رلاللهامسب!!رلانمح!!ميح

Obstructive jaundice

Contents

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- ***Metabolism of bilirubin***
- ***Anatomy of the biliary System***
- ***Causes of Billiary Jaundice***
- ***Clinical Feature***
- ***Diagnosis***
- ***Management***
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- ***Post operative jaundice***

Introduction

Jaundice or icterus

Yellowish discolouration skin, sclera& mucous membrane

Due to excess plasma bilirubin

Normal range; Is <1mg/dl

Clinically obvious

When it is>3mg/dl

1mg/dl=17mmol/l

:DEFINITION OF OBSTRUCTIVE JAUNDICE

A condition where blockage of bile flow causes over spills of bile products into the blood & incomplete bile excretion from the body

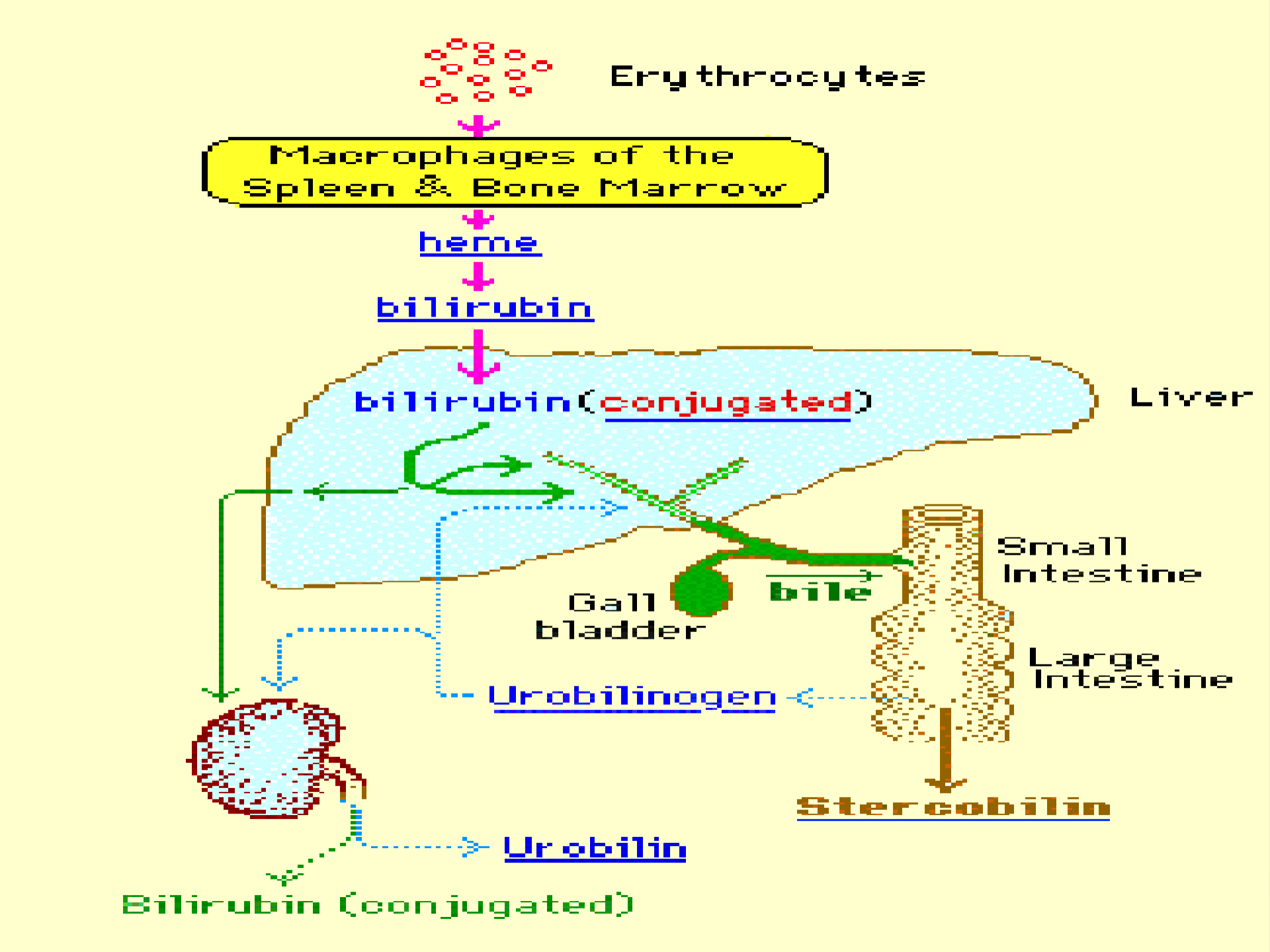
Metabolism of bilirubin

Produced in the reticuloendothelial sysetm break down of **haem**

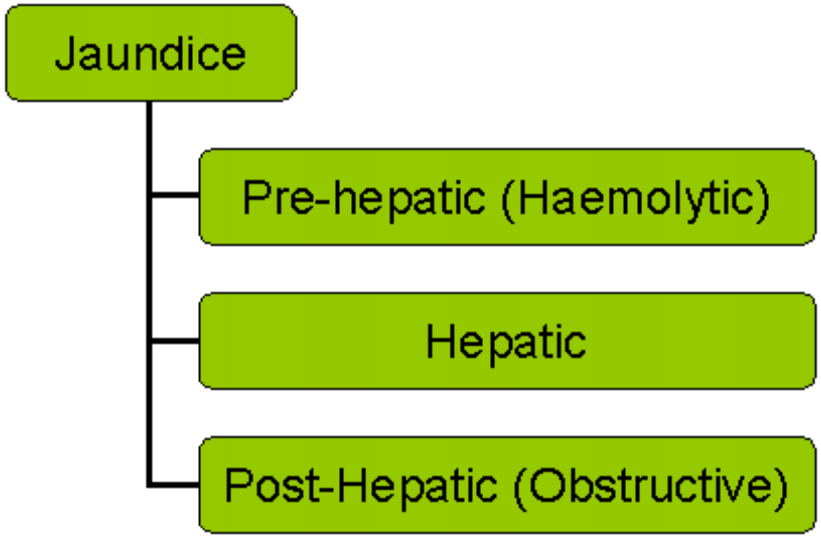
Carried to the liver bound to albumin, within the hepatocytes it is cojugated by**Glucouronyl transferase** into **bilirubin glucouronide,**which secreted by the bile canaliculi

In the intestine it is reduced by the bacterial flora into **urobilinogen** ,small amount is excreated in the stool **stecobilinogen**

The remainder reach the liver to enter the enterohepatic circulation


Erythrocytes
Macrophages of the Spleen & Bone Marrow
heme
bilirubin
bilirubin(conjugated)
Liver
Small Intestine
bile
Gall bladder
Large Intestine
Urobilinogen
Stercobilin
Urobilin
Bilirubin (conjugated)

Types of Jaundice



Surgical anatomy of the biliary system

Composed of Rt & Lt hebatic duct which unite at the *porta hepatis*

To form the *common hepatic duct*

Which join *cystic duct to* form the *common bile duct*

The CBD is 11-12cm in length & 4-10 mm in diameter it is devided into supraduodenal,retrodudenal,interapancreatic & interaduodenal part it then joined the pancreatic duct to opened in the 2nd part of the duodenum in the *major duodenal papilla*

Gall bladder is pear-shped sac 10cm in length

Commposed of fundus body & neck

Blood supply by the cystic artery

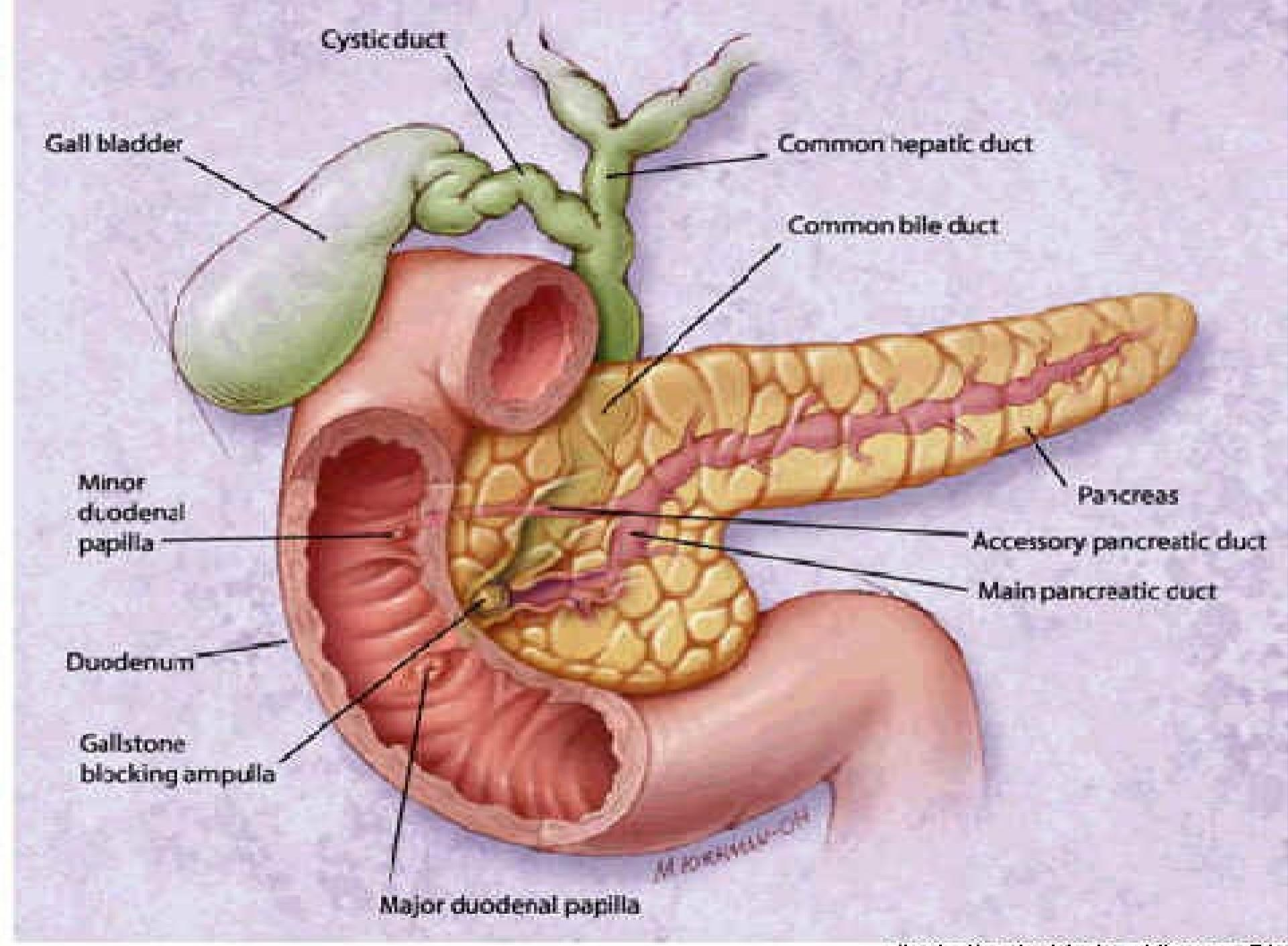


Illustration by Myriam Kirkman-Oh

Aetiology of obstructive jaundice

Common

Common bile duct stones

Carcinoma of the head of pancreas

Lymph nodes in the porta hepatis

Infrequent

carcinoma Ampullary

Pancreatitis

Liver secondaries

Rare

Benign strictures - iatrogenic, trauma

syndromeMirriz's

cholangitissclerosing

Cholangiocarcinoma

atresia Biliary

cystschoydochal

Anatomical classifications

- Obstruction within the lumen:

stone or parasite

- Pathology within the wall

*Atresia of CBD

*Tumor of the bile duct

*Traumatic stricture

*Chronic cholangitis

- External compression;

*Periampullary tumor

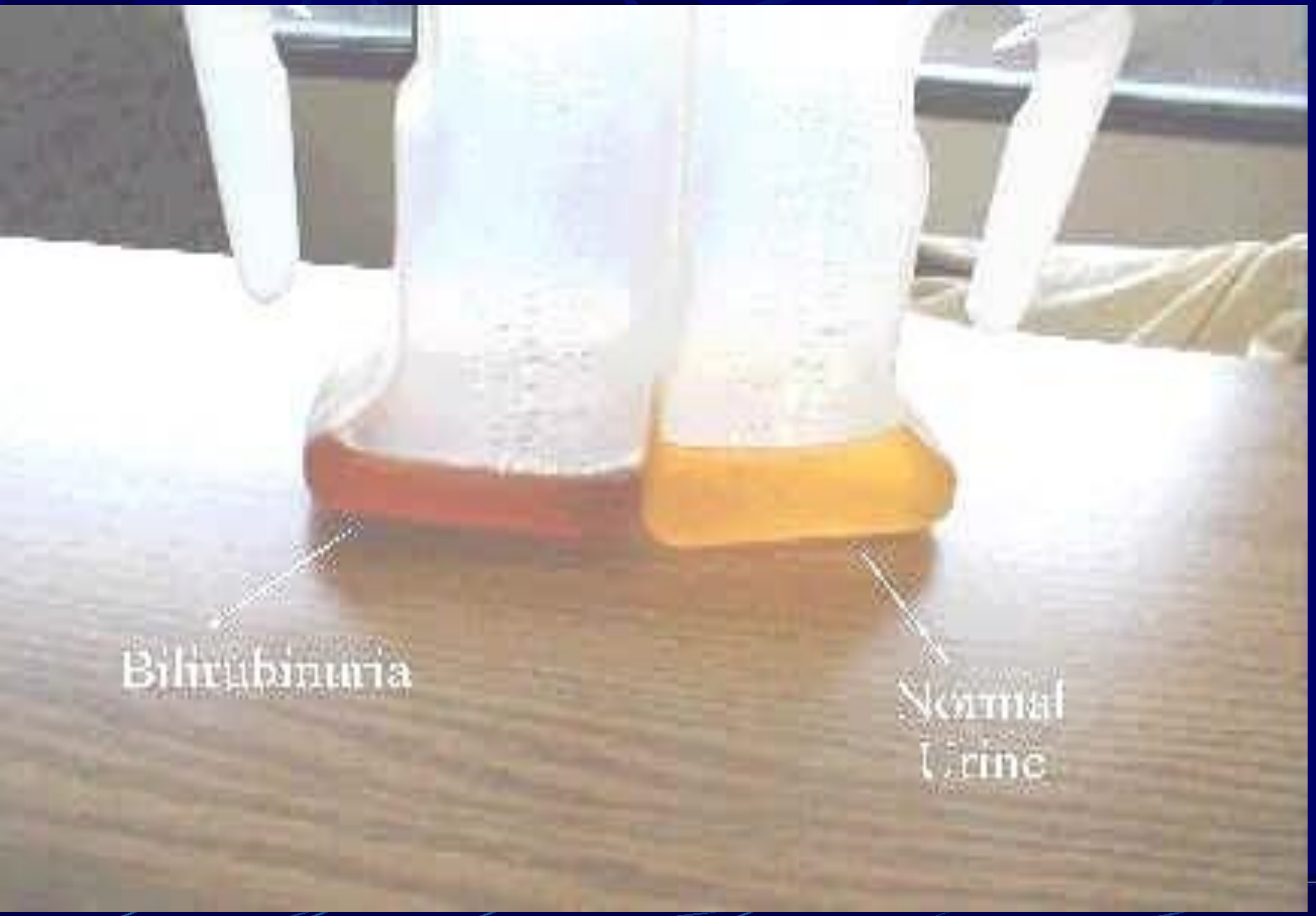
*Chronic pancreatitis

Clinical features

- Yellowish discoloration of the sclera , skin & mucous membrane
- Dark urine
- Pale stool
- Pruritis

physical examination

- Deep jaundice
- High fever and chills suggest a coexisting cholangitis
- Imatiated
- Scratch marks on the skin
- Bruses on the skin suggestive of vitK defeciency
- Bradycardia
- Gallbladder may be palpable (Courvoisier sign)..
- There may be ascite


Bilirubinuria
Normal
Urine

Investigation of obstructive jaundice

:**Aims**

- TO conferm the diagnosis
- To know the type of jaundice
- To detect the underline cause
- To detect the complications
- TO ASSES THE FITNESS FOR SURGERY

Urinalysis

- Macroscopic appearance of the urine
- Presence of bile pigment
- Absence of urobilinogene

strips are very sensitive to

bilirubin, detecting as little as 0.05 mg/dL. Thus, urine bilirubin may be found even in the absence of hyperbilirubinemia or clinical jaundice

Serum bilirubin

Doesn't give aclue about the the cause of obstruction

Conjugated & unconjugatd

- Extra hepatic obstruction;

initially it is mainly conjugated, but later on the unconjugated is rises

- Intera hepatic obstruction;

both conjugated & unconjugated are rise

Liver enzymes

ALP secreted from the endothelium of the biliary canaliculi, not specific, unless it is associated with elevation in **GGT**

The degree of elevation may be used in the differentiation between extera & interahepatic obstrution

AST mild to moderate in extera hepatic obstruction

ALT both of them are elevated in interahepatic obsruction

A 3-fold or more increase in ALT strongly suggests pancreatitis*

Prothrombin time (PT):

- This may be prolonged because of malabsorption of vitamin K.

- Correction of the PT by parenteral administration of vitamin K may help distinguish hepatocellular failure from cholestasis.

Renal function test

- Blood urea
- Serum creatinine
- Serum electorolytes

	Haemolytic Jaundice	Obstructive Jaundice	Hepatocellular Jaundice
Plasma Bilirubin	Increased (unconjugated)	Increased (conjugated)	Increased (biphasic)
Urine Bilirubin	Absent	Increased	Often absent
Urine bilinogen	Increased	Absent	May be increased or decreased
Stercobilin and colour of faeces	Increased, Dark	Decreased, Pale	Decreased or Normal, Pale or Normal
Plasma Alkaline Phosphatase	Normal	Increased	Increased
Plasma Amino-transferases (ALT, AST)	Normal	Increased Slightly	Increased
Prothrombin time	Normal	Prolonged, not corrected by IV vitamin K	Prolonged corrected by IV vitamin K

Imaging study

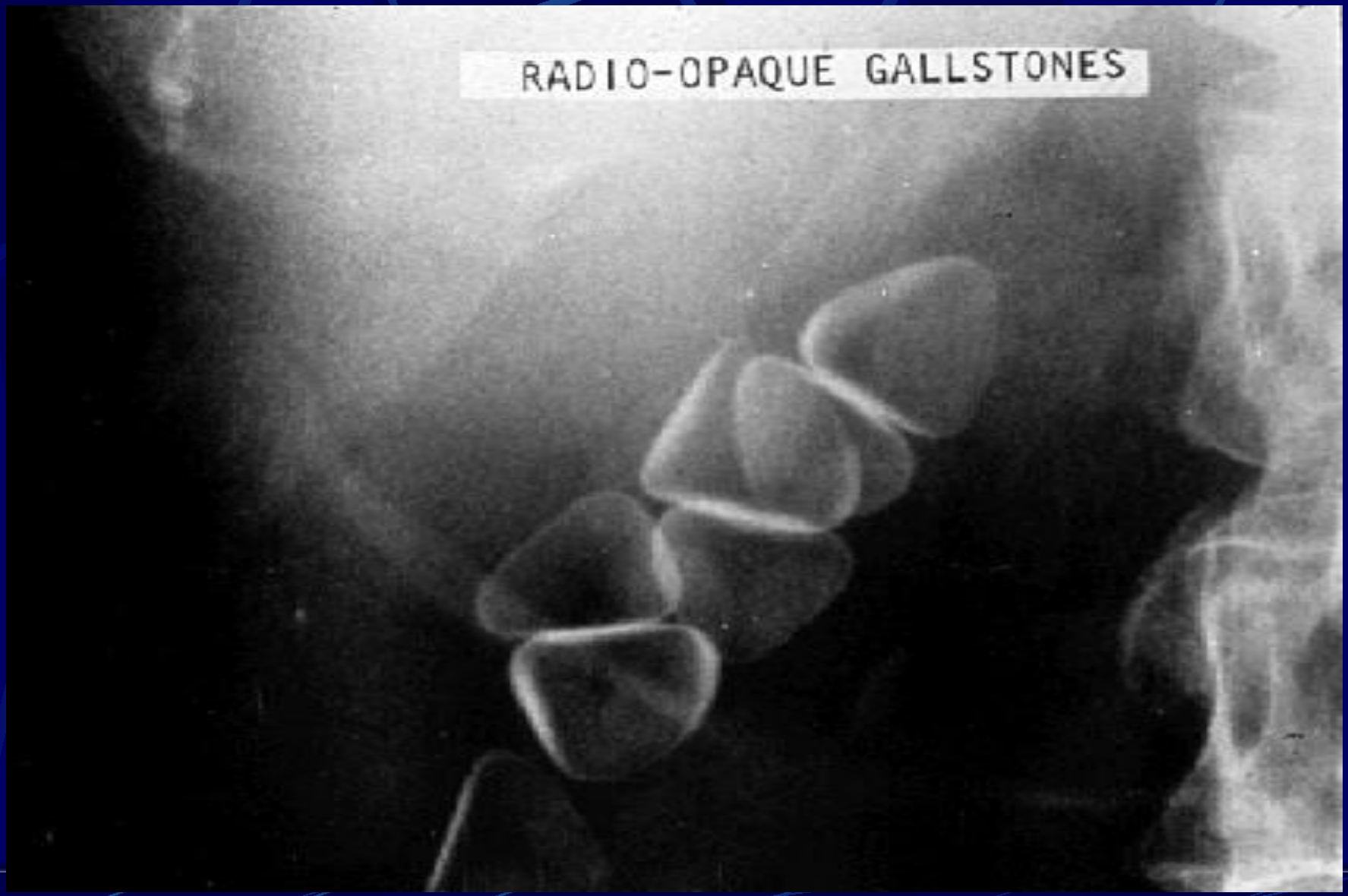
Plain X- Ray of the abdomen

Gallstones Radio-opague 10%

*It may domensterate:

- Gas in GB or biliary tree
- Calcification of GB

X-RAY abdomen: Radio obaque GB Stones



U/S abdomen

Accuracy>95%

- Shows;

stones in the GB & biliary tree*

Size of GB & thickness of it's wall*

Dalitation in the biliary tree*

Diameter of the CBD*

Pancrease inflammation or tumor*

Liver parynchyma & texture*

Differntiate intera hepatic from extera hepatic causes*

The presenc of normal CBD Diameter doesn't exclude obstruction =recent & intermittent obstruction

u/s Abdomen

Advantage:cheap available noninvasive

Disadvantage :doesn't detect

*small stones

*,stones in the distal part of CBD

*doesn't give aclue about site & extent of lesion.

*Un satisfactory in obese,ascites,previous surgery gaseous distention

ultrasound common bile duct stone

Ultrasound abdomen: stone in the neck of GB

CT abdomen

- detect spcific cause & level of obstruction
- More accurate
- can be used with contrast to see biliary tract,pancreatitis &tumour

Disadvantage:less accurate in small CBD stones ,expensive,hazard of radiation

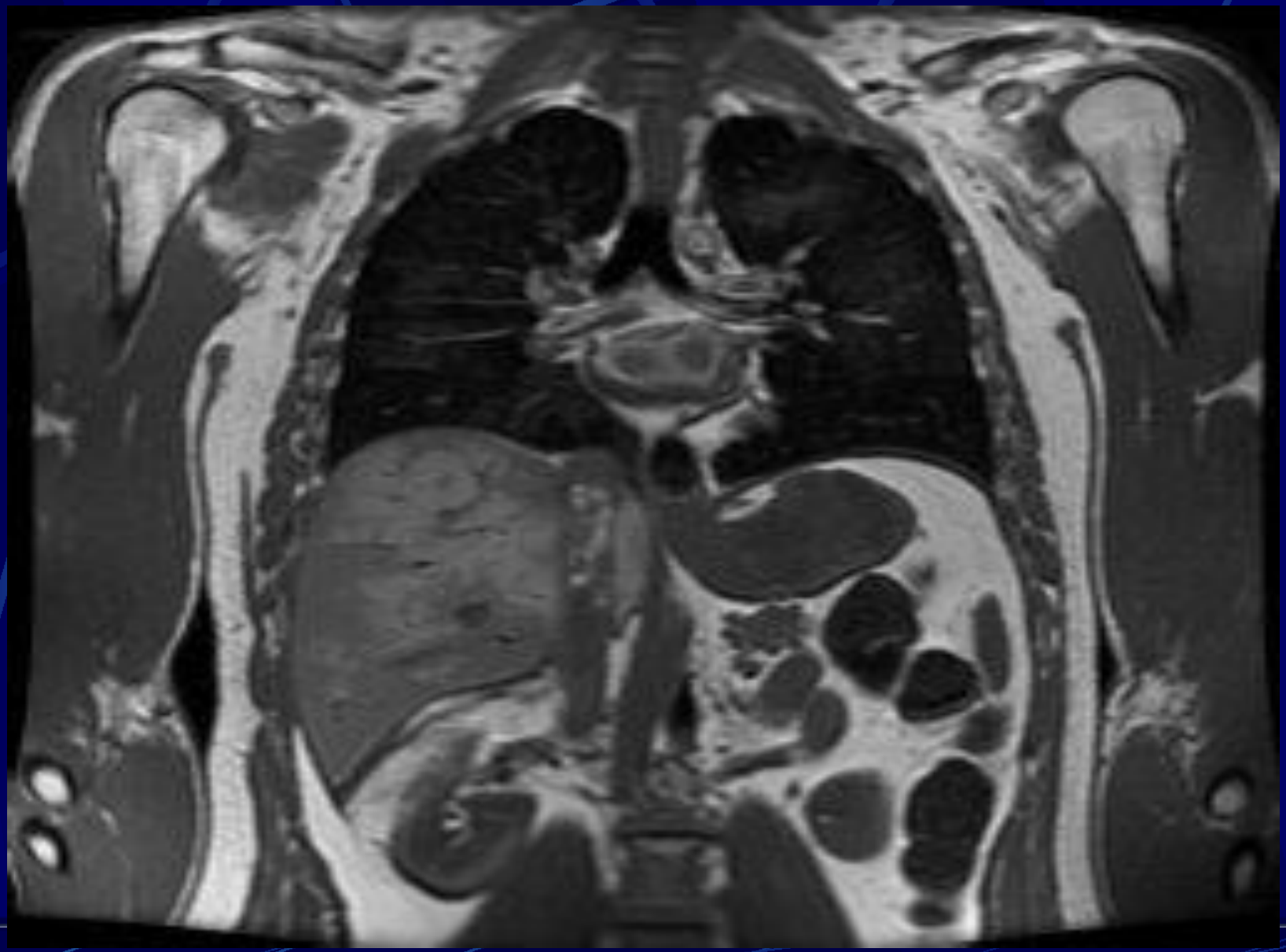
Used if US is found to be technically difficuilt

CT bdomen

MRI

- Excellent soft tissue detection
- Can be used in any plane

MRI abdomen

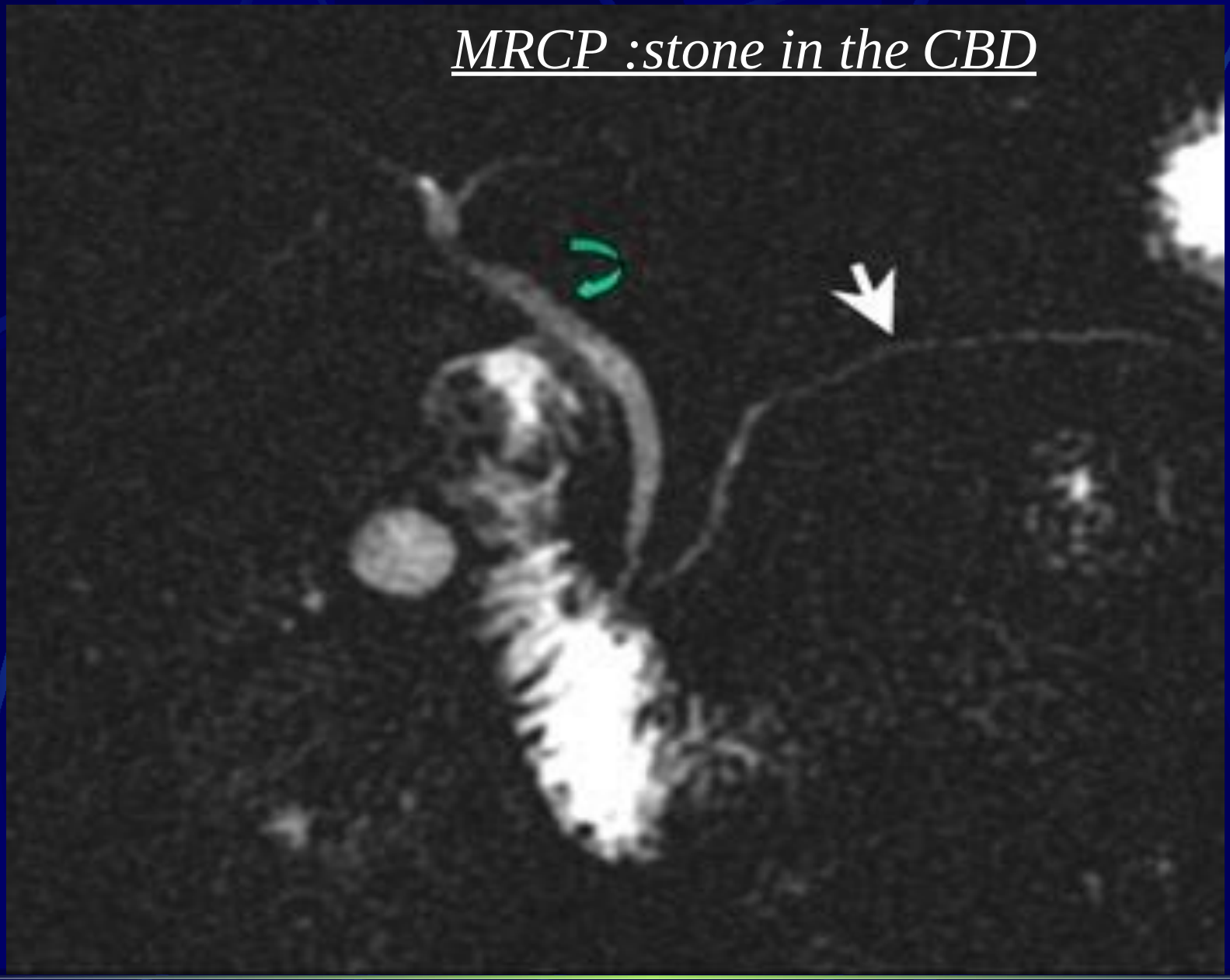


Magnetic resonance cholangiopancreatography

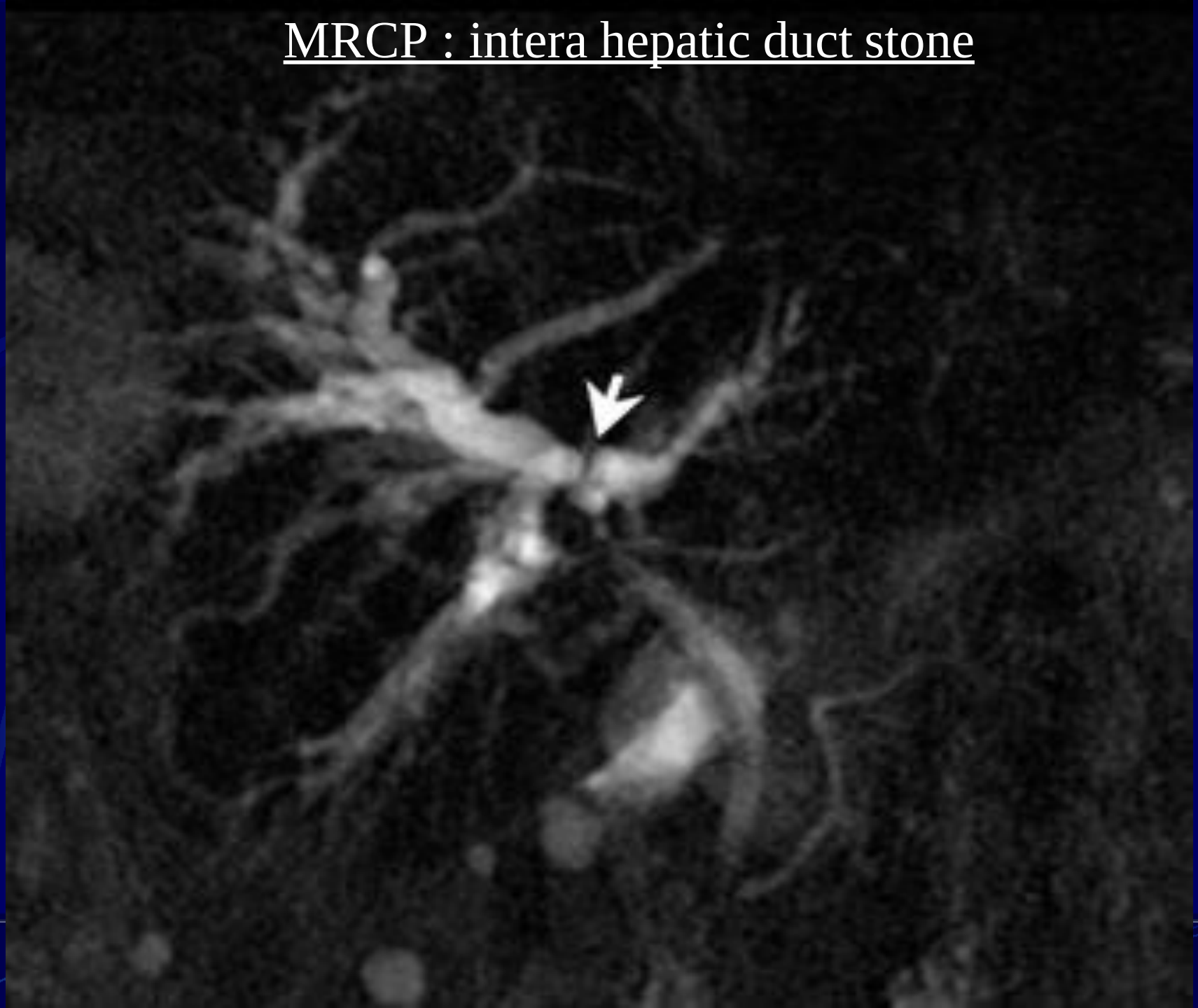
MRCP

- Detect small stones
- High specificity & sensetivty rate
- Detect CBD tumor staging
- Pancreatic lesion :tumours ,ca ampulla

MRCP :stone in the CBD



MRCP : intera hepatic duct stone



:Endoscopic retrograde cholangiopancreatography

ERCP

ERCP is procedure that combines endoscopic and radiologic modalities

- To visualize both the biliary and pancreatic duct systems.
- Endoscopically, the ampulla of Vater is identified and cannulated.
- A contrast agent is injected into these ducts
- And x-ray images are taken to evaluate their caliber length, and course

ERCP

Accuracy>90%*

•**useful for lesions** distal to the bifurcation of the hepatic ducts

Ductal stones,tumour of CBD &PANCREASE sclerosing cholangitis•

•**Has diagnostic & therapiotic modalities**

Sphincterotomy,exteraction stones,insertion of stent

:**Disadvantage***

•limited capacity to image the biliary tree proximal to the site of obstruction

•In ability to visualize intera hepatic biliary system

Complications: haemorrhage ,acute* ,pancreatitis,cholangitis,duodenal perforaion

,impacted dormia basket,gall stone illeus

ERCP

:DIFFICULTIES

- Duodenal or pyloric stenosis
- Bypass operation:cholecystojuojenostomy
- Uncooperative pt
- Inexpert personnel

Mortality

0.1%when used diagnostic

when used therapeutic 10%

MRCP versus ERCP

MRCP has the same diagnostic accuracy to ERCP except for acute pancreatitis

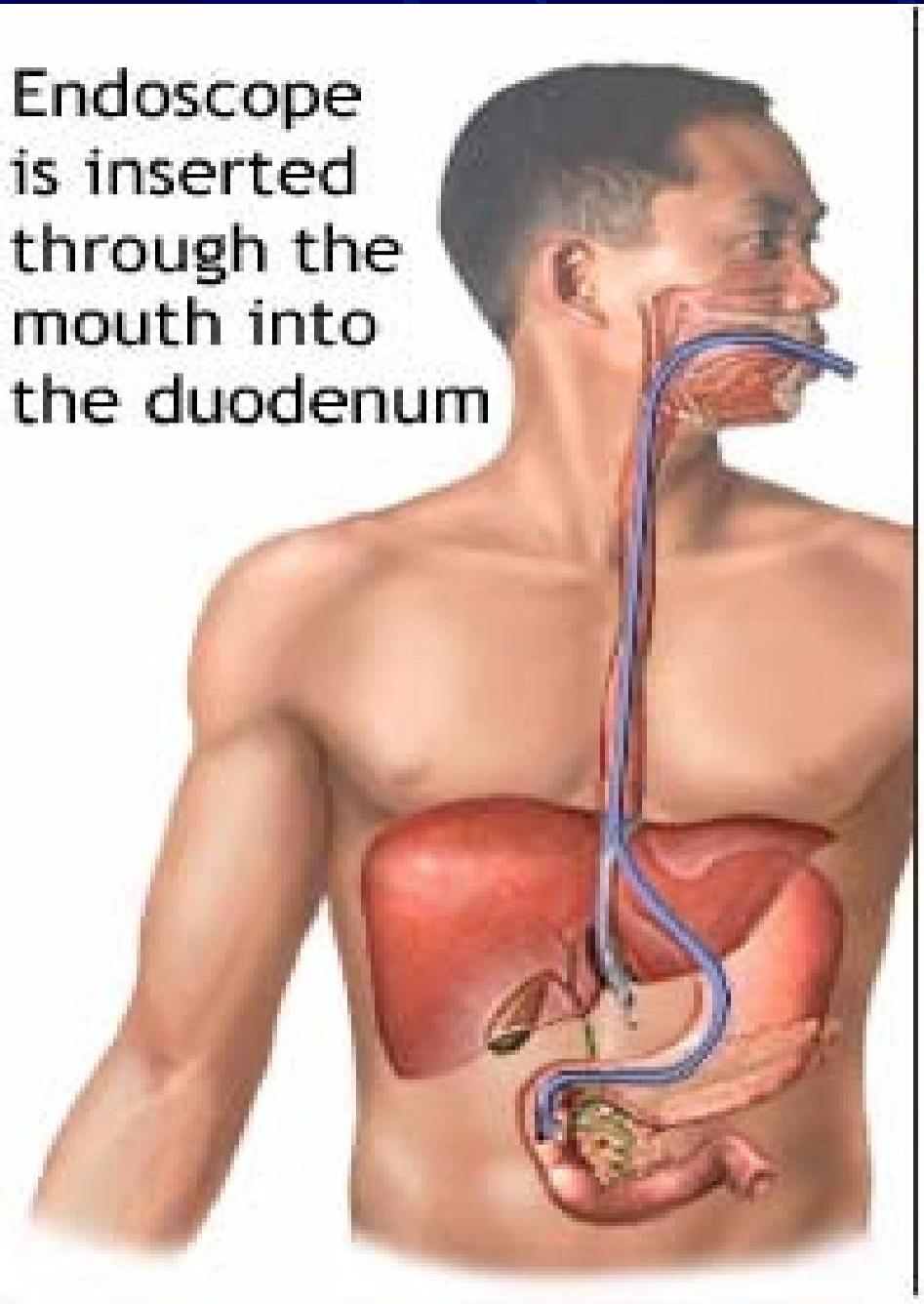
MRCP is noninvasive

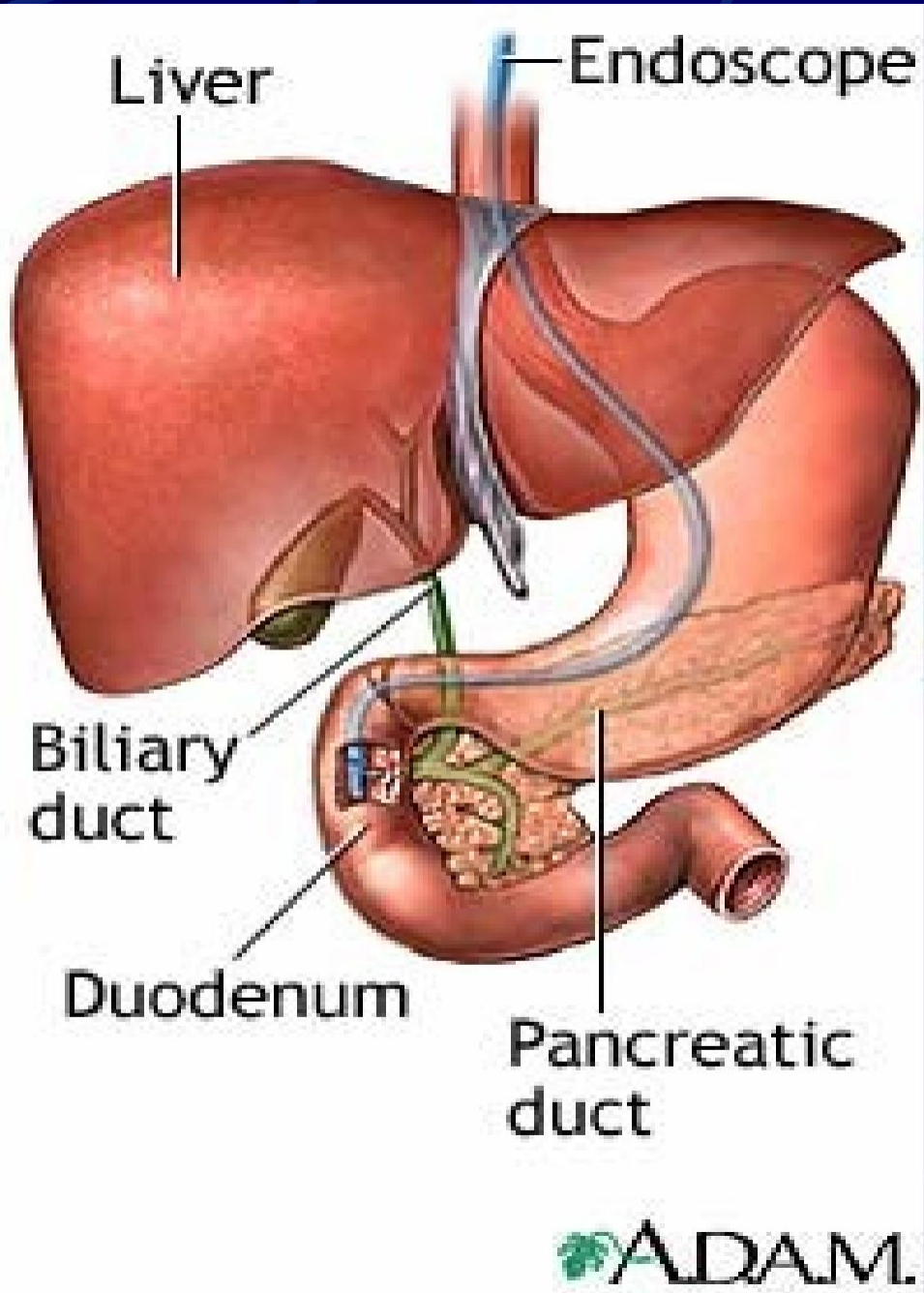
MRCP can be used in distorted anatomy

MRCP can visualise interahepatic biliary tree

MRCP can only be used as diagnostic modalities

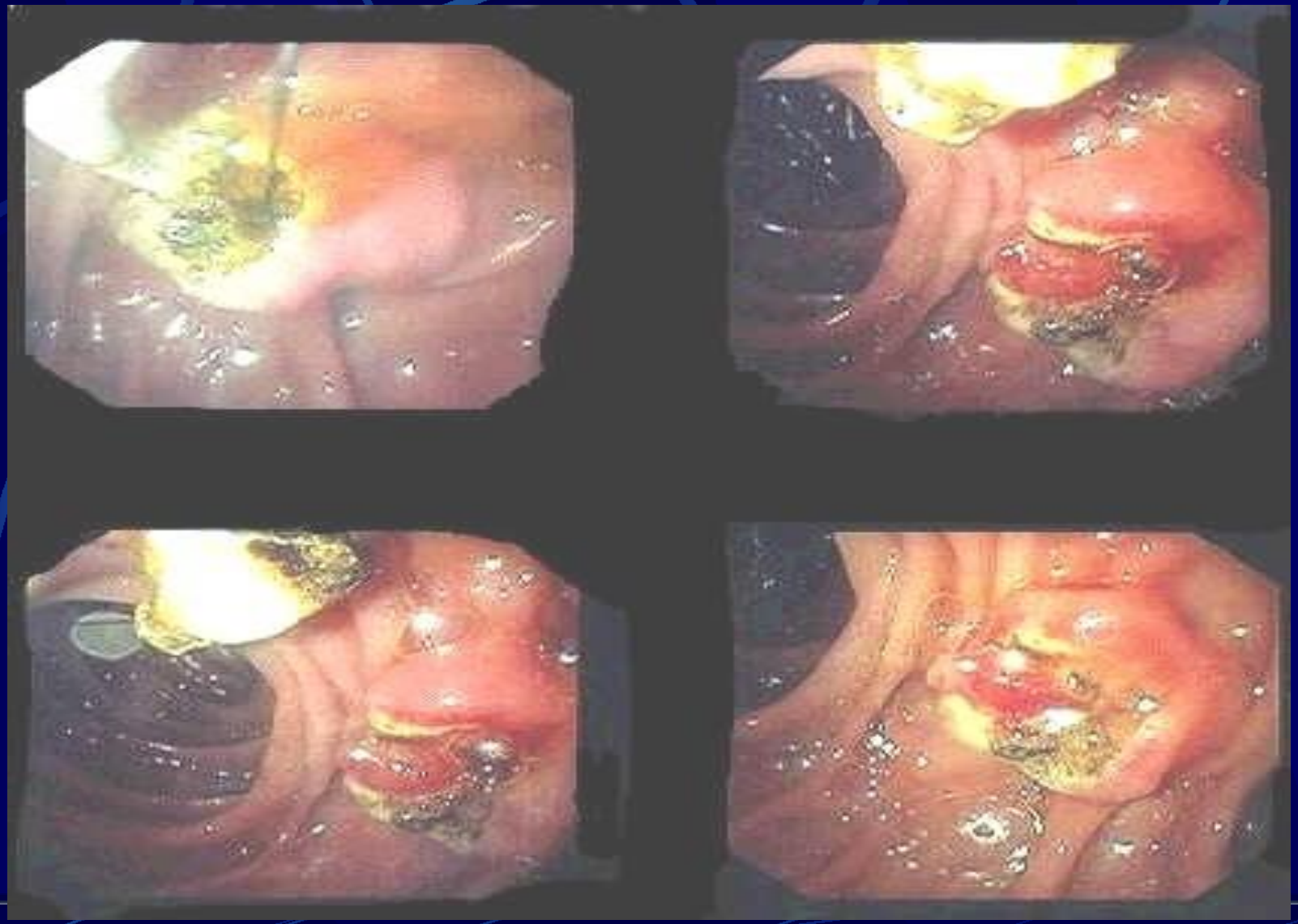
ERCP


Endoscope is inserted through the mouth into the duodenum


Liver
Endoscope
Biliary duct
Duodenum
Pancreatic duct
A.D.A.M.


Name
ID
Age 56y
07/03/01
10:07:22
Dr.
Facility

ERCP: periampullary tumor



Normal ERCP

ERCP: Stone in the CBD

Radionuclide scanning

- technetium iminodiacetic acid
- Taken up by hepatocytes and actively excreted into bile
- Allows imaging of biliary tree
- Failure to fill gallbladder = acute cholecystitis
- Delay of flow into duodenum = biliary obstruction

Percutaneous transhepatic cholangiogram **PTC**

- Sedative should be used
- The liver is punctured by **CHIBA** 22 needle to enter the intrahepatic bile duct system.
- An iodine-based contrast medium is injected into the biliary system and flows through the ducts.
- Obstruction can be identified on fluoroscopic monitor
- Pt should be covered by antibiotics.
- VitK or fresh plasma should be given

- **Indication:** failure of ERCP or in ability to detect proximal lesion

PTC

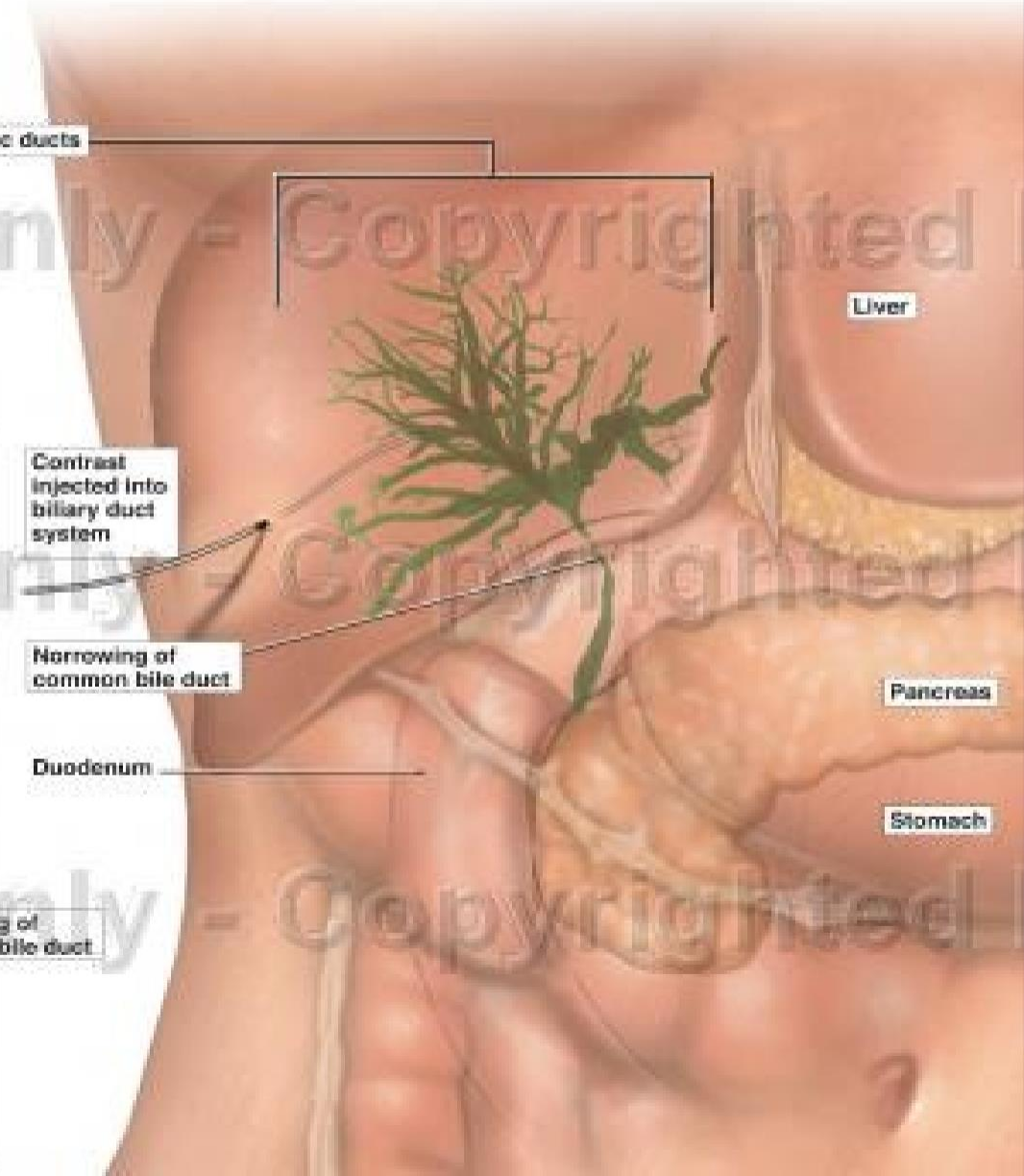
- **Complications**
- allergic reaction to the contrast medium,
- peritonitis with possible intraperitoneal hemorrhage, sepsis, cholangitis, subphrenic abscess
- lung collapse.

*Severe complications occur in approximately 3% of cases

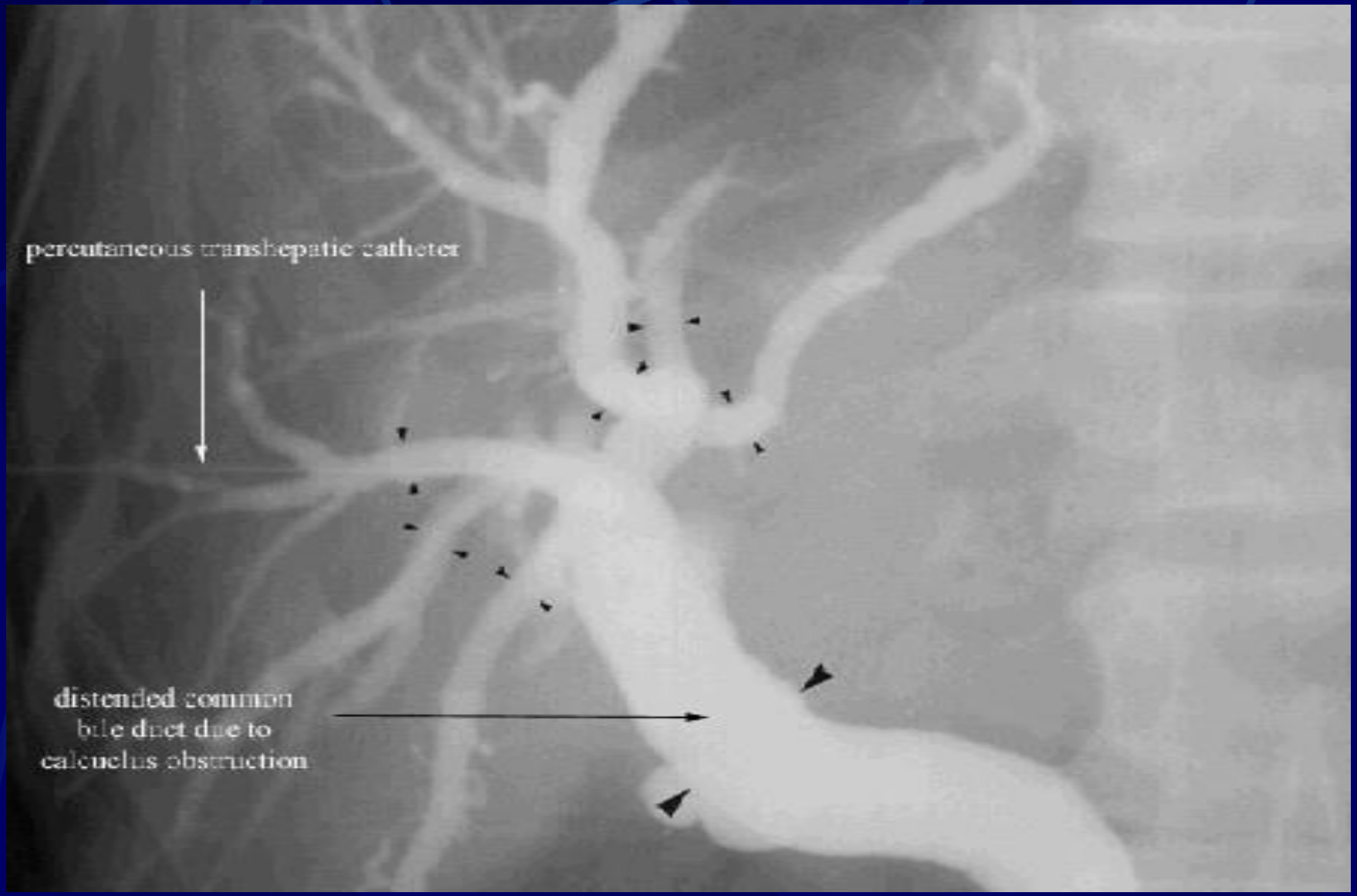
Percutaneous Transhepatic Cholangiogram

Area of Enlargement

Scan



PTC: stone in the CBD



Pre operative percutaneous transhepatic biliary drainage

Seldom used now hence :

- it increses the incidence of infection
- Excessive loss of bile

:Percutaneos insertion of endoprothesis

- Introduction of stent through gide wire
- Valiable methods in the palliative tretment
- in inoperable or incurable tumors

Interaoperative cholangiogram

*Replced by interaoperative flurocholangiogram

: **Advantage**

- Road map the biliary tree
- Indicate the need for exploration of the CBD
- Detects CBD damage interaoperatively
- Excludes anomalies of the biliary tree

Diadvantage:

Time consuming,

High false+ve results due to air pupples

Can cause hypersensetivity reaction & pancreatitis

:Types OF INTERAOPERATIVE CHOLANGIOGRAM

- Direct puncture to CBD
- Puncture to the GB=cholecystocholangeogram
- Transhepatic operative cholangeogram

Management of obstructive jaundice

General measures

- Detailed history
- Complete physical examination
- Proper investigations
- Guard against complications

Specific measures

Infections

- Normal bile is sterile

- Infection result from stasis & reduction in the immunity of the pt
- More common with ductal calculi than with malignint obstruction
- Usually due to aerobic bacteria,gram-ve bacilli
- Ranging from ascending colangitis up to septicaemia

C/F charcot’s traiad
(jaundice,fever with rigors &
abdomenal pain

RX use of prophylactic antibiotics(cephalosporins)* perioperatively

hrs after surgey reduced the incidence of 24 & infection

: Risk

•elderly pt

•stones in CBD

•after exploratoin of the CBD & Use of T-tube

- Bacteriological examination of bile should be done in every case as sepsis is common in an obstructed biliary tree.
- Large number of pathogenic bacteria can be isolated from the bile in 50% of the cases requiring surgery on the biliary tract
- Patients with biliary sepsis may develop clinical septicaemia before or after operation.

Coagulation disorders

Prolonged prothrombin time due to*

- Deficiency of Vit K
- **Rx:** iv use of vit k (10-20mg)
- Can be used to differentiate between intera & extera hepatic causes!!
- Adminestration of fresh frozen plasma is necessary pefor surgery

DIC :occurs in severly jaundice pt , due to circulating* endotoxins

Diagnosed by low fibrinogen & high FDP

RX treat infection

Give FFP +_ heparin

Renal failure

The undeline mechanism is poorly understood

- possibly due to endotoxaemia or
- reduced GFR

RX :

- Adequate hydration
- Use of diuretics at the induction
- Use of catheter
- Recently THE ADMINESTRATION OF ORAL LACTULOSE has been shown to reduced Post operative RF

HEPATIC ENCEPHALOPATHY

- Common in pt with :complete CBD obstruction
- Or those with pre-existing liver disease
- **RX** if the bilirubin is high or there is signs of impending liver failure ;period of decompresion is needed using endoprosthesis
- Correction of hpokalaemia,treat infection & restrect the use of sedatives
- External percutaneous decompression =predisose to infection & lead t loss of bile acid

Impaired drugs metabolism

- Metabolism of some drugs & anaeshtetic agents are affected eg MORFINE & HALOTHANE
- Due to hepatocytes malfunction

Wound healing

Obstructive jaundice doesn’t affect wound healing

It is usually depend on the under line cause of jaundice .& poor nutrition

Electrolytes imbalance

- Hyponatraemia & hypokalaemia
- But Iv normal saline should be restricted
- The total body Na is raised

Specific measure

:According to the under line cause

- **DUCTAL CALCULI**
- **Tumor of the pancrease**
- **Chronic pancreatitis**
- **CBD strictures**
- **Tumor of the biliary system**

Drug induced jaundice

- Common drug used in surgical practice is HALOTHANE

IT causes severe hepatotoxicity

- Especially in pt with:
- compromised liver function or
- Repeated exposure within 4wks

Prevention:

- careful history from any pt
- Repeated exposure should be avoided
- Unexplained jaundice or pyrexia following halothane is an absolute contraindication

Common drugs induced jaundice

Category	**Example**	**Mechanism**
Antibiotic	Teteracyline	Fatty infiltration dose related
	Penicillins	Hepatitis esp in hypersensitivity
Analgesics	Paracetmol	Massive liver necrosis dose dependent
	Aspirin	Focal hepatic necrois
Anesthetics	Halothane	Hepatitis massive necrosis

Management of postoperative jaundice

- Careful history (nature of jaundice & underline cause)
- Proper physical examination
- Revision of the pre operative investigations especially liver function test
- Perform serum bilirubin & urinalysis
- Assess drugs & anesthetics used during the operation
- Withdrawal all hepatotoxic drugs
- If the pt is febrile consider him as having septicaemia

In the absence of obvious cause and the MRCP or ERCP confirm the integrity of the biliary system , serial LFTs should be done to asses the course of the illnes

If no no obvious cause is detctected clinically radiolgically or through biochemical investigation **LIVER BIOBSY SHUOLD BE CONSIDERD**


THANKS