calculi** or **parasites** as ascaris or fasciola.
- Causes in the **wall of the bile ducts** which include:
 - Congenital biliary atresia**.
 - Inflammatory stricture** as with sclerosing cholangitis or secondary to an impacted stone which has been present for a long time.
 - Traumatic stricture** is usually iatrogenic following **cholecystectomy**, **choledocholithotomy** or instrumental procedures on the common bile duct.
 - Malignant stricture**.
- Causes **outside the bile ducts**, e.g., **carcinoma of the head of pancreas** obstructing the **lower part** of the common bile duct or a **mass of metastatic lymph nodes** at the **porta hepatis** obstructing the hepatic ducts.

Clinical features

History

- The **age and sex** of the patient may give a hint to the diagnosis. Jaundice in the **neonatal period** may be due to **physiological jaundice of the newborn**, Rh incompatibility, **neonatal hepatitis**, congenital syphilis or congenital biliary atresia. In **children** **haemolytic anaemias** should be suspected. **Calicular jaundice** is more common in **middle aged females** while **malignant obstructive jaundice** is commonly seen in **elderly males**.
- History of **drug intake**, recent **injections** and **blood transfusion**.
- Colour of urine and stools**. In **haemolytic jaundice** urine colour is normal while stools are **dark**. In **obstructive and hepatocellular jaundice**, urine is **dark** while stools are **pale**.
- Pruritus** is **absent** in **haemolytic jaundice**.

Cachexia: condition that causes the body to waste away.
↑↑↑ weight loss
loss of body fat



WARD TIP

Alkaline phosphatase (alk phos) is secreted by the biliary canalicular cells. In obstructive jaundice, alk phos level rises more quickly than the bilirubin level. Also, when the obstruction is relieved, the alk phos level falls more quickly than the bilirubin level.

- Recurrent attacks of haemolytic crisis suggest haemolytic jaundice.
- Depth of jaundice. Haemolytic jaundice is usually of a mild degree while hepatocellular and obstructive jaundice may be of a severe degree. Calcular jaundice is usually fluctuant while malignant jaundice is progressive.
- Pain. In haemolytic jaundice abdominal pain may be present during a haemolytic crisis. Calcular obstructive jaundice is usually accompanied by upper abdominal pain. Malignant obstructive jaundice is usually painless but may be accompanied by dull aching epigastric pain referred to the back.

Examination

- General examination focuses on pallor, pyrexia, the degree of jaundice, Virchow's lymph nodes, cachexia, stigmata of liver insufficiency, bleeding tendency, and oedema of the lower limbs.
- Abdominal examination. Patients with haemolytic anaemia usually have hepatomegaly and splenomegaly. In calcular obstructive jaundice, abdominal examination is usually negative. In malignant obstructive jaundice the liver and gall bladder are commonly palpable. Ascites may be present in advanced cirrhosis or in metastatic malignant lesions.

Investigations

Laboratory

1. Blood picture. In haemolytic jaundice there is anaemia. Special tests for various haemolytic anaemias may be required.
2. Serum bilirubin. Jaundice is easily recognizable when the conjugated bilirubin concentration in the serum reaches 2-3 mg/100 ml or the unconjugated bilirubin level is 3-4 mg/100 ml. In haemolytic jaundice, the unconjugated bilirubin level is increased, in obstructive jaundice the conjugated bilirubin is high, while in hepatocellular jaundice both types of bilirubin are increased.
3. SGOT (AST) and SGPT (ALT). In haemolytic jaundice the level of transaminases will be normal. In acute hepatitis the level will be very high while in cirrhosis there will be moderate increase. In the early stages of obstructive jaundice the level will be normal but with prolonged obstruction, some degree of parenchymatous damage occurs and the level of these enzymes will increase.
4. Alkaline phosphatase. In haemolytic jaundice the level of alkaline phosphatase is normal, in hepatocellular jaundice, there may be slight increase, while in obstructive jaundice there is moderate increase in the level of this enzyme particularly in malignant obstruction.
5. Prothrombin time and concentration are normal in haemolytic jaundice. There is prolongation of prothrombin time and diminished prothrombin concentration in both hepatocellular and obstructive jaundice. To differentiate both conditions, a course of IV vitamin K is prescribed for a few days. In obstructive jaundice the prothrombin parameters will improve but not in hepatocellular jaundice. → Vitamin K is not helping because liver is dysfunctional.
6. Serum albumin is low in patients with cirrhosis or after prolonged malignant cachexia.
7. Faecal stercobilinogen is high in haemolytic jaundice but is low in hepatocellular and obstructive jaundice.

Imaging

1. Abdominal ultrasound. This is undoubtedly the first investigation to be ordered. It will demonstrate dilatation of intrahepatic biliary radicles in patients with obstructive jaundice. Further data provided by ultrasound have been discussed before.

- I procedure to X-ray the hepatic duct & CBD. Contrasting agent injected in liver/bile and K-rayed → point of obstruction.*
2. **CT scan** is particularly indicated in patients suspected of having abdominal malignancy, e.g., carcinoma of the head of pancreas. It will clearly demonstrate the site and extent of the tumour, invasion of adjacent structures, metastatic lymph nodes or liver deposits.
 3. **ERCP** is particularly indicated in patients with obstructive jaundice suspected of having a lesion involving the lower end of the common bile duct, e.g., ampullary carcinoma.
 4. **PTC** is particularly advised in patients with obstructive jaundice suspected of having a lesion involving the upper end of the common bile duct, e.g. postoperative stricture or carcinoma of the hepatic ducts.

Cholecystectomy

Removal of the gall bladder is an operation which needs wide knowledge of the anatomy and congenital anomalies of the biliary tree. It requires meticulous dissection. If performed by a competent surgeon, it has a low morbidity and mortality, even in difficult cases.

Indications

1. **Gall stones**
 - a. Stones that cause biliary colic.
 - b. Acute calculous cholecystitis. The operation may be done early in the course of the attack, i.e., in the first three days, or late, i.e., after 6 weeks of subsidence of the attack by conservative treatment.
 - c. Common bile duct stones. Cholecystectomy is done because the gall bladder is the usual source of CBD stones. Its removal aims at prevention of recurrence.
 - d. Silent gall stones (mentioned previously).
2. Acute non-calculous cholecystitis.
3. Carcinoma of gall bladder.

Conventional (open) cholecystectomy

1. **Anaesthesia.** General.
2. **Incision.** A right subcostal or paramedian incision is performed. A paramedian incision can be extended and it allows full exploration. It is particularly indicated if the subcostal angle is narrow. A subcostal incision gives direct access to the gall bladder. It is a muscle cutting incision and may injure the ninth or tenth intercostal nerve.
3. **Exposure.** After exploration, one assistant pulls the liver upwards while the other assistant pulls the duodenum downwards thus exposing the free margin of lesser omentum.
4. **Displaying the Y junction.** Dissection starts by incising the peritoneum on the free margin of lesser omentum to expose the cystic duct, common hepatic and common bile ducts.

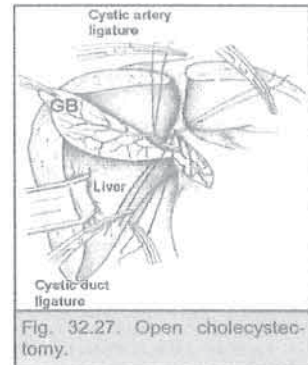


Fig. 32.27. Open cholecystectomy.

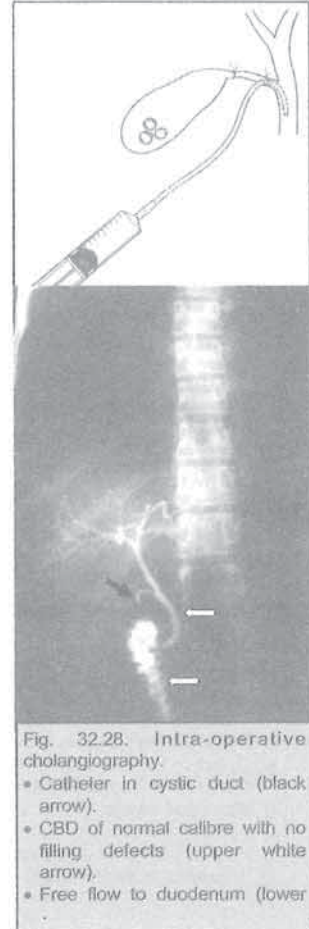


Fig. 32.28. Intra-operative cholangiography.
• Catheter in cystic duct (black arrow).
• CBD of normal calibre with no filling defects (upper white arrow).
• Free flow to duodenum (lower white arrow).

History of jaundice

Dr. Suhil MADBAK

في التاريخي معهم جداً التاريخ يكون مكتوب عشان نعرف هاد المريض مشكلته كانت متى .
 ال Signature مش يعني signature بالمدى الخفي لانه اش دبه يعرفنا هاد التوقيع
 لمن علام نكتب الاسم كامل.

Jaundice: Yellowish discoloration of skin, sclera and mucus membranes.

Types of jaundice:

→ pre hepatic:

↓

Hemolytic anemias (glucose -6- phosphate dehydrogenase (G6PD) deficiency
 Spherocytosis ...)

المشكلة بتكون قبل ال liver
 لعق ال bilirubin ما وصل ال liver

→ Hepatic: (inside the liver)

Examples:

- Viral hepatitis
- Cirrhosis
- Alcoholic hepatitis
- Dubin - Johnson Syndrome
- liver malignancy (carcinoma of liver)
- Gilbert disease → ? prehepatic

→ Post hepatic = Surgical jaundice

Examples - biliary stones

- obstruction of bile duct, could be due to:

- Cancer of head of pancreas
- cancer in bile duct (cholangiocarcinoma)
- stones

structure of
 bile duct

← ال jaundice مشترك بين الجراحة واساطنة ولكن

Obstructive jaundice is surgical but other types of jaundice is Medical.

In History of jaundice:

ال name مش حيزق في ال History ولكن ال age صغيره

↓
 neonatal jaundice (physiological jaundice)

↓
 بيختفي بعد ٣ أسابيع

Age

→ Congenital jaundice

→ Malignancy: مثلًا لو واد عمره ٨٠ سنة وضا عنده jaundice

Occupation

→

needle prick

أو الممرضين

اللي ببشتغلوا في المختبرات ممكن من

ينتقلهم liver disease

(hepatitis)

العزلات عن صنفه كثير ولكن هاي كلها لازم زعلها في المستشفى بس مش حتمية في ال jaundice

أسوأ drugs في ال drug interaction :
Antimycotic (anti fungal)
Anti histaminic
← تقريباً يتفاعلوا مع كل الأدوية في الدنيا :

Present complain of jaundice

- ممكن يجي المريض يحكي انه عنده abdominal pain (مش شرط المريض

يحكي انه عنده jaundice ممكن يكون مش ملاحظ اولاً

Common in females

Common in males

gall bladder stones, cancer head of pancreas

- ممكن المريض يحكي انه عنده صغار "jaundice"

لازم أحلل ال patient main ال (أصل الصفرة بتروح وتيجي) هل بتزيد ...
= Complain

2 - Fever and rigors : Serious → Cholangitis : ممكن دل على
~~Cholangitis~~

← خصوصياً لو كان المريض جاي عند obstruction سواء ال biliary system أو renal system

عنده Fever and rigors ← Septicemia

Septicemia : Circulation of bacteria and its toxins in the blood
(تختلف عن bacteremia اللي ممكن تكون transient عايش فيها المريض اولاً)
circulation of bacteria in blood

لكن مريض ال Septicemia يكون toxic وبيدخل في septic shock

3 Flatulent

ممكن المريض يحكي انه لما يأكل (egg, fatty meals) بيحصل نفخة

2

← أكثر أكل ممكن يعمل contraction لل gall bladder هو البسيفي.

كانوا زمان يحطوا المريض صبحه رعدنه وحقوه بيفضيه فيسوقوا إذا صار contraction لل gall bladder ولا لا، صبح كانوا يحطوا ال gall bladder stored

Dyspepsia: associated with fatty meals

Weight loss → weight loss + jaundice : malignancy (البسرطان)
usually painless jaundice (stone)

ولكن ممكن لو كبير حجم ال tumor كثير يضغط على ال structure الي حواله
فممكن يكون في pain ← *Dull aching epigastric pain referred to the back.*



Dart urine: presence of bilirubin in urine
Pale stool → absence of stercobilin

Absent in hemolytic J.

Itching → abdominal examination بلاعة
↓
bile salts → Scratch marks

Itching + dark urine + pale stool → Obstructive jaundice
↓
clay colored stool (زوي الطيبة)

- * prevent drainage of bile or conjugated bilirubin
- * Absence of enterohepatic circulation. (obstruction في الأنه)
- * Absence of urobilinogen

OSCE Question H.Y
Characteristics of obstructive jaundice
هذا الـ OSCE معكم صبح في ال OSCE كيف تعرفوا اذا obstructive jaundice

Jaundice with:
- nausea + vomiting without abdominal pain → hepatitis
- nausea + vomiting with abdominal pain → Gall bladder stones

← لو مريض مخطوط catheter في فال urine bag موجود **DARK urine** كيف أعرف
إذا فيه bile أم لا؟
بتمسك ال bag مبعوضه ولو طلع رغو، ما ذك ال urine فيه bile (shalce the bag)
ممكن يكون نتيجة drug oligouria

10 Skin tattoo → hepatitis C, B
 blood transfusion →
 (emergency or lab acids)

- Drugs rifampine, chlorpromazine, erythromycin, phenytoin, ciprofloxacin
- Travel: malaria, schistomiasis, azithromycin

position of the
Inso

11 Drug induced jaundice ⇒ cholestatic jaundice

Example of drugs:

✗ Acetaminophen (paracetamol)

✗ Amoxicillin

✗ azithromycin

12 Post operative jaundice

لو كانت العملية ما إلتا علاقة Gall bladder و liver - بنوع نوري الـ drugs
 ممكن نغوف الـ anesthetic

↓
 الـ Halothane نغول jaundice

Examination in a case of jaundice

- Part of the abdominal examination.

Inspection

Palpation

auscultation

Percussion

General preparation:

Environment: should be warm

→ privacy

→ Good light: حالات jaundice بالاذان ما تبين في الضوء العادي.

(الـ jaundice يتفحص في نور رطب!)

Examination couch: (on the bed)

Exposure: ✗ exposed from nipples to mid thigh

→ Your position on the Right Side of the patient

← لو المريض عنده مشكلة في abdominal muscles بنخليه to flex the knee

↓
 To relax the abdominal muscles

Relaxation of them
 by flexation of knee! (4)

Position of the patient: lying supine on the examination couch

Inspection

General Examination

- Inspection of the patient from the end of the bed
... Cynosis ^{has}, jaundice, cachexia or overweight

Look for
* Cachexia
* Pallor
* Jaundice
* Scratch marks



- ① jaundice
- ② spider angioma (Scattered)
- ③ gynecomastia
- ④ caput medusae
- ⑤ scratch marks
- ⑥ palmar erythema
- ⑦ Ascites



Signs of liver disease
inspect

Inspection of the abdomen: shape, size, color, etc.

Shape of the abdomen.

Look for Building Flanks

- Distended
- Flat
- everted umbilicus (not normal)
- Caput medusa (not normal)
- bulging abdomen
- colostomy abdomen
- scratch marks
- Scar
- Previous operation
- sinus



في الامتلاء البطن

Inspection of abdomen → normal shape, ^{normal} good movement with respiration, normal umbilicus, no scars, no...

Skindiscoloration

Acute disease / specific

Recti divarication

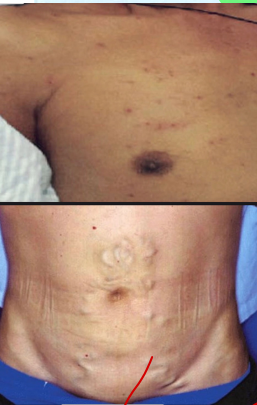
the two recti are separated

(swelling between the two recti) bulg

أنشوف في ال abdomen موجود scar بنينا نظري
 normal shape of abdomen then the scar → Transverse scar just above the umbilicus about 20 cm in length.

Description of Scar

- Site of the Scar: which quadrants of the abdomen.
 (left / Rt lower quadrant, left / Rt upper quadrant)
- Shape of scar vertical / horizontal
- Size of scar length



Caput medusae:

→ Dilated vein ~~above~~ around the umbilicus.

It is caused by portal hypertension

→ Portal hypertension ال Posto Systemic shunt

→ Dilated veins also found in:

lower Esophagus → esophageal varices

Anus → Hemorrhoids

AA Abdominal aortic aneurysm → Visible pulsation ← ممكن نطلع على ال abdomen

Cullen's sign

→ ~~Br~~ Bruising around the umbilicus. (discoloration of around the umbilicus)

→ It can be due to acute pancreatitis

→ Cullen's sign

Palpation

→ It is done by tip of fingers and palmar aspect

Palpation → superficial
 → Deep

① ②
 tenderness أو Organomegaly palpation عنان ندور على

Rules of palpation:

- ① palpation واحنا بنطلع على وجه (عينه) المريض
 ② نبسأل المريض إذا في عنده pain أم لا؟ ووين مكات الـ pain؟
 ③ palpation لا non tenderness areas
 ④ palpation لكل الـ nine Quadrants of the abdomen
 "Look me in the eyes, tell me what you see"
 "Start away from the pain"



- لو لقينا mass في الـ abdomen لانزنجكي
 Site of the mass (e.g. Rt iliac fossa)
 Shape (rounded...)
 hard / soft
 tender / tenderness
 pulsatile / Non pulsatile
 Character: hard / soft, tender / nontender, pulsatile

3 Reactions during palpation:

① Guarding: abdominal muscles will contract as pressure applied → inflammatory area (protective mechanism)

② Rigidity: indicate perforation → peritonitis

③ Rebound: Sudden release of pressure causes pain
 deep palpation لو راحا بنعمل deep palpation لو رافنا، ايضاً وردة المريض صراخ.

Palpation of the liver

Palpation of gall bladder: It is palpated at the angle between the 9th costal cartilage and semilunar line

Liver: to extend from 5th intercostal space to the costal margin

Liverspan: 12 cm Cat mid clavicular line

Palpation of liver:
 نبدأ نخط الـ tip of fingers والـ hand على الـ Right iliac fossa ونبذل المريض يافداً
 نفساً ، وبعد كل نفس نبتلع إصبعنا لفرق لأخيه ما ~~نحس~~ نحس الـ liver

• Liver normally non palpable

- إذا حسيت الـ liver بنحكي كم 3 cm نازل تحت الـ costal margin
 - ونبتلي إذا الـ edge
 Round → Sharp
 edge → tender

(3 cm below costal margin)

Palpation of spleen

Enlargement of the spleen:

لأن الـ spleen ينحني ينزل

Downward diagonally toward umbilicus (Right iliac fossa)

• Palpation of spleen (palpation of liver نفس الـ)
 نبدأ من الـ Right iliac fossa ونبذل
~~toward umbilicus~~ toward umbilicus
 Left upper quadrant

• Normally spleen not palpable : 2-3 مرات
 عشان أحسه لازم يكون متضخم

Spleen have a palpable notch →

بتخليني أميز بين الـ spleen والـ kidney

إذا الـ spleen not felt ، ننسج المريض على اليمين ، على أساس ينزل الـ spleen
 وجعل كمات مره palpation

Murphy's sign: Acute cholecystitis.

while doing deep palpation of right upper quadrant, the patient holds his breath

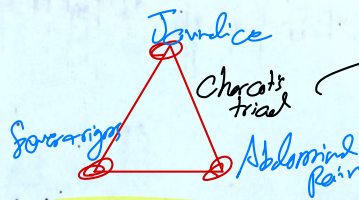
Courvoisier's sign →

(fibrous wall of gall bladder)

① palpable gall bladder
 ② jaundice
 gall bladder stones
 malignancy
 inflamed gall bladder heals by fibrosis
 الـ gall bladder ما بتكون destended ، اذن مستل stone

not palpable if stone
 SOB

Charcot's triad



- Jaundice + fever + rigors + abdominal pain → Septicemia, ascending cholangitis
- Serious Case, mortality in 50% of patient.

Examination of Ascites

- Bulging flanks
- Fluid wave test
- Shifting dullness

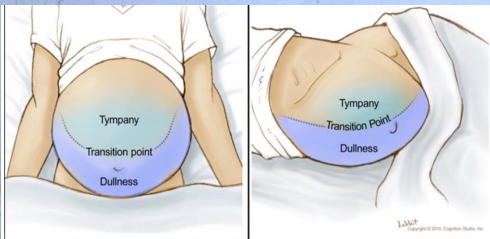
Fluid wave test: بنحلي ال Assistant في نص ال abdomen ونبخبط بإيدي ال abdomen فنجس ال Fluid wave بالإبراثانية (على الجهة الثانية من ال abdomen)



Percussion

- Strike the distal interphalangeal joint of your left middle finger.
- You have to percuss all Quadrants of the abdomen.
- Tympanic: air filled structure.
- Dull: solid organ or fluid
- Resonant.

Shifting dullness Percussion من فوق لخص لمانسجل Transition point بختل الصوت من tympanic → dull
 نبصت إيدنا على ال Transition point وبنحلي للرفعة وبنحلي ال Fluid Shift على ال Flank. خالطة ال كان dull
 على ال percussion بالرفعة من tympanic mass هاد بدل انه من mass



Shifting Dullness
 To perform the shifting dullness test, place the patient in the supine position, percuss the entire abdominal region, and mark the dullness-tympany transition point (left figure). Then place the patient in the right lateral decubitus position, wait 30 to 60 seconds, repeat the percussion, and again mark the dullness-tympany transition point (right figure). A positive shifting dullness test is indicated by a shifting of the transition point.

Ascultation

- على ذائقه في bowel sound لانك انت الساعة على ال abdomen لمدة 30 sec. متواصلة
- ال bowel sound بتجى normally كل 5 sec.

Heus : ~~listen~~ Silent abdomen (no bowel sound)

Don't forget to examine

- Supra clavicular lymph node
- Back
- Hernial orifices
- Femoral pulses
- External genitalia
- Rectum C/P R.

Next try to
the 80!

②