Obstructive Jaundice and Gall stones

Prof Mohan de Silva
Objectives

- To learn the clinical approach to workout the **cause** and the **level** of obstruction in a patient who has evidence of extra hepatic biliary obstruction.

- To learn the different investigative modalities.

- To workout the best management plan based on pathological and radiological evidence.
A 72-year-old male presents with a one month history of generalised weakness, loss of appetite and jaundice. His urine is dark and stools are pale. He has pruritus especially at night. He has no abdominal pain. He is a non-alcoholic and has no other co-morbidities.

On examination he is thin and icteric. No lymphadenopathy or stigmata of chronic liver disease. Abdominal examination reveals a enlarged liver and a tensely cystic mass in the right hypochondrium. No ascites and the digital rectal examination is normal.
An elderly male presenting with painless jaundice, dark urine, pale stools and pruritus. He has a palpable gall bladder. The clinical picture is suggestive of obstructive jaundice.
What are the cardinal features of obstructive Jaundice?
Cardinal features of obstructive jaundice

- JAUNDICE
- PALE STOOLS
- DARK URINE
- PRURITUS

Obstruction to the extra hepatic biliary tree

When do you suspect cancer?

PAINLESS = CANCER
Jaundice becomes clinically apparent when the bilirubin level reaches 40mmol/l.

The scleral elastin has a high affinity for bilirubin, This is the reason why jaundice is easily detectable in the eyes.
Dark urine confirms conjugated hyperbilirubinaemia which is filtered via the kidneys. Unconjugated bilirubin is tightly bound to albumin which prevents glomerular filtration.
- **Stools are pale** because the bile is not reaching the duodenum

- Deposition of bile salts irritate the skin and cause **pruritus**
The most likely **CAUSE** of jaundice in this patient is

- Malignant obstruction of the extra hepatic biliary tree
- Painless progressive obstructive jaundice in the elderly is highly suggestive of a *malignant obstruction*
Could the cause of the obstruction be a stone?

Unlikely, because he has painless obstructive jaundice and has a palpable gallbladder.
Why can’t he have a palpable gallbladder if a stone blocks the ampulla?

- Because the gallstones are formed in the gallbladder over a period of time and the chronic inflammation will contract the gall bladder.

- This is compatible with the Courvoisier’s law.
What is Courvoisier’s law?

In a patient with jaundice and a palpable gallbladder the cause of jaundice is unlikely to be due to a stone.
Most likely **LEVEL** of obstruction

Below the insertion of the cystic duct
Could the level be higher such as at the porta hepatis?

No

because the gallbladder is palpable
What is the differential diagnosis?

- Carcinoma of the head of pancreas
- Carcinoma of the ampulla of vator
- Carcinoma of the distal common bile duct
- Could it be Klatskin’s tumor?
What is a Klatskin’s tumour?

- Klatskin’s tumour is a cancer involving the common hepatic duct.

- The gallbladder is not distended in these patients as the bile cannot reach the gallbladder.
What leading questions would help to support the diagnosis?

- **Presence of melaena**
  
  Ampullary cancers bleed and cause intermittent melaena because stagnation of bile cause pressure on the tumour to break and bleed

- **Weight loss**

- **Back pain**
Progress of the patient - What investigations?

- FBC
- Liver profile (Alkaline Phosphatase)
- Renal profile
- PT/INR
- Tumour markers
- Ultrasound scan
  - Dilated intrahepatic biliary tree and distended gallbladder and Pancreatic head mass
- Contrast CT Scan
  - 2.5X 2.5 cm mass involving the Head of pancreas
  - not involving Superior mesenteric vein
Progress of the patient - What is the next step?

To obtain a histological diagnosis of the pancreatic head mass

Endoscopic Ultrasound guided core biopsy performed
Histology report

Adenocarcinoma
Progress of the patient

- MDT discussion
- Pre operative laparoscopy to exclude small peritoneal deposits
- If negative- WHIPPLES OPERATION
What is WHIPPLES OPERATION?

- Major complex operation involving removal of distal stomach, distal bile duct, gall bladder, entire duodenum and head and neck of pancreas.
Cancer of the pancreas - Core

- Extremely poor prognosis – Survival after curative intent resection <5%
- Significant post operative morbidity and mortality
  - Most are not suitable for radical surgery at the diagnosis
  - 70% occur in the Head of pancreas
  - Body and tail present late- rarely suitable for radical surgery
  - Radiotherapy is not used
  - Gemcycatbine as adjuvant therapy has shown some survival benefit
  - Palliative stenting using metal is the treatment of choice to relieve obstruction
OUTCOME - Bile duct and Head of Pancreas cancers

- Peri-operative Mortality for Whipples operation is 0-8% in established units for pancreatic surgery
- 5 year survival for Peri ampullary cancers is 40-70%
- 5 year survival for adenocarcinoma of the Head of the pancreas is 5-11% in best of centres
Endoscopic palliation
Questions
When do we say that a patient has obstructive Jaundice?

What is the cardinal clinical feature that differentiates between stone obstruction and cancer obstruction?

What is the physical sign that helps to identify the level of obstruction?

What is Courvoisier’s law?
What investigations will help to confirm the level of the obstruction?

What investigations help to confirm the cause of obstruction?
How to obtain a histology in biliary and pancreatic head cancers?

- Peri ampullary cancer - Direct biopsy
- Distal or proximal cholangiocarcinoma – Brush cytology
- Pancreatic head cancer - Endoscopic ultrasound guided core biopsy
What are the complications anticipated in patients following surgery for **Obstructive Jaundice**?

1. **Bleeding problems**
   (Solution - get INR corrected, Vit K, FFP)

2. **Hepato renal syndrome**

3. **Wound healing problems**

4. **Sepsis**
Possible sites of obstruction in a patient with painless obstructive jaundice, a palpable gallbladder and dilation of the intrahepatic biliary tree on ultrasound would be

a) Common bile duct
b) Cystic duct
c) Common hepatic duct
d) Porta hepatis
e) Ampulla of vator
An US Scan performed on a deeply icteric elderly male with no abdominal pain, reveals a dilated intrahepatic biliary tree. Gall bladder and the bile ducts are not visualised.

Likely causes of the obstruction include:

a. Carcinoma of the head of pancreas
b. Klatskin’s tumor
c. Carcinoma of ampulla of vator
d. Cholangiocarcinoma of the common bile duct
e. Enlarged lymph nodes at the porta causing external compression
A 65 year-old man presents with painless progressive obstructive type jaundice with a palpable gall bladder. Ultrasound is suggestive of pancreatic head mass and distended gallbladder and dilated intra hepatic bile ducts.

Most useful investigation to establish a diagnosis is

a) ERCP
b) MRCP
c) Ca 19.9
d) Abdominal CT scan and biopsy
e) Endoscopic ultrasound and biopsy
True/false

- Progressive painless jaundice in elderly is indicative of a gallstone obstructing the bile duct

- Courvoisier’s law is applied only to patients who are jaundiced

- Klatskin tumour is a cholagiocarcinoma in the distal bile duct

- Intermittent painless jaundice in elderly is suggestive of periampullary cancer

- ERCP is the investigation of choice to diagnose pancreatic head cancer
BILIARY COLIC
Biliary colic

Objectives

- To learn the varying clinical presentations of gallstones
- To recollect the pathogenesis of gallstone disease
- To learn the process of clinical judgment and decision making in a patient with symptomatic gallstones
A 60-old female presents with epigastric pain radiating to right upper abdomen of 2 hour duration. Pain commenced as a dull ache but became so severe that she had to be rushed to the hospital at night.

- She looked unwell and the temperature is 38.4°C. Vital signs are normal. Mild right hypochondrial tenderness is noted.
She is given 50 mg of Pethidine intravenously

Pain has disappeared when she work up in the morning but a dull ache in the right hypochondrium is persisting

What investigations would you perform?

- WCC 14,000/cubic mm
- Liver profile – Normal
- Serum Amylase - Normal
- Renal profile – Normal
- Ultrasound scan
Ultrasound scan findings

Multiple gallbladder stones, thickened gallbladder wall and a bile duct diameter of 5 mm

What is the normal diameter of the bile duct on US?

6-7 MM in an adult
Most likely clinical diagnosis

Biliary colic leading to early acute cholecystitis

WHY NOT BILIARY COLIC?
Why not biliary colic?

- Pain is persisting as a dull ache
- Slight pyrexia
- High WCC
- Oedematous gallbladder wall on US
Biliary colic is a misnomer

- colic

- Biliary colic
She has epigastric pain and pyrexia? Could this be Cholangitis?

What is Cholangitis?

Could this be Cholangitis?

- No obstructive Jaundice
- No fever with chills and rigors
- No US evidence of dilated bile duct
- Liver profile is normal
Aute Suppurative Colangitis is a surgical emergency

Mortality of untreated Acute Suppurative Colangitis is 100%
Could she have Empyema of the Gallbladder?

What is Empyema of the Gallbladder?

- Duration is short
- No significant co-morbid factors
- General condition is not very poor
- No physical signs of peri-cholecystitis
Could this picture compatible with Acute Gallstone Pancreatitis?

Possible because we have seen this patient within first 24 hours

But

- No back pain
- S Amylase is normal

(In about 10% Amylase may be normal in early stages)
Could she have Chronic Cholecystitis?

- Unlikely

Forty, fertile, fatty female with chronic persistent right hypochondrial discomfort and fat intolerance

Gallbladder dyspepsia = Chronic cholycystitis

This patient did not have dyspepsia
Progress of the patient

- How would you manage this patient as a house officer?
  - Nil by mouth/IV fluids
  - IV Antibiotics Cefuroxime or Ciprofloxacin
  - Review to assess the response

- Definitive treatment
  - Laparoscopic or open cholecystectomy?
  - Immediately or in 4 - 6 weeks?

Present consensus

Emergency Cholecystectomy is safe if performed within 48-72 hours of the onset of Acute Cholecystitis
Progress of the patient

- Patient underwent an uneventful laparoscopic cholecystectomy
- Operative cholangiogram was not performed
What is operative Cholangiogram?

What other cholangiograms you know of?

- Percutaneous Trans-hepatic Cholangiogram (PTC)
- Endoscopic Rerograde Cholangiogram (ERC)
- T tube Cholangiogram
Questions
Essential core - Gallstones

- 10% has it
- 10% has both gallbladder and bile duct stones
- \( \frac{3}{4} \) are asymptomatic
- \( \frac{1}{4} \) are symptomatic
- Produce abnormal bile – Lithogenic bile
- In planning strategy, bile duct stones takes priority over gallbladder stones
Can we dissolve gallstones?

- **YES**
  - Oral bile acids effectively dissolve small gallstones made of cholesterol
  - Duration of therapy 2 years
  - 50% recur
  - Not used as a acceptable form of therapy
Asymptomatic Gall stones - Evidence for decision making

Middle aged patient was found to have gall stones during a routine medical. He is seeking your guidance

Does he need surgery?

- Majority (70%) remain asymptomatic throughout the life
- Risk of developing complications – 1% per year
- When symptoms occur, is usually biliary colic than a life threatening complication

HE DOES NOT NEED SURGERY
I have heard that long term presence of gallstones in the gallbladder predisposes to the development of gallbladder cancer?

So is it safe for me not to have a cholecystectomy just because I have not had any symptoms from it?
Gall bladder cancer is an aggressive and lethal disease.

Gall stones are associated with gall bladder cancer.

No evidence to suggest prophylactic cholecystectomy reduces deaths related to gall bladder cancer.

Most decision analysis studies do not favor prophylactic cholecystectomy for silent gall stones.
Supplementary reading

- Mirrizzi syndrome
- Mucocele of Gallbladder
- Gallbladder cancers
Obstructive Jaundice and Gall stones

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What is obstructive Jaundice?

Obstruction to the extra hepatic biliary tree
What are our learning objectives?

- How to workout the cause of obstruction?
- How to work out the level of obstruction?
  on history and examination

- How to investigate?

- How to work out the management based on the cause and level of obstruction?
What are the cardinal features of obstructive Jaundice?
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Obstruction to the extra hepatic biliary tree

When do you suspect cancer?

PAINLESS = CANCER
PAINFUL = STONES
BILE DUCT STONE or CANCER
Benign or Malignant
Painful obstructive jaundice means A

STONE IN THE BILE DUCT

STONE IN THE GALLBLADDER WILL NOT CAUSE JAUNDICE

EXCEPTION?
Painful obstructive jaundice means A STONE IN THE BILE DUCT

Exception

MIRIZZI’S SYNDROME
Is, bile duct stones the only benign condition?
Benign causes of Obstructive jaundice other than stones

- Benign bile duct strictures due to iatrogenic bile duct injury
- Chronic Pancreatitis
Painless progressive obstructive jaundice in the elderly is highly suggestive of a malignant obstruction.
What are the cancers?

- Carcinoma of the head of pancreas
- Carcinoma of the ampulla of vator
- Carcinoma of the common bile duct
- Carcinima of the common hepatic duct (Klatskin’s tumour)
- Gallbladder cancer
What are our learning objectives?

- How to workout the **cause** of obstruction?
- How to work out the **level** of obstruction? on history and examination

- How to investigate?

- How to work out the management based on the cause and level of obstruction?
How to workout the level of obstruction?

TO LOOK WHETHER THE GALLBLADDER IS PALPABLE OR NOT?
Gallbladder

R. & L. hepatic ducts

Common hepatic duct

Cystic duct

Supraduodenal portion

Duodenum

Retroduodenal portion

Common bile duct

Pancreatic portion

Intraduodenal portion

Pancreatic duct (Wirsung)
What is Courvoisier’s law?

In a patient with jaundice and a palpable gallbladder the cause of jaundice is unlikely to be due to a stone.
What investigations?

- **FBC**
- **Liver profile** *(Alkaline Phosphatase)*
- **Renal profile**
- **PT/INR**
- **Tumour markers**
- **Ultrasound scan**
  - Dilated intrahepatic biliary tree, **distended gallbladder**, Pancreatic head mass
- **Contrast CT Scan**
  
  Mass characteristics? – Is Superior mesenteric vein involved?
When do we do an ERCP?
When do we do an ERCP?

1. To confirm presence of bile duct stones
2. To remove bile duct stones
3. To obtain cytology
4. To palliate malignant obstruction by placement of stents
How to obtain a histology in biliary and pancreatic head cancers?

- Peri ampullary cancer - Direct biopsy
- Distal or proximal cholangiocarcinoma – **Brush cytology**
- Pancreatic head cancer- **Endoscopic ultrasound guided core biopsy**
What are our learning objectives?

- How to workout the **cause** of obstruction?
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  on history and examination

- How to investigate?

- How to work out the management based on the **cause** and level of obstruction?