"A CLINICAL STUDY ON PRESENTATION OF OBSTRUCTIVE JAUNDICE IN INFLAMMATION , STONE DISEASE AND MALIGNANCY"

A DISSERTATION SUBMITTED TO THE TAMILNADU

DR MGR MEDICAL UNIVERSITY

CHENNAI

In partial fulfillment of the requirement for the degree of

M.S. (GENERAL SURGERY)

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DEPARTMENT OF GENERAL SURGERY

TIRUNELVELI MEDICAL COLLEGE

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PRINCIPAL INVESTIGATOR: PG STUDENT
DESIGNATION OF PRINCIPAL INVESTIGATOR: DR.S.J.KARTHIKEYAN. MBBS.,
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Dear Dr.S.J.KARTHIKEYAN., MBBS, The Tirunelveli Medical College Institutional Ethics Committee (TIREC) reviewed and discussed your application during The IEC meeting held on 01.09.2017.

THE FOLLOWING DOCUMENTS WERE REVIEWED AND APPROVED

1.	TIREC Application Form	☐
2.	Study Protocol	☐
3.	Department Research Committee Approval	☐
4.	Patient Information Document and Consent Form in English and Vernacular Language	☐
5.	Investigator's Brochure	☐
6.	Proposed Methods for Patient Accrual Proposed	☐
7.	Curriculum Vitae of The Principal Investigator	☐
8.	Insurance /Compensation Policy	☐
9.	Investigator's Agreement with Sponsor	☐
10.	Investigator's Undertaking	☐
11.	DCGI/DGFT approval	☐
12.	Clinical Trial Agreement (CTA)	☐
13.	Memorandum of Understanding (MOU)/Material Transfer Agreement (MTA)	☐
14.	Clinical Trials Registry-India (CTRI) Registration	☐

THE PROTOCOL IS APPROVED IN ITS PRESENTED FORM ON THE FOLLOWING CONDITIONS

1. The approval is valid for a period of 2 year/s or duration of project whichever is later
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4. An annual status report should be submitted.
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7. The PI should report to TIREC within 7 days of the occurrence of the SAE. If the SAE is Death, the Bioethics Cell should receive the SAE reporting form within 24 hours of the occurrence.
8. In the events of any protocol amendments, TIREC must be informed and the amendments should be highlighted in clear terms as follows:
   a. The exact alteration/amendment should be specified and indicated where the amendment occurred in the original project. (Page no. Clause no. etc.)
   b. The PI must comment how proposed amendment will affect the ongoing trial. Alteration in the budgetary status, staff requirement should be clearly indicated and the revised budget form should be submitted.
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   e. Approval for amendment changes must be obtained prior to implementation of changes.
   f. The amendment is unlikely to be approved by the IEC unless all the above information is provided.
   g. Any deviation/violation/waiver in the protocol must be informed..

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CONTENTS

INTRODUCTION

The word “Jaundice” arises from French word “Jaune” which means yellow. Jaundice is defined as yellowish discolouration of the skin, sclera and mucus membrane by bilirubin – yellow orange bile pigment.

Obstructive jaundice (Surgical Jaundice) in simple terms means the outflow of bile has been obstructed anywhere from the liver to the duodenum. A correct pre-operative diagnosis is almost always possible today because of advances in imaging techniques over the decades. Removal of block relieves the symptoms and often results in cure.

There are varied causes of obstructive jaundice, but it is most commonly due to choledocholithiasis (also called bile duct stones or gallstones in the bile duct) – presence of a gallstone in the common bile duct. Other causes like, malignancies such as cholangiocarcinoma, periampullary and pancreatic cancers, and benign stricture including chronic pancreatitis have become increasingly prevalent. There is also rise in iatrogenic causes of obstructive jaundice, like injury of biliary tract and cholangitis with the increase of invasive procedures performed on the biliary tract.

Biliary tract disorders can be significantly found in worldwide population, and the quite majority of cases are attributable to choledocholithiasis.

Patients with obstructive jaundice usually present with complain of yellow skin and eyes, pale stools, dark colored urine, jaundice, and pruritus. Abdominal pain often misleading for diagnosis– some patients with choledocholithiasis have painless jaundice, whereas some patients with hepatitis have distressing pain in the right upper quadrant.

Malignancy often associated with the absence of pain and tenderness during the physical examination. Patients with obstructive jaundice have tendency to develop nutritional deficits, infectious complications, acute renal failure, and impairment of cardiovascular function. Other adverse events such as coagulopathy, hypovolemia, and endotoxemia can be insidious and significantly increase mortality and morbidity.

An accurate diagnosis can usually be made with combination of different approaches like, history, physical examination, and biochemical tests, and when appropriate cholangiography and liver biopsy and observation of the patient's course.

Early and precise detection of etiology of obstructive jaundice can help surgeons to accurately manage such patients and thus will improve quality of

life of patient and improving the survival rates among the patients with malignant pathology. Hence, present study was undertaken to study the clinical profile of patients with obstructive jaundice..

AIMS & OBJECTIVES:

The aim of the study is to

1. To estimate the correlation of clinical, biochemical and radiological features in obstructive jaundice patients.
2. To analyze the efficacy different modalities of treatment and other complications.
3. To assess the morbidity and mortality of the disease

MATERIALS AND METHODS:

This study was conducted in Tirunelveli Medical College Hospital, Department of General Surgery, Tirunelveli

Period of study:

From September 2017 to August 2019.

INCLUSION CRITERIA

1. All patients admitted in surgical ward Tiruneveli Medical College Hospital, Department of Surgery during the period were included

EXCLUSION CRITERIA

1. Non obstructive jaundice
2. H/o previous biliary surgery
3. Age <12 years

METHOD OF COLLECTION OF DATA

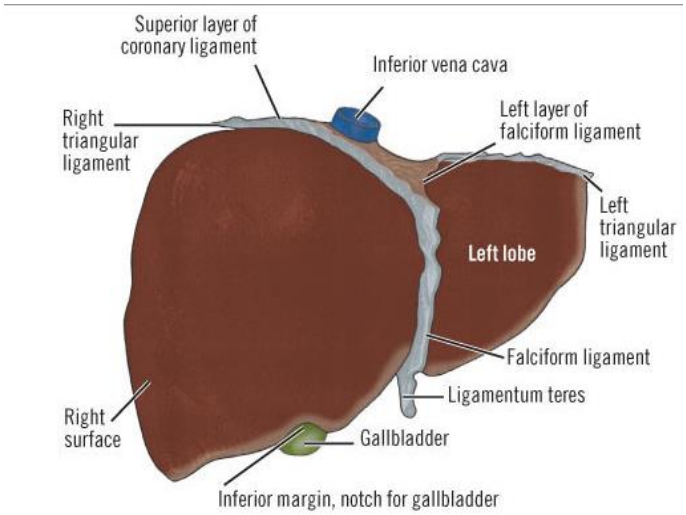
1. Proper history and clinical examination of the patients
2. Routine basic investigations,
3. Liver Function Test, Prothrombin time
4. Urine test like Fouchet test for bile pigment, Hays test for bile salt
5. USG abdomen pelvis, CECT abdomen pelvis & MRCP
6. Surgery as per the diagnosis made
7. .Histopathology of resected specimen

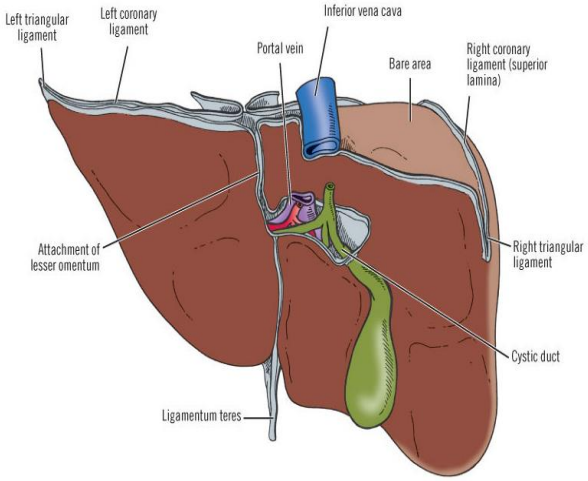
REVIEW OF LITERATURE:

ANATOMY OF BILIARY TREE

Liver:

Liver is a wedge shaped organ with five surfaces- anterior, posterior, superior, inferior and right. It is divided into right and left lobes anatomically and functionally. Anatomic division is by the attachment of falciform ligament, ligamentum teres and ligamentum venosum. Depending on the intrahepatic distribution of hepatic artery, portal vein and biliary ducts liver is divided into functional right and left lobes.



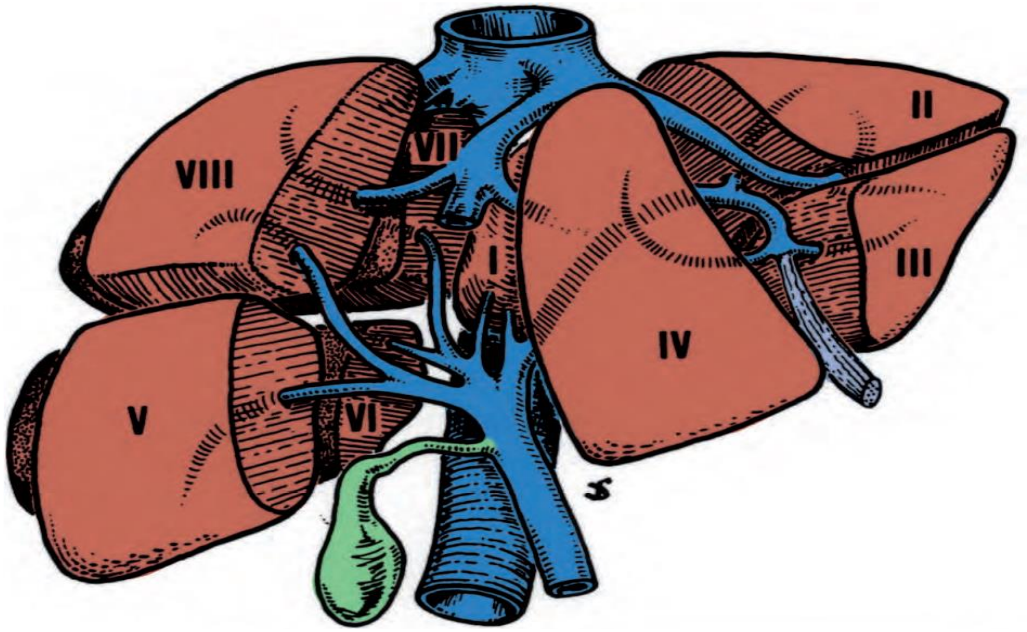


Couinaud hepatic divisions:

According to couinaud, liver is divided into eight segments which are numbered in the counterclockwise direction by the fissures-main portal fissure, right portal fissure and left portal fissure.

Biliary drainage:

The common bile duct is formed by the union of right and left hepatic ducts. The left hepatic duct is formed by the joining of three segmental ducts draining segments II to IV. The right hepatic duct is formed by the joining of right anterior and right posterior segmental ducts.



The right posterior segmental duct is formed due to the union of ducts draining segments VI and VII. The right anterior segmental duct is formed due to the union of ducts draining segments V and VIII. In approximately 80% of cases caudate lobe is drained by both right and left hepatic ducts. In 15% cases it drains into only the left hepatic duct. In 5% cases it entirely drains into right hepatic duct.

Vascular supply

The liver is supplied by the hepatic artery and the portal vein. Hepatic artery supplies one-fourth of blood supply to the liver and remainder is by the portal vein. Blood from both hepatic artery and portal vein is mixed in the blood sinusoids in the liver parenchyma and drained by the tributaries of the hepatic veins. Hepatic veins drain into the inferior vena cava.

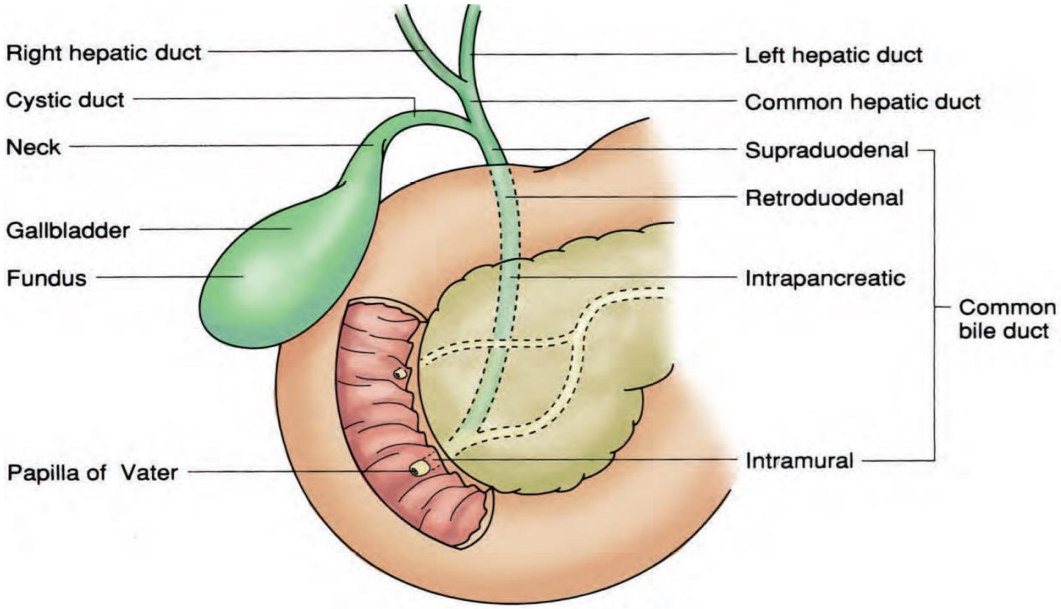
Gall blabber:

The gall bladder lies adherent to the inferior surface of the liver in the fosse for gall bladder in the junction of right and quadrate lobes. It is about 7 to 10 cm in length. It's capacity is 50 to 60 ml when moderately distended.

Parts of gall bladder:

Gall bladder has four parts- fundus, body, infundibulum and neck. The Hartmann's pouch is an asymmetrical bulge seen in the infundibulum. The neck continues as the cystic duct.

Spiral valves of heister are spirally arranged mucosal folds found in the neck and cystic duct. These spiral valves prevent the transit of gallstones.



Cystic duct:

The cystic duct is about 2 to 4 cm in length. It joins the supraduodenal portion of the common hepatic duct (CHD) at an acute angle. Rarely it can join the right hepatic duct or retroduodenal portion of CHD or CHD at right angles or directly enter the duodenum.

Calot's triangle:

Calot's triangle is a triangular area which is very important during cholecystectomy.

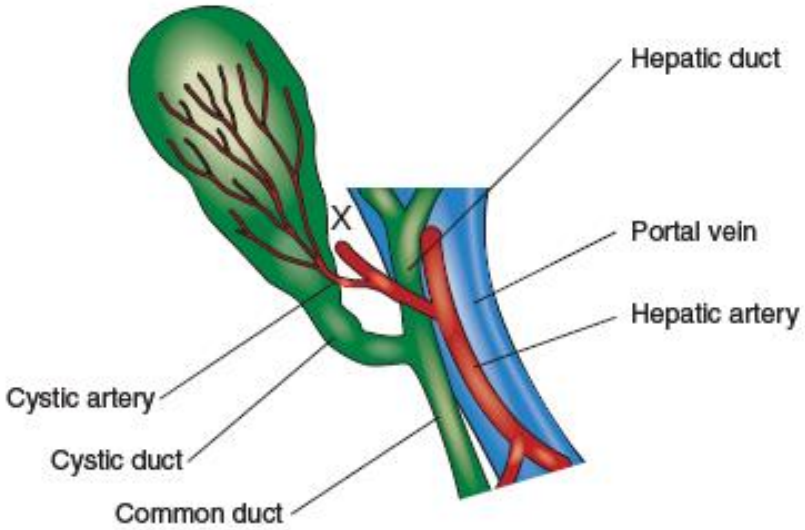
Boundaries

Superiorly- inferior border of right lobe of liver

Medially- common hepatic duct

Laterally- cystic duct.

It contains cystic artery, right hepatic artery and cystic duct lymph node of Lund.



Histology of gall bladder:

The wall of gallbladder consists of five layers -the epithelium, lamina propria, smooth muscle, perimuscular subserosal connective tissue, and serosa. Muscularis mucosa and submucosa are absent in the gall bladder. The cells in the mucosa are columnar cells, and their main function is absorption.

There are invaginations of epithelium into the lamina propria, muscle, and subserosal connective tissue called *Rokitansky-Aschoff sinuses*. They are present in about 40% of the normal gallbladders and are present in large numbers in all the inflamed gallbladders.

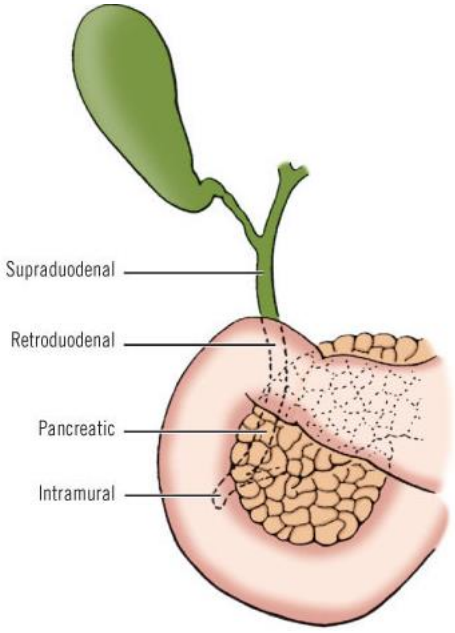
There are very tiny bile ducts found around the muscle layer on the hepatic side of the gallbladder called the *ducts of luschka*[1]. They are found in about 10% of normal gallbladders

Vascular supply:

Cystic artery is the main source of blood supply to gall bladder and cystic duct. It is a branch of right hepatic artery. Rarely it can arise from proper hepatic artery or gastroduodenal artery. An accessory cystic artery can arise from common hepatic artery.

Common Bile Duct(CBD):

CBD is formed by the union of cystic duct with the common hepatic duct which is formed by the union of right and left hepatic ducts. It is about 5 to 15 cm in length.



It has four segments or parts:

1.Supraduodenal,

2.Retroduodenal,

3.Pancreatic and

4.Intramural parts.

as depicted in the picture.

Sphicter of oddi:

The terminal portion of common bile duct is surrounded by a ring of smooth muscles which form the *sphincter choledochus*. It's function is to cause accumulation of bile in the gall bladder and concentration of bile.The terminal region of pancreatic duct is also surrounded by a similar smooth muscle ring which forms *sphincter pancreaticus.* The hepatopancreatic ampulla is surrounded by the third sphincter called the *sphincter ampullae*.

Sphincter of oddi is the term applied to all sphincters collectively but more specifically to sphincter ampullae.

Vascular supply:

Extrahepatic biliary ducts are supplied by the cystic artery from above and posterior superior pancreaticoduodenal artery from below.

Lymphatic drainage:

The lymphatics from gall bladder and cystic duct drain into cystic lymph node of lund located at the junction of cystic duct and common hepatic duct. From the cystic node into the hepatic nodes and ultimately into celiac nodes. Lymphatics from upper bile duct drains into hepatic nodes. Lymphatics from the lower bile duct drain into lower hepatic and upper pancreatic nodes.

Neural innervation:

Sympathetic and parasympathetic nerve supply to the gall bladder and biliary system is from the celiac plexus. The hepatic branch which arises from the anterior or left vagus supplies the liver, gallbladder and bile duct. Sympathetic innervations are from 5^{th} to 9^{th} thoracic segments. Sensory fibers from the right phrenic nerve also innervate the gall bladder. This brings out the etiology for referred pain in the shoulder in any gall bladder disease.

PHYSIOLOGY OF BILIARY DRAINAGE:

Bile:

Liver produces about 500 to 1000ml of bile per day. The secretion of bile is dependent on neurogenic, chemical and humoral stimuli. Vagal stimulation causes increase in secretion of bile, whereas splanchnic nerve stimulation causes decrease in bile flow. Secretin is a hormone which increases the production and flow of bile. Other gastrointestinal hormones like cholecystokynin and gastrin also stimulate biliary ductular secretion**.**

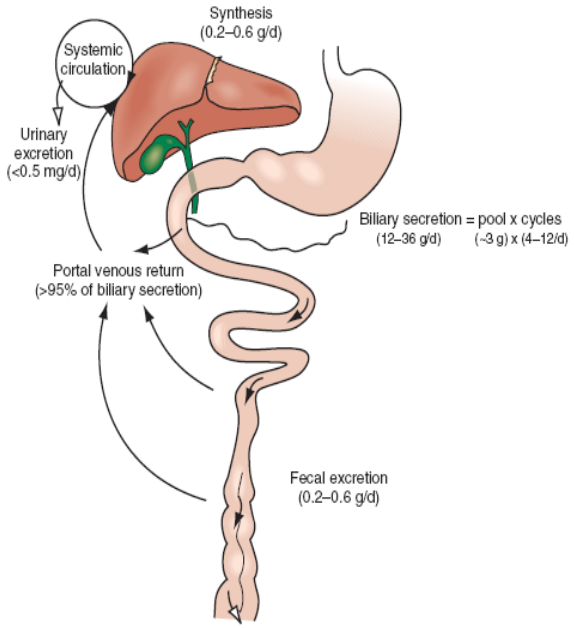
Composition:

Water, bile salts, electrolytes, bile pigments, proteins and lipids. Sodium, potassium, calcium, and chlorine are in the same concentration in bile as in plasma. The hepatic bile is found to be neutral or slightly alkaline in pH, but pH

can vary with diet; Increase in protein diet shifts the pH of bile to a more acidic pH. Cholesterol and phospholipids are the important lipids found in bile and they are synthesized in liver. Their synthesis is regulated by bile salts.

Enterohepatic circulation:

Primary bile salts are synthesized in the liver from cholesterol. They are *cholate* and *chenodeoxycholate*. These primary bile salts are conjugated with taurine and glycine to produce bile acids which are anions and these anions are balanced by sodium in the bile. The bile salts are secreted into bile duct by the liver cells. They cause digestion and absorption of fatty acids and fat soluble vitamins in the intestine. In the terminal ileum about 80% of conjugated bile acids are reabsorbed. Rest are deconjugated in the gut by bacteria in gut to produce secondary bile acids which are *deoxycholate* and *lithocholate*. They are reabsorbed from the colon and returned to liver further conjugated and secreted in bile. Only 5% of bile acids is excreted in stool. About 95% of bile acid pool is reabsorbed and returned back to the liver called *enterohepatic circulation*.



Functions of liver:

- Protein metabolism – synthesis of plasma protein(albumin & α-acid glcoprotein, C-reactive protein, haptaglobin, pseudocholinestrase, deamination of AminoAcids , formation of urea.
- Glucose Homeostasis - Gluconeogenesis, Glycogenolysis, Glycogenesis
- Fat Metabolism - Synthesis of lipoproteins, cholesterol, triglycerides, oxidation of fatty acid to ketone bodies
- Reservoir of Blood
- Endocrine Function:

  IGF1, Thrombopoietin, Angiotensinogen, Thyroid homeostasis,

  Steroidhormoneinactivation(Tetosterone,estradiol,glucocorticoids,aldosterone)
- Bilirubin formation & excretion
- Drug & Hormone Metabolism
- Hematological function – haematopoiesis in fetus, heme synthesis.
- Immunological function – largest reticuloendothelial organ, Kupffer cells - phagocytosis of Antigen from GIT.

- Synthesis of Coagulation factors: I,II,V,VII,IX,X,XI, XII,XIII, prekallikrein, kininogen.
- Anticoagulants: Antithrombin III, α1antitrypsin, α2 antiplasmin, protein C & S, plasminogen, plasminogen activator inhibitor.

Functions of gall bladder:

Absorption and secretion:

The gall bladder stores 80% of bile produced by the liver. The mucosa of gall the bladder has the highest absorptive capacity per unit surface area. It can absorb sodium, chloride, bicarbonate ions and water. Bile is concentrated to over 10 fold. Rest is absorbed by simple diffusion. The epithelial cells secrete hydrogen ions and glycoproteins into the lumen. Calcium and carbonate ions are present in the bile. Hydrogen ions usually combine with carbonate to produce bicarbonate ions. Precipitation of calcium carbonate is thus prevented. Acidification decreases the pH of entering hepatic bile.

Neurohumoral and motor activity:

Gall bladder filling is regulated due to the pressure gradients between the gall bladder and bile ducts. It partially empties into the duodenum in association with migratory myenteric motor complex in the gut.

Contraction of the gall bladder is stimulated by cholecystokynin(CCK) and the vagus. Splanchnic sympathetic stimulation, somatostatin and its analogues, vasoactive intestinal peptide, inhibits contraction and hence cause relaxation of gall bladder.

Sphincter of oddi:

It creates a high pressure zone between the bile duct and duodenum. It regulates flow of bile and pancreatic juice into the duodenum and prevents the reflux of duodenal contents. It is about 4 to 6 mm long and has a resting pressure of about 13mmHg higher than the duodenal pressure.

Bilirubin metabolism:

Breakdown of scenescent RBC's

↓

Heme oxygenase

↓

Heme ring

↓

Biliverdin reductase

↓

Biliverdin

↓

Glucuronic acid UDP glucuronyl transferase

↓

Bilirubin

↓

Bilirubin monoglucuronide/diglucuronide

↓

Bile (conjugated bilirubin)

↓

Urobilinogen

↓

Excreted in urine / feces

- About 300 mg of bilirubin is formed per day

- Normal total serum bilirubin: 0.3 – 1.3 mg/dl

- Normal value of Direct/conjugated bilirubin is 0.1 – 0.4 mg/dl

- Normal value of Indirect/unconjugated bilirubin is 0.2 – 0.9mg/dl

- When Plasma bilirubin exceeds 1mg/dl –it is called hyperbilirubinemia

Difference between conjuagated & unconjugated bilirubin:

	Unconjugated	**Conjugated**
In water	insoluble	Soluble
In alcohol	Soluble	Soluble
Normal value	0.2-0.9mg/dl	0.1-0.4mg/dl
In bile	Its Absent	Its Present
In urine	Always absent	Normally absent
Absorption in gut	Absorbed	Not absorbed
Diffusion into tissues	Diffuses and produces yellow colour	Doesn't diffuse
Van den bergh	Indirect +	Direct +

Urine bilirubin:

- Unconjugated bilirubin – binds to albumin in serum and is not filtered by the kidneys
- Any bilirubin in urine is conjugated bilirubin fraction, the presence of bilirubinuria is seen in liver diseases.
- Urobilinogen is absent in Urine in obstructive jaundice.
-

JAUNDICE

Definition:

Yellowish discoloration of the skin and sclera due to accumulation of the bilirubin pigment in the blood and tissues. For jaundice becomes clinically apparent the bilirubin level has to be more than 35-40micomol/litre.

Classification:

Prehepatic (haemotytic) jaundice

Excess production of unconjugated bilirubin (from red blood cells) causes exhaustion of the ability of the liver to conjugate the extra load of bilirubin, e.g. congenital haemolytic anaemias like hereditary spherocytosis, thalassaemia , sickle cell disease and hypersplenism.

Hepatic (hepatocellurlar) jaundice

-Failure of transport of unconjugated bilirubin into the cell, e.g. Gilbert's syndrome

-Failure of activity of the enzyme bilirubin-glucuronide glucuronosyl transferase, e.g. Crigler-Najjar syndrome

-Injury to the liver cells causes failure of excretion ofbilirubin into the biliary system.

The common causes are:

(a) Infections: viral hepatitis.

(b) Poisons: carbon tetrachloride and aftatoxin

(c) Drugs: paracetamol,anaesthatic agent- halothane

Posthepatic (obstructive) jaundice

Diseases which cause obstruction to the outflow of conjugated bilirubin from the hepatocyte or causing obstruction to the delivery of the same conjugated bilirubin into the duodenum are known to cause surgical jaundice.

e.g. Choledocholithiasis, Periampullary carcinomas, Carcinoma head of pancreas.

LIVER FUNCTION TESTS:

- Non-invasive method of screening for the presence of liver dysfunction

- Pattern of lab test abnormality causes recognition of the general type of disorder

- To assess the severity and to allow prediction of outcome

- To follow the course of disease, evaluate response to treatment given and adjust treatment when necessary

Serum Biliribin:

- Normal value of total serum bilirubin is <1.0mg%
- Direct and Indirect fractions estimated by Van Den Berg reaction.
- Bilirubin reacts with diazo reagent to produce coloured azo pigment. At pH 5 –pigment becomes purple .

Serum Enzymes:

To detect damage to liver

- Aminotransferases (AST,ALT)
- Helpful in detecting hepatocellular diseases such as hepatitis.

Serum enzymes:

That show the presence of cholestasis:

- Alkaline Phosphatase (ALP)
- 5'Nucleotidase
- Gamma glutamyl transpeptidase(GGT)

5'Nucleotidase:

- Normal level :2 – 10 U/L
- Moderately elevated in hepatitis
- Highly elevated in biliary obstruction.

Gamma glutamyl tranferase:(GGT)

- Used in body for synthesis of glutathione
- 11 iso-enzymes are present
- Seen in liver, kidney, intestinal cells, prostate, pancreas.
- Normal level: 0– 30 U/L
- Raised even when other LFT are normal in alcoholics.
- Moderate rise is seen in infective hepatitis, prostatic Carcinoma
- High rise is seen in alcoholism, neoplasm of liver, obstructive jaundice.

Serum Albumin:

- Produced by hepatocytes
- Normal value is : 4–6 g/dl
- Hypoalbuminemia is seen in chronic liver diseases (cirrhosis), Ascites, protein malnutrition.

Serum Globulins:

- Increased stimulation peripheral reticuloendothelial system due to shunting of antigens past liver and impaired clearance by kupffer cells
- Normal value : 2 – 3.5 g/dl
- Increased gamma globulins and reversal in albumin globulin ratio – suggests liver cell pathology.

Prothrombin Time:(PT)

- Normal value is: 10.9 – 12.5 sec
- Prolongation of PT by 2 sec or more is abnormal
- PT is influenced by factors II,V, VII, X
- In vitamin K deficiency, vitamin K 10 mg injection decreases prolonged PT >30% within 24 hours

INR (international normalised ratio)

- More frequently used.
- Standardizing the reports of PT
- INR = [Patient Prothrombin Time/mean control ProthrombinTime] ^{ISI}
- *ISI - international sensitivity index*

OBSTRUCTIVE JAUNDICE

Obstructive jaundice is a most common surgical problem that occurs when there is an obstruction to the outflow of conjugated bilirubin from the hepatocytes to the intestine.

Jaundice due to biliary obstruction is caused by a heterogeneous group of diseases that include both benign and malignant conditions. Obstructive jaundice is not a definitive diagnosis. Pathological changes like secondary biliary cirrhosis can occur if obstruction is unrelieved and the disease has a high mortality rate. So early investigation to find out the correct aetiology is of great importance.

Courvoisier's Law:

Enlarged gallbladder in a jaundiced patient is mainly due to carcinoma of head of pancreas or carcinoma of the common bile duct. Caluculus jaundice is usually not associated with enlargement of gallbladder owing to previous inflammatory fibrosis.

Exceptions to Courvoisier's law:

- Double impaction of stone in cystic duct and CBD

- Mucocele of gall bladder due to stone in the cystic duct

- Oriental cholangiohepatitis

- Pancreatic calculi obstructing the ampulla of Vater

COMPLICATIONS OF OBSTRUCTIVE JAUNDICE:

- Sepsis especially cholangitis
- Biliary cirrhosis
- Pancreatitis
- Coagulation failure
- Renal shut down
- Hepatic failure.

<u>Causes for obstructive jaundice</u>:

In the lumen:

- Stones in common bile duct-
- Parasitic - Schistosomiasis,Ascariasis
- Hemobilia

In the wall:

- Stricture in the common bile duct
- Cholangiocarcinoma
- Sclerosing cholangitis

- Choledochal cyst
- Biliary atresia

Outside the wall:

- Carcinoma head of pancreas
- Porta hepatis lymph nodes.

Benjamin's classification of biliary obstruction:

Type 1: Complete obstruction

Pancreatic and cholangio carcinoma, iatrgenic CBD ligation

Type 2: Intermittent obstruction

CBD stones, Periampullary tumour, Hemobilia

Type 3: Chronic complete obstruction

CBD stricture, Traumatic, Cystic fibrosis

Type 4: Segmental obstruction

Sclerosing cholangitis, Cholangiocarcinoma, Intrahepatic biliary stones.

Choledocholithiasis:

It presents with *charcot's triad*- intermittent pain, fever and jaundice. Stones are mostly from gall bladder. It can also be due to primary choledocholithiasis which are pigment stones.

Primary- brown pigment stones

Secondary-75% cholesterol stones, 25% black pigment stones

CBD Stricture:

It can be benign or malignant. Causes for benign stricture are trauma, iatrogenic injury during cholecystectomy, liver surgery, gastrectomy or inflammatory. Malignant ones present with an underlying growth

Bismuth classification for CBD stricture

Type Strictures.

Type 1 Low CHD stricture, >2cm distal to hilum

Type II Proximal CB D stricture, <2cm distal to hilum

Type III Hilar involvement upto proximal extent of CHD but confluence preserved

Type IV Confluence involved, no communication between right and left ducts

Type V Involvement of right hepatic branch alone or with common duct

Choledochal Cyst:

According to TODANI classification there are 5 types of choledochal cysts:

Type Ia and b: Diffuse cystic. Most common accounting to 75%

Type II: Diverticulum of the common bile duct-
supraduodenal diverticulum

Type III: Diverticulum within the pancreas-
choledochocele.

Type IV: Extension into the liver-multiple intra and extra-
hepatic cysts.

Type V: Cystic dilatation only in the intrahepatic ducts-
Caroli's disease

They present with triad of right upper quadrant pain, jaundice, and an abdominal mass. Incidence of cholangiocarcinoma is higher than in general population.

Periampullary Carcinoma:

Peri-ampullary cancers can be defined as tumors arising within 1 cm of the ampulla of Vater and include ampullary, distal bile duct, pancreatic, and duodenal cancers. However, without careful histological analysis, it is difficult to differentiate the tumor type correctly. They present with waxing and waning of jaundice and silvery stools.

Carcinoma head of Pancreas:

Pancreatic ductal adenocarcinoma is one the most lethal GI malignancy with an overall 5-year survival rate of less than 4%. Factors influencing this grave prognosis are

1) In the early stages of the disease clinical symptoms are usually absent or non specific resulting in late diagnosis, and only 15–20% of tumors are resectable at the time of presentation.

2) Tumor is very aggressive with retroperitoneal and perineural infiltration, high local relapse rates, angioinvasion, formation of metastases.

3) Tumor does not respond to most of the available treatment regimens, making management of the patient a complex and difficult task.

Cholangiocarcinoma:

Cholangiocarcinomas are epithelial cancers of the cholangiocytes and they may occur at any level of the biliary tree.

They are broadly classified into intra-hepatic tumours, extra-hepatic hilar tumours and extra-hepatic distal bile duct tumours. Hilar cholangiocarcinoma accounts for two thirds of all cases of extra-hepatic cholangiocarcinoma. Majority of these tumours arise in the absence of risk factors. Some of the risk factors are age, primary sclerosing cholangitis, bile duct adenoma, biliary papillomatosis, Caroli's disease, choledochal cyst, smoking, chronic typhoid carrier state and parasitic biliary infestation.

Klatskins Tumour:

Tumour occurring at the confluence of both hepatic ducts-where left and right hepatic ducts join to form common hepatic duct is called Klatskin tumour.

Carcinoma Gallbladder:

3% of gall stones with cholecystitis will present with carcinoma gall bladder. It can spread to liver, duodenum locally, lymphatic spread through lymph node of lund and peripancreatic nodes, blood spread to lungs and bones. Nevin's staging is used to stage the tumour.

Investigations for Obstructive Jaundice:

- Bilirubin, Serum enzymes (SGOT, SGPT)
- Alkaline phosphatase, GGT, 5-nucleotidase
- Proteins: Albumin, Globulins,
- Bleeding time, Clotting time
- Prothrombin time, aPTT.
- Urine test for urobilinogen
- Ultrasound, CECT abdomen pelvis

- Magnetic Resonance Cholangio Pancreaticography
- Tumour markers
- ERCP and Percutaneous Transhepatic Cholangiography
- Upper GI endoscopy
- Endoscopic ultrasound

Biochemistry/Hematology:

Elevated total serum bilirubin level and high levels of the conjugated fraction of bilirubin is usually seen. In general, patients with benign disease have less hyperbilirubinemia than those with malignant obstruction.

The transaminases (AST & ALT) may rise abruptly many fold above normal. Alkaline phosphatase and gamma glutamyl transferase are important markers for cholestasis. When the obstruction to outflow of bile rises progressively, the levels of these two markers rise several times above the normal level.

Urine Tests:

Fouchet's test for bile pigments

Hay's test for bile salts

Ehrlich's test for urobilinogen

Radiological Imaging:

The indications for radiological imaging in obstructive jaundice cases are:

(1) To confirm the presence of biliary system obstruction in order to differentiate surgical and medical jaundice.

(2) To find out the level of the obstruction-intra or extra hepatic

(3) To provide additional information related to the underlying diagnosis such as staging information in cases of carcinomas.

The radiological investigations available for the diagnosis of obstructive Jaundice can be divided into

Noninvasive - Ultrasonography, CECT & MRCP

Invasive - ERCP and PTC.

A plain abdominal x-ray:

- Not much useful.
- It can identify calcified gallstones, porcelain gallbladder,

  air in the biliary tract or air in the gallbladder wall .

***Ultrasonography abdomen/pelvis* :**

Ultrasound is the most widely used imaging method which is due to its non-invasive and non-radiating character, the absence of documented side effects, its non-painful and non-bleeding nature, as well as to its relatively high accuracy allowing the detection of tumor formations up to 10 mm in size.

Conventional ultrasound uses, planes or sections through the anatomic areas of interest. The limitations of this method are known, the most important one being represented by the planar or two dimensional characters (2D). These limitations result in an impossibility to get information on the coronal plane for unpaired organs situated on the median line of the body, information which is sometimes required for a better tumor staging or just for a better understanding of normal topography. The two-dimensional character of the investigation also prevents a better representation of the surfaces of normal or pathological structures, information which is frequently "reconstructed" in the examiner's imagination, that confers a marked subjectivity to the ultrasonographic method .

Three-dimensional ultrasound can be performed concomitantly with 2D ultrasound or it can be resumed and finalized in a second stage, by the use of an external work station, after the patient has left the department. This is represented by a network of computer connected to the ultrasound machine, which functions as a second examining machine.

Tumors up to 10 mm in size can be accurately detected and information on their position in relation to the reference vessels like hepatic veins, inferior vena cava, and portal veins can be obtained. Using the volume function, accurate information on the real size of a tumor mass can be obtained and oncological safety elements can be added, including the application of a parenchymal layer with predetermined thickness that might allow the surgeon to assess the tissue volume to be removed. This information is particularly important, as it may be a decisive element in establishing whether surgery is indicated or for choosing another therapeutic solution such as radiofrequency ablation.

It is extremely useful, in particular, to understand the spatial position of a structure at the level of the biliary tree in relation to hepatic segmentation. The operative strategy and final results often depend on this component. Three-dimensional ultrasound allows the spatial representation of anatomic structures and facilitates, by means of special software, the spatial rotation of the volume and a cut-out within it.

The bile ducts and the hepatic vessels can be relatively easily differentiated by the rotation of the volume around the longitudinal axis, that allows their dissociation. In addition, the rotation of the volume around a transverse axis allows the exploration of the hepatic hilum, the examination being highly similar to an intra operative macroscopic examination.

The diagnostic performance of 3D ultrasound increases when the bile ducts are dilated. The explanation is that cystic aspects are easier to evidence using the transparent and inverse mode software. The spatial disposition of the bile ducts is more clear and the distance between the hepatic ducts in the case of a klatskin tumor is more easy to assess by this technique. The best known application of this method is the characterization of biliary cysts whose spatial distribution is extremely easy to evidence.

The introduction of this technique into clinical practice is very recent, therefore more extensive studies over longer periods and on larger patient groups are expected in order to assess its usefulness in routine examinations.

Endoscopic ultrasonography:(**EUS**)

EUS has variety of applications, with regard to the biliary system, EUS is useful for the diagnosis and staging of ampullary tumors, detection of micro calculi, choledocholithiasis and evaluation of benign and malignant biliary strictures. It can help us to identify the involvement of portal venous system. Endoscopic ultrasound is also useful to aspirate cysts and take guided biopsy from solid lesions, EUS guided FNAC, celiac axis neurolysis, EUS guided immunotherapy but is operator-dependent and not readily available in most centers.

***Computed tomography* (CT):**

CT of the abdomen provides excellent visualization of the liver, gallbladder, pancreas, kidneys, and retroperitoneum. CT is helpful to differentiate between intra and extra hepatic obstruction with very high accuracy. CT helps to assess the operability of tumours in malignant obstruction.

Contrast-enhanced multi-slice CT :

It is very useful for assessment of biliary malignancies.

Contrast agents given orally or intravenously are used and imaging done in unenhanced, arterial and venous phases. CT angiogram or venogram to assess vascularity and portal venous system in malignancy.

***ERCP(*Endoscopic Retrograde Cholangio Pancreatography**)

Endoscopic Retrograde Cholangio Pancreatography (ERCP) is gold standard in evaluation of obstructive jaundice. ERCP detects obstruction below the confluence of right and left hepatic ducts

ERCP can be used both for diagnostic and therapeutic purposes. Diagnostic-It can pick up CBD stones, strictures of CBD, periampullary carcinoma, any obstruction of the CBD as well as helps in taking the brush

cytology. Therapeutic-Its used in stone removal using dormia basket, lithotripsy after sphincterotomy; balloon dilatation for stricture; placing stents in inoperable tumours and stricture.

PTC (Percutaneous transhepatic cholangiography):

It is used to detect obstruction below the level of confluence of right and left hepatic ducts. PTC combined with biliary drainage is done as a diagnostic and palliative/ pre surgical procedure to improve patient condition/ outcome. Polythene catheter can be kept in situ to have biliary drainage. It is used to decompress, assess proximal dilated obstructed biliary system when ERCP fails and stenting across the obstruction can be done under image guidance.

However ERCP and PTC are invasive investigations .The complications are infection, pancreatitis, biliary leakage and bleeding. Also these investigations require specific expertise and equipment which are of limited availability.

Magnetic resonance cholangiopancreatography (MRCP):

Magnetic Resonance Cholangiopancreatography is a relatively new MR imaging technique which has revolutionized the imaging of biliary and pancreatic ducts and has emerged as an accurate, non-invasive means of visualization of the biliary tree and pancreatic duct without injection of

contrast material. MR Cholangiopancreatography has undergone a wide variety of changes.

Magnetic Resonance Cholangiopancreatography with its inherent high contrast resolution, multiplanar capability, rapidity and virtually artifact free display of anatomy and pathology, has proved to be the imaging of choice in these patients.

MRCP shows the entire biliary tract and pancreatic duct without any intervention and use of oral or IV contrast. The quality of images obtained are comparable with those of direct cholangiographic procedures like ERCP, which is considered as standard of reference in biliary ductal pathologies. The diagnostic accuracy of MRCP suggests that, it has the capacity to replace the more invasive procedures like diagnostic ERCP, which should be used only in cases where intervention is being contemplated.

It has proved effective in demonstrating bile duct dilatation, stricture and choledocholithiasis. In patients with malignant obstruction or stenosis of biliary-enteric anastomosis, this type of non invasive imaging technique demonstrates the site and extent of the stenosis, the presence and size of biliary stones, the degree of proximal dilatation, and other associated findings.

Tumour markers*:*

Tumour markers like CA 19-9, CEA and CA-125 are useful in malignant obstruction.CA 19/9 is useful for pancreatic carcinoma with 70% sensitivity and 90%specificity. It is more than 70units/L. But it may also rise in other causes of biliary obstruction and cystadenoma.

***TREATMENT*:**

Surgical treatment is planned according to the etiology. Extrahepatic biliary obstruction requires mechanical decompression. Other goals include treatment of the underlying cause, symptoms, and complications (e.g., vitamin malabsorption). Decompression of extrahepatic biliary obstruction can be achieved by any of these three methods: surgical bypass, resection of obstructing lesions, percutaneous or endoscopic insertion of stents.

Pre-operative preparation of the patient:

- Proper diagnosis and assessment
- Vitamin K injection 10 mg intramuscularly for 5 days
- Adequate hydration with 5% or 10% dextrose
- Blood transfusion in case of anemia
- Repeated monitoring by doing prothrombin time, electrolytes

- Antibiotics like third generation cephalosporins
- Calcium supplementation in the form of calcium chloride

Preoperative biliary decompression is indicated in sepsis, severe malnutrition, hepatorenal syndrome, cardiopulmonary disease.

Correction of coagulopathy, prevention of renal failure, infection, hepatic encephalopathy, electrolyte imbalance

Correction of hypoglycemia and dilutional hyponatremia due to water retention and avoiding isotonic saline infusion.

Management of pruritis:

Pruritis may be due to retention of bile salts which activates release of histamine in skin, central mechanism or by release of endogenous opioids. It is often difficult to treat. Once cause is treated and obstruction is relieved pruritis regresses.

Drugs and therapies used are- Cholestyramine- Its an ion exchange resin which bile salts in intestine inhibiting their absorption. Other drugs used are rifampicin, gabapentin, ondensetran, sertratine, ursodeoxycholicacid, antioxidants, phototherapy, plamapheresis.

Choledocholithiasis:

For proximal stones-open cholecystectomy, choledocholithotomy and removal of stones followed by choledochoduodenostomy.

For distal stones-ERCP and papillotomy, stone extraction through dormia basket or balloon catheter fragmenting the stone and extraction or removal through baby endoscope. CBD stent can be placed in situ.

CBD stricture:

Treatment of stricture is operative resection or bypass if extrahepatic; endoscopic stenting of dominant stricture if available. For lower 1/3 stricture-ERCP and sphincterotomy or transduodenal sphincterotomy or sphincteroplasty. For middle 1/3-ERCP and balloon dilatation or stenting or by-pass. For upper 1/3-porto enterostomy; HEPP-Couinaud by-pass with segment III of liver.

Choledochal cyst:

Type I - Excision and roux-en-y hepatico jejunostomy

Type II -Excision and suturing of CBD wall

Type III -Endoscopic sphincterotomy

Type IV -Lily's procedure leaving the serosa of posterior wall adherent to portal vein

Type V -(Caroli's disease)-liver transplantation.

Malignancies:

Assessment of the resectability of a tumor usually hinges on whether the superior mesenteric vein, the superior mesenteric artery, portal vein and porta hepatis are free of tumor and on whether there is evidence of significant local lymphadenopathy or extra pancreatic extension of tumor.

For lesions that are resectable or amenable to surgical palliation, the choice of treatment will depend on the level of obstruction and the precise etiology. For this purpose, the lesions can be classified into three:

a) Upper third obstruction

Surgical palliation is best achieved with a left hepaticojejunostomy .The long extrahepatic course of the left hepatic duct makes it more accessible. For

respectable lesions, the tumor is resected with a possible hepatectomy or segmentectomy and reconstruction achieved by hepaticojejunostomy.

b) Middle third obstruction

Surgical palliation is better and hepaticojejunostomy after the bifurcation is done. If tumor is resectable, reconstruction is achieved with hepaticojejunostomy.

c) Lower third obstruction :

Surgical palliation done using a roux-en-y choledochojejunostomy. Cholecystojejunostomy carries a high risk of complications and subsequent jaundice. If tumor is resectable, a pancreaticoduodenectomy by Whipple's procedure or local ampullary resection should be done.

Palliation of inoperable pancreatico-biliary malignancies :

Malignant obstructive jaundice cases can receive adequate palliation with ERCP. Biliary drainage by endoscopic stenting can be achieved over 90% of patients successfully with low morbidity and mortality related to the procedure. Success rate is high in those with distal obstruction. Percutaneous transhepatic approach is also used as an alternative to ERCP in biliary decompression, but it is reserved for those patients with duodenal obstruction or

failed ERCP. A diagnostic ERCP is necessary before to stent insertion to evaluate the extrahepatic duct system.

Types of stents

a) Plastic stents- These are mostly made of polyethylene. The plastic stents can maintain patency for about 2 to 4 months. Important complications associated with plastic stents are stent occlusion, fracture, migration and sepsis. Recurrence of jaundice or cholangitis can occur due to stent occlusion requiring exchange of stent in 30-60% of cases.

b) Metal stents- are made of stainless steel alloy monofilament or nickel titanium alloy and are self expandable. Mechanisms by which self expandable metallic stents can be occluded are biliary sludge, tumor ingrowth or over growth, and epithelial hyperplasia. These metal stents can also be covered with silicon membrane to prevent tumor in growth and now there are bio degradable stents in use.

Periampullary carcinoma:

The mainstay of treatment for peri-ampullary cancers is surgical resection. Preoperative staging and assessment of resectability is important. If the tumor is can be resected, then the procedure of choice is a pancreaticoduodenectomy.

Whipple's procedure is the classical approach described by Kausch and Whipple and the most popular technique. The more conservative approach or pylorus preserving whipple's resection described by Watson in 1943 and later popularized by Traverso and Longmire are other techniques that are gradually gaining more importance.

The advantages of Pylorus-preserving pancreatico- duodenectomy are easier and less time-consuming operation with less blood loss, a short hospital stay, and better weight gain during follow-up care. Also, between pylorus-preserving pancreaticoduodenectomy and the standard Whipple procedure there are no differences in the recurrence rate and patient survival.

For inoperable cases, palliative treatment is given depending on the comorbidities, availability of resources and expertise for endoscopic treatment. Biliary bypass procedures for palliation can be done operatively, laparoscopically, endoscopic stenting or by percutaneous transhepatic approaches.

In patients with gastric outlet obstruction Gastric bypass procedures are also indicated. It has been found by various trials that a prophylactic gastrojejunostomy significantly decreases the incidence of late gastric outlet obstruction and does not increase the incidence of postoperative complications or increase the length of hospital stay.

Carcinoma head of pancreas:

Surgery is the only curative modality of treatment, but unfortunately less than 20% of the tumours are resectable. There is now an acceptable operative mortality rate of less than or equal to 5% for resected patients when performed at experienced centers with high volume of patients.

The treatment options for pancreatic cancers are closely similar to peri-ampullary cancers. Tumour shows some response to agents like Gemcitabine, 5FU. Pain Palliation- Patients who present with severe pain should receive opioids. Morphine is usually the drug of choice. Usually, the oral route is preferred in routine practice. Parenteral routes of administration are considered for patients who have impaired swallowing or gastrointestinal obstruction. Percutaneous celiac plexus blockade should be considered, especially for patients who have poor tolerance to opiate analgesics.

Cholangiocarcinoma:

The only curative modality of treatment for cholangiocarcinoma is surgery. Extent of spread, available surgical expertise and associated co-morbidities are some of the factors that determine the therapeutic approach to the patient. Preoperative staging with an aggressive onco-surgical approach involving en-bloc hilar or hepatic resections are being advocated recently. Currently procedures like cholecystectomy, lobar or extended lobar hepatic and bile duct resection, regional lymphadenectomy, and roux-en-y

hepaticojejunostomy are the treatments of choice for hilar cholangiocarcinoma. Photofrin based photodynamic therapy is being tried very recently with encouraging results.

Systemic therapy/Palliative therapy :

Most of the patients present with advanced stage of disease co-morbidities making surgery an impossible treatment option.. The treatment goal is to obtain adequate palliation for such patients. Biliary endoprosthesis (stent) placement is a useful option for palliation of jaundice. ERCP for distal lesions and transhepatic route for proximal lesions are preferred. Other palliative options available are photodynamic therapy, radiation and chemotherapy. Gemcitabine or 5-Fluorouracil are the two common agents which used either as a single agent or in combination with other drugs.

Gall bladder carcinoma:

In operable cases extended cholecystectomy with removal of segments IV and V of liver and perihepatic nodal clearance or hemihepatectomy with cholecystectomy with node clearance. In inoperable cases systemic or intra-arterial chemotherapy and adjuvant radiotherapy.

Post-operative care:

- ICU Monitoring with prothrombin time, bilirubin level, albumin, creatinine, electrolytes estimation
- FFP and blood transfusion if needed
- IV Antibiotics
- Observation for septicemia, hemorrhage, pneumonia, bile leak, pleural effusion
- CVP line, nasogastric tube, urinary catheter.

Recommendations

1. Based on patient factors and availability of resources and personnel treatment should be individualized for all patients.

2. Dedicated centers should be established in order to maximize treatment for pancreatic cancers and other cancers.

3. Pylorus preserving resection is recommended now-a-days instead of the Classical Whipple's resection.

4. Extensive palliative procedures can cause a high degree of morbidity and mortality in advanced hepatobiliary malignancies and should be discouraged.

5. Training in endoscopic procedures is much needed for all surgeons.

6. For biliary decompression by trans-hepatic drainage ERCP is the preferred modality except for obstructions near the hepatic bifurcation.

RESULTS

Table 1: Distribution of study subjects based on Age

Age group	Frequency	Percentage
<30 Years	3	6%
31-40 Years	9	18%
41-50 Years	15	30%
51-60 Years	12	24%
>60 Years	11	22%
Total	**50**	**100%**

The mean age of the study participants was 49.68±12.659

Figure: Age distribution of study sample

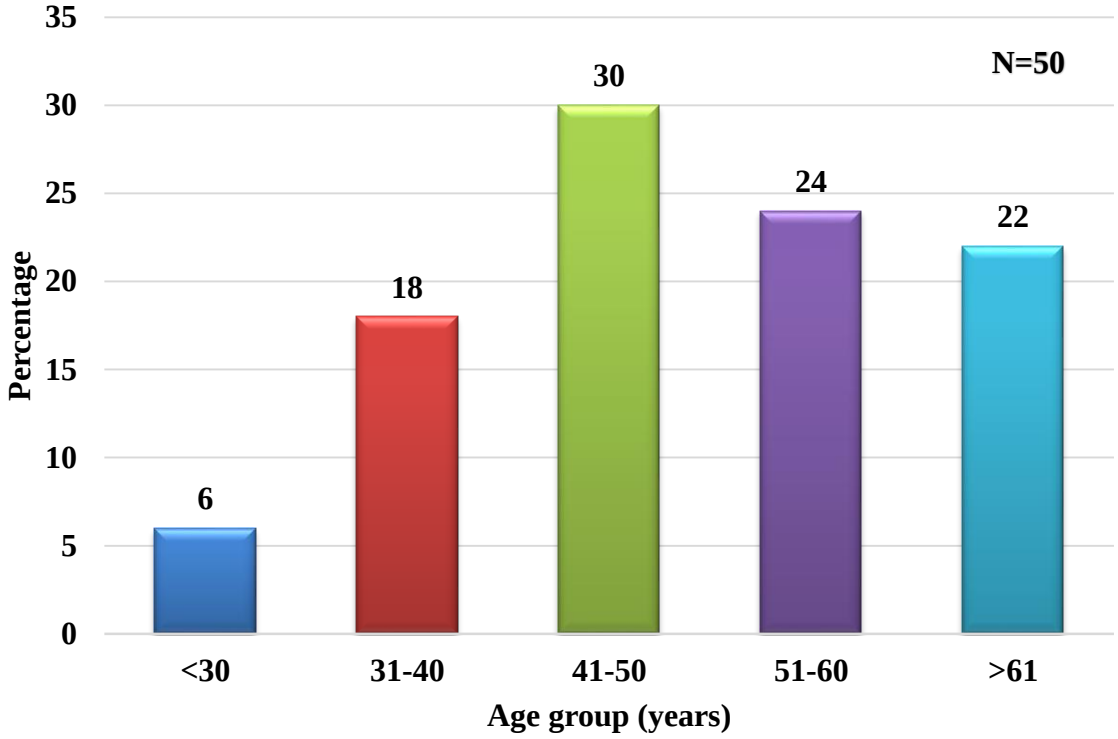


Table 2: Distribution of study subjects based on Gender

Gender	Frequency	Percentage
Female	26	52
Male	24	48
Total	**50**	**100**

Figure: Gender distribution of study sample

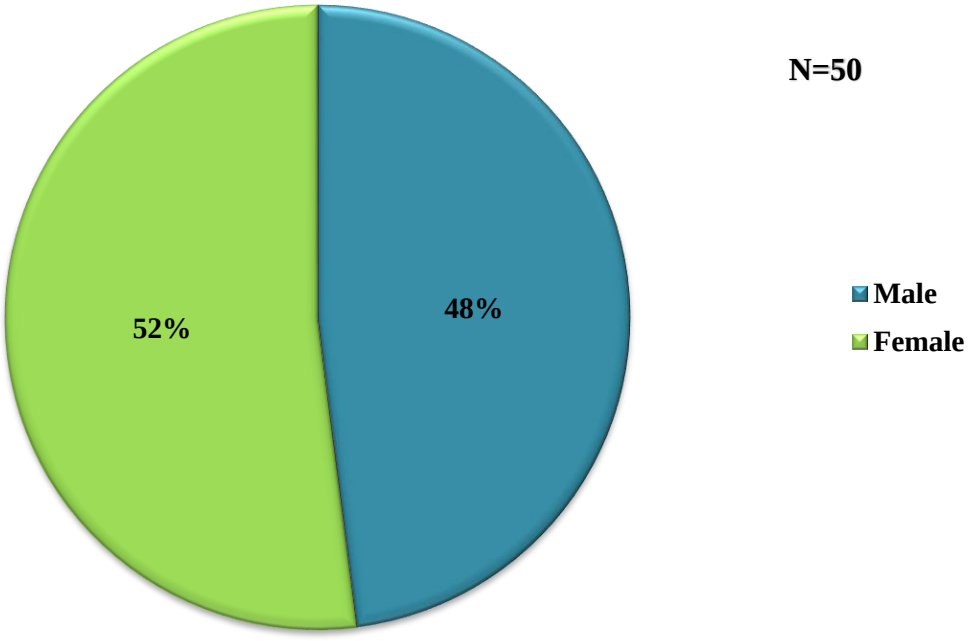


Table 3: Distribution of study subjects based on symptoms

Symptoms	Frequency	Percentage (%)
Abdominal pain	26	52.0
Abdominal pain & Jaundice	5	10.0
Jaundice	12	24.0
Loss of appetite & Weight loss	4	8.0
Loss of appetite & jaundice	1	2.0
Weight loss & jaundice	2	4.0
Total	**50**	**100.0**

Figure: Distribution of study subjects based on symptoms

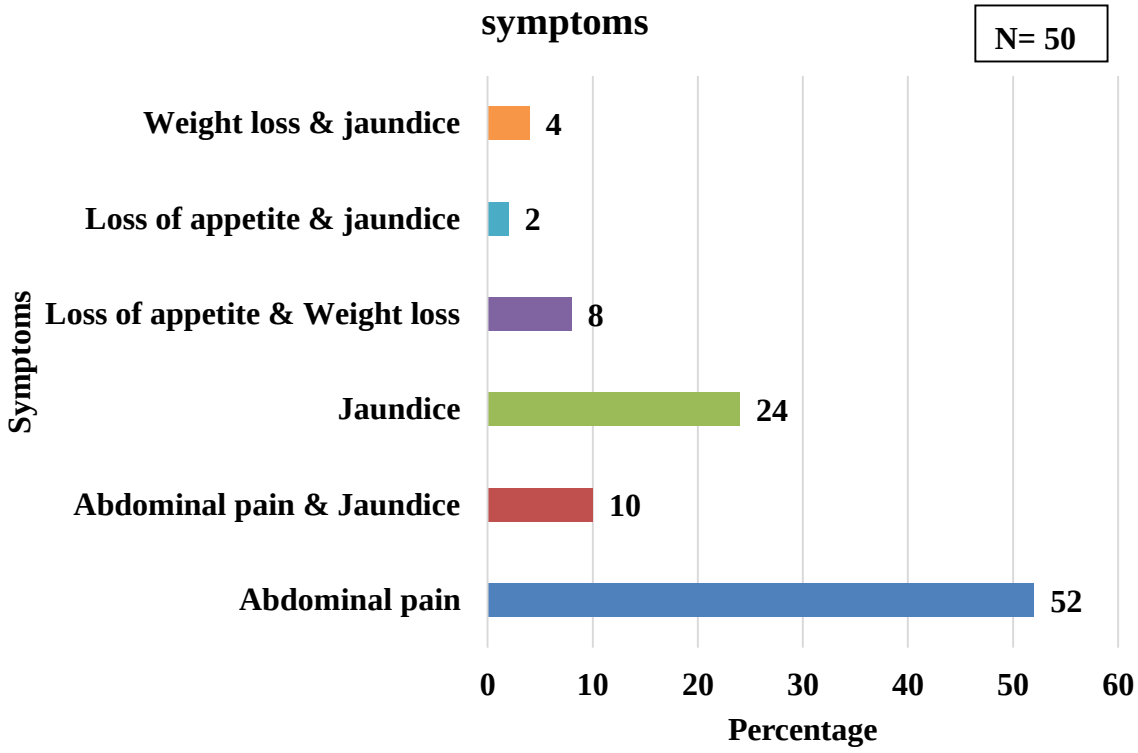


Table 4: Distribution of study subjects based on Diabetes Mellitus

Diabetes Mellitus	Frequency	Percent
Yes	32	64
No	18	36
Total	**50**	**100**

Figure: Distribution of study subjects based on Diabetes Mellitus

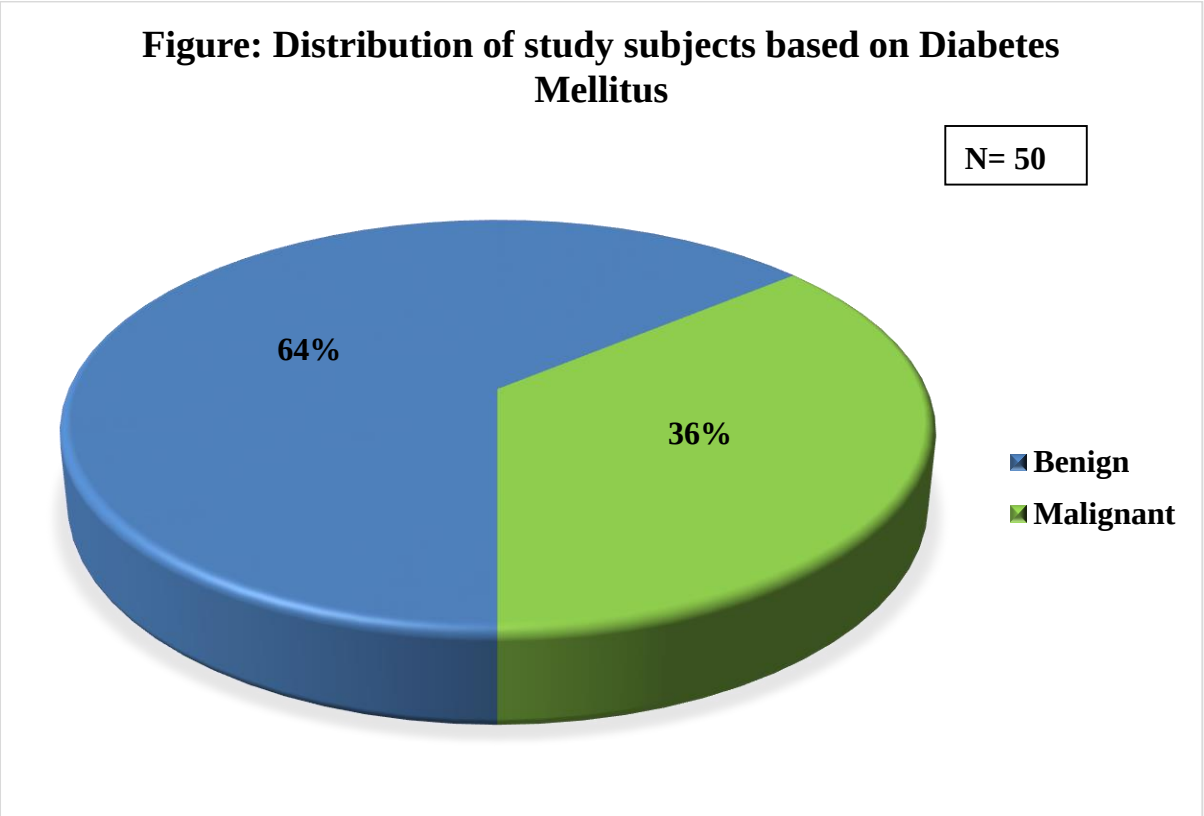


Table 5: Distribution of study subjects based on Hypertension

Hypertension	Frequency	Percent
Yes	29	58
No	21	42
Total	**50**	**100**

Figure: Distribution of study subjects based on Hypertension

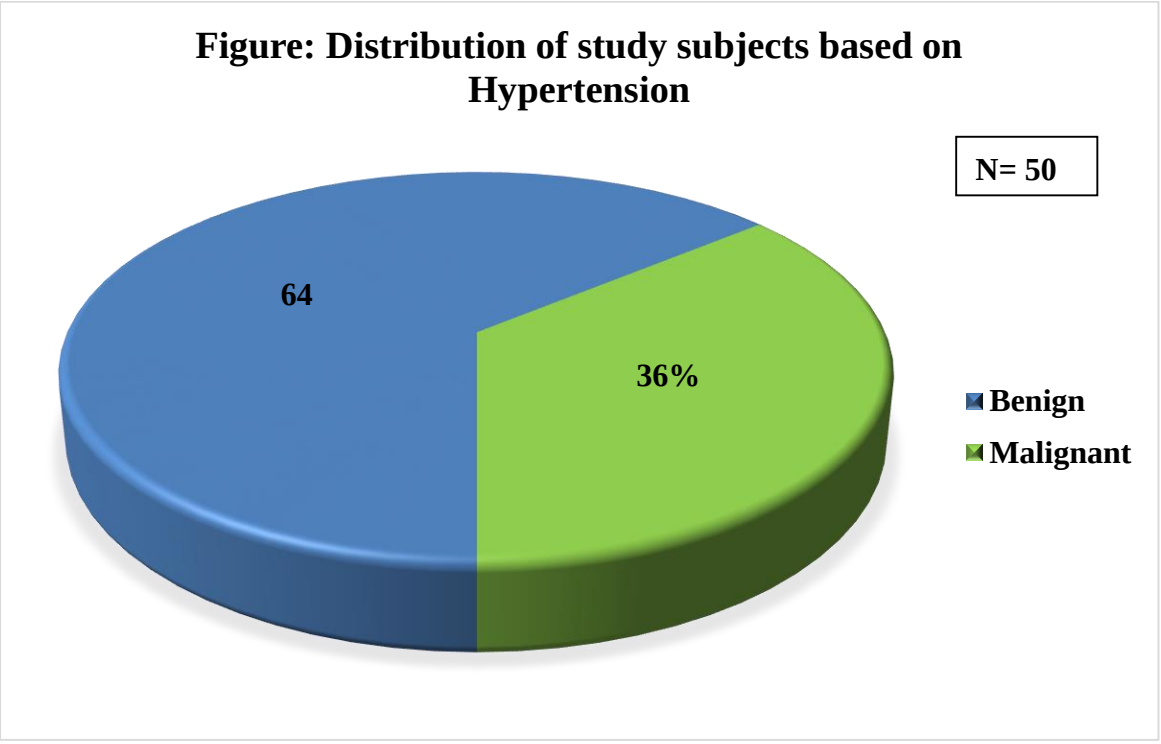


Table 6: Distribution of study subjects based on cause of obstruction

Aetiology	Frequency	Percent
Benign	32	64
Malignant	18	36
Total	**50**	**100**

Figure: Distribution of study subjects based on cause of obstruction

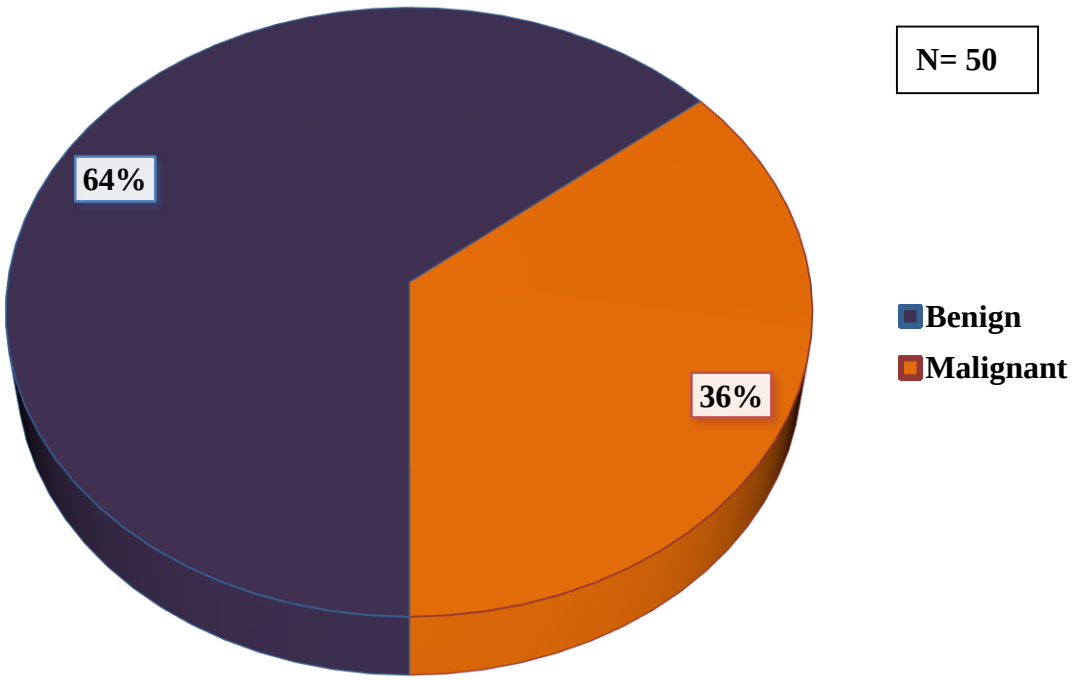


Table 7: Distribution of study subjects based on Aetiology and Diagnosis

Aetiology		**Frequency**	**Percentage**
Benign	Common Bile duct stone	30	60
	Common Bile duct stricture	2	4
Malignant	Ca Gall Bladder	3	6
	Ca head of pancreas	2	4
	Ca stomach with jaundice	2	4
	Hilar cholangio carcinoma	1	2
	Peri ampullary growth	10	20
Total		**50**	**100**

Figure: Distribution of study subjects based on Aetiology and Diagnosis

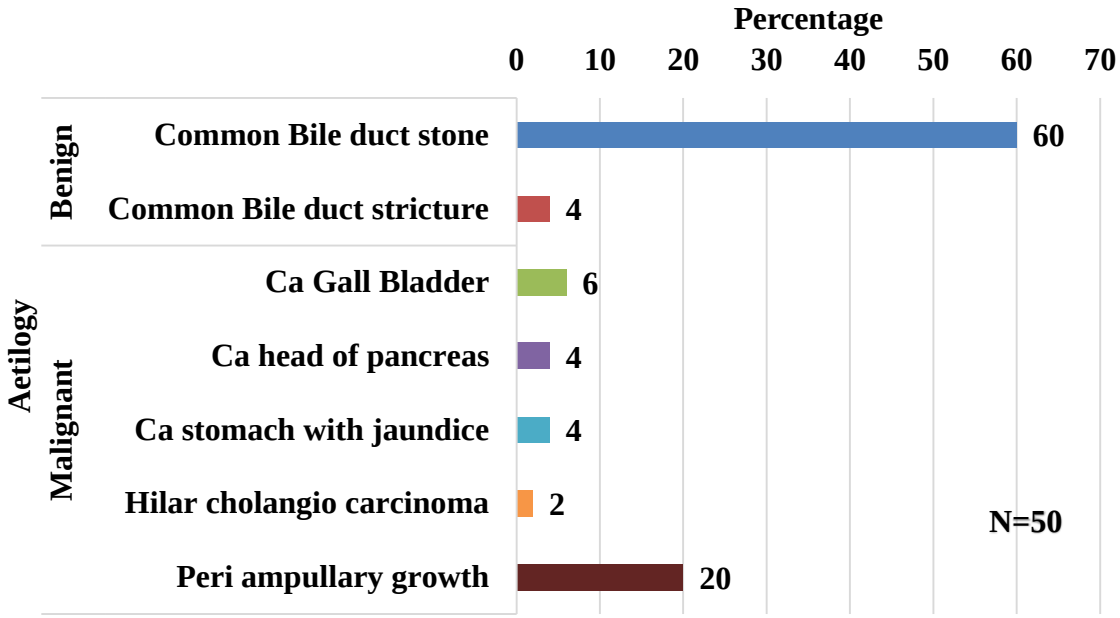


Table 8: Distribution of study subjects based on symptoms and Aetiology

Symptoms	Benign		Malignant	
	n	%	n	%
Abdominal pain	23	88.5	3	11.5
Abdominal pain & Jaundice	0	0	5	100
Jaundice	8	75	4	25
Loss of appetite & Weight loss	1	25	3	75
Loss of appetite & jaundice	0	0	1	100
Weight loss & jaundice	0	0	2	100

Table 9: Mean Bilirubin level before and after the surgery

Mean Bilirubin level	Pre op Mg/dl	POD 1 Mg/dl	POD 3 Mg/dl	POD 6 Mg/dl	POD 9 Mg/dl
Total	4.54	4.09	3.06	2.16	1.49
Direct	3.36	2.77	2.02	1.44	0.96
Indirect	1.19	1.32	1.04	0.72	0.54

Figure: Mean bilirubin level before and after the surgery

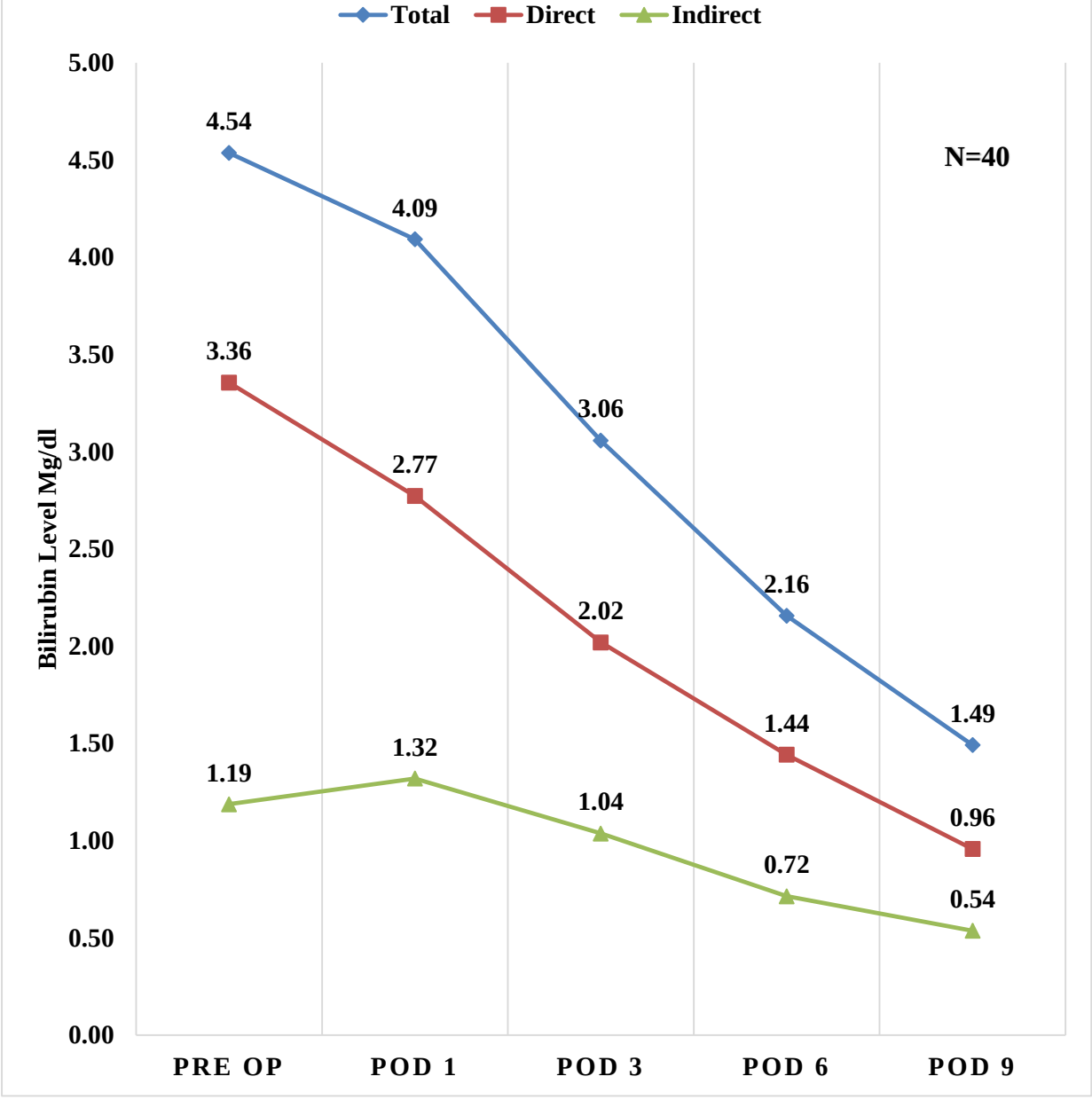


Figure: Mean Alkaline Phosphatase level before and after the surgery

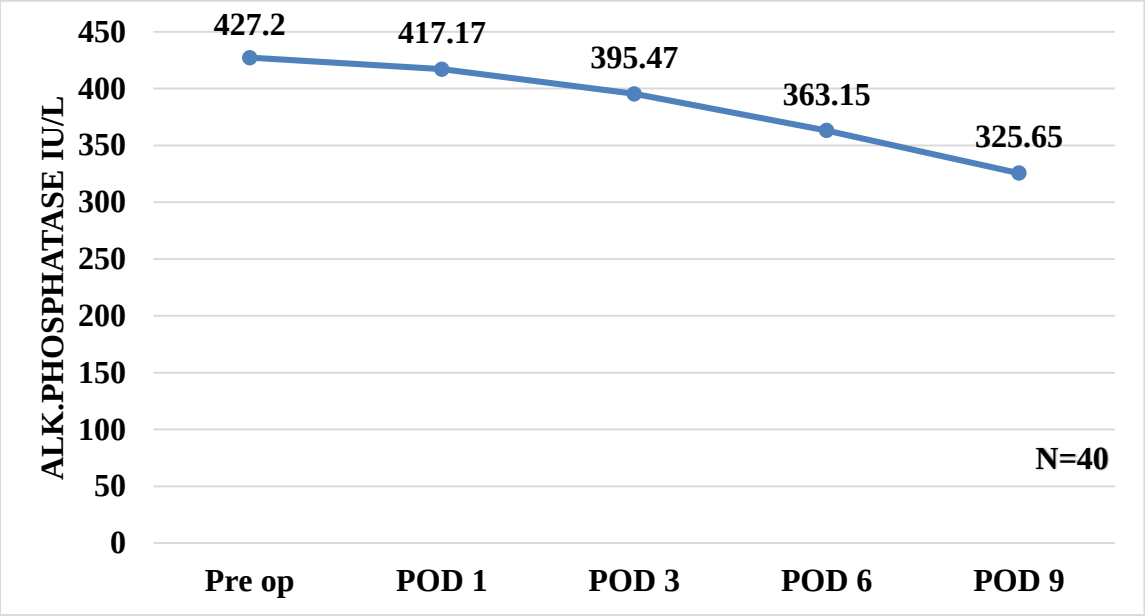


Table 10: Distribution of study subjects based on Management

Management	Frequency	Percentage
Surgery	40	80.0
Palliative	6	12.0
Non Compliance	3	6.0
Referral	1	2.0
Total	**50**	**100.0**

Figure: Distribution of study subjects based on Management

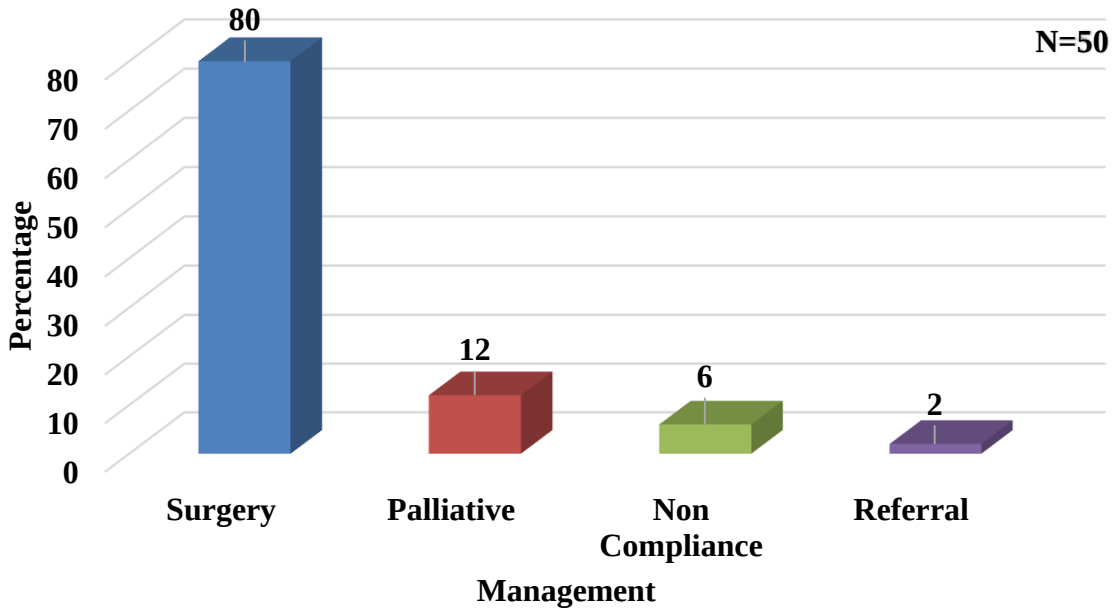


Table 11: Distribution of study subjects based on the surgical procedure done

Diagnosis	Surgery done	Frequency (n= 40)
Peri-ampullary growth	Whipple's Procedure	8
	Triple bypass	2
Common Bile duct stone	Cholecystectomy/Common Bile Duct Exploration with T-Tube insertion	6
	Cholecystectomy with choledocho duodenostomy	17
	Cholecystectomy/ choledocholithotomy/ choledocho duodenostomy	6
Ca head of pancreas	Whipple's Procedure	1

Figure: Distribution of study subjects based on the surgical procedure done

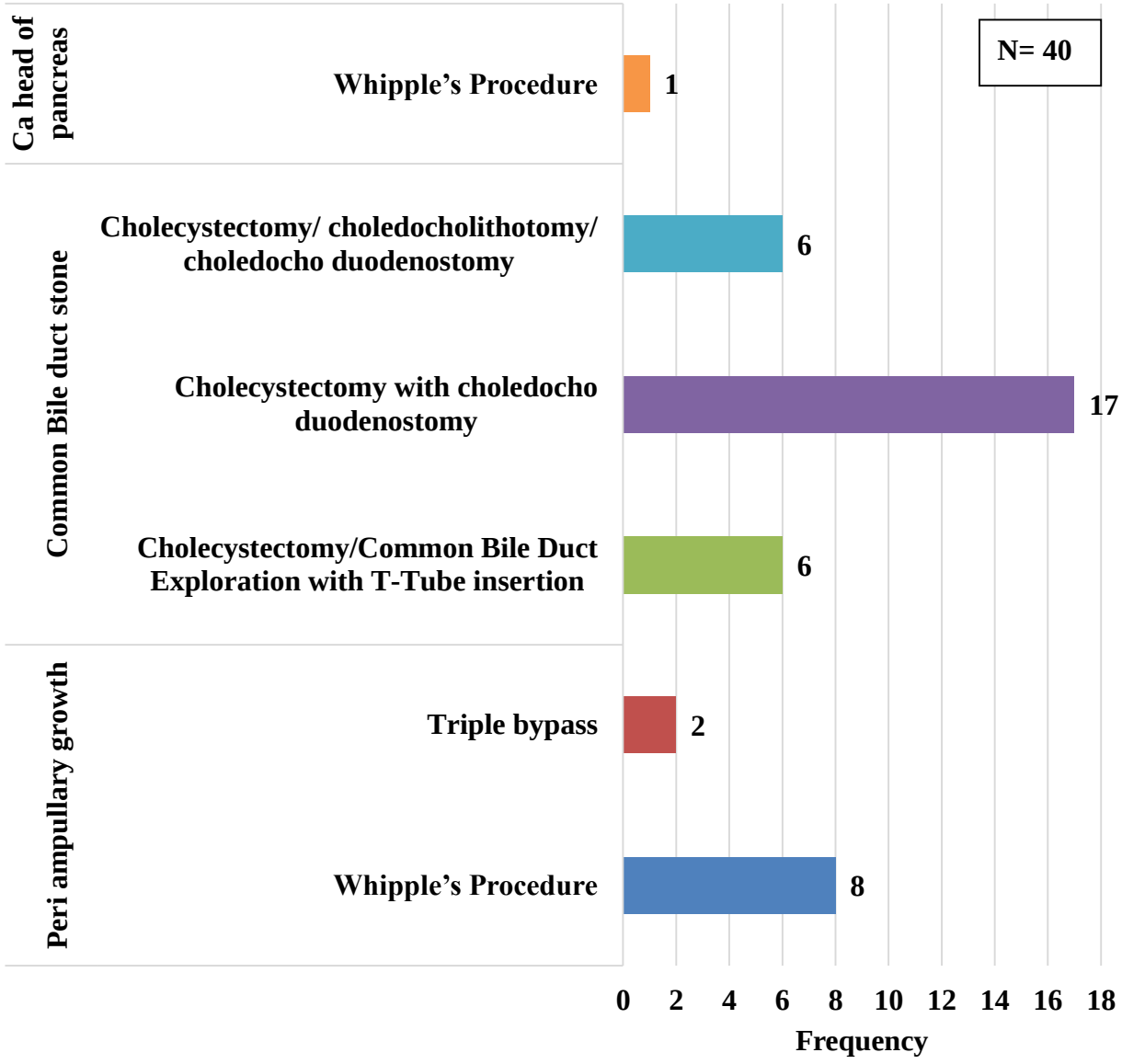
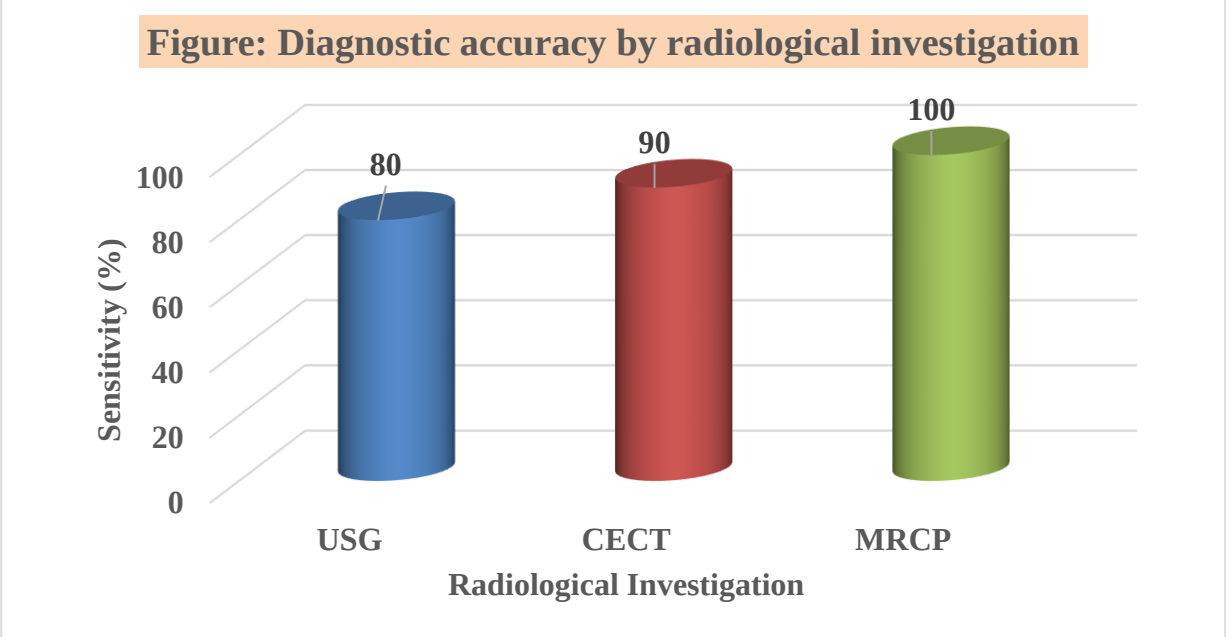


Table 12: Details of investigations done

DIAGNOSIS	***USG abdomen/pelvis***			***CECT abdomen/pelvis***			***MRCP***		
	Total No.of cases done	**Diagnosed**	**Not diagnosed**	**Total No.of cases done**	**Diagnosed**	**Not diagnosed**	**Total No.of cases done**	**Diagnosed**	**Not diagnosed**
Choledocholithiasis	30	28	2	11	8	3	30	30	0
Peri ampullary Ca	10	6	4	10	9	1	10	10	0
Ca Gallbladder	3	3	0	3	3	0	3	3	0
CBD Stricture	2	0	2	2	1	1	2	2	0
Ca head of pancreas	2	2	0	2	2	0	2	2	0
Ca stomach with porta hepatis nodes	2	1	1	2	2	0	2	2	0
Hilar cholangio carcinoma	1	1	0	1	1	0	1	1	0

Table 13: Diagnostic accuracy by radiological investigations

Radiological Investigation	Diagnosed	Un-diagnosed	Total number of cases scanned	Sensitivity
USG	40	10	50	80%
CECT	18	2	20	90%
MRCP	50	0	50	100%
Fischer exact test value: 11.11	P value: 0.0039, Statistically significant			



DISCUSSION

The purpose of the study was to evaluate patients with obstructive jaundice clinically, biochemically and radiologically and to determine the most common cause, age incidence, sex incidence and chief compliant are analysed in our set up in current scenario. Accuracy of radiological investigations like USG and CT abdomen are evaluated and complications of treatment in our hospital were analyzed among 50 cases admitted and treated for obstructive jaundice in the hospital for a period of one and a half year.

Various studies observed that Jaundice is a major health problem in India in which specific symptoms will not arise in initial phase of the disease. They will occur once the disease becomes locally advanced or including adjacent vital structures.

The mean age of incidence of surgical jaundice was 49.68yrs in present study. Comparing with study done by Friess H et al [20] in the year 2004 who did similar study in which there is more or less equal age incidence in present study.

The most common age group affected with obstructive jaundice was between 41 to 50 years of age accounting to about 30% and youngest being 24 years and eldest being 75 years. The next most common age group was 51-60 years and >60 years with 24% and 22% respectively. Thus it was a disease of middle age group.

The most commonly affected sex is female. The increased incidence of obstructive jaundice amongst the females is due to the fact that gall stones are frequently found in them. In the study among the 50 cases 24 patients are male accounting to about 48%. Malignant disease appears to be most common in elderly males. About 18 cases among 50 are affected by malignant obstructive jaundice. The ratio of male:female appears to be1.08:1 in our set up. This almost correlates with the study of Verma et al[2] (2010) in which the male:female ratio was 1.8:1

The most common chief complaint was abdomen pain in about 52% of patients. The next most common complaint was yellowish discolouration of eye, itching i.e., jaundice accounting to about 24%.Some patients have two complaints in combination like abdominal pain and yellowish discolouration of eye (10%) followed by there was Loss of appetite and Weight loss (8%). This goes with Siddique et al[18] (2008) study where abdomen pain was most common presenting feature (51.66%)

Among the 50 cases studied only 18 have malignant aetiology accounting to about 36%.About 64 % have a benign aetiology. Malignant cases were higher in male than female and benign cases were higher in female than male. This doesn't correlates with Sidddique et al[18] (2008) who stated that malignancy is the most common cause (56.6%) but correlates with Bekele et al[5] (2000) study who reported choledocholithiasis is most common cause for obstructive jaundice.

The most common benign aetiology in my study was choledocholithiasis accounting for about 60% of the overall aetiology and 93.75% of the benign aetiology. Choledocholithiasis was also found to be the commonest benign cause in others study(2). Among the 30 cases with choledocholithiasis 17 cases were females indicating the high prevalence of stone disease in females. Choledocholithiasis was the commonest benign cause and it was observed in study done by B Roy et al[3](2015). Two cases presented with benign stricture. But unfortunately both patients are not willing for surgery even after counselling.

The most common malignant aetiology was periampullary carcinoma in my study. About 55.55 % of the malignant aetiology and 20% of the overall aetiology of obstructive jaundice was periampullary carcinoma. This doesn't correlates with Sharma & Ahuja[15](2009) who reported carcinoma gallbladder as the most common cause. Among the 10 cases 8 were treated with whipple's procedure and rest 2 were treated with triple bypass.

The next most common malignancy was carcinoma gall bladder. Among the 3 cases all were presented with advanced & inoperable stages and treated aiming palliation.

Liver secondaries with porta hepatis nodes was found to be the cause in 2 cases accounting to 4%. Among them both had primary in the stomach and received palliative chemotherapy. 2 patients presented as carcinoma head of pancreas accounting 4% of obstructive jaundice & 11.11% of malignant

aetiology in our study and one patient treated by whipple's procedure and one patient is not willing for surgery. One patient presented with advanced hilar cholangio carcinoma with inoperable stage treated aiming palliation. Similar Incidence of various malignancies in patients of obstructive jaundice has been seen in various studies. These observations reflect differences inetiological spectrum from one centre to another.

Majority of patients with malignant obstructive jaundice underwent palliative treatment and majority of patients with benign aetiology underwent curative surgery. Similar treatment pattern was also reported by Mohammed et al[11](2007).

Mortality occurred in one case. That is a case of advanced carcinoma stomach with liver secondaries on palliative & supportive care. Abdul Ghafoor Dalwani et al[21](2001) study has showed a high mortality rate in about 11.25% of cases.

Amongst the radiological investigations ultrasonography was the initial imaging investigation for all cases of obstructive jaundice to diagnose the cause of obstruction. Ultrasonography of abdomen and MRCP was done in all cases. CECT was done in 20 cases. The sensitivity of MRCP (100%) was higher than the other two radiological investigations and this difference were found to be statistically significant by Fischer's exact test (p value=0.0039).

Asma Afzal Kiani et al[22](2000) study stated that- Ultrasonography should be the first and best initial imaging procedure in patients who have obstructive jaundice. CT was found to be more sensitive than USG.

According to *Jennifer et al[23](2000)* study - Traditional computed tomography (CT) scan is usually considered more accurate than US for helping determine the specific cause and level of obstruction.

The study done by B Roy[3](2015) evaluated of imaging techniques for diagnosis, sensitivity of Ultrasound was 82% and sensitivity of CT was 91%.. But in our study Sensitivity of ultrasonogram was 80% but CT scan 90%.(3)CT scan has several advantages over USG. CT scan was done in patients mostly suspecting of malignancy in USG. Tumor size, its local, regional and distant spread can more accurately be determined by CT scan.

In my study we did surgical treatment in 80% of patients. Only two patients received bypass procedures due to the severi ty of the disease. All choledocholithiasis patients treated with surgery except one patient who is referred for ERCP. Open cholecystectomy with CBD exploration and T-Tube drainage was done for 6 patients and for 23 cases open cholecystectomy with choledochoduodenostomy done. Among 10 cases of peri-ampullary carcinoma 8 patients were treated with whipple's procedure and 2 were with triple bypass. Among 2 cases of carcinoma head of pancreas 1 was treated with whipple's procedure and one is not willing for surgery. All the 3 cases of carcinoma gallbladder and carcinoma stomach and hilar cholangio carcinoma were

inoperable even at presentation. Another 2% were referred to higher centre and 6% were non-compliant to treatment.

Biochemically Bilirubin level and Alkaline Phosphatase was monitored before and after surgery on day 1,3,6 & 9. There was reduction in mean Total bilirubin level 4.54 to 1.49mg/dl, direct bilirubin from 3.36 to 0.96 mg/dl, indirect bilirubin from 1.19 to 0.54 mg/dl. There was reduction inmean Alkaline Phosphatase from 427.2 to 325.65 IU/L. In our study also the reduction of bilirubin post operatively correlates with David O Irabor et al[19] results.

Most common complication was wound gaping and wound infection and the organism were E.coli, Klebsiella and proteus. Similar bacterial profile was also found Leida z et al[13] (2008) study. Post operative wound infections in biliary surgery has been reported in literature to be due to contamination by gram negative enteric aerobes like E.coli, Klebsiella by opening the biliary tract in patients with bactibilia and patients with wound infection were treated with daily twice cleaning and dressing, culture &sensitivity and appropriate antibiotics.

CONCLUSION

1. Obstructive jaundice is a common surgical problem in our setting and poses diagnostic and therapeutic challenges. It is more common among females.
2. Benign etiology is common in females and malignant etiology is common in males
3. Careful clinical examination and correlation with radaiological investigations played a major role in diagnosis and treatment
4. Pre operative evaluation and correction of abnormalities will reduce the morbidity and mortality
5. Endoscopic ultrasound is the best imaging modality for common bile duct stones.
6. Minimal invasive surgery will play a role in surgical management of obstructive jaundice.

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PROFORMA

Name:

Age/Sex:

IP No:

Contact Details:

D.O.A:

D.O.S:

D.O.D:

Chief Complaints:

H/O Presenting Illness:

Past History:

Personal History:

Family History:

General Examination:

Vitals :

Systemic Examination:

Local Examination:

Inspection:

Palpation:

Percussion:

Auscultation:

Investigations:

Routine:

Specific Investigations:

Treatment:

Complications:

HPE Report:

Outcome:

நோயாளிகளுக்கு அறிவிப்பு மற்றும் ஒப்புதல் படிவம்
(மருத்துவ ஆய்வில் பங்கேற்பதற்கு)

ஆய்வு செய்யப்படும் தலைப்பு:
பங்கு பெறுவரின் பெயர்:
பங்கு பெறுவரின் வயது:

		பங்கு பெறுவர் இதனை ✓ குறிக்கவும்
1.	நான் மேலே குறிப்பிட்டுள்ள மருத்துவ ஆய்வின் விவரங்களை படித்து புரிந்து கொண்டேன். என்னுடைய சந்தேகங்களை கேட்கவும், அதற்கான தகுந்த விளக்கங்களை பெறவும் வாய்ப்பளிக்கப்பட்டுள்ளது என அறிந்து கொண்டேன்.	☐
2.	நான் இவ்வாய்வில் தன்னிச்சையாக தான் பங்கேற்கிறேன். எந்த காரணத்தினாலோ எந்த கட்டத்திலும், எந்த சட்ட சிக்கலுக்கும் உட்படாமல் நான் இவ்வாய்வில் இருந்து விலகி கொள்ளலாம் என்றும் அறிந்து கொண்டேன்.	☐
3.	இந்த ஆய்வு சம்பந்தமாகவோ, இதை சார்ந்து மேலும் ஆய்வு மேற்காள்ளும் போதும் இந்த ஆய்வில் பங்குபெறும் மருத்துவர் என்னுடைய மருத்துவ அறிக்கைகளை பார்ப்பதற்கு என் அனுமதி தேவையில்லை என அறிந்து கொள்கிறேன். நான் ஆய்வில் இருந்து விலகிக் கொண்டாலும் இது பொருந்தும் என அறிகிறேன்.	☐
4.	இந்த ஆய்வின் மூலம் கிடைக்கும் தகவலையோ, முடிவையோ பயன்படுத்திக் கொள்ள மறுக்க மாட்டேன்.	☐
5.	இந்த ஆய்வில் பங்கு கொள்ள ஒப்புக் கொள்கிறேன் எனக்கு கொடுக்கப்பட்டஅறிவுரைகளின் படி நடந்து கொள்வதுடன், ஆய்வை மேற்கொள்ளும் மருத்துவ அணிக்கு உண்மையுடன் இருப்பேன் என்று உறுதியளிக்கிறேன். என் உடல் நலம் பாதிக்கப்பட்டாலோ, அல்லது எதிர்பாராத, வழக்கத்திற்கு மாறான நோய்குறி தென்பட்டாலோ உடனே இதை மருத்துவ அணியிடம் தெரிவிப்பேன் என உறுதி அளிக்றேன்.	☐

பங்கேற்பவரின் கையொப்பம் / ..... இடம் .....
கட்டைவிரல் ரேகை
பங்கேற்பவரின் பெயர் மற்றும் விலாசம் .....
ஆய்வாளரின் கையொப்பம் /..... இடம் .....
ஆய்வாளரின் பெயர் .....
மையம் .....
கல்வியறிவு இல்லாதவற்கு (கைரேகை வைத்தவர்களுக்கு) இது அவசியம் தேவை
சாட்சியின் கையொப்பம் /..... இடம் .....
பெயர் மற்றும் விலாசம் ....

S.NO	NAME	AGE/SEX	COMPLAINT	DIAGNOSIS	TOTAL BILIRUBIN mg/dl	DIRECT BILIRUBIN mg/dl	INDIRECT BILIRUBIN mg/dl	ALK.PHOSPHATASE IU/L	PT/INR (S)	T2DM	SHT	MORBIDITY	CBD DIAMETER	BILIRUBIN POD-1 TB/DB/IB	BILIRUBIN POD-3 TB/DB/IB	BILIRUBIN POD-5 TB/DB/IB	BILIRUBIN POD-9 TB/DB/IB	ALK.PHOSPHATASE POD-1 IU/L	ALK.PHOSP POD-3 IU/L	ALK. PHOSP POD-5 IU/L	ALK.PHOSP POD-9 IU/L	USG	CT	MRCP	TREATMENT	T-TUBE CHOLANGIOGRAM ON DAY 10	COMPLICATIONS
1	Bhuvaneswari	34/f	Abd pain	Cbd stone	2.4	1.7	0.7	190	10/0.9	NO	NO		1.3CM	2.1/1.5/0.6	1.5/0.9/0.6	1.1/0.7/0.4	0.8/0.5/0.3	185	178	176	165	Cbd stone	Cbd stone	choledocholithiasis	Cholecystectomy / CBD Exploration with T-Tube	Normal study	
2	Mahalakshmi	24/f	Abd.pain	Cbd stone	1.9	1.1	0.8	185	11/0.9	NO	NO		1.2CM	1.8/1.1/0.7	1.2/0.7/0.5	0.9/0.6/0.3	0.6/0.4/0.2	180	172	170	165	Cbd stone	Cbd stone	choledocholithiasis	Cholecystectomy / CBD Exploration with T-tube	Normal study	
3	Pramu	40/f	Abd.pain	Cbd stone	2.6	1.7	0.9	210	11/0.9	YES	NO		1.3CM	2.2/1.5/0.7	1.7/1.1/0.6	1.1/0.7/0.4	0.8/0.5/0.3	201	200	192	185	Cbd stone	Cbd stone	choledocholithiasis	Cholecystectomy / CBD Exploration with T-tube	Normal study	
4	Esakkimuthu	45/m	Abd.pain	Cbd stones	2.7	1.9	0.8	235	10/1.0	NO	YES		1.2CM	2.7/1.8/0.9	1.5/0.9/0.6	1.1/0.8/0.3	0.8/0.6/0.2	220	215	205	187	Acute calculus cholecystitis	Acute calculus cholecystitis	Acute cholecystitis/Chole with choledocholithiasis	Referred to grh for ercp		Referral
5	Madathy	53/f	Abd.pain	Cbd stones	2.2	1.5	0.7	180	11/1.1	YES	YES		1.9CM	2/1.2/0.8	1.3/1.1/0.2	0.9/0.5/0.4	0.6/0.4/0.2	180	170	175	155	Cbd stone	Cbd stone	Cbd stone	Cholecystectomy/Choledocho duodenostomy		bile leak
6	Kaliammal	52/f	Abdomen pain	Cbd stones	2.1	1.5	0.6	200	11/0.8	YES	NO		1.9CM	2.1/1.7/0.4	1.2/0.7/0.5	0.9/0.5/0.4	0.7/0.5/0.2	196	188	175	160	Cbd stones	Chole with choledocholithiasis/ cbd dilated	Chole with choledocholithiasis/cbd & ihbr dilatation	Cholecystectomy/ choledocholithotomy/ choledocho duodenostomy		
7	Mupidathy	51/f	Abdomen pain	Cbd stones	2.2	1.3	0.9	215	9/1.0	NO	YES		2.3CM	2.1/1.8/0.3	1.3/0.7/0.6	0.8/0.6/0.2	0.7/0.4/0.3	205	206	190	178	Cbd stones	Cbd dilated	Cbd dilated/ihbr dilated/cbd stone	Cholecystectomy/Choledocho duodenostomy		
					0																	Cbd dilated/ ihbr dilated					
8	Palaniammal	65/f	Yellowish sclera	Cbd stones	3.2	2.1	1.1	335	9/1.0	YES	YES		2.2CM	2.9/1.9/1.0	2/1.1/0.9	1.7/1.1/0.6	1.1/0.7/0.4	300	305	290	282	Cbd stone		Choledocholithiasis	Cholecystectomy/Choledocho duodenostomy		WOUND GAPING
9	Rahamathulla	35/m	Yellowish sclera	Cbd stones	3.3	1.9	1.4	311	9/1.0	NO	NO		2.3CM	2.9/2.1/0.8	2.1/1.2/0.9	1.7/1.0/0.7	1/0.6/0.4	300	305	290	280	Chole with choledocholithiasis	Chole with choledocholithiasis	Chole with choledocholithiasis	Cholecystectomy/ choledocholithotomy/ choledocho duodenostomy		
10	Syed ghour mohideen	70/m	Abd.pain	Cbd stones	2.4	1.7	0.7	286	10/1.0	YES	YES		1.4CM	2.1/1.4/0.7	1.4/1.0/0.4	1.1/0.8/0.3	0.9/0.6/0.3	280	275	232	208	Cbd stones		choledocholithiasis	Cholecystectomy/CBD Exploration with T Tube	Normal study	pneumonia
11	Muthukrishnan	65/m	Itching	Cbd stones	4.1	3.3	0.8	399	10/1.0	YES	YES		2.2CM	4/2.8/1.2	2.7/1.9/0.8	1.8/1.1/0.7	1.2/0.7/0.5	390	350	310	290	Cbd stones		Chole with choledocholithiasis	Cholecystectomy with choledocho duodenostomy		
			Yellow eye																								
12	Rajeswari	26/f	Abdomen pain	Cbd stones	2.8	2	0.8	288	11/1.1	NO	NO		2.3CM	2.8/1.9/0.9	1.7/1.2/0.5	1.2/0.7/0.5	0.9/0.5/0.4	280	270	260	250	Chole with choledocholithiasis	Chole with choledocholithiasis	Chole with choledocholithiasis	Cholecystectomy/ choledocholithotomy/ choledocho duodenostomy		
13	Durai	53/m	Abd.pain	Cbd stones	3.4	2.2	1.3	333	10/1.0	NO	YES		2CM	3.1/2.3/0.8	2.1/1.2/0.9	1.8/1.1/0.7	1.1/0.7/0.4	325	300	300	300	Chole with choledocholithiasis	Terminal cbd dilated	Chole with choledocholithiasis	Cholecystectomy/ choledocholithotomy/ choledocho duodenostomy		
			Yellow urine																								
14	Thangammal	43	Abd pain	Cbd stones	2.6	1.7	0.9	299	9/0.9	NO	NO		1.3CM	2.1/1.4/0.7	1.5/0.9/0.6	1.1/0.7/0.4	0.8/0.5/0.3	300	280	285	230	Cbd stones		Choledocholithiasis	Cholecystectomy/CBD Exploration with T Tube	Normal study	
15	Rajesh kannan	44/m	Yellow eye	Cbd stones	3.9	2.9	1	447	10/0.9	NO	NO		2.2CM	3.1/2.2/0.9	2.3/1.2/0.9	1.3/0.8/0.5	1.2/0.7/0.5	460	440	425	360	Chole with choledocholithiasis		Chole with choledocholithiasis	Cholecystectomy/ choledocholithotomy/ choledocho duodenostomy		
16	esakkiyammal	28/f	Abdomen pain		2.7	2	0.7	311	11/0.8	NO	NO		2.0CM	2.1/1.4/0.7	1.7/1.1/0.6	1.2/0.8/0.4	0.9/0.5/0.4	300	300	260	195	Cbd stones		choledocholithiasis	Cholecystectomy/Choledocho duodenostomy		
17	Mohammed sulaina	70/m	yellow sclera	Cbd stones	3.4	2.7	0.7	297	12/1.2	YES	YES		2.2CM	2.8/1.9/0.9	2/1.3/0.7	1.4/0.9/0.5	1.1/0.8/0.3	290	270	275	235	Cbd stones		choledocholithiasis	Cholecystectomy/Choledocho duodenostomy		
18	Kanagaraj	40/m	Abd.pain	Cbd stones	2.9	1.9	1	267	12/0.8	YES	NO		2.3CM	2.3/1.6/0.7	1.9/1.1/0.8	1.5/1.1/0.4	1.1/0.7/0.4	250	220	210	190	Cbd stones	Terminal choledocholithiasis	choledocholithiasis	Cholecystectomy/ choledocholithotomy/ choledocho duodenostomy		WOUND GAPING
19	Thirumalai samy	35	Abd pain	Cbd stones	2.8	1.8	1	299	10/0.9	NO	NO		1.5CM	2.1/1.5/0.6	1.6/1.1/0.5	1.5/0.9/0.6	0.9/0.6/0.3	250	220	210	190	Cbd stones		choledocholithiasis	Cholecystectomy/CBD Exploration with T Tube insertion	Normal study	
20	Kumar	45	Abd pain	Cbd stones	2.9	2.1	0.8	309	12/1.1	YES	YES		2.6CM	2.4/1.7/0.7	1.7/1.0/0.6	1.1/0.8/0.3	0.9/0.5/0.4	300	289	222	211	Cbd stones		choledocholithiasis	Cholecystectomy with choledocho duodenostomy		
21	KANNAN	33	Abd pain	Cbd stones	1.9	1.1	0.8	254	10/1.0	NO	NO		2.2CM	1.8/1.1/0.7	1.2/0.7/0.5	0.9/0.6/0.3	0.6/0.4/0.2	250	245	241	199	Cbd stones		choledocholithiasis	Cholecystectomy with choledocho duodenostomy		
22	MADASAMY	54	Yellow eye	Cbd stones	4.1	2.9	1.2	399	10/0.9	YES	YES		2.4CM	3.6/2.8/0.8	2.6/1.7/0.9	1.8/1.1/0.7	1.2/0.7/0.5	380	380	371	352	Cbd stones		choledocholithiasis	Cholecystectomy with choledocho duodenostomy		
23	MOHAMMED	45	Yellow eye	Cbd stones	3.1	2.2	0.9	344	11/1.1	NO	NO		2.3CM	2.8/1.8/1.0	2.1/1.3/0.8	1.6/1.1/0.5	1/0.6/0.4	340	333	287	235	Cbd stones		choledocholithiasis	Cholecystectomy with choledocho duodenostomy		
24	JAMES	46	Abd pain	Cbd stones	1.9	1	0.9	211	10/0.8	YES	NO		2.2CM	1.8/1.1/0.7	1.1/0.7/0.4	0.9/0.5/0.4	0.9/0.5/0.4	200	200	155	145	Cholelithiasis		choledocholithiasis	Cholecystectomy with choledocho duodenostomy		
25	PERUMAL	49	Abd pain	Cbd stones	1.9	1.1	0.8	190	10/0.8	NO	YES		2.3CM	1.6/1.1/0.5	1.2/0.7/0.5	1.1/0.7/0.4	0.9/0.5/0.4	185	170	133	122	Cbd stones		choledocholithiasis	Cholecystectomy with choledocho duodenostomy		WOUND GAPING
26	PUSHPA	39	Abd pain	Cbd stones	2.1	1.4	0.7	309	11/1.0	NO	NO		2.4CM	1.8/1.1/0.7	1.3/0.8/0.5	1/0.6/0.4	0.8/0.6/0.2	300	270	255	196	Cbd stones		choledocholithiasis	Cholecystectomy with choledocho duodenostomy		
27	RANI	33	Abd pain	Cbd stones	2	1.2	0.8	282	9/0.8	NO	NO		2.3CM	1.8/1.0/0.8	1.3/0.7/0.6	1/0.7/0.3	0.9/0.6/0.3	280	222	199	166	Cbd stones		choledocholithiasis	Cholecystectomy with choledocho duodenostomy		
28	AVUDAIYAMAL	54	Abd pain	Cbd stones	2.5	1.6	0.9	271	10/0.8	YES	YES		2.1CM	2.3/1.5/0.8	1.5/0.9/0.6	1.1/0.7/0.4	0.8/0.5/0.3	270	260	228	187	Cbd stones		choledocholithiasis	Cholecystectomy with choledocho duodenostomy		
29	BEEVI	51	Abd pain	Cbd stones	2.4	1.6	0.8	300	10/0.8	YES	YES		2.1CM	2.1/1.2/0.9	1.4/0.9/0.5	1.2/0.8/0.4	0.8/0.5/0.3	300	277	256	199	Cbd stones		Choledocholithiasis	Cholecystectomy with choledocho duodenostomy		
30	SELVI	43	Abd pain	Cbd stones	2.4	1.9	0.5	333	11/1.1	YES	NO		2.3CM	2.2/1.7/0.5	1.5/0.9/0.6	1/0.7/0.3	0.7/0.5/0.2	330	303	288	212	Cbd stones		choledocholithiasis	Cholecystectomy with choledocho duodenostomy		
31	Kanagavalli	44	Abd pain & jaundice	Periampullary growth	9.7	6.5	3.2	765	11/1.0	NO	NO		2.3CM	8.8/5.4/3.4	6.4/4.1/2.3	4.3/2.7/1.6	3.2/1.9/1.3	755	700	578	490	Growth peri ampuullary region	Peri ampullary growth	Peri ampullary growth	Whipples		
32	Murugan	48/m	Abd.pain	Peri ampullary growth	11.2	9.9	1.3	1010	9/0.9	YES	YES	anorexia	2.3CM	10.6/6.9/3.7	7.1/4.6/2.5	5.1/3.6/1.5	3.8/2.5/1.3	1010	967	922	901	Gb not visualized	Peri ampullary growth	Periampullary growth	Whipple's		
			Yellow eye																								septicemia
33	Sami	35/m	Abd pain & jaundice	Peri ampullary growth	11	8.8	2.2	987	11/0.9	NO	NO		2.1CM	10.1/6.5/3.6	7.1/4.8/2.3	5.3/3.8/1.5	3.6/2.2/1.4	981	960	911	899	Growth peri ampuullary region	Peri ampullary growth	Peri ampullary growth	Whipple's		
34	Maridurai	42/m	Abd pain & jaundice	Peri ampullary growth	8.9	6.9	2	789	12/1.3	YES	NO		2.2CM	7.9/4.9/3.0	5.5/3.5/2.0	4.8/2.9/1.9	2.9/1.9/1.0	780	678	567	456	? terminal cbd stricture	Peri ampullary growth	Peri ampullary growth	Whipple's		WOUND GAPING
35	Siva nantha perumal	70/m	Yellow eye	Peri ampullary growth	12.3	9.8	2.5	823	12/1.3	YES	YES	anorexia	2.2CM	11.5/8.3/3.2	8.1/5.1/3.0	5.1/3.8/1.3	4.2/2.9/1.3	800	765	654	543	Growth peri ampuullary region	Peri ampullary growth	Peri ampullary growth	Whipple's		GI Bleeding
36	Murugan	48/m	Weight loss & jaundice	Peri ampullary growth	7.7	6.1	1.6	932	10/0.9	YES	YES		2.1CM	7.1/5.1/2.0	5/3.5/1.5	3.8/2.6/1.2	2.5/1.7/0.8	911	900	884	799	Growth peri ampuullary region	Peri ampullary growth	Peri ampullary growth	Whipples		WOUND GAPING
37	ABDULLA	51	Yellow eye	Peri ampullary growth	6.9	5.1	1.8	698	8/1.0	YES	YES		2.2CM	6.1/4.5/1.6	4.3/2.5/1.8	3.2/1.8/1.4	2.2/1.2/1.0	691	634	587	522	Growth ampullary region	Peri ampullary growth	Peri ampullary growth	Whipple's		bile leak
38	SELVAMARI	48	Loss of apettite & jaundice	Peri ampullary growth	13.1	9.7	3.4	655	11/1.3	YES	YES	cholangitis	2.3CM	12.6/7.9/4.7	8.4/5.4/3.0	6/3.9/2.1	4.2/3.1/1.1	622	601	549	488	Growth ampullary region	Peri ampullary growth	Peri ampullary growth	Whipple's		pancreatitis
39	Muthammal	73/m	Abdomen pain & jaundice	Peri ampullary growth	8.1	6.8	1.3	499	10/0.9	YES	YES	anorexia	2.1CM	7.6/5.1/2.5	5.1/3.4/1.7	6.1/4.6/1.5	2.6/1.6/1.0	500	476	404	378	Ampulla- nodular thickening	Ihbr/cbd dilated	Peri ampullary growth	Triple bypass		pneumonia
																							Sug-mrcp				
40	Vanmathi	49	Yellow eye	Peri ampullary growth	7.7	5.8	1.9	976	9/0.8	YES	YES		2.34CM	7/5.1/1.9	4.9/3.1/1.8	3.5/2.5/1.0	2.5/1.8/0.7	930	901	799	754	Cbd stone	Peri ampullary growth	Peri ampullary growth	Triple bypass		WOUND GAPING
																						? underlyng pancreatic mass					
41	muthulakshmi	60/F	Weight loss & jaundice	Ca GB with distal cbdcalculi	9.3	7.8	1.5	810	12/1.2	YES	YES	Anorexia	2.1CM									Gb mass	Ca GB	Ca GB	Unresectable		

S.NO	NAME	AGE/SEX	COMPLIANT	DIAGNOSIS	TOTAL BILIRUBIN mg/dl	DIRECT BILIRUBIN mg/dl	INDIRECT BILIRUBIN mg/dl	ALK.PHOSPHATASE IU/L	PT/INR (S)	T2DM	SHT	MORBIDITY	CBD DIAMETER	BILIRUBIN POD-1 TB/DB/IB	BILIRUBIN POD-3 TB/DB/IB	BILIRUBIN POD-5 TB/DB/IB	BILIRUBIN POD-2 TB/DB/IB	ALK.PHOSPHATASE POD-1 IU/L	ALK.PHOSP POD-3 IU/L	ALK. PHOSP POD-6 IU/L	ALK.PHOSP POD-5 IU/L	USG	CT	MRCP	TREATMENT	T-TUBE CHOLANGIOGRAM ON DAY 10	COMPLICATIONS
42	Ranganathan	62/m	Yellow eye	Ca GB	8.1	6.8	1.3	951	11/1.1	YES	YES		1.9CM									Mass GB with upper cbd stricture	Ca GB	GB mass			
			Loss of apetitte									Cachexia												Ca GB			
																								.	Unresectable		
43	sameerammal	64	Abd pain & jaundice	Ca GB	7.7	6.6	1.1	659	11/1.1	YES	YES	Anorexia	1.8CM									Gb mass	Ca GB	Ca GB	Unresectable		
																							Liver secondaries	Liver secondaries			
44	Muthammal	60/f	Loss of apetitte	Cbd stricture	2.9	1.6	1.3	300	10/0.9	YES	YES		1.9CM									? stricture	CBD Stricture	CBD stricture	AMA Discharge		AMAs.
45	Esakki devar	75/m	Yellowish discolouration of eyes	Cbd stricture	3.3	2.1	1.2	260	11/0.9	YES	YES		2.2CM									Cbd dilatation	Cbd dilatation	Terminal CBD Stricture	At request discharge		AT REQUEST
																						Ihbr dilatation	Ihbr dilatation				
																						Abruptcbd cut off	Abruptcbd cut off				
																						Imp: distal cbd growth	p/o distal cbd stricture				
46	Rooth	66	Abd pain	Ca head of pancreas	6.9	5.7	1.2	700	12/1.1	YES	YES	anorexia	2.2CM	5.6/3.9/1.7	4.5/2.9/1.6	3.4/2.6/0.8	2.2/1.3/0.9	700	639	611	554	Mass in pancreatic head region	Ca head of pancreas	Ca head of pancreas	Whipples		septicemia
47	MUTHU	56	Weight loss	Ca head of pancreas	5.9	4.9	1	598	12/1.2	YES	YES	Cachexia & liver secondaries										Mass in pancreatic head region	Ca head of pancreas	Ca head of pancreas liver deposits	Not willing for surgery		NOT WILLING FOR SURGERY
																							Liver deposits				
48	Thiraviya kalai	46/m	Weight loss	Ca stomach with jaundice	4.1	3	1.1	707	10/1.2	YES	NO	Cachexia & liver secondaries	2.0CM									Growth antrum	Antro pyloric growth involving duodenum,cbd,pancreas with liver secondaries	Carcinoma stomach extending duodenum,cbd,pancreas, liver secondaries	Palliative care		DEAD
			Loss of apetitte																			Infiltrating lesion noted in cbd					
																						Ascites					
49	Murugan	60/m	Weight loss	Ca stomach with jaundice	5.3	3.9	1.4	878	11.0.9	YES	YES	Cachexia & liver secondaries & ascites	2.2CM									Antro pyloric growth	Ca stomach with porta hepatis nodes	Carcinoma stomach with nodes at porta hepatis, liver secondaries	Palliative care		
																						Ascites					
50	Anna packiyam	62/f	Abdomen pain	Hilar cholangio carcinoma	10.3	8.9	1.4	985	12/1.0	YES	YES	anorexia & liver secondaries & ascites	1.9CM									? mirizzi syndrome	Hilar growth p/o hilar cholangio carcinoma with liver mets	Hilar cholangio carcinoma with liver secondaries	Palliative		
																						Ascites					