

# Jaundice and Hepatobiliary Diseases

**Dr Allan HK Lam**

Division of Hepatobiliary & Pancreatic Surgery

Division of Liver Transplantation

Department of Surgery

The University of Hong Kong

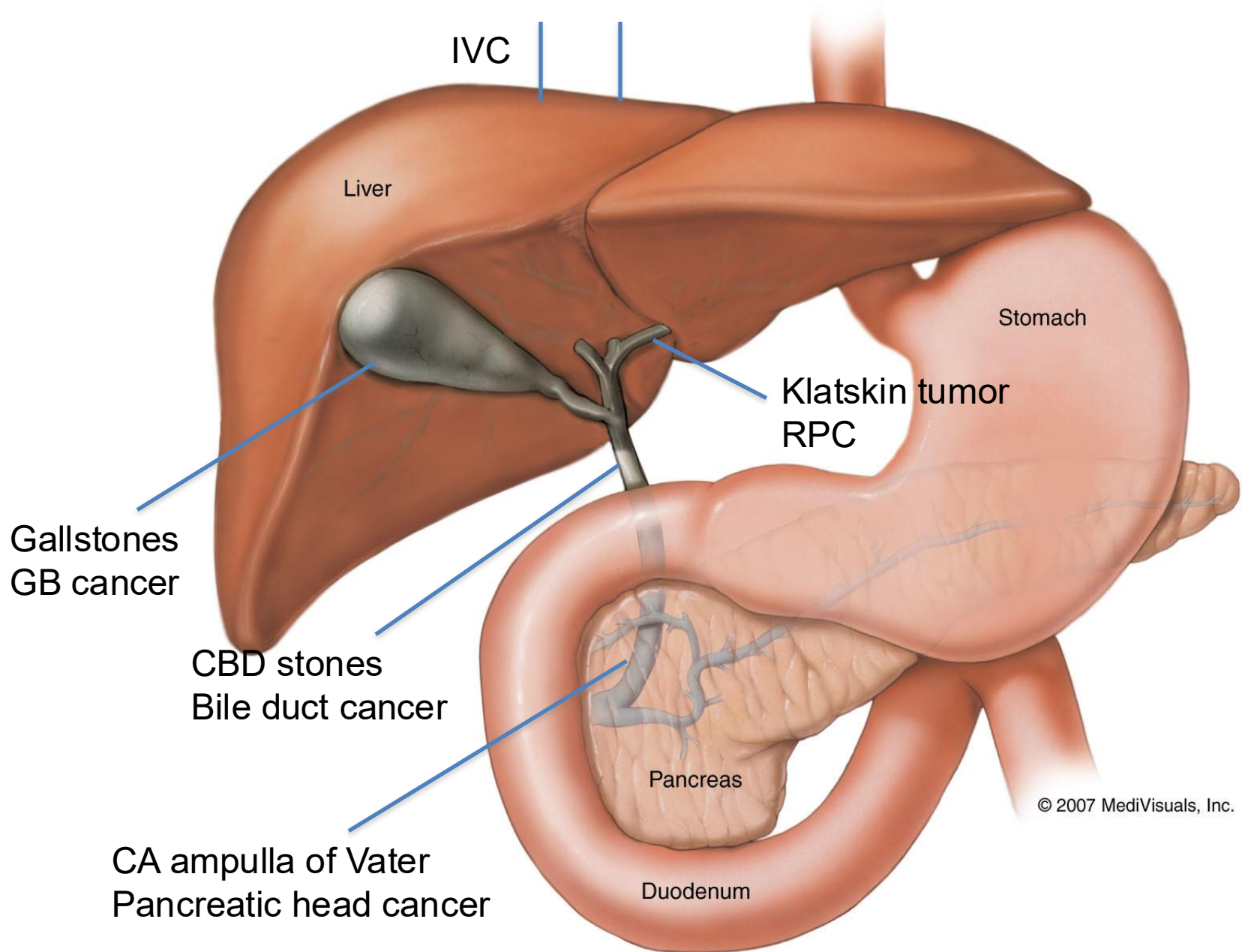
# Jaundice

- Yellow discoloration of the skin due to high serum bilirubin level

# Causes

- Pre-hepatic
  - Budd Chiari, suprahepatic IVC obstruction, cardiac causes
- Hepatic
  - Hepatitis (viral, drug, herbal medicine, autoimmune)
- Post-hepatic
  - CBD obstruction

# Ductal Anatomy of Liver and Pancreas



# Gallstones

- Gallstones are hard, pebble-like deposits that form inside the gallbladder. Gallstones may be as small as a grain of sand or as large as a golf ball.



# Epidemiology of gallstones

- 12% men
- 24% women
- 10-30% symptomatic

# Types of gallstones

- Cholesterol stones
  - Most common type of stones
- Pigment stones
  - Made from too much bilirubin in bile

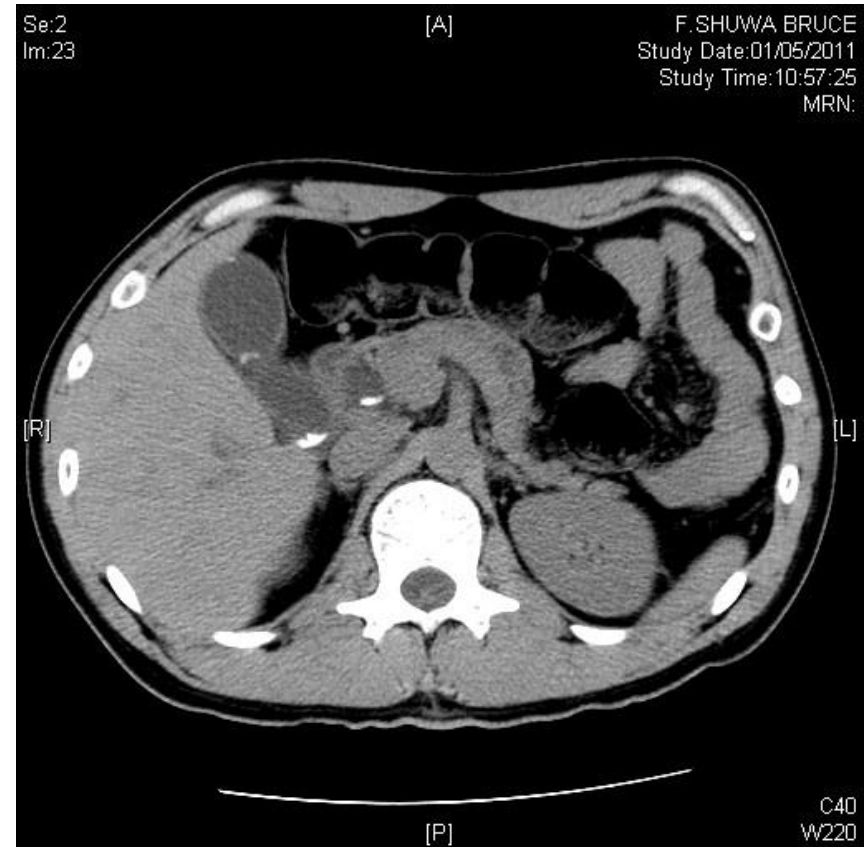
# Risk factors for gallstones

- Females, middle age, obesity
- Failure to empty bile from gallbladder
  - Pregnancy
  - Previous gastrectomy
- Liver cirrhosis
- Haemolytic anaemia, haemolytic disorders
- Diabetes mellitus
- Bone marrow transplant/solid organ transplant
- On long-term parenteral nutrition



# Investigations

- Liver ultrasonography
- CT scan



# Management

- Laparoscopic cholecystectomy
  - 4 ports
  - Single port
- Percutaneous transhepatic cholecystostomy

# Complications

- Acute cholangitis
- Acute pancreatitis
- Empyema of gallbladder
- Gallbladder gangrene
- Mucocele of gallbladder
- Choledochoduodenal fistula

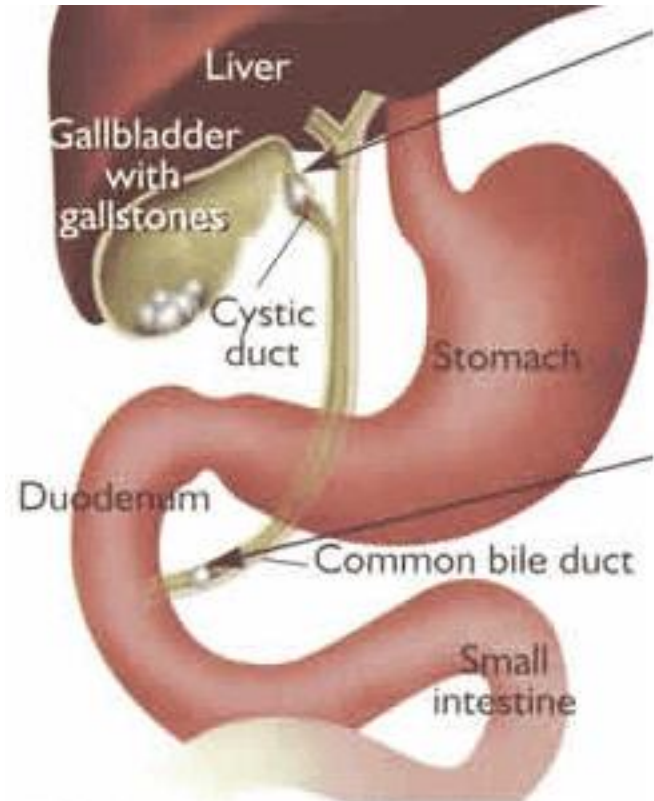


Illustration courtesy of RACS(Royal Australasian College of Surgeons) and Mi-tec Medical Publishing

# Acute cholangitis

- Infection of the biliary tract due to bile flow obstruction
- Charcot's triad
  - Fever
  - Jaundice
  - Abdominal pain

# Investigations

- Blood tests
  - Complete blood profile
  - Renal and liver function tests
  - Coagulation profile, type and screen
- Microbiology
  - Blood culture and sensitivity

# Imagings

- Liver ultrasonography
  - Bile duct diameter
  - Presence of stones
  - Liver abscess
- CT scan

# Treatment

- Endoscopy
  - Endoscopic retrograde cholangiopancreatography (ERCP)
- Surgical
  - Exploration of common bile duct
- Radiological
  - Percutaneous transhepatic biliary drainage

# Acute pancreatitis

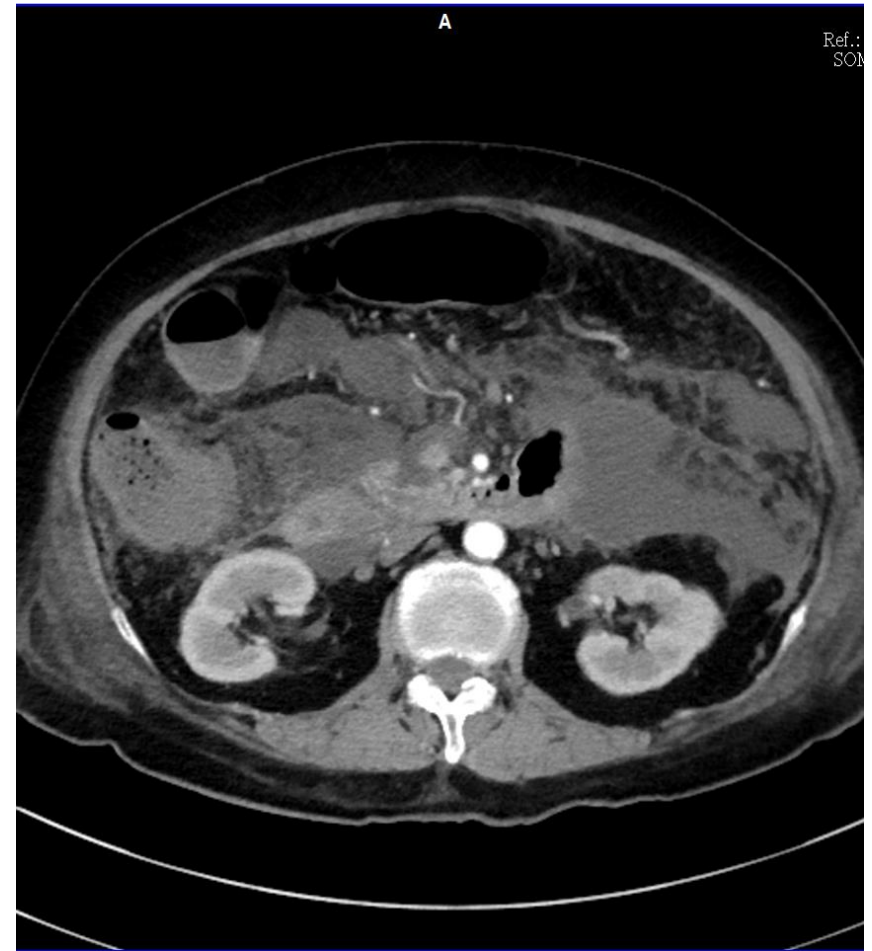
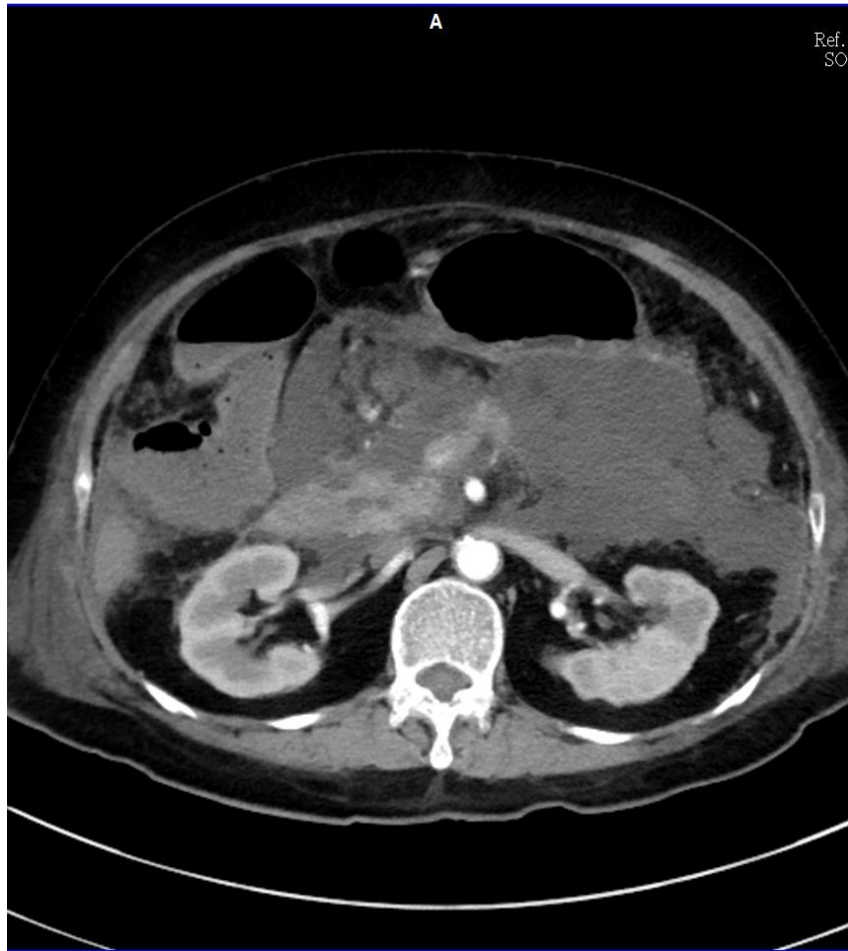
- Characterised by sudden onset epigastric pain with radiation to the back
- Usually associated with nausea and vomiting
- High fever not a common symptom but when it occurs, it often implies complications have already arisen
- The pain is so severe than it could mimic signs of generalised peritonitis due to perforated viscus



# Complications of acute pancreatitis

- Pseudocyst
- Infected pseudocyst
- Necrotising pancreatitis
- Haemorrhagic pancreatitis
- Pleural effusion
- Ascites
- Splenic vein thrombosis

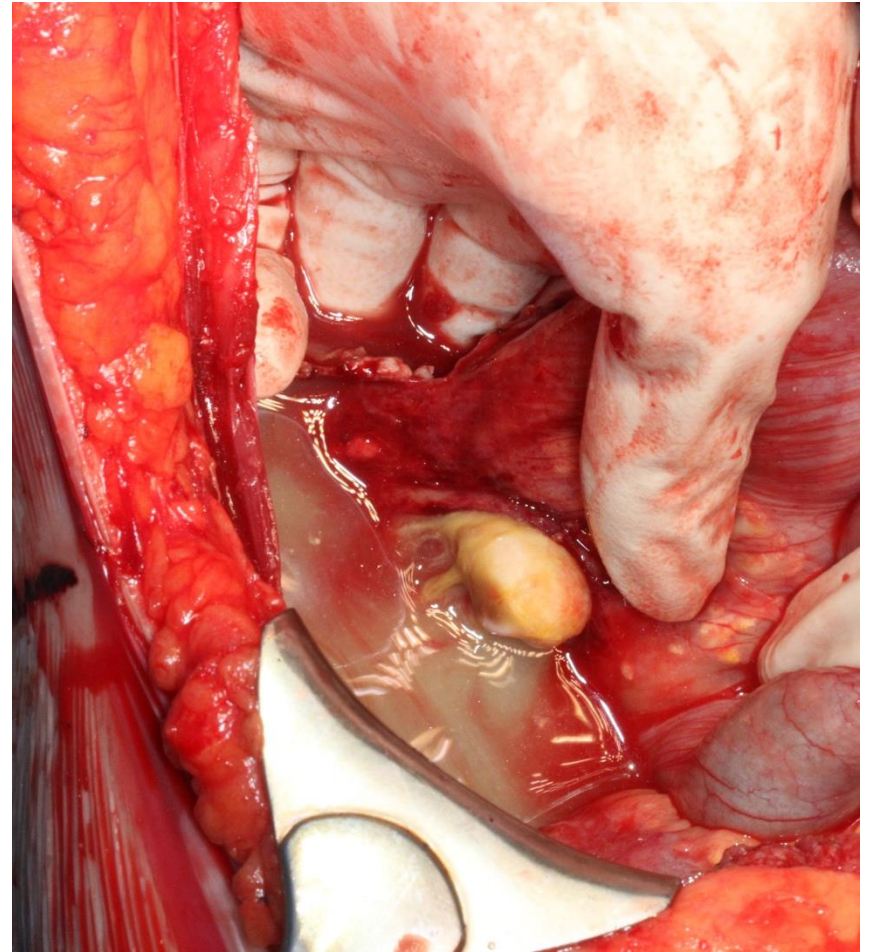
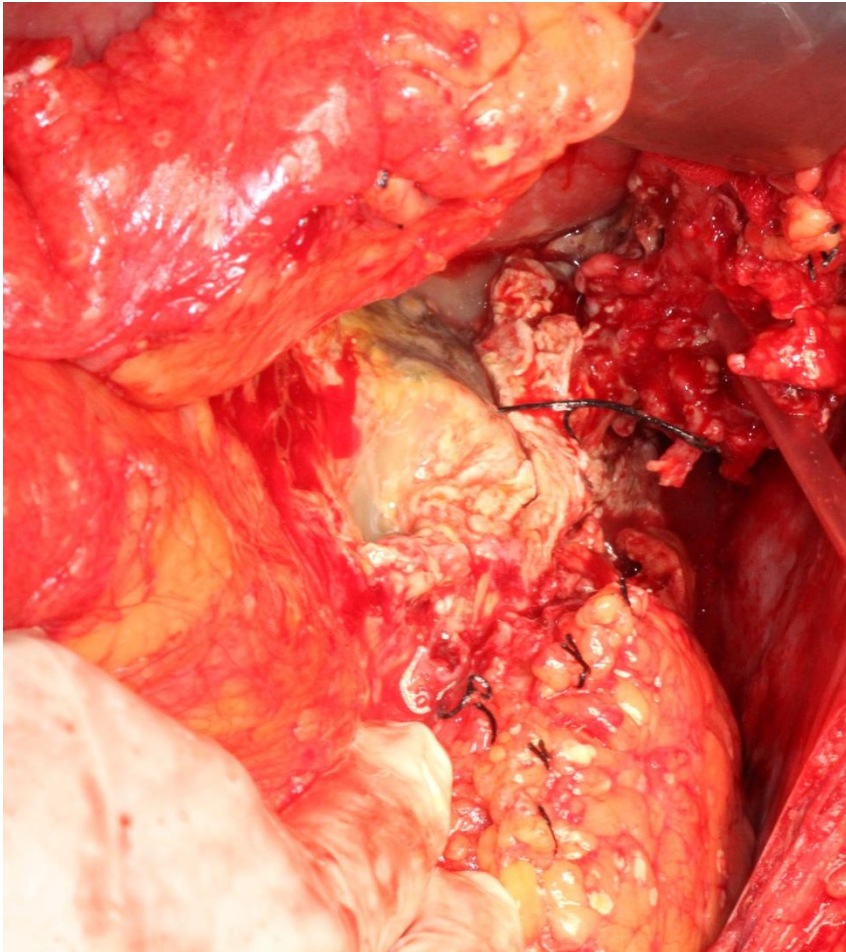
# Necrotising pancreatitis



# Treatment

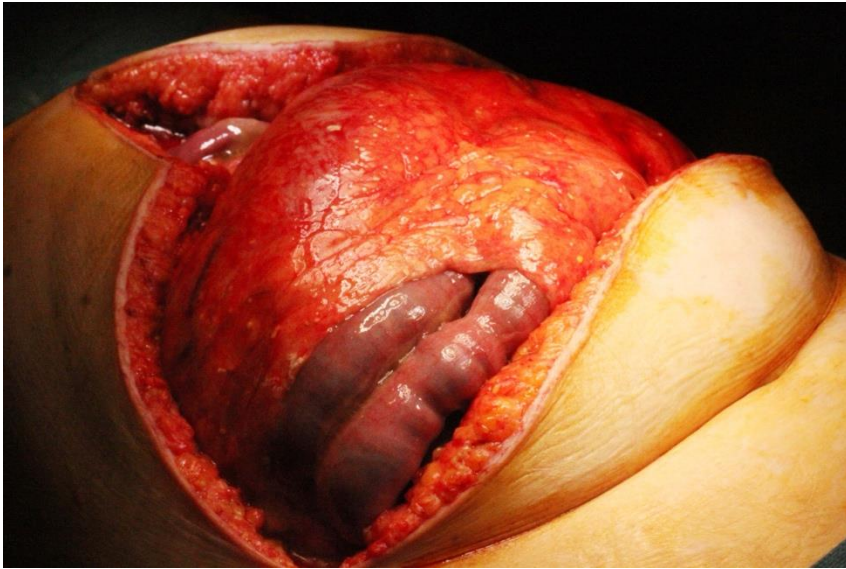
- Conservative treatment with nutritional support and intravenous antibiotics
- Indication for necrosectomy if clinical deterioration or evidence of infected necrosis
- Approach for necrosectomy
  - Endoscopic
  - Open approach

# Pancreatic necrosectomy

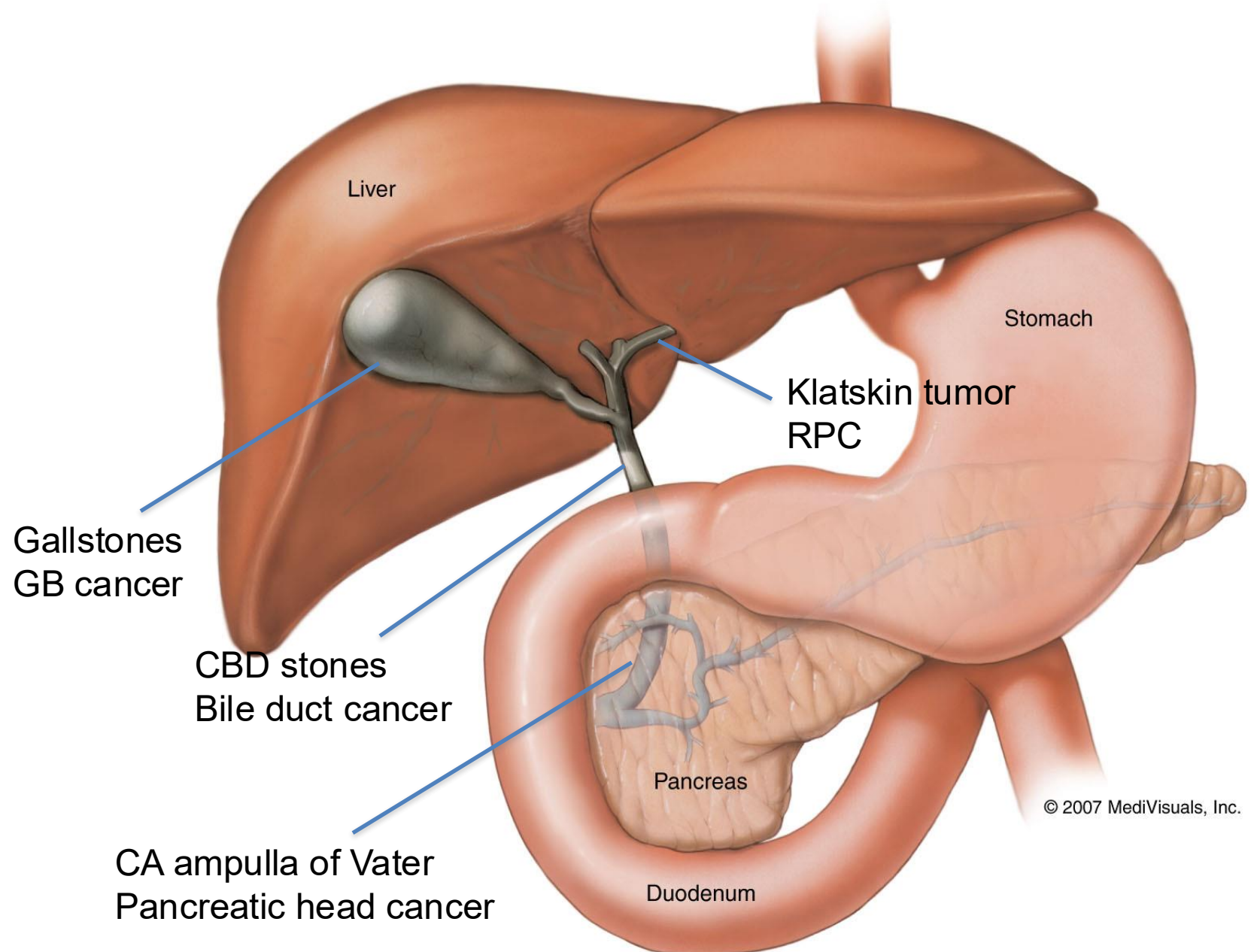




# 2<sup>nd</sup> look laparotomy



# Ductal Anatomy of Liver and Pancreas



# Cholangiocarcinoma

- 2% of all cancers
- Advanced age is a risk factor
- Peak incidence: age 70-80



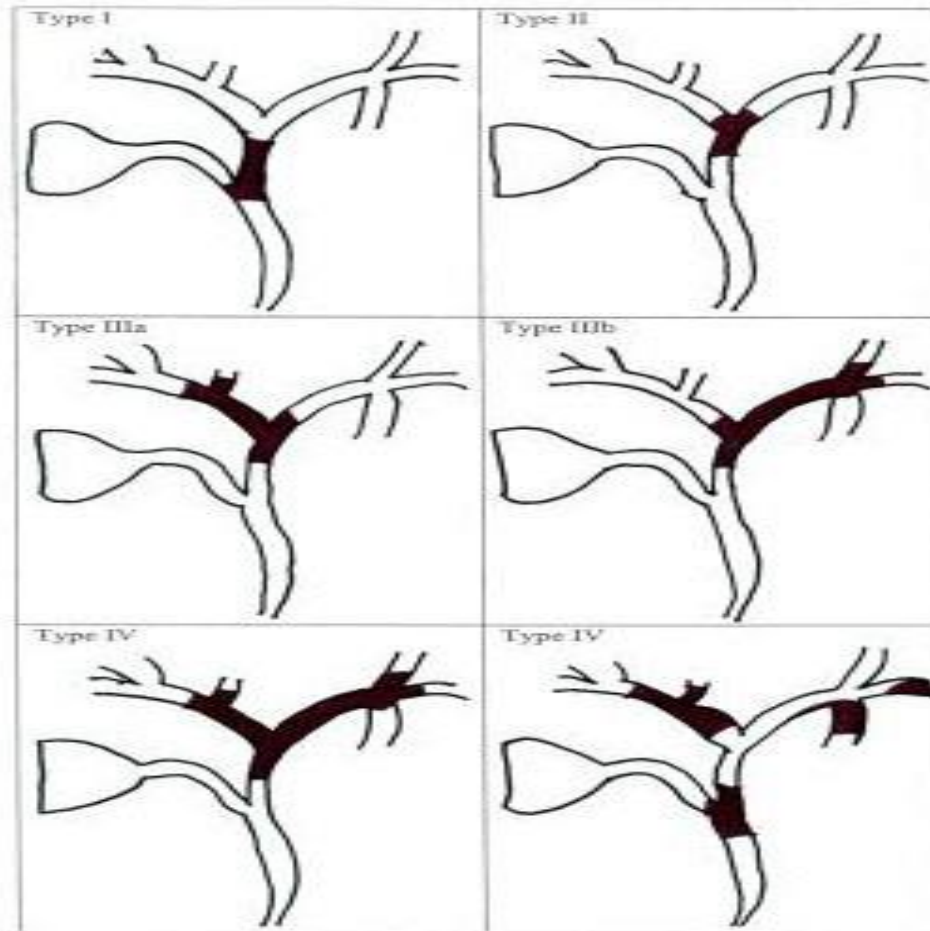
# Clinical presentation

- Painless jaundice
- Weight loss
- Loss of appetite
- Fever





# Bismuth classification

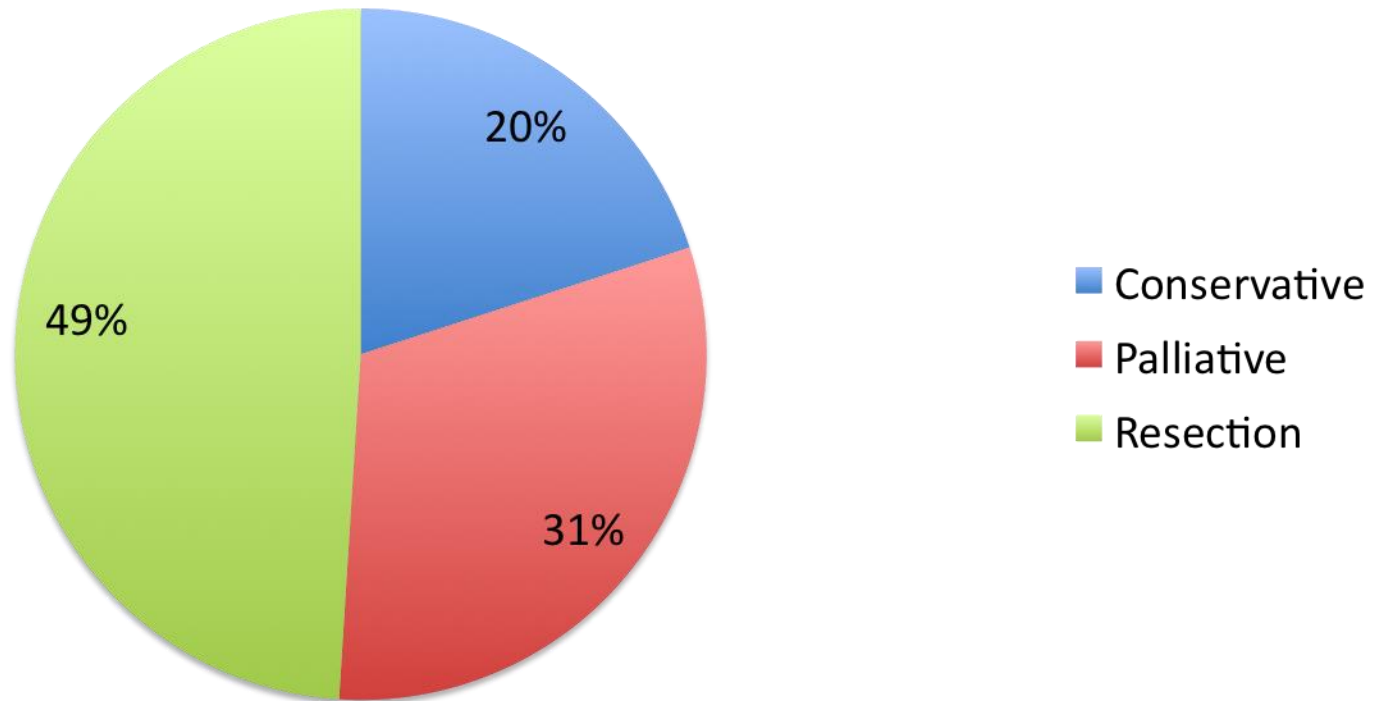


# Treatment

- Curative
  - Hepatectomy + bile duct excision + hilar lymph node clearance + bile duct reconstruction
- Palliative
  - Radiotherapy
  - Chemotherapy
  - Metallic stenting/Surgical bypass

# Queen Mary Experience

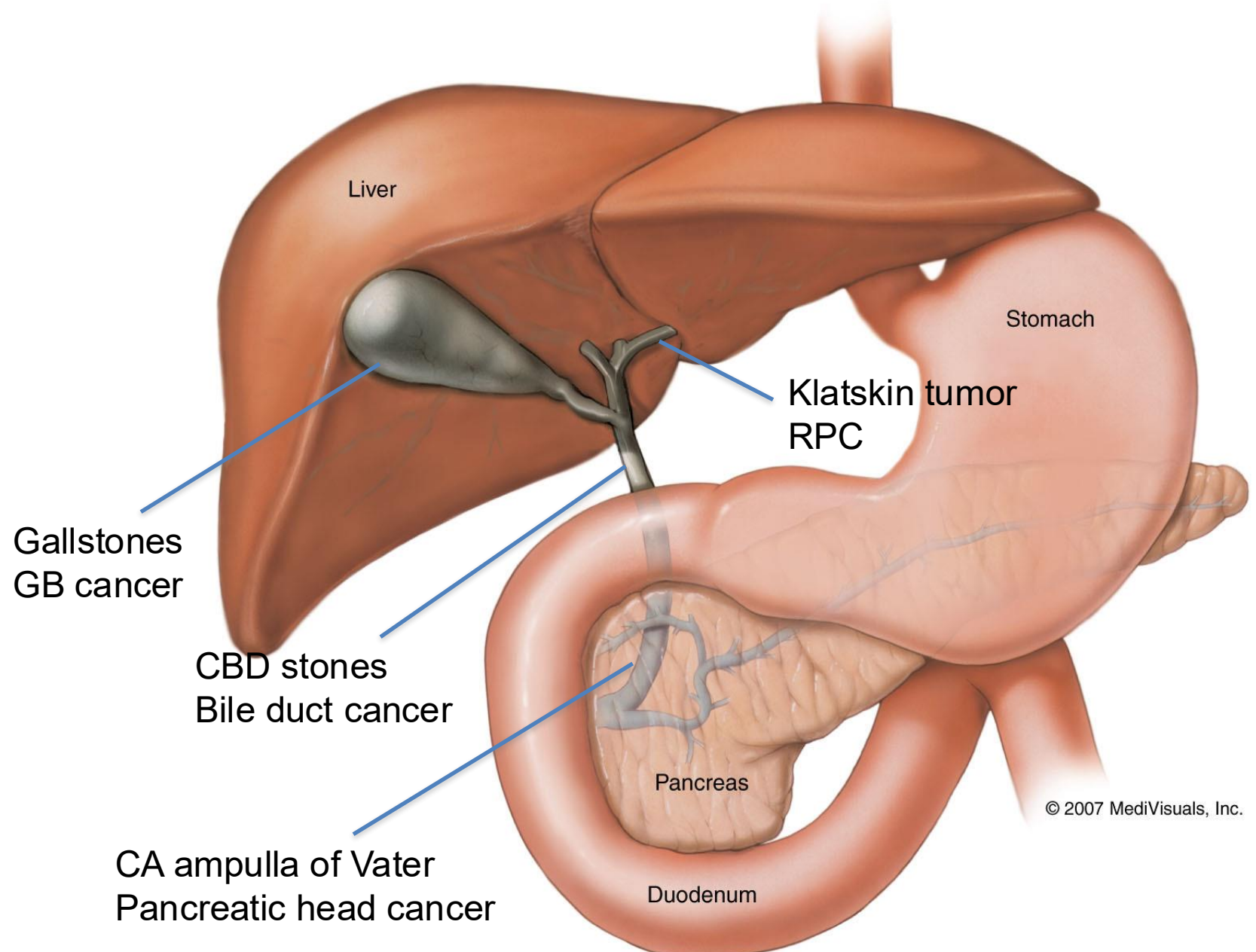
Choice of treatment



# Treatment outcome

- 1-year survival: 60.3%
- 3-year survival: 29.4%
- 5-year survival: 22.0%

# Ductal Anatomy of Liver and Pancreas



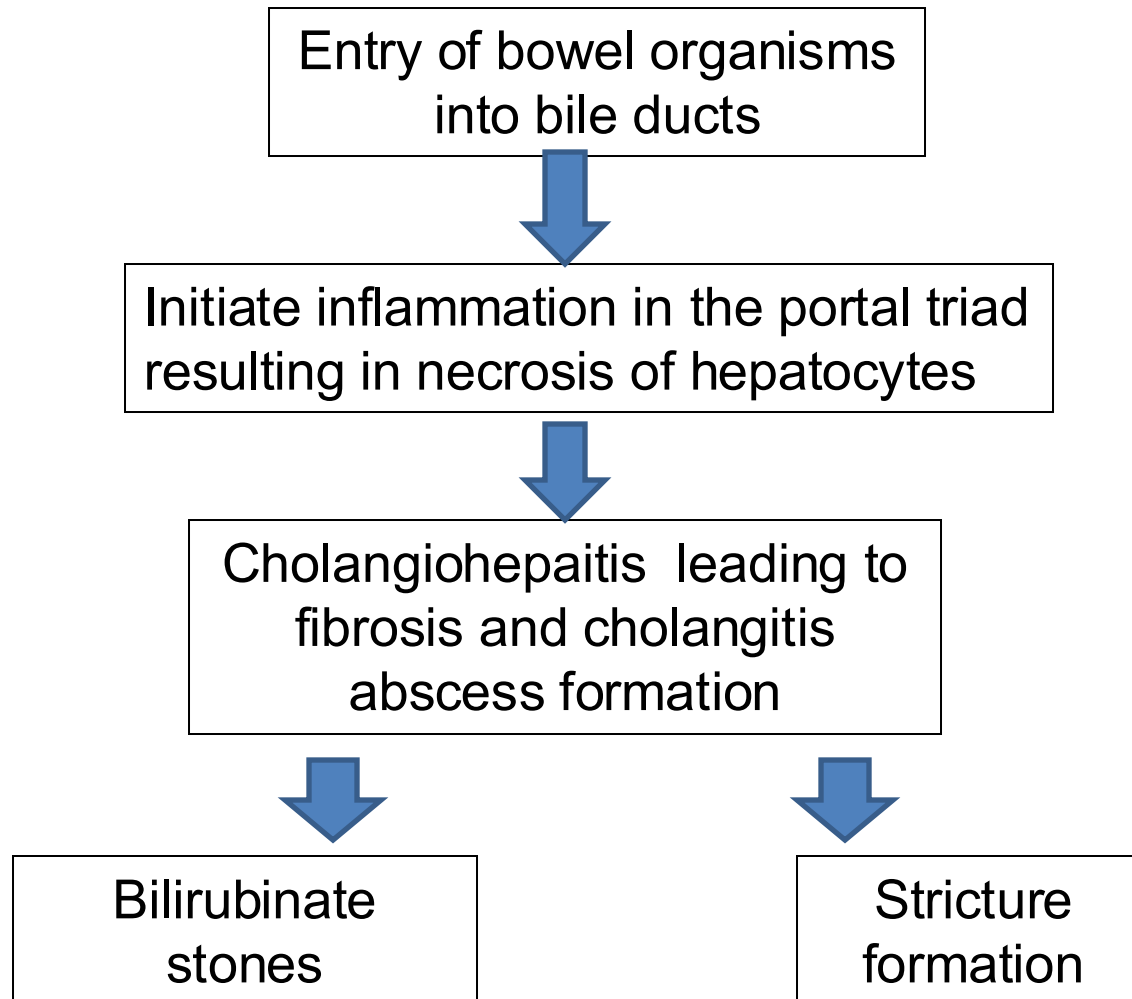
# Recurrent Pyogenic Cholangitis

*‘characterised by repeated attacks of bacterial infection of the biliary tract as a result of stones and strictures in the bile ducts, especially in the intrahepatic segments’*

# Eastern and Western perspectives

- Rare in western countries
- Increased incidence in Asian migrants
- Common in South East Asia
- Young and lower socio-economic groups
- No gender preponderance

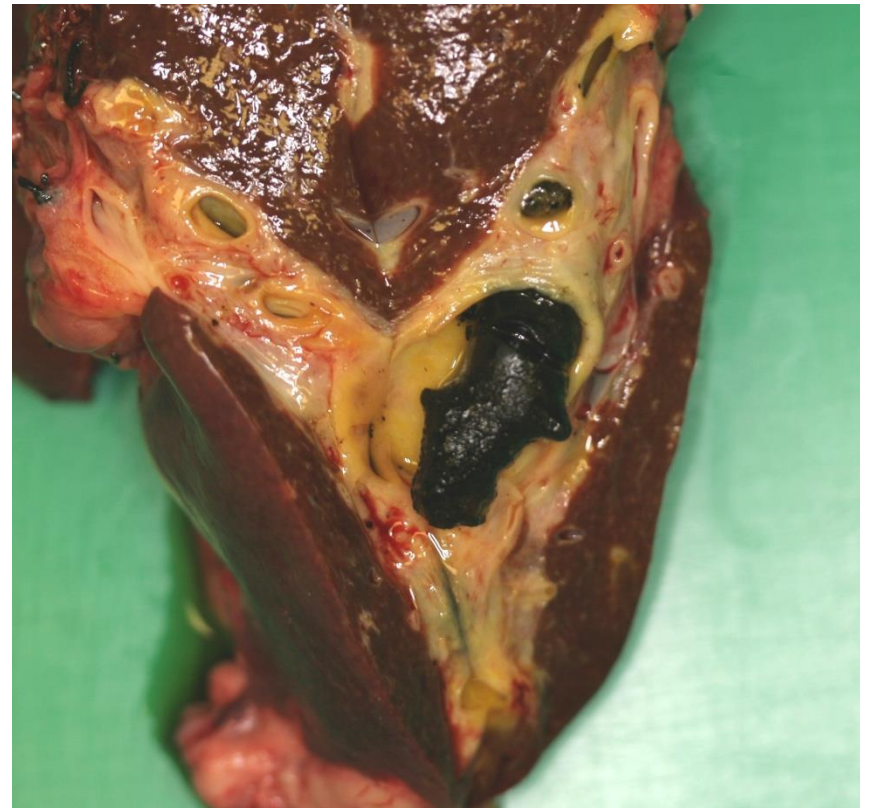
# Pathogenesis





# Characteristics of RPC

- Infection
- Stricture formation
- Stone formation



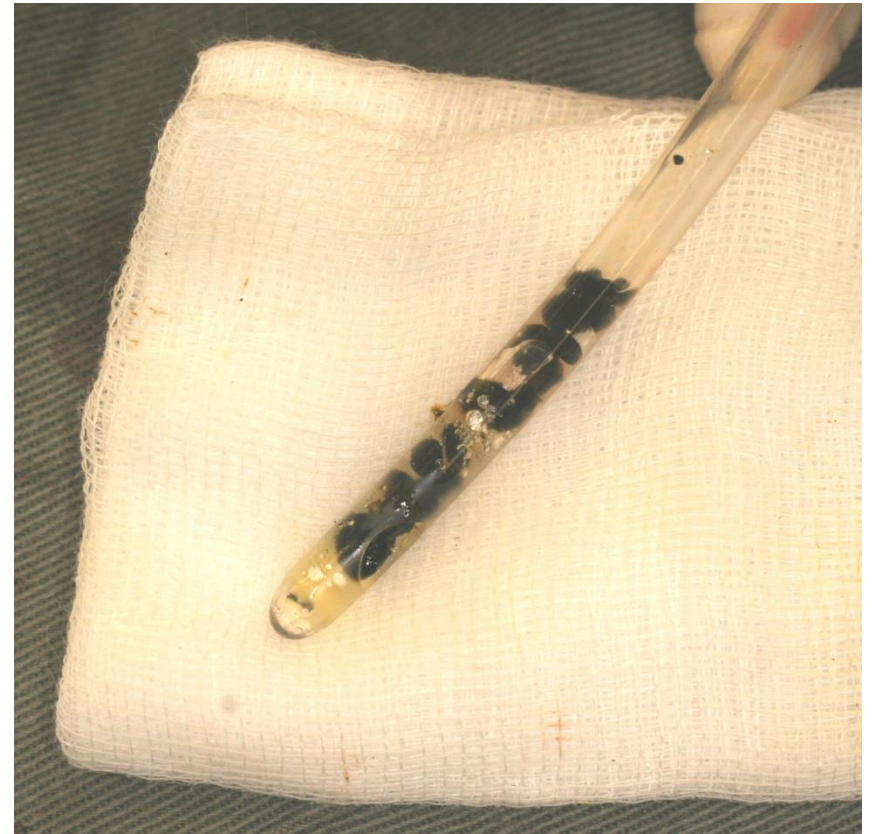
# Causative organism

- Clonorchis sinensis
  - Liver fluke
  - flatworm



# Stones in RPC

- Bilirubinate stones
- Infected bile becomes an insoluble precipitate from a supersaturated solution



# Stricture formation

- More common in left main hepatic duct or segmental ducts
- Stricture in the main duct usually short-segment
- Intrahepatic strictures usually long-segment
- Proximal dilatations behind the strictures

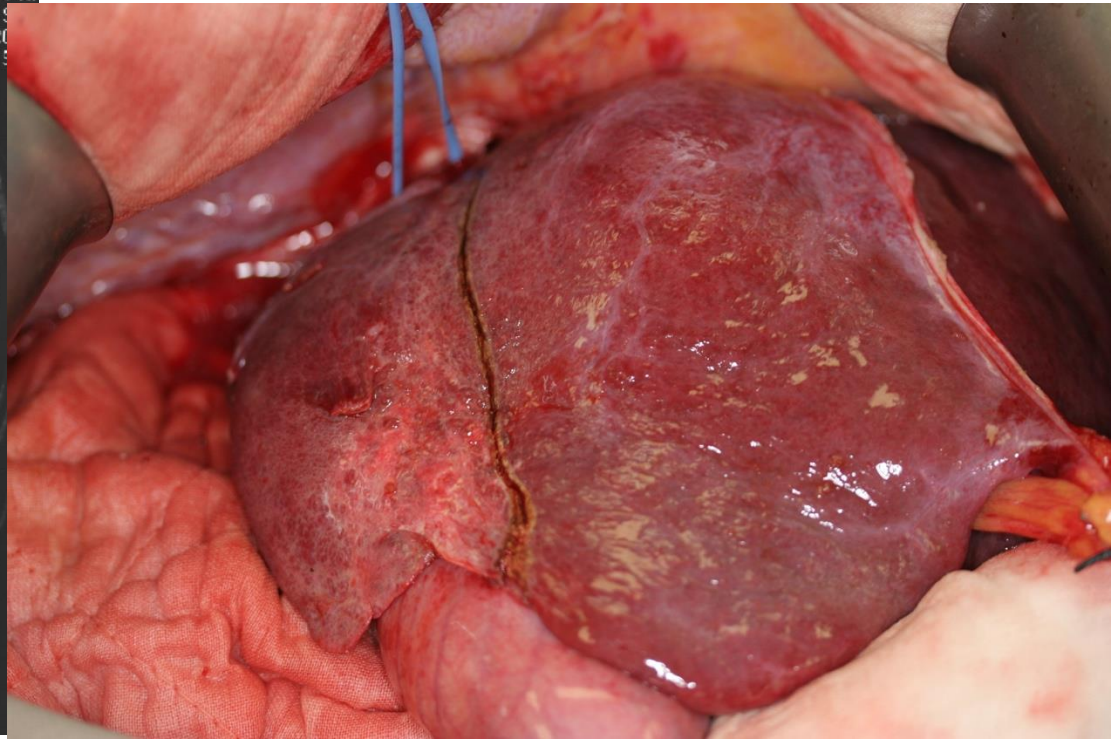
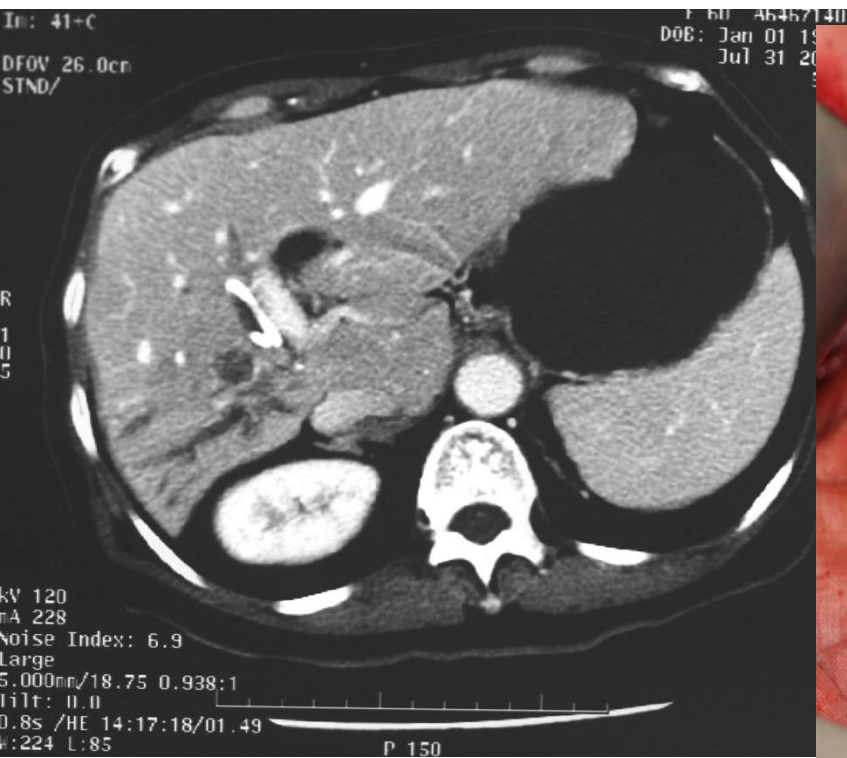
# Clinical presentation

- Pain
- Fever
- Jaundice

# Investigations

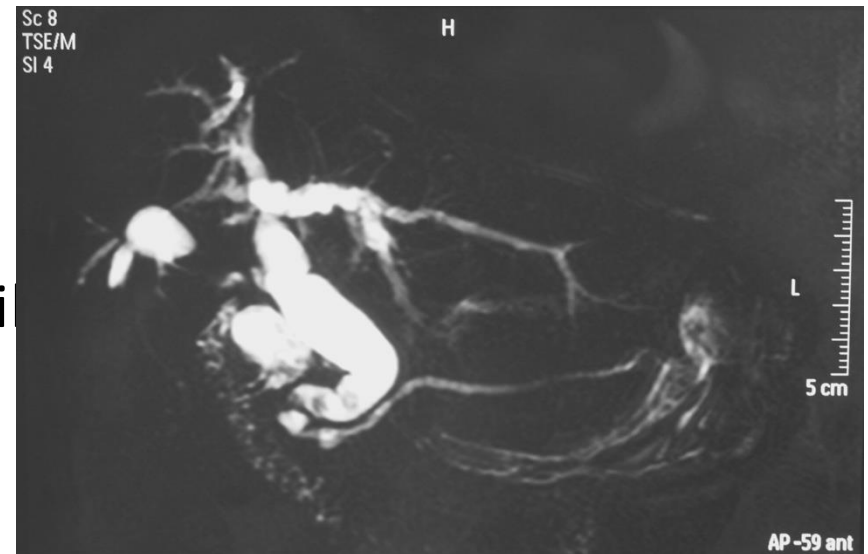
- Liver ultrasonography
- Computer tomography
- Magnetic resonance imaging
- Endoscopic retrograde  
pancreatocholangiography
- Percutaneous transhepatic cholangiogram

# CT scan



# MRI

- Enhancement of ductal walls on contrast enhanced T1 weighted images
- On T2 weight images
  - Bile – high intensity signal
  - Stones – signal void
  - Good for showing ductal di





# ERCP

WU, CHIU MUI, C0773040, 1/1/1941, F  
Run 1 - Frame 1 / 1

Queen Mary Hospital  
74kV, mAs, 140mA, 50s  
Zoom 60%



SID 102 mm

L 129  
W 133

4:46 PM  
7/27/2009

WU, CHIU MUI, C0773040, 1/1/1941, F  
Run 1 - Frame 1 / 1

Queen Mary Hospital  
74kV, mAs, 140mA, 50s  
Zoom 60%



SID 102 mm

L 115  
W 134

4:54 PM  
7/27/2009

WU, CHIU MUI, C0773040, 1/1/1941, F  
Run 1 - Frame 1 / 1

Queen Mary Hospital  
77kV, mAs, 180mA, 52s  
Zoom 80%



SID 102 mm

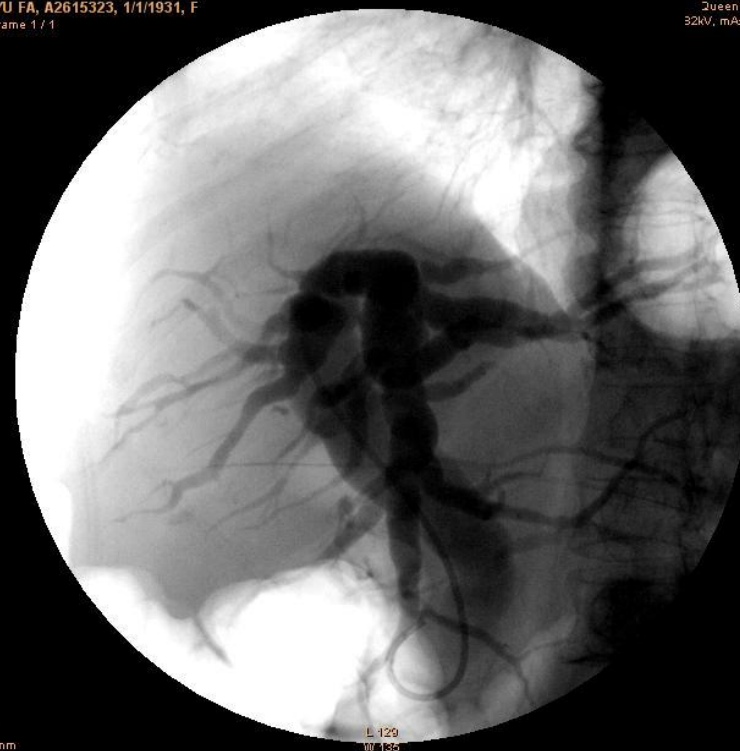
L 117  
WV 135

5:34 PM  
7/27/2009

SHUM, YU FA, A2615323, 1/1/1931, F  
Run 1 - Frame 1 / 1

Queen Mary Hospital SHUM, YU FA, A2615323, 1/1/1931, F  
34kV, mAs, 140mA, 5 Run 1 - Frame 1 / 1  
Zoom 60%

Queen Mary Hospital  
32kV, mAs, 140mA, 50s  
Zoom 60%



SID 105 mm

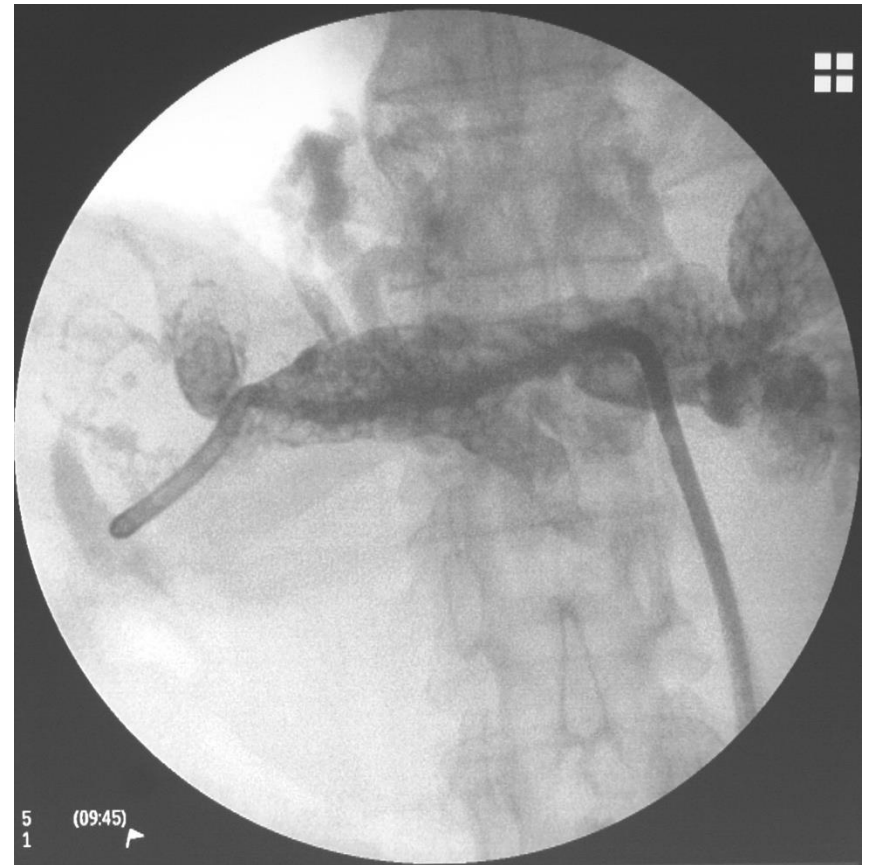
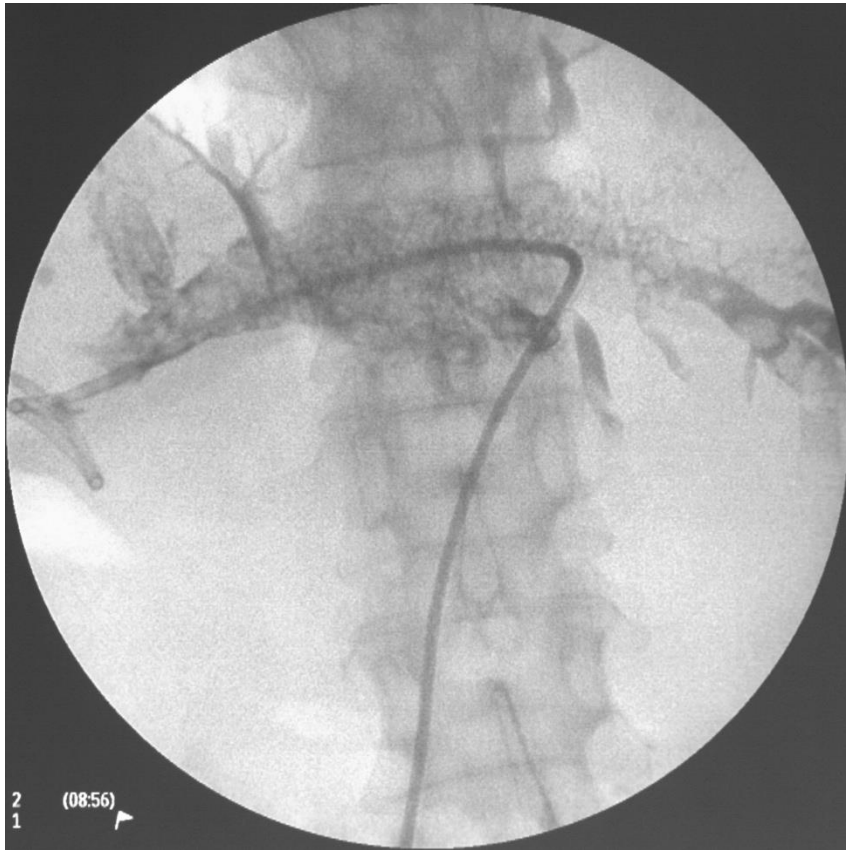
L 129  
W 135

3:19 F SID 105 mm  
3/1/2009

L 129  
W 135

3:37 PM  
3/1/2009

# PTC



# Clinical management

- Acute attack
- Definite treatment

# Acute attack

- Most resolved with intravenous antibiotics, rehydration, and analgesics
- Common pathogens
  - *Escherichia coli*
  - *Klebsiella* spp
  - *Pseudomonas*
  - Anaerobes

# Acute attack

- Conservative treatment only successful in 30% cases
- Fluid resuscitation and intravenous antibiotics
- Urgent biliary decompression
  - Radiologically
  - Endoscopically
  - Laparotomy

# Non-operative approach

- ERCP + insertion of endoprosthesis





# Operative approach

- Exploration of common bile duct
- Drainage of pus and infected bile
- Removal of stones within common bile duct

# Definitive treatment - objectives

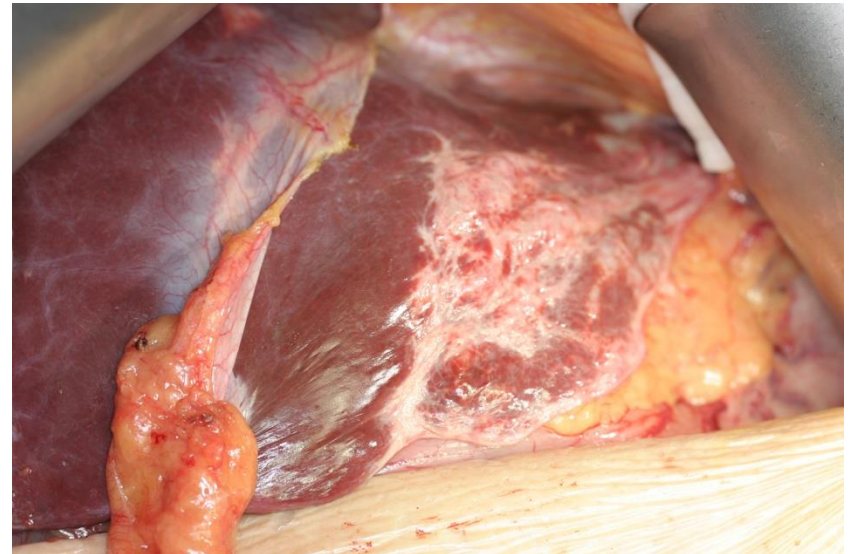
- To remove biliary ductal stones
- To enlarge or bypass strictures
- To provide adequate biliary drainage
- To provide permanent percutaneous access to the biliary tract

# Surgical options

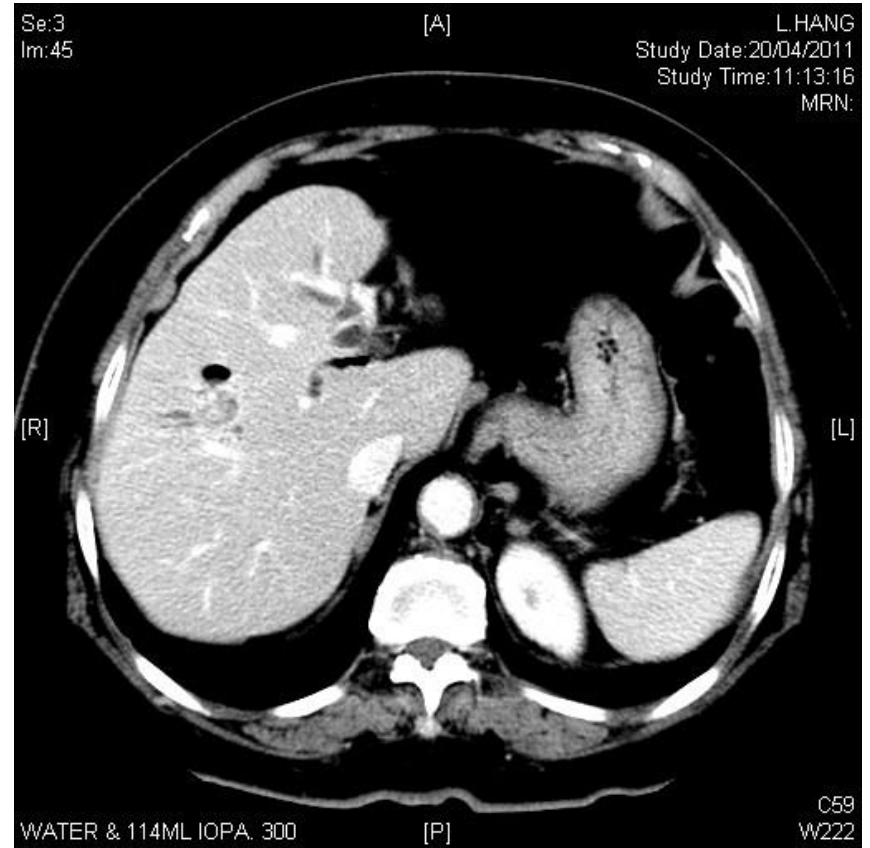
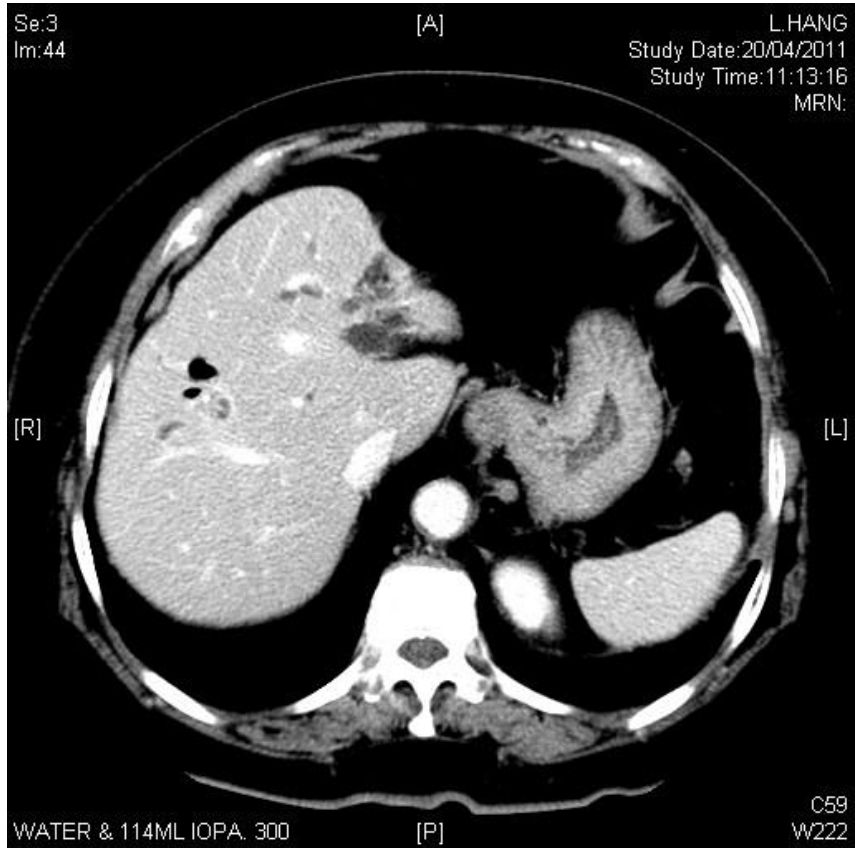
- Hepaticojejunostomy
  - Allow passage of bile, sludges and stones into small bowel
- Hepaticojejunostomy with a cutaneous stoma  
i.e. hepaticocutaneous jejunostomy
  - Provides a percutaneous route for future stone removal via choledoscopy

# Hepatectomy

- For destroyed liver segment
- Intrahepatic strictures and stones
- Multiple liver abscess
- cholangiocarcinoma



# Female, age 75



Se:1  
Im:1

L.HANG Se:5  
Study Date:30/07/2011 Im:1  
Study Time:10:39:51  
MRN:



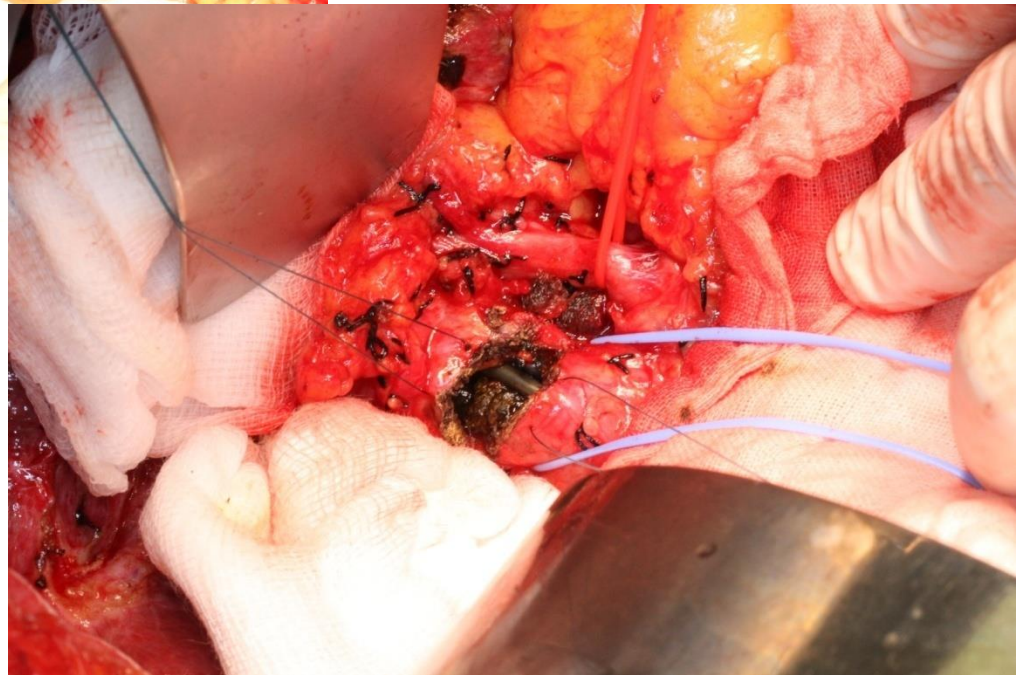
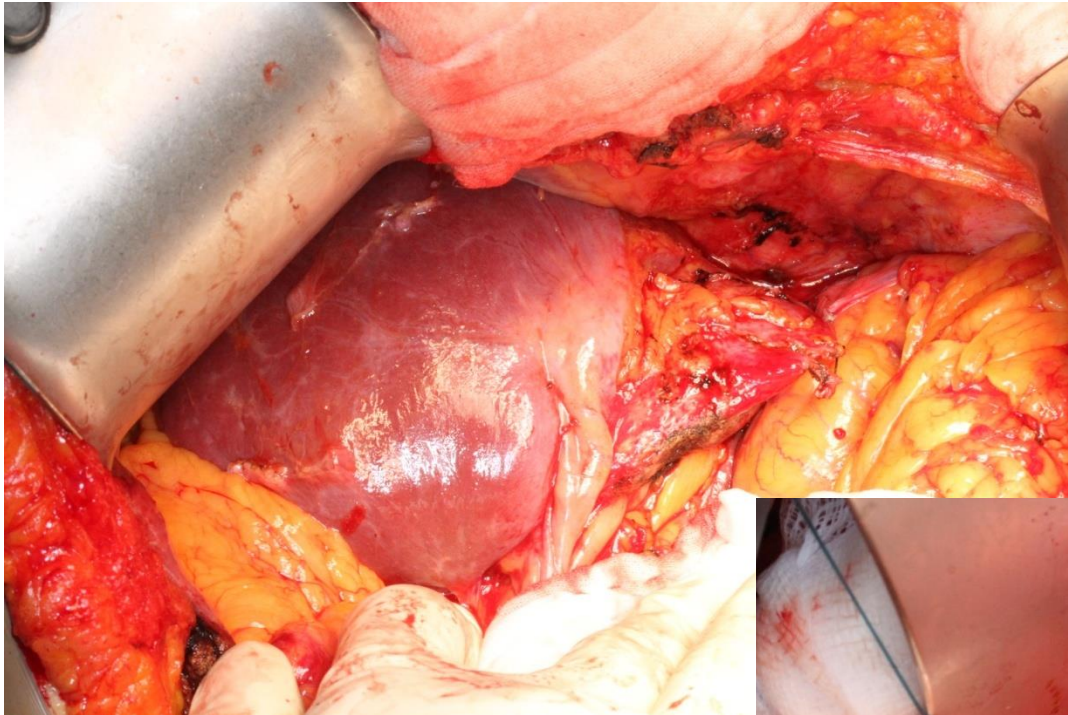
C122  
W254

L.HANG  
Study Date:30/07/2011  
Study Time:10:39:51  
MRN:



C125  
W256

# Exploration of CBD and bile duct excision

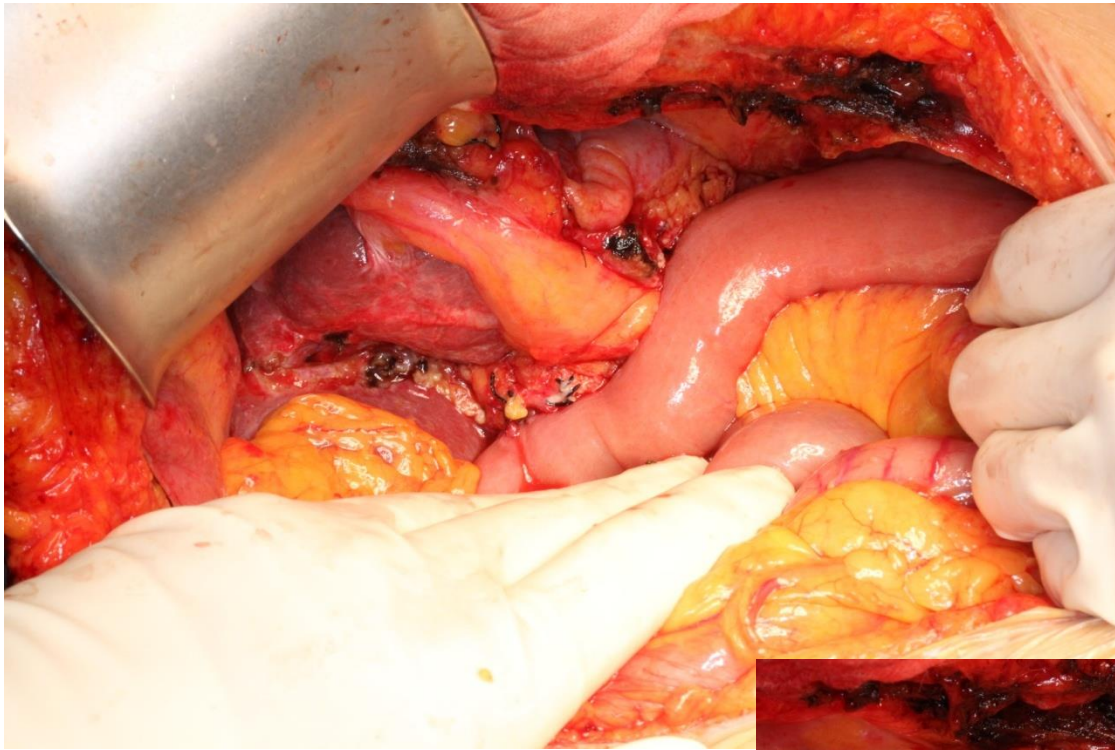




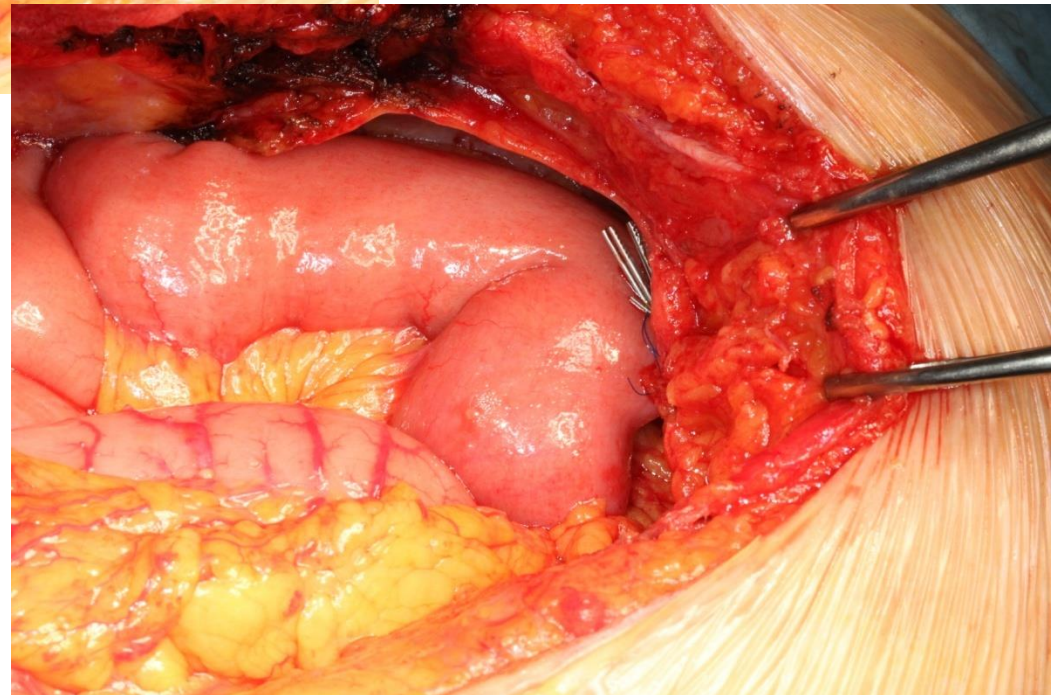
# Fiber-optic choledochoscopy

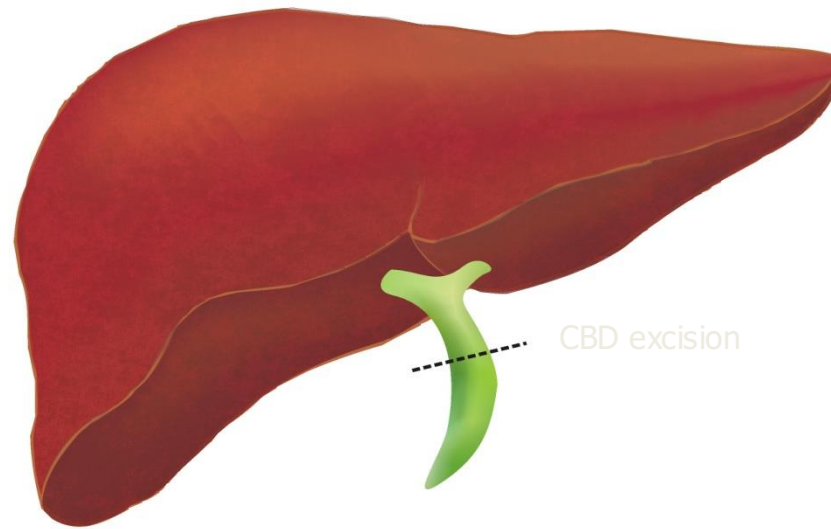






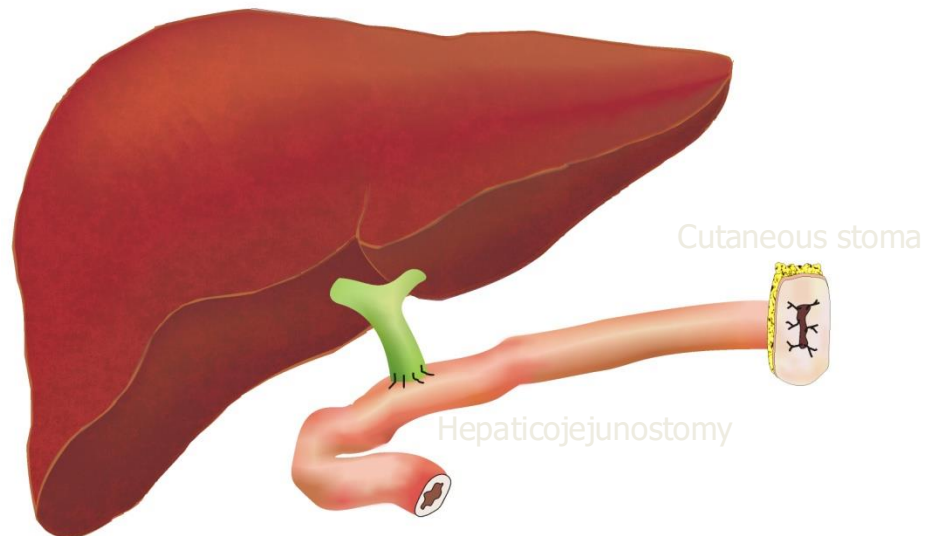
Hepatico-cutaneous  
jejunostomy





CBD excision

## Hepatiojejunostomy



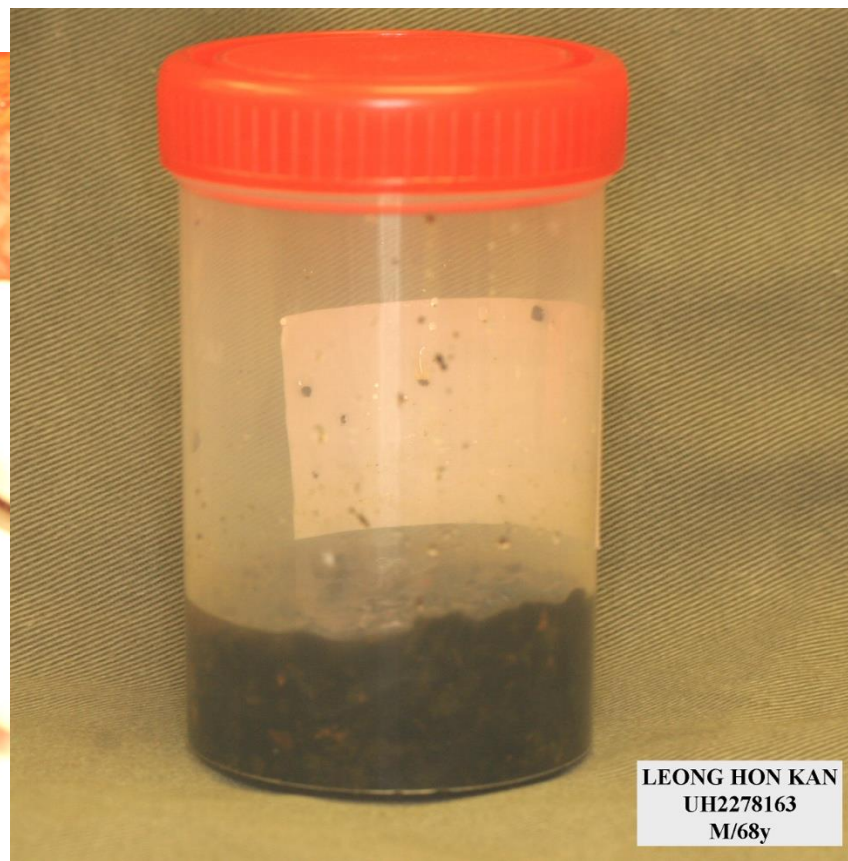
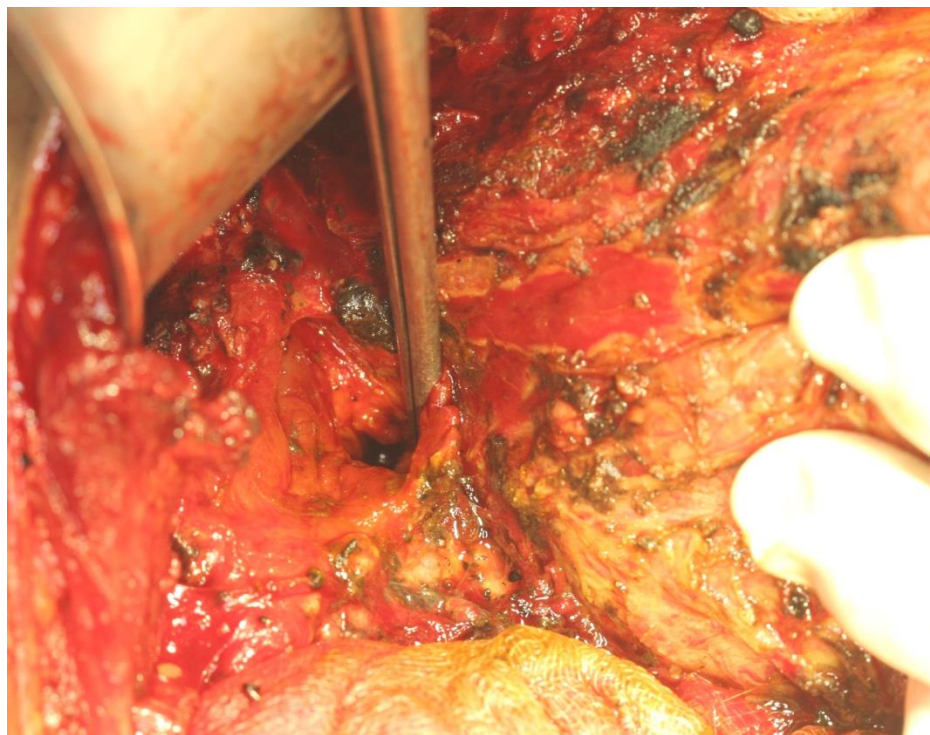
Cutaneous stoma

Hepaticojejunostomy

# Complications of RPC

- Liver abscess
- Choledochoduodenal fistula
- Acute pancreatitis
- Portal vein thrombosis
- Biliary cirrhosis
- Cholangiocarcinoma



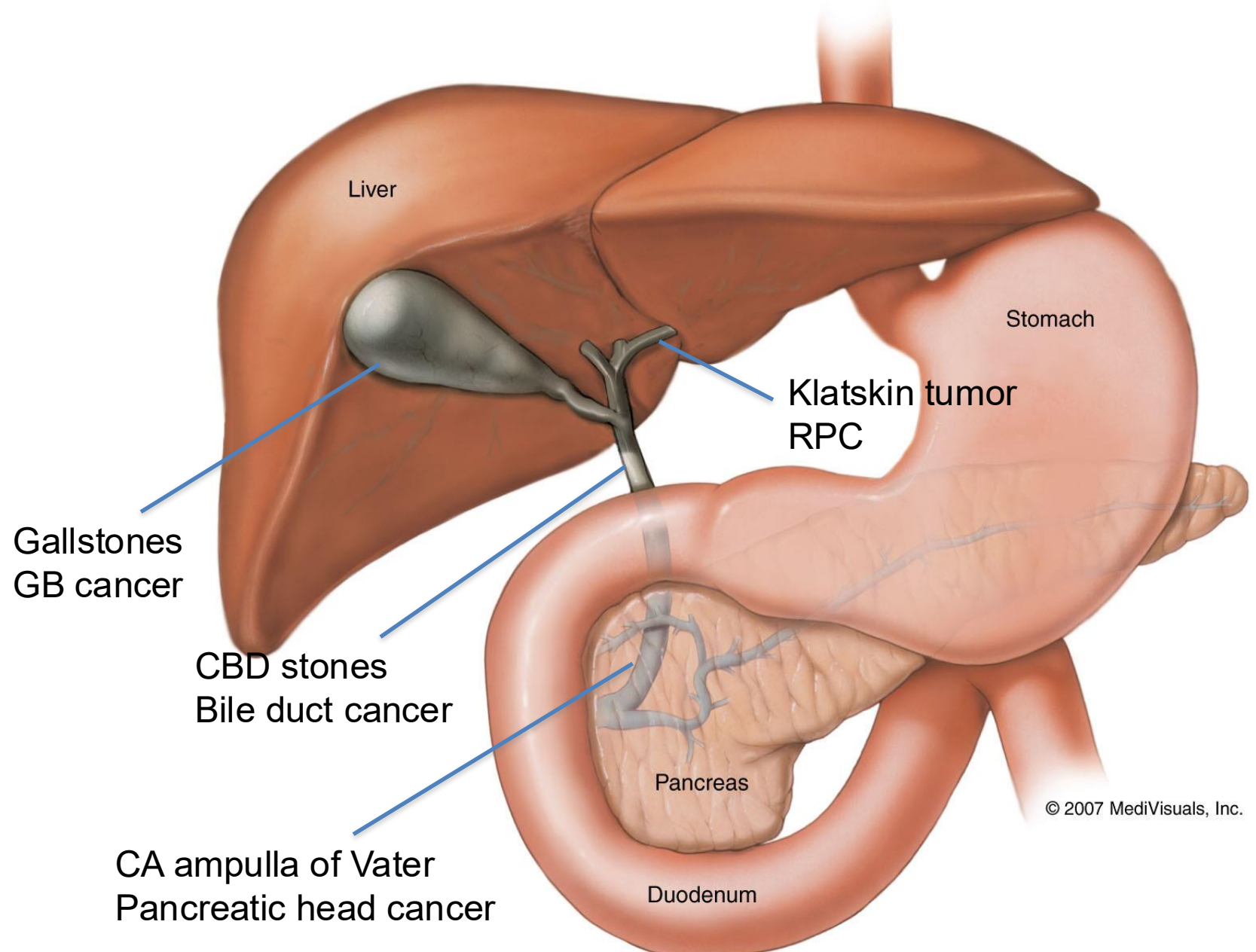


LEONG HON KAN  
UH2278163  
M/68y

# Outcomes of treatment

- Short-term outcomes
  - Immediate stone clearance: 90%
  - Final stone clearance: 98%
  - 10% had concomitant cholangiocarcinoma
- Long-term outcomes
  - Stone recurrence: 9%
  - 5-year survival
    - With cholangiocarcinoma: 9%
    - Without cholangiocarcinoma: 93%

# Ductal Anatomy of Liver and Pancreas

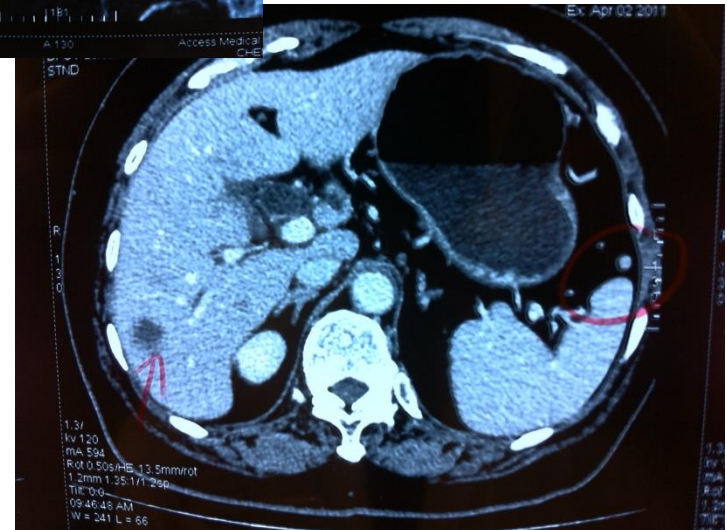


# Pancreatic cancer

- Highly lethal cancer, even if resectable
- Peak age of onset: above 60s
- Early cancer is usually asymptomatic
- Clinical presentation often indicates advanced diseases

# Indications for Whipple operation

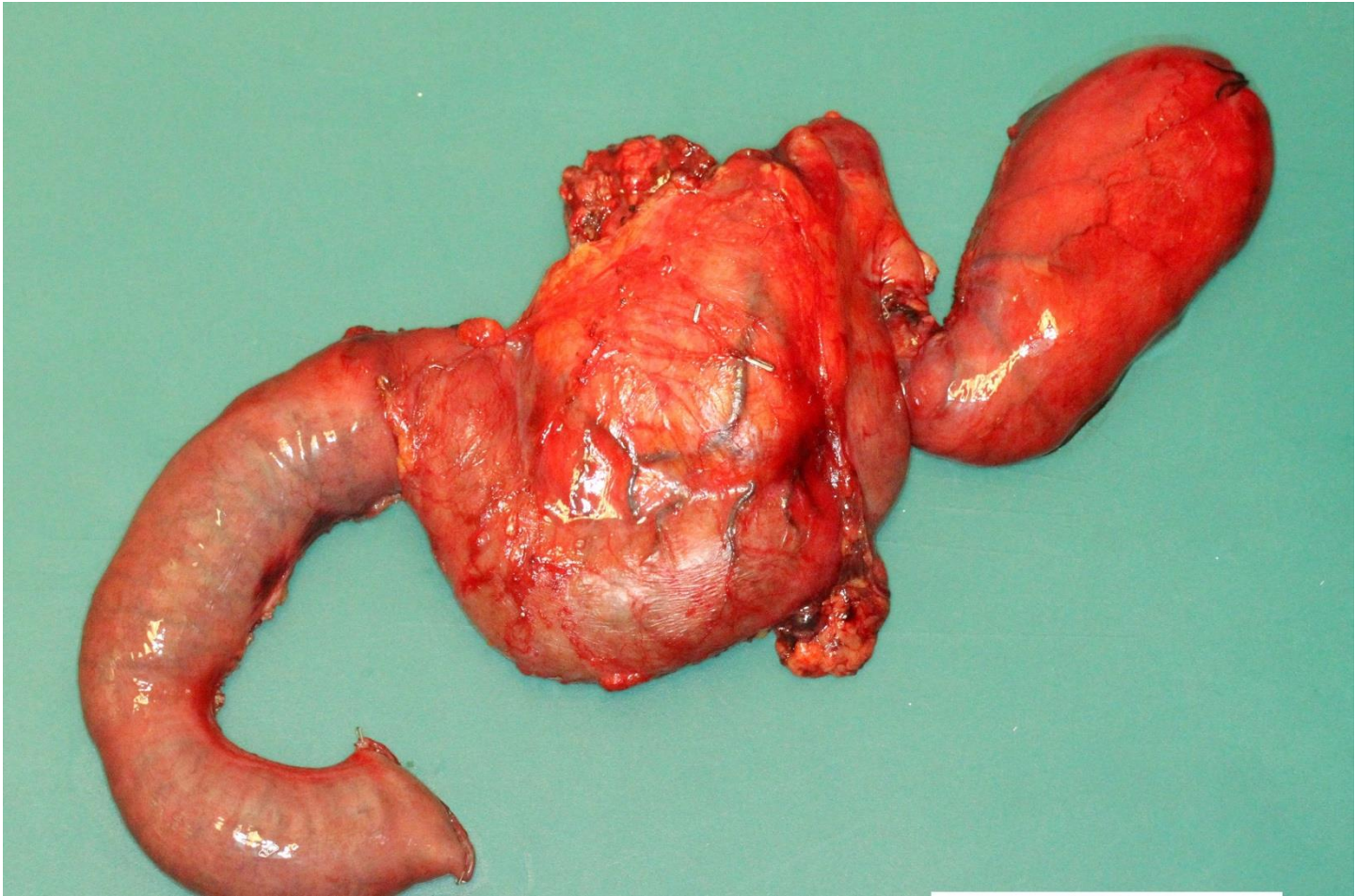
- Medically fit for major surgery but age is not a contraindication
- Localised disease
- Free from metastasis
- No tumor involvement in superior mesenteric artery





# Curative treatment

- Radical pancreaticoduodenectomy (Whipple operation)
  - Excision of pancreatic head
  - Excision of duodenum
  - Excision of common bile duct
  - Partial excision of stomach
- Reconstruction to restore GI tract continuity
  - Pancreaticojejunostomy
  - Hepaticojejunostomy
  - Gastrojejunostomy



# Palliative treatment

- Double bypass + coeliac axis block
  - Gastrojejunostomy
  - Hepaticojejunostomy
- Metallic stenting
- Radiotherapy
- Chemotherapy

***Thank You***

