THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

CHENNAI

A STUDY OF FIFTY CASES OF INTERNAL BILIARY DIVERSIONS

DISSERTATION SUBMITTED FOR

BRANCH I – M.S. (GENERAL SURGERY)

DEGREE EXAMINATIONS

MARCH 2008

ACKNOWLEDGEMENT

I wish to express my sincere gratitude to my chief PROF.DR.V. SEETHARAMAN.M.S., Department of Surgery, Government Rajaji hospital and Madurai medical college for his unstinted support and valuable guidance throughout the study period.

I wish to express my sincere gratitude to my Prof .DR.M.GOBINATH .M.S., Head of the Department, Department of Surgery, Government Rajaji Hospital and Madurai medical college for his constant encouragement in completing this study.

I express my thankfulness and gratitude to all assistant professors in my unit and Professor department of surgical gastroenterology and all assistant professors department of surgery for their constant inspiration and encouragement.

Above all I am deeply indebted to THE DEAN DR.V.RAJI.M.D, Madurai medical college for allowing me to conduct the study in our institution.

I am extremely thankful to all the patients who had participated in this study.

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CERTIFICATE

This is to certify that this dissertation entitled **"A STUDY OF FIFTY CASES OF INTERNAL BILIARY DIVERSIONS"** is bonafide work done by **Dr.B. VELLADURAICHI** under our guidance and supervision in the Department of Surgery, Madurai Medical College, Madurai submitted for the M.S., (General Surgery) BRANCH 1 EXAMINATION, to be held in March 2008, by the Tamilnadu DR.M.G.R. Medical University, Chennai.

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DECLARATION

I **Dr. B. VELLADURAICHI** solemnly declare that the dissertation titled "**A STUDY OF FIFTY CASES OF INTERNAL BILIARY DIVERSIONS**" has been prepared by me. I also declare that this bonafide work or a part of the work was not submitted by me or any other for my award, degree, diploma to any other university & board with in India or abroad.

This is submitted to The Tamilnadu Dr. M.G.R. Medical University, Chennai in partial fulfillment of the rules & regulations for the award of M.S. (General Surgery) Branch – I to be held in March – 2008.

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CONTENTS

INTRODUCTION

Biliary obstruction is a common problem in surgical practice. Commonest presentation is the Jaundice. The other symptoms vary depending upon the cause of the obstruction and site of the obstruction.

Treatment also varies from curative to palliative. Biliary diversions are done depending upon the condition of the patient and the cause of obstruction.

This study on biliary diversions was made over a period of two years from June 2005 to August 2007. Internal biliary drainage was the procedure studied in detail in this dissertation.

AIM

1. To study about the pattern of presentation of obstructive jaundice in patients who under went internal biliary diversion procedures.

2. To study about the incidence of benign and malignant causes of obstructive jaundice.

3. To study about the gender and age of presentation of Benign and malignant causes of obstructive jaundice.

HISTORY OF BILIO ENTERIC ANASTOMOSIS

The bilioenteric anastomosis has played an integral part in the surgical management of biliary tract disease during the past century. A wide variety of techniques for suturing a portion of the digestive tract to the biliary tract have been described since Vonwiniwater's first cholecystoenterostomy.

Cholecystostomy was first performed by John Stouugh bobs in 1867 and first cholecystectomy was performed by Carl langen buch in 1882. Langenbuch suggested in 1884 that choledochotomy might be performed to remove common bile duct stones.

In 1887, the Russian surgeon Monostyrski performed a cholecystojejunostomy in a 50 year old patient with a periampullary carcinoma. In 1891 Oskar sprengel of Germany described the first attempt to establish an anastomosis between common bile duct and duodenum.

In 1902, German surgeon Hans Kehr resected a cancer at the junction of the cystic and common hepatic ducts. He performed the first hepaticoduodenostomy. Techniques of Roux-en-Y hepaticojejunostomy were introduced by several authors in 1940's after it was first described by Dahl in 1909.

MILESTONES IN EARLY BILIARY SURGERY

1880	Von winiwater	Cholecystocolostomy
1887	Monostryski	Cholecystojejunostomy
1889	Terrier	Cholecystoduodenostomy
1891	Sprengel	Cholecystoduodenostomy
1909	Dahl	Roux-en-Y Hepaticojejunostomy

APPLIED SURGICAL ANATOMY OF THE BILIARY TREE

Biliary anatomy first became of practical importance to surgeons towards the end of the last century, following first choleystectomy by Carl Langen Buch in 1882.

ANATOMICAL NORMALITY IN THE BILIARY TREE

Normality in the sense on the anatomical pattern which is repeated in the majority of individuals is a term which cannot be used in relation to the biliary tree. Variation is such that less than 50% of individuals exhibit a pattern common in even major details any attempt to define the normal anatomy of the biliary tree therefore, would be artificial and misleading.

BILE DUCTS AT LIVER HILUM

The ducts in the hilum may be encountered either deliberately during the partial hepatectomy or when dealing with tumour or stricture at the porta hepatis or accidentally in the course of a difficult cholecystectomy. It is important to know that some portion of both right and left hepatic ducts hence their confluence are always extrahepatic and therefore accessible at the porta. In some

cases portion of the major tributaries at the right and the left ducts are also outside the liver.

a) **RIGHT HEPATIC DUCT :**

Right hepatic duct is formed by intrahepatic union of the dorso caudal and ventrocranial branches draining two sectors of the right liver (V to VIII).

The ventrocranial duct is in direct line with the right hepatic duct and crosses in front of the dorsocaudal branch as this arches downwards before reaching the confluence of two ducts.

b) **LEFT HEPATIC DUCT :**

Left hepatic duct is formed by medial and lateral branches draining segments II to IV. It follows a partial extra hepatic course and therefore dilates readily in the presence of distal obstructive disease.

The extra hepatic portion left duct and its segment III branch can be accessed surgically at the hilum by following the insertion of round ligament in the depths of the recessus of rex.

The round ligament approach is an effective method of bilio-enteric by pass for inoperable cholangio carcinoma of extra hepatic ducts

C) CONFLUENCE OF HEPATIC DUCTS:

Confluence is formed by the union of right and left hepatic duct is usually extrahepatic (90% within 1 cm of liver parenchyma) high up in the porta hepatis.

DUCTAL ANOMALIES :

Intrahepatic arrangement outlined above applies in 75% of cases. A different arrangement is encountered in the remainder when either the right dorsocaudal or ventro cranial ducts join the left hepatic duct or the common hepatic duct forms a trifurcation.

Important extrahepatic anomalies some times referred to as aberrant ducts are encountered in 15-19% of patients. In the vast majority of aberrant duct joins right hepatic duct or common hepatic duct or cystic duct and very rarely Gall bladder.

D) COMMON HEPATIC DUCT:

This bile duct segment is one of enormous surgical importance being involved in two thirds of post operative strictures. It is formed by the final confluence of all ducts issuing from the liver and ends when the lumen of the cystic duct opens into it, to form the common bile duct. It is 2.5 to 3.5 cm in length. The major relations of the common hepatic duct are fairly constant, it lies

in the right edge of the lesser omentum , with the common hepatic artery to its left and portal vein situated posteriorly.

E) GALL BLADDER:

This least variable part of the biliary tree, is usually globular in shape, lying in its fossa on the undersurface of the liver. It is 10cm in length.

It is situated in the inferior surface of segment V of the right liver. It is covered with layer of peritoneum that contains many small veins that require coagulation, during cholecystectomy. It is divided into fundus which has the poorest blood supply especially when the organ is distended, body and the neck or infundibulum which leads to the cystic duct. The neck has an abnormal sacculation known as Hartmann's pouch.

F) CYSTIC DUCT:

Cystic duct starts from the infundibulum of the Gall bladder and joins the common hepatic duct. The diameter of the lumen is 1-3mm. its length is variable (1cm) depending upon the type of insertion with the common hepatic duct.

It insertion can be angular (75%) parellel (20%), spiral (5%), and is found at supraduodenal part of common bile duct in 80% of patients. However it can extend downward to retro duodenal or retro pancreatic area.

Occasionally, the cystic duct joins the right hepatic duct. The mucosa of the cystic duct is arranged in spiral folds known as valves of Heister. It's wall is surrounded by a sphincteric structure called the sphincter of Lutkens.

The veins of the Gall bladder drain into the right portal branches and intra hepatically into the middle hepatic vein.

G) CALOT'S TRIANGLE / CYSTOHEPATIC TRIANGLE OF CALOT

Calot's triangle is an important land mark in the biliary surgery. It is bounded inferiorly by cystic duct, neck of Gall bladder, superiorly by the liver edge and medially by the common hepatic duct. It is a triangular fold of peritoneum containing cystic duct, cystic artery, cystic node and variable amount of fat.

It also contains the right hepatic artery which usually enters the triangle behind the common hepatic duct before it gives off the cystic artery. The cystic hymphnode is most often situated at the junction of cystic duct with common hepatic artery.

80% of aberrant right hepatic duct is located in this triangle.

H) COMMON BILE DUCT:

The common hepatic duct is formed by the union of the right and left hepatic ducts each draining the respective hemiliver. It is joined at a variable distance along its course by the cystic duct and forms common bile duct.

It is divided into supraduodenal, retroduodenal, intrapacreatic, intra duodenal segments it serves as a conduit of bile from the liver and Gall bladder to the duodenal papilla. In the adult it measures 11 to 12 cm in length and average diameter is 7mm (range 4-10mm).

The supraduodenal segment is important surgically because it is the area that is most commonly explored. It is in the free edge of hepatoduodenal ligament to the right of the hepatic artery and anterolateral to the portal vein.

The retroduodenal segments curves to the right away from the portal vein behind the first part of the duodenum before entering into the head of the pancreas. However in 20% of patients the duct has a partial or complete pancreatic course.

The trans duodenal segment which traverses obliquely the duodenal wall and usually joins the pancreatic duct opens into the duodenal lumen at the summit of major duodenal papilla. The usual location of papilla of vater is 8-10cm from the pylorus.

BLOOD SUPPLY OF THE BILE DUCT:

The blood supply to the supra duodenal portion arises from the retro duodenal artery, right branch of hepatic artery, the cystic artery, the gastro duodenal artery and the retro portal artery. An average of eight small arteries each measuring 0-3mm in diameter. The most important vessels run along the lateral borders of the duct.

The hilar ducts receive blood supply from surrounding vessels, left and right branch of middle hepatic vein forming a rich plexus in the surface of the ducts, in continuity with the vessels around the supraduodenal part.

The source of blood supply of retropancreatic duct is retropancreatic artery which provides multiple small vessels running around the duct in to mural plexus.

Arrangement of the blood supply to the extrahepatic bile duct has important surgical significance.

- The main bile duct should never be stripped for exposure.
- It should be opened longitudinally through an area devoid of vessels leaving fascial envelope intact.

The vein draining the bile duct usually exit parallel to the corresponding artery along the borders of common bile duct.

BILIARY OBSTRUCTION AND ITS SEQUELAE

The term biliary tract obstruction requires precise definition. Its clearly inadequate to equate biliary tract obstruction with jaundice. Similarly obstruction and dilation of the biliary tract are not synonymous, and the classical biochemical changes associated with complete obstruction may be absent or unreliable in many cases.

It is necessary for the Clinician to recognize atleast four categories of biliary tract obstruction.

i. Complete obstruction producing jaundice.

ii. Intermittent obstruction which produces symptoms and typical bio chemical changes, but may or may not be associated with attacks of clinical jaundice.

iii. Chronic incomplete obstruction with or without classical symptoms or the observation of bio-chemical changes but producing Pathological change in the bile ducts or liver.

iv. Segmental obstruction in which one or more isolated segments of the intra hepatic biliary tree are obstructed. This obstruction may take a form of complete, intermittent or chronic intermittent or chronic incomplete obstruction as defined above.

Lesions commonly associated with biliary tract obstruction.

1. **Complete Obstruction :**

   Congential biliary Atresia.

   Tumors especially of the Pancreatic head.

   Ligation of the CBD

   Cholangio Carcinoma

   Parenchymal liver tumors primary or secondary.

2. **Intermittent Obstruction :**

   Choledocholithiasis

   Periampullary tumors

   Duodenal diverticula

   Papillomas of the bile duct

   Choledochal cyst.

   Polycystic Liver disease.

   Intra biliary parasite

   Haemobilia

3. **Chronic Incomplete obstruction:**

   Stricutres of the CBD

   Congenital

   Traumatic – Iatrogenic

   Sclerosing cholangitis

Post radio therapy

Stenosed biliary enteric anastomosis

Stenosis of sphincter of ODDI

Chronic pancreatitis

4. **Segmental obstruction:**

Traumatic (including latrogenic)

Hepatodocholithiasis

Sclerosing Cholangitis

Cholangio carcinoma

EFFECTS OF BILLIARY TRACT OBSTRUCTION

PHYSICAL AND PATHOLOGICAL EFFECTS

Back Pressure

The normal secretory pressure of bile is 120-250 mm of H20. When the intra biliary pressure is more than 300 mm of water there is total inhibition of hepatic bile secretion. The effect on secretion of bile salts, cholesterol and phospholipids are unequal. Proximal dilatation of biliary tract above an obstruction is the rule and this is seen in its most marked form in acute complete obstruction of a previously normal biliary tract.

EFFECTS ON BLOOD FLOW:

It is reasonable to assume that obstruction of the large bile ducts, by raising the intra hepatic hydrostatic pressure will produce an elevation of hepatic sinusoidal pressure which may have an adverse effect on hepatic tissue perfusion there is however very little evidence in relation to this situation.

PATHOLOGICAL EFFECTS:

The morphological features of cholestasis depend upon its severity, duration and the underlying cause of obstruction. Microscopically, elongated green-brown plugs of bile are visible in the dilated canaliculi. Rupture of the

canaliculi leads to extravasation of bile and droplets of bilepigments accumulate within the hepatocytes.

Obstruction to the biliary tree whether intra hepatic or extrahepatic induces distension of instream bileducts by bile stasis. Bile stasis and back pressure induces proliferation of duct epithelial cells, edema of the portal tract and periductular infiltration of neutrophils.

Prolonged obstructive stasis lead not only to foamy degeneration of hepatocytes also focal alteration of parenchyma and coalscent of necrotic focus generates bile lakes unrelivered obstruction leads to portal tract fibrosis. Ultimately end stage bile stained cirrhotic liver is created.

BIO CHEMICAL EFFECTS :

BILIRUBIN :

Although jaundice is the classical physical sign associated with biliary tract obstruction, the bilirubin level may be elevated only marginally and in incomplete and intermittent obstruction repeated serum estimations may be necessary to detect an elevated level.

1. **Unconjugated hyper bilirubinemia:**

Over production of bile pigment from excessive hemolysis creates a situation in which the normal liver is confronted with more pigment than it is

able to remove. This occurs in physiologic jaundice of infancy and in all pathologic hemolytic states.

2. **Conjugated hyper bilirubinemia:**

An accumulation of conjugated bilirubin in the blood may be due to inpaired hepatic excretion or extra hepatic obstruction. This bilirubin pigment is water soluble and is readily excreted in the urine which becomes brown. Intra hepatic impaired excretion may be related to a congenital secretary failure like Dubin – johnson syndrome or due to cirrhosis.

Bile Acids:

Complete biliary tract obstruction will of course interrupt the entero hepatic circulation of the bile salts. Serum bile acid level may be very high ranging from 4 to 60 times the normal level. Nevertheless the synthesis of bile acids is grossly impaired with upto five fold reduction in the levels of the rate limiting enzymes for bile acid synthesis. There is an increase in the urinary excretion of bile acid.

Highest level of liver Alkaline Phosphatase are found in the patients with complete biliary obstruction. Minor or intermittent degrees of obstruction however also produce significant elevation of this enzyme and this may be an important bio-chemical sign raising suspicion of biliary pathology in the absence

of jaundice. The return of Alkaline Phosphatase to normal after relief of biliary obstruction may be a good index of successful therapy in the majority of cases.

Other Enzymes:

Gamma glutamy transpeptidase tends to parallel alkaline phosphatase and is sometimes used as an alternative to the iso-enzyme fraction of alkaline phosphatase. 5 Nucleotidase is another important enzyme raised in obstructive jaundice.

PATIENT EVALUATION

An orderly approach to the diagnosis of jaundice is essential for instituting the appropriate therapy in a timely manner.

The variety of diagnostic tests and therapeutic options are available

History :

Significant information leading to a focused differential diagnosis can be gleaned from a carefully performed history taking.

Scleral icterus is the most common presenting symptom and typically is present if serum bilirubin level exceeds >2.5mg ldL.

A detailed family history and history of drug ingestion should be taken.

History of chronic alcohol ingestion is also important. Age of presentation, gender, travel history, diet, associated constitutional symptoms, presence of pruritus and pain are important factors.

The colour of urine and stool will help to classify the problem as conjugated or unconjugated hyper bilirubinaemia.

Constitutional symptoms:

Anorexia, weight loss, easy fatiguability

Abdominal pain indicates an inflammation or acute extra hepatic obstruction. Insidious development of deep jaundice in the absence of acute pain is characteristic of neoplastic obstruction.

Physical examination :

Patients presenting with jaundice require a complete physical examination with emphasis on specific areas. The first where the hyper bilirubinaemia can be detected is the sclera as a result of affinity of elastin for bilirubin.

Yellowing of skin and mucus membrane occurs if serum bilirubin level is >6mg/dL.

Physical finding that suggest chronic liver disease are hepato splenomegaly, spider angioma, gynaecomastia, ascites.

The liver should be carefully palpated and assessed for size as well as degree of tenderness. Large, hard nodular liver is indicative of carcinoma. Patients with malignant obstruction of distal common bile duct often have a large distended easily palpable Gall Bladder (courvoisier's law)

LABORATORY STUDIES :

1. **Blood Hb%, TC, DC, peripheral smear.**

Hemolytic jaundice is accompanied by anaemia and increase reticulocyte count smear for spherocytes, target cells and sickle cells should be made.

2. Urine Bile salts & Bile pigments :

In obstructive jaundice bile salts & bile pigments are detected in the urine. They are detected by dipstick test, Icotest tablets or by shaking the urine looking for the characteristic yellow foam

3. Stools should be assessed for pigment and for presence of Guaiac reaction, indicative of bleeding.

4. Serum Bilirubin

One minute direct fraction test should be carried out in addition to total and differential level of bilirubin.

5. Liver function test :

a) Serum alkaline phosphatase: is most sensitive indicator of extrahepatic biliary obstruction regardless of etiology or location. Elevation of this enzyme may also be caused by any of several iso enzymes derived from liver, intestine, bone and placenta.

Hepatobiliary alkaline phosphatase is secreted by ductular endothelium. Increased serum levels found in acute biliary obstruction, result from back

diffusion or leak from the ducts. This may remain significantly elevated long after biliary obstruction has been relieved.

In situation, where elevated serum alkaline phosphate is elusive, estimation of 5 nuleotidase may be useful. Other enzymes are leucine Amino peptidase and gamma -Glutamyl transferase. There is mild elevation of SG0T and SGPT in extrahepatic obstruction.

b) Serum proteins : serum proteins are recognized widely as indicator of hepatic synthetic function, but its long half life limits its role in diagnosing acute hepatic injury.

C) Prothrombin time : One of the most useful tests for hepatic functions.

RADIOLOGICAL STUDIES :

1. **Plain x-ray abdomen** will reveal gall stones in only 20% of patients. Speckled classification in the region of head of the pancreas may be suggestive of chronic pancreatitis.
2. **Ultra sonogram** is often the initial study performed to determine presence and the level of intra hepatic and extra hepatic dilatation.

Diagnostic findings of intra hepatic biliary dilatation includes parallel intra hepatic channels. It can provide useful information regarding nature and etiology of obstruction, choledocholithiasis, mass lesion can be visualized.

3. **CT Scan :** CT scan can trace the course of the bileduct, visualize the adjacent structure and more accurately define the cause of the obstruction. Small 1 to 2 cm masses in the liver parenchyma can be visualized.

Oral contrast identifies the duodenum small bowel. Dilatation of intra hepatic ducts seen as linear branching or circular structures. Abrupt termination of dilated duct is suggestive of a neoplasm.

4. **MRCP** : Megnetic resonance cholangio Pancreatogram

i) MRCP detects stones as small as 2mm in the bile duct even when the bile duct is not dilated

ii) It is the best technique for demonstrating the presence and exact location of intra hepatic stone.

iii) It displays all types of choledochal cysts.

iv) It outlines both the ducts and the peri heptic collection but is unable to establish whether the bile leak is active or not.

v) It provides anatomical information of the entire biliary tract on both sides of the stricture. It detects the extension of tumour along the intra hepatic ducts and enables the complete staging of the disease ie, assess involvement of liver, portal nodes and portal vein.

vi) It is very useful in detecting tumours. It detects dilated bile duct abutting on an irregular ampullary mass indenting the duodenum.

5. **Endoscopic Ultra Sound:** is more accurate than ERCP and CT scan in defining nature and extent of the cause of biliary obstruction. It gives information about the mucosal, vascular, ductal and parenchymal abnormalities in single examination.
6. **ERCP : Endoscopic Retrograde Cholangio Pancreaticogram.**

   ERCP is a combined radiographic and endoscopic procedure that allows inspection of duodenum and ampullary repion as well as direct intubation and radiographic visualization of bile duct and pancreatic duct.
7. **Percultaneons trans hepatic cholangiography (PTC):** PTC is a technique useful for the visualization of the biliary tract in a jaundiced patient. PTC is used when ERCP fails or does not provide sufficient information on the proximal intra hepatic biliary tree because of an obstructing extra hepatic ducts. However, MRCP can provide this information and if available is used in preference to PTC.
8. **Biliary Scintigrpahy**: Scintigraphic studies use radio – isotope labelled compounds that are excreted in bile. The most commonly used agents are 99m TC labelled Imino diacetic Acid derivatives. Focal abnormalities appear as photopenic areas.

   Normal hepatic uptake without evidence of activity within the gut is suggestive of biliary obstruction. But its role in evaluation of jaundice patients in quite limited.

Laparoscopy : Laproscopy usually provides a direct visualization of the underlying pathology and the exact cause of jaundice can be determined in all patients by ancillary techniques. Such as laparoscopic Ultrasound, cholangiography or targeted biopsy or cytology are employed.

The liver, Gall bladder, pancreas and biliary tract are directly visualized

It also detects secondary tumour deposits in the liver and peritoneal dissemination. Thus it avoids unnecessary laparotomy in patients with inoperable disease.

In patients with chronic liver disease with bleeding tendency, laparoscopic liver biopsy is undertaken in preference to the blind percutaneous procedures.

CLASSIFICATION OF BILIARY DIVERSION SURGERIES

It is broadly classified into

1. External biliary diversion

2. Internal biliary diversion

EXTERNAL BILIARY DIVERSIONS

a) Percutaneous transhepatic biliary drainage

b) Naso biliary drainage

c) Cholecystostomy

II INTERNAL BILIARY DIVERSION:

This is classified in to 3 types

a) Extra hepatic biliary enteric anastomosis

b) Porto Enteric anastomosis

c) Intra hepatic biliary enteric anastomosis

a. EXTRA HEPATIC BILIARY ENTERIC ANASTOMOSIS

1) Choledocho duodenostomy

2) Choledocho jejunostomy

3) Cholecysto jejunostomy

4) Cholecysto Gastrostomy

5) Cholecysto duodenostomy

6) Hepatico jejunostomy

B. PORTO ENTEROSTOMY

Original Kasai operation and its modifications

C. INTRA HEPATIC BILIARY ENTERIC ANASTOMOSIS

1) Longmire procedure

2) Segment III hepatico jejunostomy

3) Right sided intra hepatic hepatico jejunostomy

CHOLEDOCHO DUODENOSTOMY

INTRODUCTION

Choledochoduodenostomy is now the accepted procedure for primary or secondary choledocholithiasis in the presence of a dilated CBD. Numerous

studies involving large number of cases, many with long term followup confirm the technical case, low mortality rate and excellent results of this procedure.

In 1988 Riedel was the first to perform Choledochoduodenostomy for common duct stones. Sprengel in 1890 performed the first successful Choledochoduodenostomy and gave the procedure its name . In 1913 sasse reported 10 successful cases and recommended its use routinely in patients with common duct stones to avoid problems with retained calculi

Two basic technical criteria are essential for a successful Choledochoduodenostomy. A dilated CBD is the most essential criteria a CBD of 1.4 cms diameter is usually the smallest accepted size . A stoma size of 2.5 cms is essential

INDICATIONS

1. Bile duct stones:

a. **Large Stone:** Stone of size more than 1.5cm in diameter are difficult to extract endoscopically. Open exploration should be performed when non operative methods fail.

b. **Multiple CBD stones:** The technical difficulty of removing all calculi or sludge is well known to all who operate on the biliary tree. It has been well shown that hepatic bile after cholecystectomy remains lithogenic. The

combination of biliary stasis, a dilated common bile duct and lithogenic bile will inevitably results in a significant number of late primary CBD stones in these patients.

c. **Impacted stones:** Impaction of stones most often in the distal end of the CBD where it traverses the pancreas, when endoscopy is failed to remove the impacted stone, choledcho duodenostomy should be performed.

d. **Intrahepatic calculi:** Any stone lodged in the intrahepatic biliary tree will easily pass through an adequate size choledochoduodenostomy.

2. Stricture : - Short stricture in the distal duct with dilatation of proximal duct whether due to inflammatory or secondary to impacted stones or pancreatitis represent an ideal indication for choledochodnodenostomy.

3. Intra papillary diverticulum: A dilated common bile duct with recurrent bouts of cholangitis may be seen in conjuction with juxta papillary diverticulum with or without common duct calculus

4. Iatrogenic Injuries: Strictures resulting from iatrogenic injury to the CBD distal of the cystic duct are rare, but are easily treated by end to side choledochodnodenostomy after complete mobilization of duodenum and pancreas.

5. Primary common duct stones

6. Residual stones

CONTRAINDICATIONS :

a) **Non dilated common duct**

b) **Sclerosing cholangitis**

c) **Malignant obstruction**

d) **Significant duodenal edema or inflammation**

Technique:

All patients receive preoperative antibiotics. Generally one or two doses of Ampicillin and Gentamicin are given preoperatively and continued 24 hrs post operatively.

An extended Kocher's manuever is routinely performed to enhance exploration of the CBD and performance of choledochoduodenostomy. The CBD is opened in a longitudinal fashion in the supraduodenal location 2 to 2.5cm longitudinally extended upto common hepatic duct.

After the exploration has completed. A longitudinal incision of size about 1-5cm was made in the post bulbar duodenum.

Stay sutures are placed at the corners of the planned choledochoduodenal anastamosis. These sutures pass from the end of the duodenal incision to the mid point of the choledochal incision.

The duodenal incision must be somewhat smaller than the expected stomal caliber because of the elasticity of duodenum can result in excessive stretching.

The posterior row of sutures is then placed with 4-0 vicryl, so that the knots are placed on the internal aspect of the anastomosis. The anterior row of sutures, are placed without tying. Then they are tied, beginning at the medial side of anastamosis. Closed suction type drain is placed posterior to choledochoduodenostomy.

Laparoscopic Choledochoduodenostomy :

Anastamosis of the CBD to duodenum using laparoscopic techniques has been successfully performed now a days.

CHOLECYSTO JEJUNOSTOMY: Decompression of the biliary tract obstructed by malignant periampullary lesion as indicated for the relief of obstructive jaundice and intolerable pruritus. Surgical biliary enteric by pass has a viable role in the palliation of patient who have periampullary carcinoma, particularly in younger, more fit patients are likely to survive for a reasonable length of time.

Technique : the first loop of jejunum that easily and comfortably reaches the subhepatic space is passed in an anticolic manner without tension and

approximated to the Gall bladder with posterior row of sero muscular interrupted silk sutures.

Using electrocautery an incision was made in the body of the gall bladder and antimesentric border of jejunum. The full thickness of the gall bladder and jejunum was anastamosed with 3-0 or 4-0 monofilament absorbable interrupted sutures. Closed suction drain is kept for 3-4 days.

Laparoscopic cholecystojejunostomy

Recent advances in laparoscopic surgery makes it possible to safely perform the double bypass procedure laparoscopically. It takes longer time but results in reduced operative injury and shorter and easier post operative course and more rapid convalescence.

CHOLECYSTOGASTROSTOMY

This is technically the easiest operation. It is now seldom emplyed however , since it has certain serious disadvanatages , bilious vomiting due to irritative cholangitis due to regurgitation of gastic contents into the biliary passages.

CHOLECYSTODUODENOSTOMY

This is technically very difficult and has no special advantages . it is therefore seldom performed

Hepatico jejunostomy

Anastmosis of roux-en loop of jejunum to common hepatic duct.

Indications

i) Benign biliary stricture

ii) Type I choledocal cyst

iii) Certain types of atresias of bile ducts.

Technique

The biliary tract can be approached through right subcostal or bilateral subcostal incision. Dissection of the area of hepatoduodenal ligament and kocherization of duodenum is done. After the identification of bile duct, the biliary system is opened.

The first jejunal loop close to the ligament of trietz is divided and the distal part of its brought through a window in the transeverse mesocolon. The proximal afferent loop of jejunum is sutured in two layers end to side manner with ascending limb of defunctionalized jejunum.

The length of intestine should be 45-75cm long between biliary enteric and Roux-en-y anastamosis to avoid reflux of GIT content and resulting cholangitis.

Proximal end of jejunal loop is closed in two layers using silk. 5 c.m proximal to this closure on the antimesentric aspect of the intestine one layer biliary enteric anaslamosis is fashioned.

A closed suction drain is placed in the foramen of winslow.

PORTO ENTEROSTOMY

This type of biliary diversion is done for extra hepatic biliary atresia. The original procedure was developed by Kasai (1974) in Japan following his original observation of residual microscopic bile channels in the fibrous tissue of the porta hepatis.

Technique: original kasai operation

A transverse abdominal incision across the right rectus muscle is sited over the palpable live edge, and the inferior surface of the right lobe of the liver is exposed. The fundus of the gall bladder is exposed and incised within a purse string suture and a small polythene catheter is inserted. Operative cholangiography is mandatory whenever bile is found in the Gall bladder.

The cystic artery is ligated and the cystic duct traced to its junction with the fibrotic CBD. The distal portion of the CBD is divided between ligatures at the level of the upper border of the duodenum.

Dissection of the extra hepatic bile duct is now performed toward the porta hepatis and meticulous tying with fine ligatures close to the ducts helps to prevent post operative ascites from lymphatic leak. Dissection proceeds above and the tissue is transected at its junction with the capsule of the liver.

The aim is to expose the remnants of hepatic bile ducts. The jejunum is transected just distal to the duodenojejunal flexure. The distal end is oversewn and passed in an antecolic manner to the hilum of the liver. An end to side anastomosis is fashioned accurately between the edges of the transected liver tissue and jejunal loop with 4/0 vicryl, tied with the knots on the outside. Intestinal continuity is reestablished by anastomosing the proximal jejunum to the distal loop at approximately 30 cms from the porta hepatis.

Intra hepatic biliary enteric anastomosis

Surgical decompression in obstructive jaundice due to benign or malignant stricture of the hepatic ducts is usually best obtained by biliary enteric anastomosis usually to a Roux-en-Y loop of jejunum. If this is not possible adequate biliary drainage can only be obtained by intubation or biliary enteric anastomosis to the right or left hepatic ducts or their intra hepatic branches.

Principles

There are only three important fundamental principles in biliary enteric anastomosis.

1. Identification of healthy bile duct mucosa proximal to the site of obstruction.
2. Preparation of Roux-en-Y loop of jejunum.
3. Direct mucosa to mucosa anastomosis between these two.

The anastomosis may be splinted or protected by a trans anastomotic tube passed either trans hepatically or trans jejunely or as a U-tube.

A. Long mire procedure

This procedure involved removal of liver tissue with greater blood loss and often less effective biliary enteric anastomosis. This procedure is reserved

for patients in whom there is unilobar right lobe atrophy accompanied by left lobe hyper trophy.

The essence of the approach is the removal of the portion of the left lobe of the liver so as to expose the dilated intra hepatic ducts of segment II. This carrying be done Roux-en-y loop of jejunum may be prepared and brought up for anastomosis. Again identification of a suitable size duct may be difficult.

B. Segment III hepatico jejunostomy

Occasionally wedge excision of segment III allows exposure of the segment III duct with subsequent hepatico jejunostomy.

C. Right sided intrahepatic hepatico jejunostomy

Very rarely the right hepatic ductal system may be approached by excision of liver tissue on the right side. The procedure being similar to that described by long mire for the left lobe of the liver. The tip of the segment V/VI of the right lobe is removed and hepatico jejunostomy carried out in a similar fashion to that described for the Longmire procedure.

EXTERNAL BILIARY DIVERSIONS

I. Cholecystostomy

It is nearly always a procedure of compromise but it is frequently a life saving one. It is a measure that meets the immediate demand to save the patient's life, and it also paves the way for safety at a later date for the performance of a definitive operative procedure.

Indications

a. Acute cholescystitis with gall stones

Cholecystotomy is indicated in these circumstances when the patient is aged and infirm, perhaps with serious renal cardiovascular or pulmonary complications.

When there is some anaesthetic problem during the early stages of the exploratory laparotomy.

When cholecystectomy presents with unusual technical difficulties.

b. Chronic calculus cholecystitis

When the surgeon lacks experience in operating on the biliary tract.

c. Acute pancreatitis with obstructive jaundice

d. In some instances of carcinoma of pancreas

Technique

An upper right paramedian or a right subcostal incision gives excellent approach. Gentle exploration of the gall bladder region is carefully performed. The gall bladder is now decompressed. It contents are aspirated with a wide bore needle. The fundus is seized with Allis or Babcock's tissue forceps and an incision of sufficient length to admit the finger is made through the fundus, the suction tube is introduced into the gall bladder and the septic bile, inflammatory

debris are withdrawn. When no further stones can be palpated within the cystic duct or in the G.B. a Foley's catheter or a Malecot's self retaining catheter is passed through the fundal incision so that tip lies comfortably within the body of the gall bladder. The incision is then closed around the tube. The tube is brought through a separate small stab incision and the tube is connected to a sterile plastic bag and the wound closed.

II. Precutaneous transhepatic biliar drainage (PTBD)

Indications

Patients considered for PTBD can be divided into two groups. Patients requiring only temporary drainage to facilitate some other form of therapy and those requiring permanent intubation for palliation.

The former group includes selected patients with malignant obstruction prior to chemotherapy or surgical resection. The latter group includes patients with advanced tumours where it is done exclusively for palliation.

Contra-indications

a. Severe bleeding diathesis
b. Ascites
c. Minimal symptomatology in a terminally ill patients.

Technique

An entry point is selected for a percutaneous puncture in the mid-axillary line usually immediately above the 10^{th} or 11^{th} rib. A complete transhepatic cholangiogram is performed with a thin walled 22 gauge needle. Contrast is slowly injected through the needle and it is gradually withdrawn through the parenchyma. When the tip of the needle communicates with the ductal system, the contrast will begin to outline the biliary tree. After administration of local anaesthesia a 16 gauge sheathed needle is advanced into the target duct and the stylet is removed. Bile returns freely through the sheath when its tip is intraductal. A drainage catheter with side holes is now introduced into the sheath so that it can be positioned in the duct above the stricture. The catheter may be left in the biliary system and connected externally to a drainage bag.

Complications

1. Sepsis
2. Hemorrhage – biliary
   Intraperitonial
3. Fluid and electrolyte loss

II. Nasobiliary drainage

This procedure is done as a

1. Palliative procedure in patients with incurable disease.
2. Preoperative biliary drainage in patients prior to palliative surgical bypass.

MATERIALS AND METHODS

Cases for this study of biliary diversion surgeries were taken from all the general surgical units of Govt. Rajaji Hospital, Surgical Gastroenterology and from the Paediatric Surgery unit of G.R.H.

The study was done over period of two years from June 2005 – August 2007.

All the cases admitted with obstructive jaundice and subsequently subjected to internal biliary drainage were taken up for study.

Methods

Internal biliary drainage was the procedure taken for my study. Various methods of internal biliary drainage adopted are:

1. Choledochoduodenostomy
2. Cholecystojejunostomy
3. Roux-en-y hepatico jejunostomy
4. Porto enterostomy – kasai procedure

Choledochoduodenostomy is the procedure adopted for jaundice due to choledocholithiasis with a dilated common bile duct.

Cholocystojejunostomy was done as a diversion procedure for malignant obstruction of the BD and the patients usually presenting with jaundice and distented gall bladder.

Roux-en-Y hepaticojejunostomy was done for patients choledochal cysts, and benign biliary stricture.

Kasai procedure was done for extra hepatic biliary atresia

Total number of cases studied	-	50
Choledochoduodenostomy done in	-	18
Cholecystojejunostomy done in	-	20
Roux-en-Y hepaticojejunostmy done in	-	10
Portoentrostomy – Kasai procedure	-	2

BILIARY DIVERSIONS

Total number of cases	Cause for jaundice		Age (average)		Sex	
	Benign	malignant	Benign	malignant	Benign	malignant
Adults 48	28	22	42.5 Years	54 Years	1:1	1:1.2
Paediatric cases 2	0	0	2.5/12 Years	-	1:1	

CHOLEDOCHODUODENOSTOMY

No. of	Causes for	sex	Age

cases	Jaundice	Male	Female	(average)
18	Choledocholithiasis	9	9	49.5 years

CHOLECYSTOJEJUNOSTOMY

No. of cases	Causes for Jaundice	sex		Age (average)
		Male	Female	
20	Periampullary ca	10	10	53 years

Hepatico jejunostomy

No. of cases	Causes for Jaundice	sex		Age (average)
		Male	Female	
10	Stricture – 4	3	1	42 years
	Choledochalcyst – 4	0	4	24 years
	Cholangiocarcinoma – 2	2	0	60.5 years

PORTOENTEROSTOMY – KASAI PROCEDURE

No. of cases	Causes for Jaundice	sex		Age (average)
		Male	Female	
2	Extra hepatic biliary atresia	1	1	2.5/12 years

Of the total number of fifty cases studied, fourty eight cases were in the adult age group and two cases were in the paediatric age group. Among the fourty eight cases in the adult age group twenty eight were suffered from a benign and twenty two were from a malignant obstruction to the flow of bile. Those patients affected showed an average age of 42.5 years in the benign and fifty four years in the malignant obstruction group. Sex ratio showed a 1:1for benign causes and 1:1.2 for malignant causes of obstructive jaundice.

Among the two cases in the paediatric age group the average age of the affected patients was 2.5/12 years and the sex ratio was male: female 1:1. Both the cases were operated for a benign condition.

Of the eighteen cases of choledochodudenostomy all the cases had a dilated CBD with a diameter ranging from 1.5 cm to 2.5 cm. All had multiple

stones in the gall bladder. So a cholecystectomy followed by choledochodudenostomy was done.

There was no difference in the sex of the patients affected according to my study, male : female ratio was found to be 1:1. The age of the patients affected range between 30 and 70 years. Average age of patients affected by choledocholithiasis is 49.5 years all the patients did well after surgery. Post operative S. Bilirubin level reverted back to normal within 7 days.

Of the twenty patients who underwent cholecystojejunostomy all patients had a growth in the periampullary region. Fourteen patients who underwent cholecystojejunostomy were above the age of 50.six patients were between 30-45 yrs. Regarding the sex ratio the male patients dominated the female in the ratio 1:1.2.

Of the ten patients who underwent hepatico jejunostomy four patients had stricture common bileduct , four patients had choledochal cyst and two patients had cholangio carcinoma of four patients of common bileduct stricture , two patients had already undergone cholecystectomy . Average age of presentation is 42 years. Of the four patients of choledochalcyst all the four are female and all the patients had type 1 choledochalcyst. Average age of presentation of choledochalcyst is 24 years. Of the two patients of cholangio carcinoma both are male since they are inoperable palliative hepatico jejunostomy was done

Of the two patients who underwent kasai procedure both had extra hepatic biliary atresia

DISCUSSION

CHOLEDOCHODUODENOSTOMY

As a diversion procedure this surgery was found to have number of advantages over other procedures for dilated common bile duct with stones.

One criticism of this procedure has been ascending cholangitis from either a retained calculi and debris or food particles entering via the newly created anastomosis. In our experience, we have not come across such a complication.

Another criticism has been the creation of “blind” segment or pouch between the anastomosis and the papilla of VATER, the ‘sump syndrome’. It is

postulated that this blind segment serves as a sump and promotes stasis and cholangitis by permitting food particles and infected bile to remain in the distal portion of the common bile duct.

The other **Advantages** of this procedure are:

1. Techniquewise it is an easy procedure and we found no difficulty in approximating the common bile duct with duodenum. There is no fear of any tension in the suture line.
2. Any stone lodged in the intrahepatic biliary tree will easily pass through an adequate sized cholodochoduodenostomy. A missed primary stone in the lower end of CBD will cause problems if T-tube alone is kept after CBD exploration whereas a bypass surgery will avoid this complication.
3. Post-operative course following the surgery has been remarkably benign and significantly simpler than with a T-tube in the CBD. The majority of our patients were put on normal diet by the fourth day and were ready for

discharge by eighth day whereas in a patient with T-tube it may take atelast 3 weeks to remove the T-tube after a cholangiogram.

4. Electrolyte imbalance due to temporary biliary fistula is also avoided.

Choledochoduodenostomy vs T-Tube

The data comparing both the types of biliary diversions emphasise the numerous advantages of the choledochoduodenostomy. The reported mortality for common duct exploration with or without cholecystectomy varies from 2.1 to 4.7%. The occurrence of retained stones after positive duct exploration is between 7 to 10%. The great majority of the patients require reoperation or endoscopic manipulative stone retrieval. The complication rate is no different than T-tube placement and the mortality rate for choledochoduodenostomy is significantly lower.

CHOLEDOCHODUODENOSTOMY Vs SPHINCTEROPLASTY :

Although strictly not comparable , sphincteroplasty may be considered as a variety of choledochoduodenostomy. The mortality rate is found to be twice that of choledochoduodenostomy and the incidence of pancreatitis is more common after sphincteroplasty Transduodenal sphincterplasty should be reserved for benign distal obstruction or an impacted stone in a small duct.

Cholecystojejunostomy

This surgery is designed to short circuit irremediable obstruction of the CBD, such as caused by carcinoma or chronic pancreatitis. It is widely accepted that pancreatic resection of any type is too formidable a procedure to be employed for pallitative purposes.

If cure is impossible, jaundice, intractable pruritus and impending cholangitis must be palliated by Cholecystojejunostomy provided the GB is distended and the cystic duct is in wide open communication with the dilated proximal biliary tree.

Hepatio jejunostomy (Roux-en-Y anastomosis)

The advantages of total cyst exicion inlcude removal of a fibrous walled dilated duct, conservation of which may lead to gall stone formation, infection or malignancy. The technique can be performed in all age groups and is the definitive treatment for complications occurring in the cysts previously anastomosed to the gastrointestinal tract.

Kasai procedure

The more radical kasai approach is now recommended for all cases except those with long residual segment of proximal bile duct.

CONCLUSION

Fifty cases of biliary diversions were studied over a period of two years. of these 18 patients were presented with choledocholithiasis, 20 patients presented with Periampullary carcinoma, 4 patients presented with common bileduct stricture, 4patients presented with choledochal cyst, 2 patients presented with Cholangio carcinoma and 2 patients presented with extra hepatic biliary atresia. Four types of internal biliary diversions, choledochoduodenostomy, cholecystojejunostomy, hepatiocojejunostomy and portoenterostomy were studied in detail.

Choledochoduodenostomy was mainly done for a dilated common bileduct with stones. Cholecystojejunostomy was done to divert the bile in cases of malignant obstruction of the bile duct.

Hepatico jejunostomy was done for choledochalcyst and stricture in the proximal common bile duct . Hepatico jejunostomy was also done to divert the bile in cases of cholangio carcinoma

Kasai procedure was done for extra hepatic biliary atresia

The incidence of malignant cause of obstructive jaundice is more than that of the benign causes

The average age of presentation of malignant cause of obstructive jaundice is more than that of the benign causes

In this study it was noted that obstructive jaundice due to malignant causes was much common than the benign causes (p - 0.031).

The study showed that there was no difference in the incidence of obstructive jaundice due to benign causes among males and females. However obstructive jaundice due to malignant causes was higher in males (p – 0.025).

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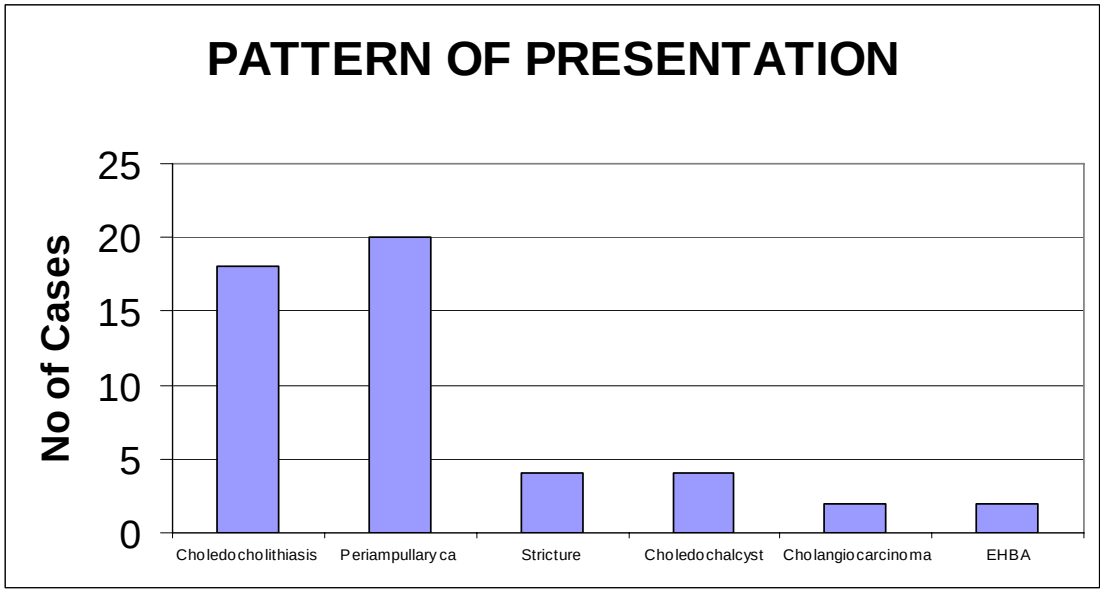
PATTERN OF PRESENTATION
No of Cases
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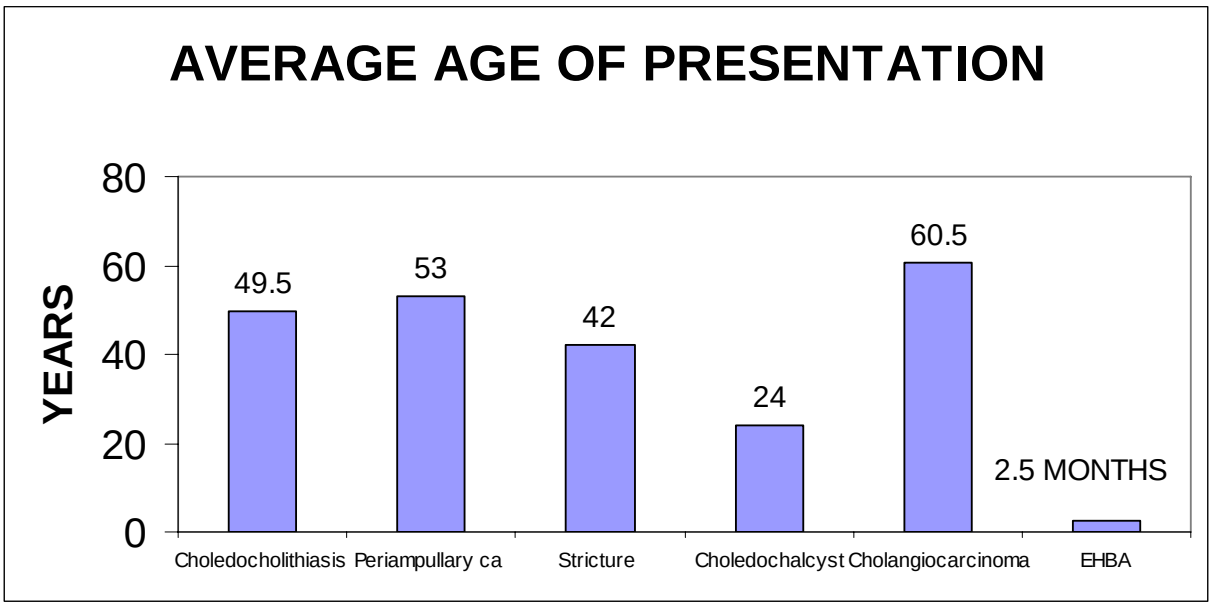
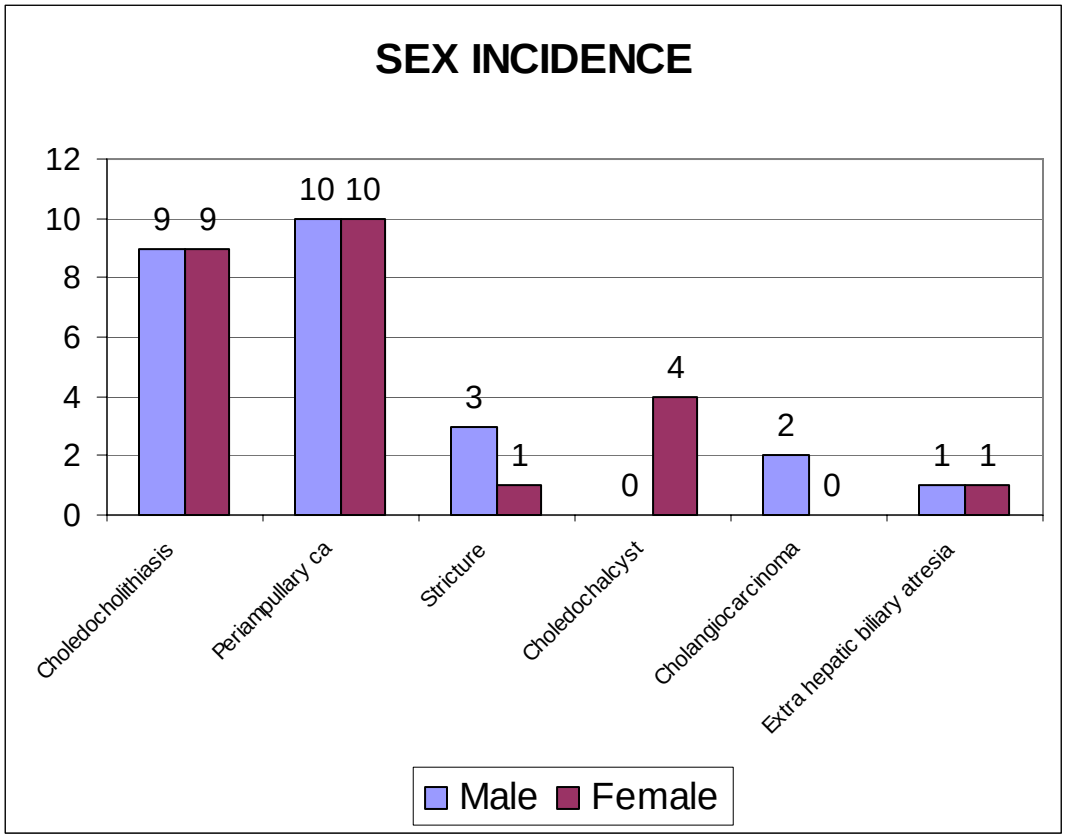
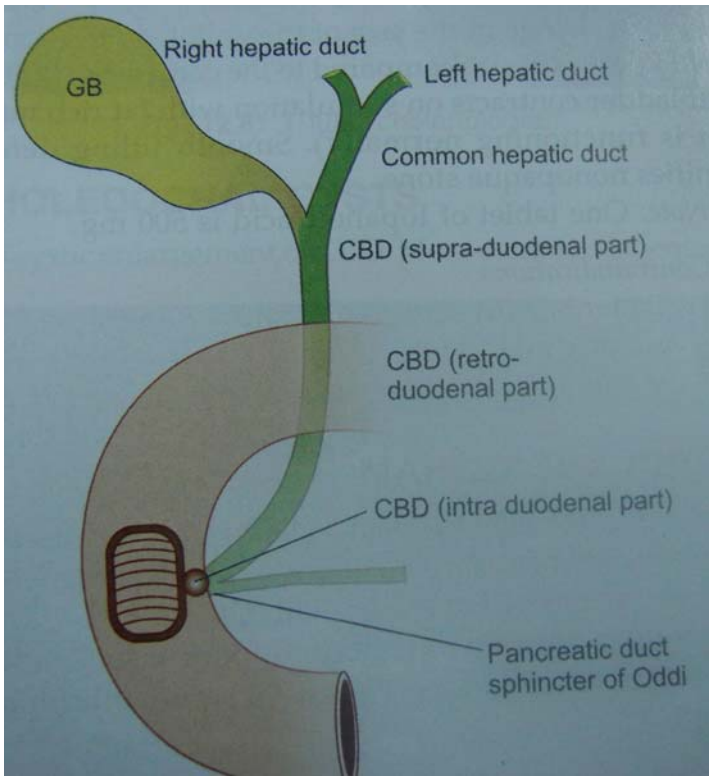
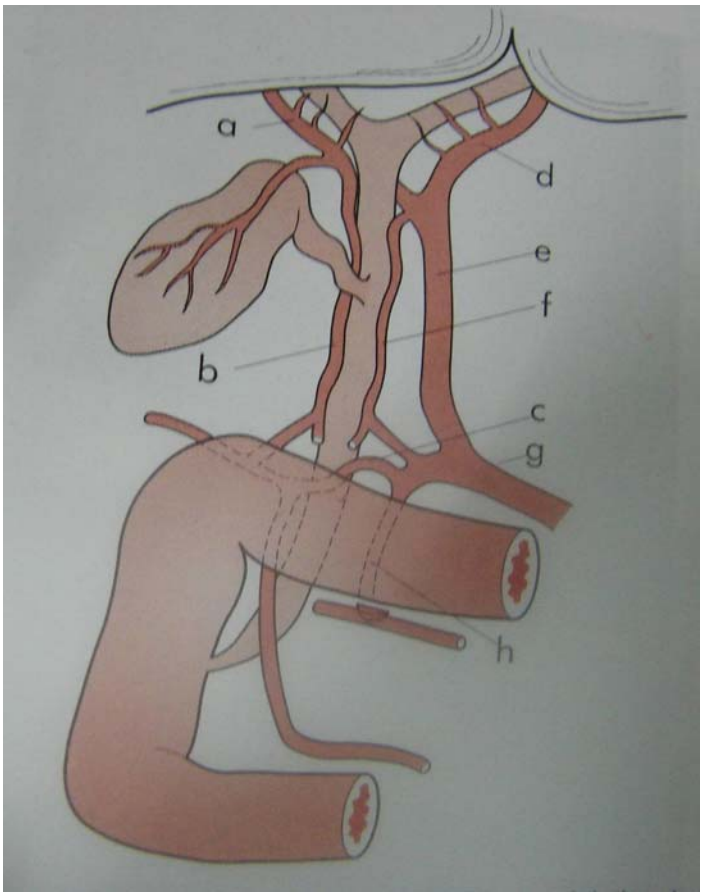
20
15
10
5
0
Choledocholithiasis
Periampullary ca
Stricture
Choledochalcyst
Cholangiocarcinoma
EHBA


AVERAGE AGE OF PRESENTATION
YEARS
80
60
40
20
0
49.5
53
42
24
60.5
2.5 MONTHS
Choledocholithiasis
Periampullary ca
Stricture
Choledochalcyst
Cholangiocarcinoma
EHBA


SEX INCIDENCE
12
10
8
6
4
2
0
9 9
10 10
3
1
0
4
2
0
1 1
Choledocholithiasis
Periampullary ca
Stricture
Choledochalcyst
Cholangiocarcinoma
Extra hepatic biliary atresia
Male
Female

ANATOMY OF BILIARY TREE

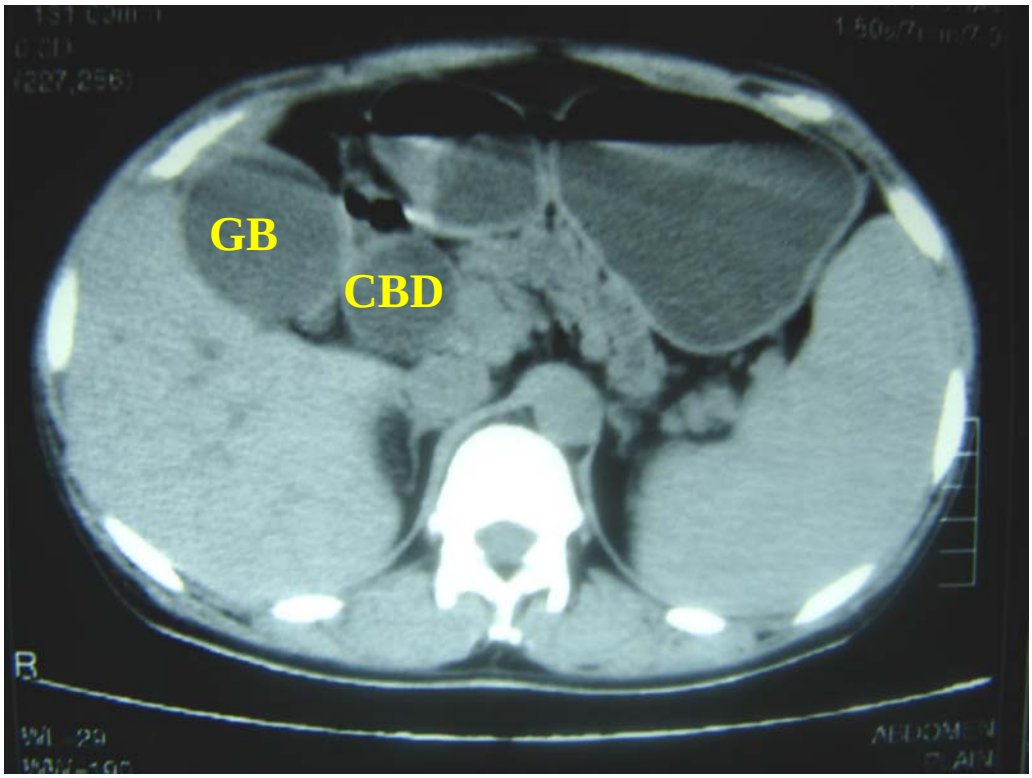




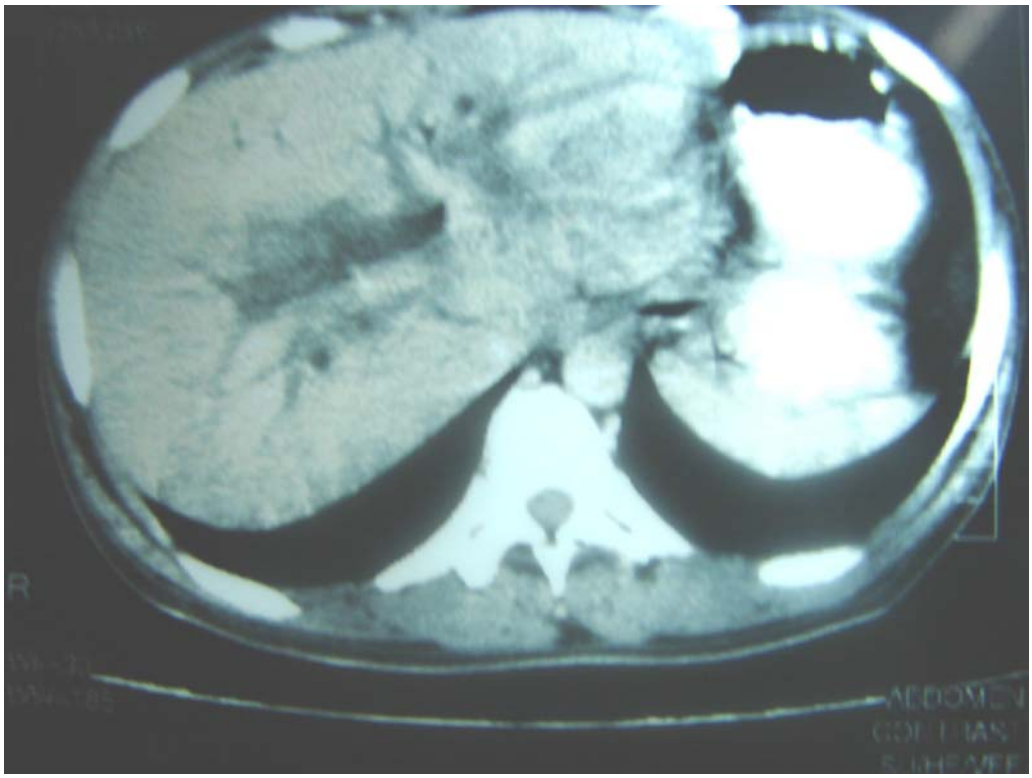
SCLERAL ICTERUS

ULTRASONOGRAM – CBD STONE

CT SCAN – PERIAMPULLARY CARCINOMA WITH DILATED CBD



DILATED INTRA HEPATIC BILIARY RADICALS

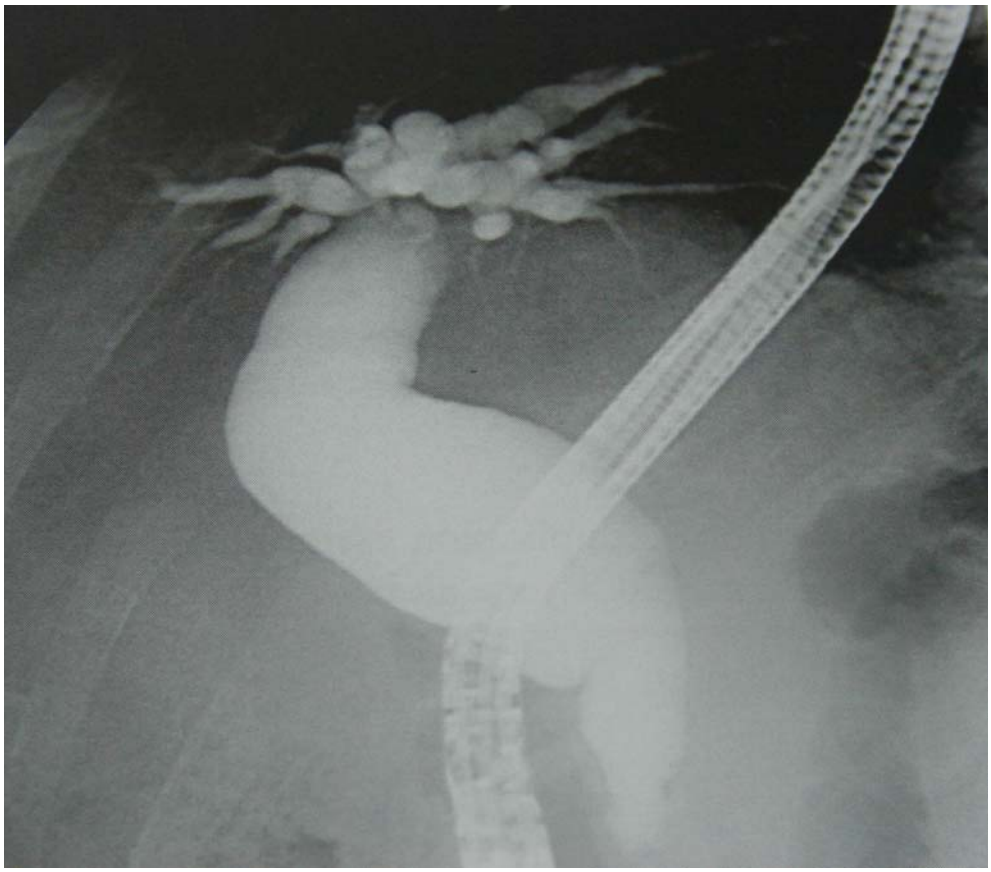


MAGNETIC RESONANCE CHOLANGIO PANCREATOGRAM – CBD STONE

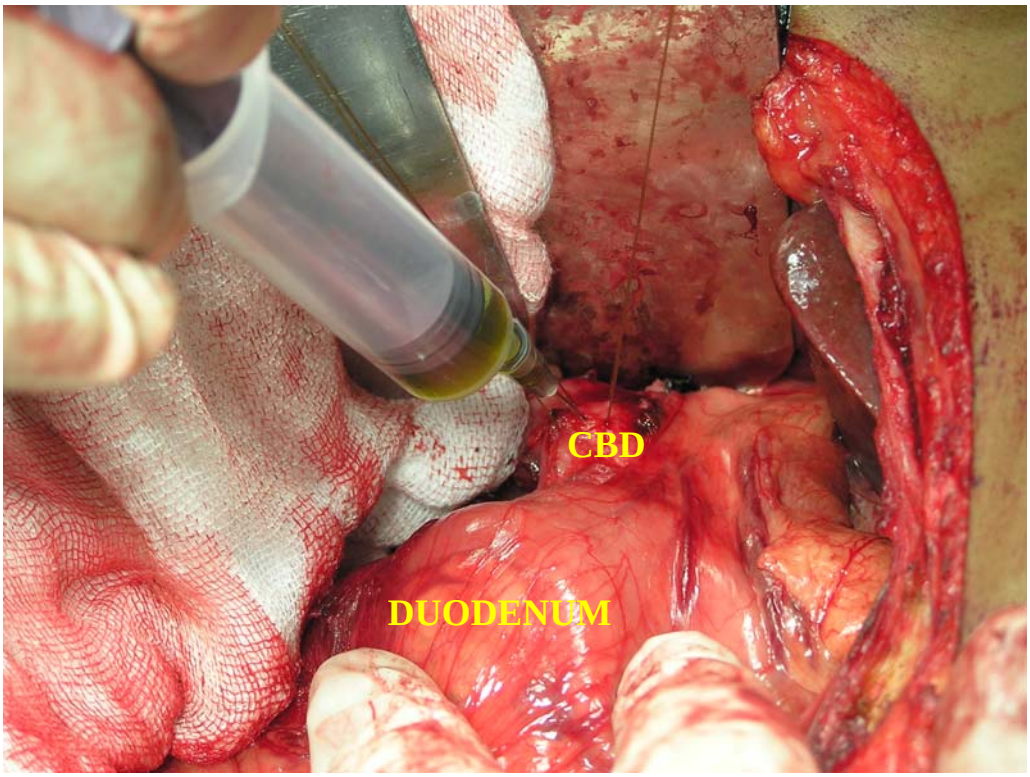
CT WITH RECONSTRUCTION – CBD STONE

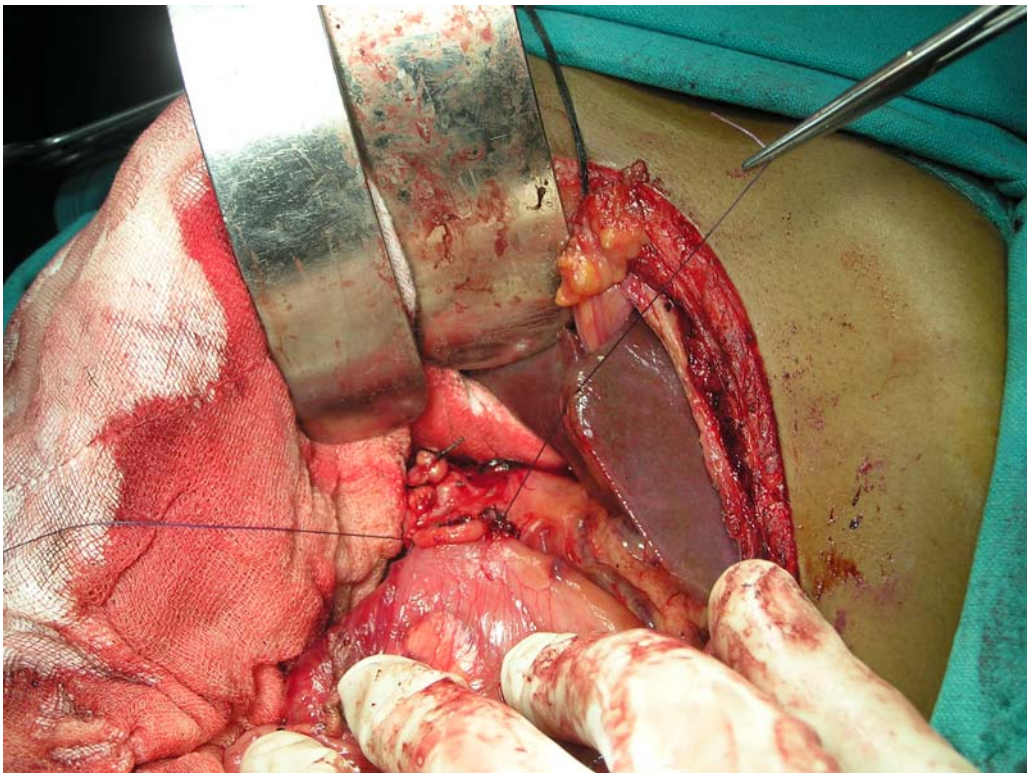
ULTRASONOGRAM – CHOLEDOCHAL CYST

ERCP – CHOLEDOCHAL CYST

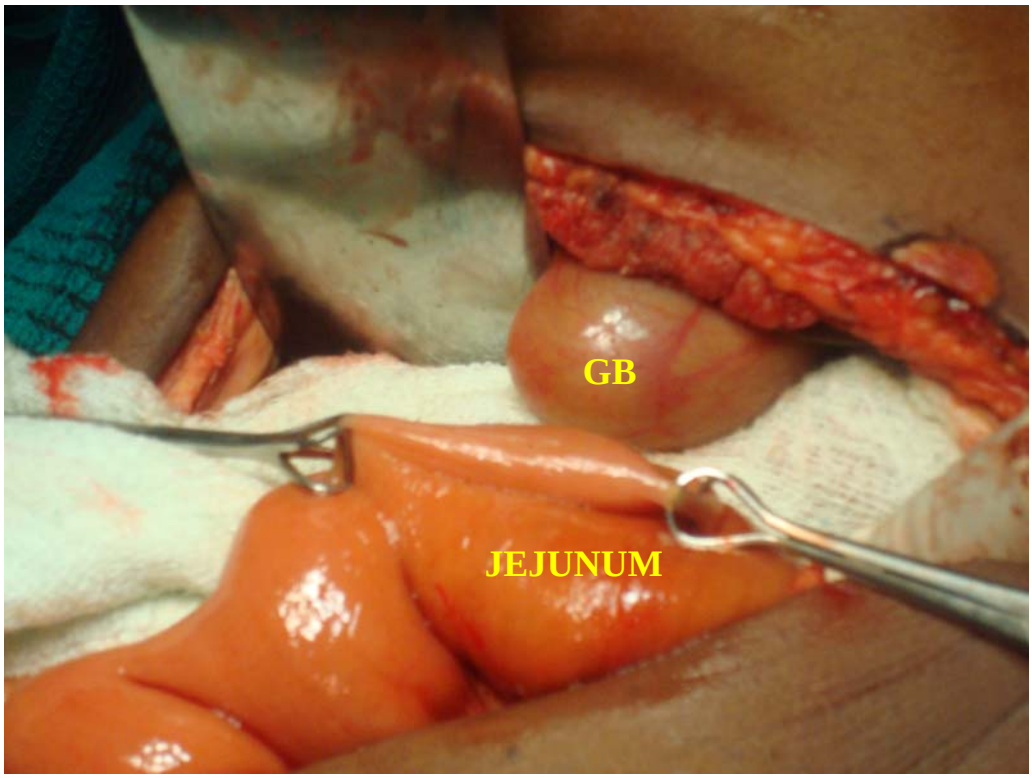


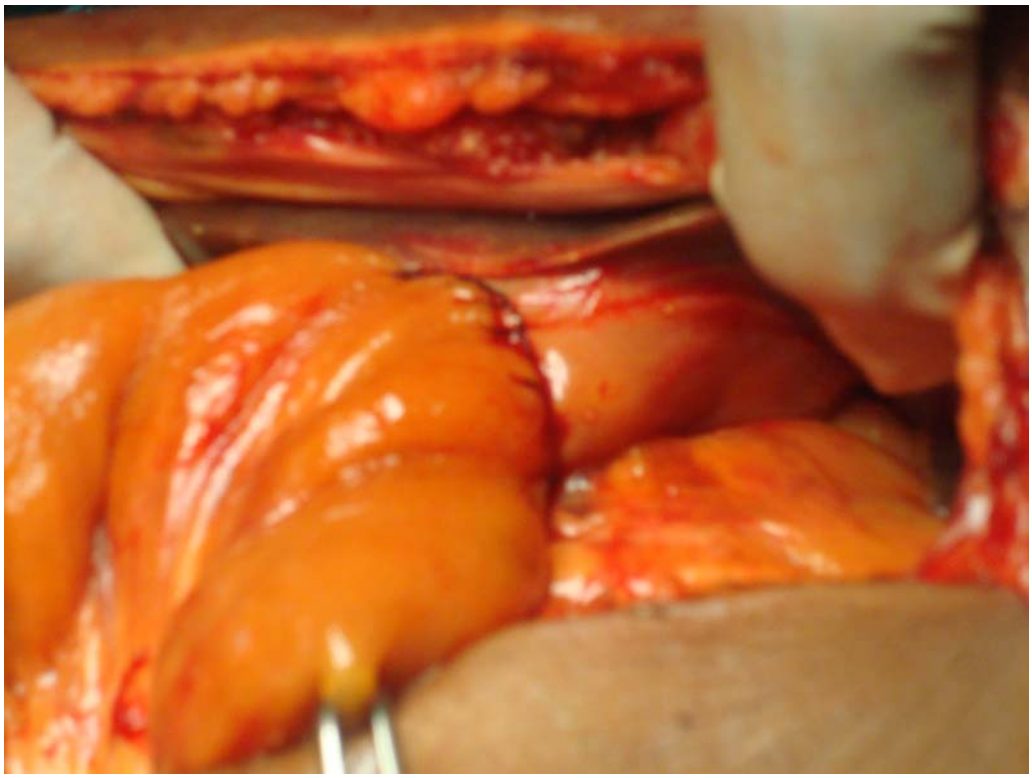
CHOLEDOCHO DUODENOSTOMY


CBD
DUODENUM

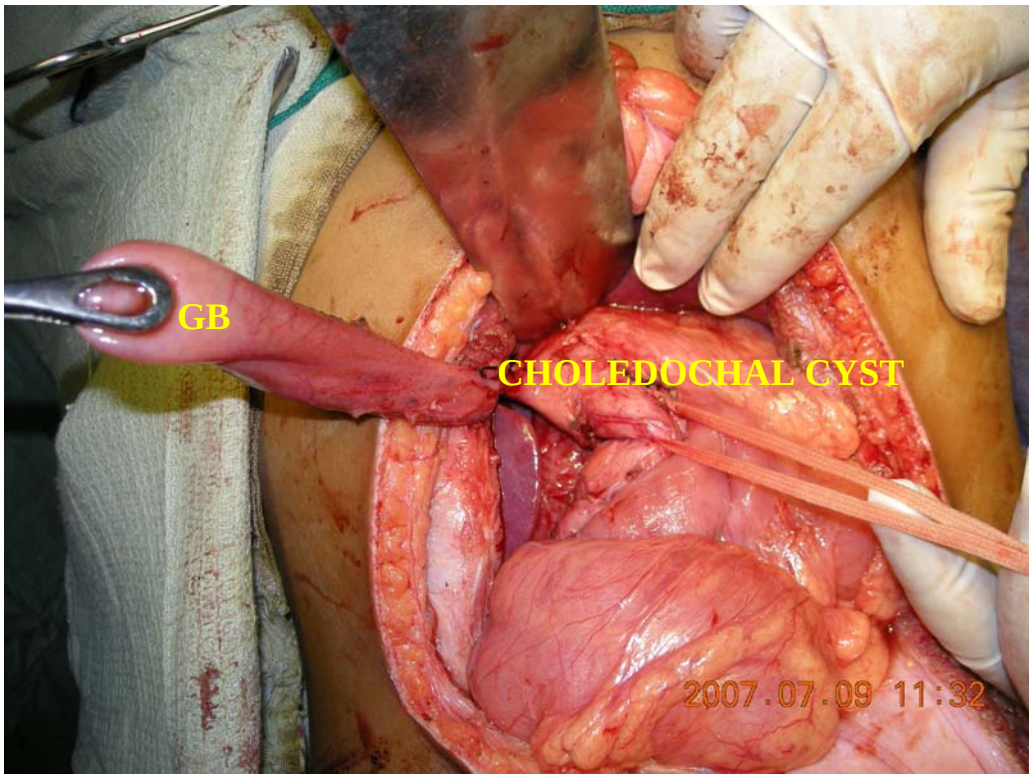


CHOLECYSTO JEJUNOSTOMY





HEPATICO JEJUNOSTOMY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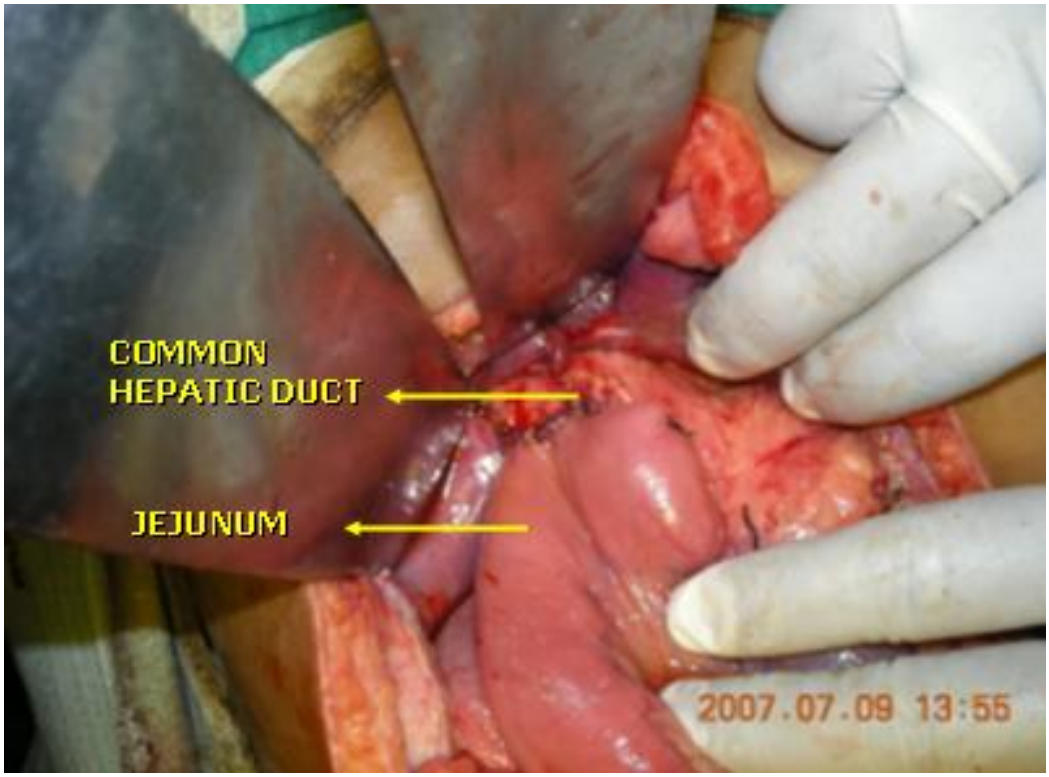
COMMON
HEPATIC DUCT
JEJUNUM
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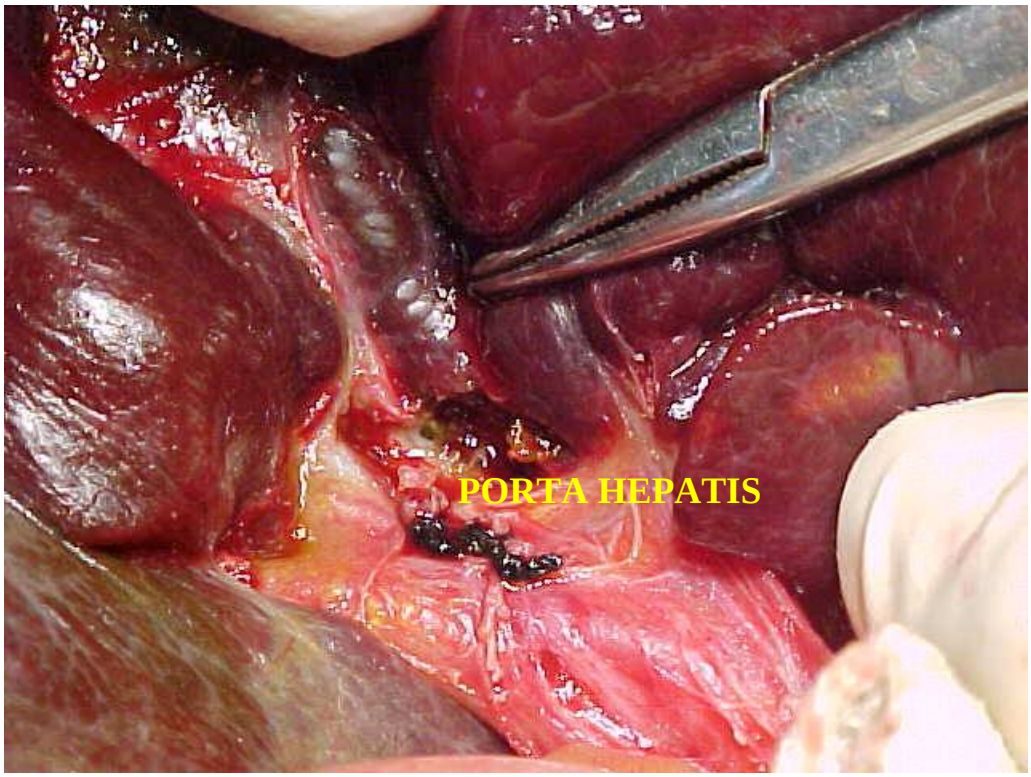
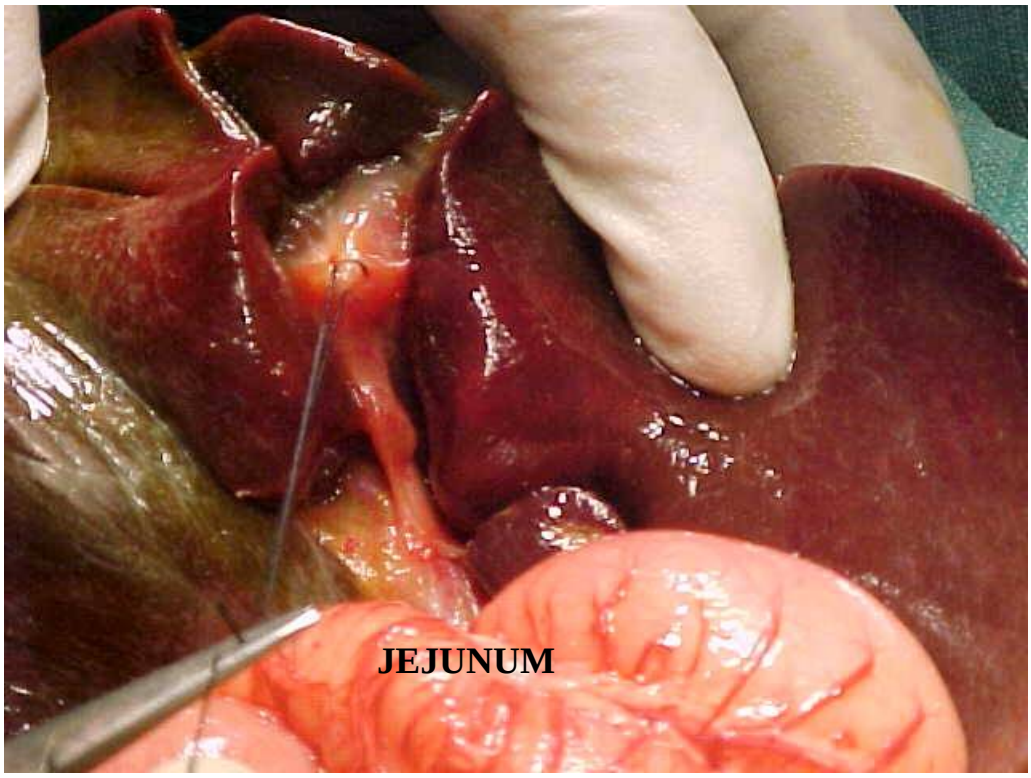
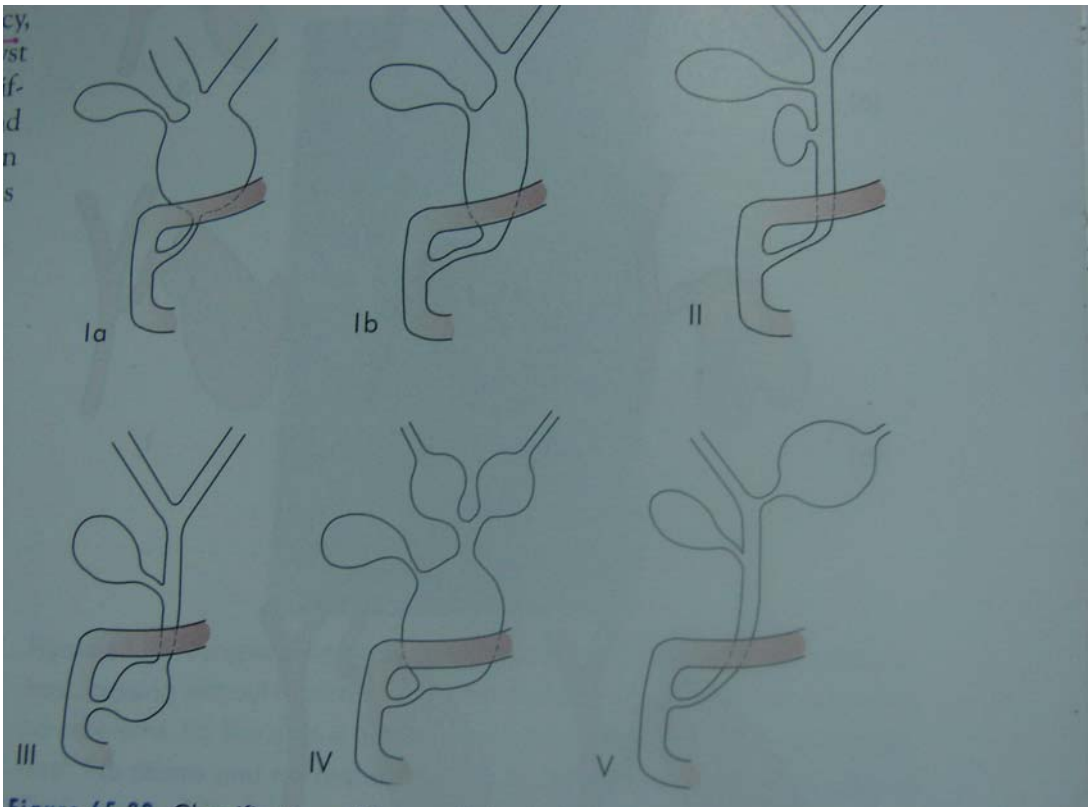
KASAI PROCEDURE

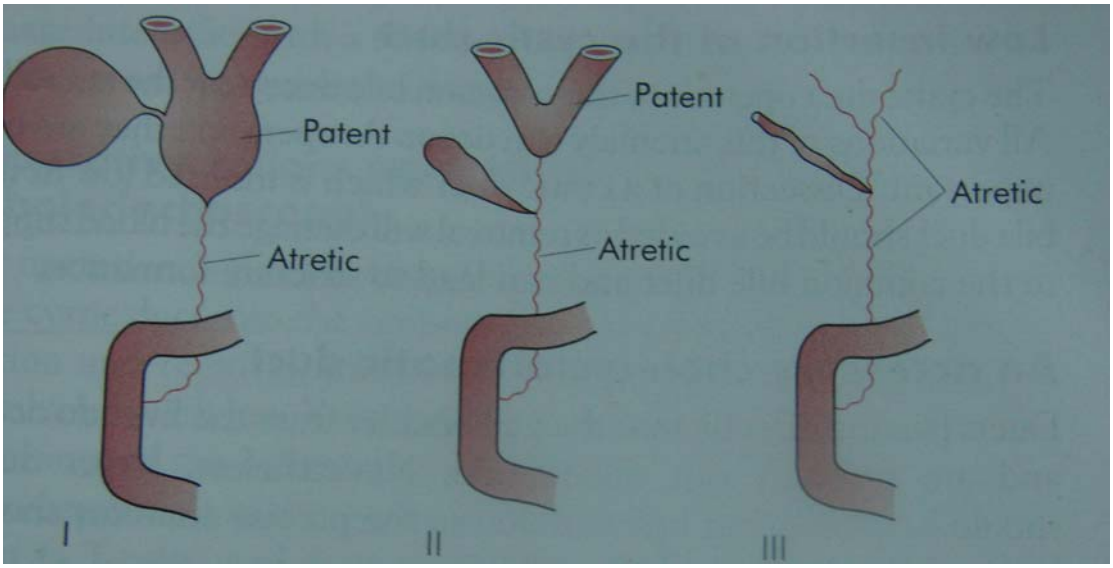




CHOLEDOCHAL CYST



CLASSIFICATION OF BILIARY ATRESIA



MASTER CHART

S. NO	NAME	AGE	SEX	IP.NO	CAUSE	SITE	PROCEDURE
1	BALU	55	M	12341	MULTIPLE GB CALCULI WITH CBD STONE	DISTAL CBD	CHOLEDOCHODUODENOSTOMY
2	LAKSHMI	38	F	494194	GB CALCULUS WITH CBD STONE	DISTAL CBD	CHOLEDOCHODUODENOSTOMY
3	MARIAMMAL	65	F	10806	GB CALCULUS WITH CBD STONE	AMPULLA OF VATER	CHOLEDOCHODUODENOSTOMY
4	RAMAR	40	M	15565	MULTIPLE GB CALCULI WITH CBD STONE	DISTAL CBD	CHOLEDOCHODUODENOSTOMY
5	KANAGARAJ	30	M	421439	MULTIPLE GB CALCULI WITH CBD STONE	DISTAL CBD	CHOLEDOCHODUODENOSTOMY
6	NAGALAKSHMI	50	F	51288	MULTIPLE GB CALCULI WITH CBD STONE	AMPULLA OF VATER	CHOLEDOCHODUODENOSTOMY
7	RAJATHY	58	M	6075	MULTIPLE GB CALCULI WITH CBD STONE	DISTAL CBD	CHOLEDOCHODUODENOSTOMY
8	MUTHUSAMY	50	M	6739	MULTIPLE GB CALCULI WITH CBD STONE	DISTAL CBD	CHOLEDOCHODUODENOSTOMY
9	MURUGAIAH	54	M	412466	GB CALCULUS WITH CBD STONE	DISTAL CBD	CHOLEDOCHODUODENOSTOMY
10	BRINDHA	70	F	410201	GB CALCULUS WITH CBD STONE	SUPRADUODENAL CBD	CHOLEDOCHODUODENOSTOMY
11	JEYARAJ	52	M	460116	MULTIPLE GB CALCULI WITH CBD STONE	DISTAL CBD	CHOLEDOCHODUODENOSTOMY
12	MYLATHAL	45	F	8075	MULTIPLE GB CALCULI WITH CBD STONE	DISTAL CBD	CHOLEDOCHODUODENOSTOMY
13	DHANALAKSHMI	26	F	32884	MULTIPLE GB CALCULI WITH CBD STONE	DISTAL CBD	CHOLEDOCHODUODENOSTOMY
14	PETCHIAMMAL	40	F	70377	MULTIPLE GB CALCULI WITH CBD STONE	DISTAL CBD	CHOLEDOCHODUODENOSTOMY

S. NO	NAME	AGE	SEX	IP.NO	CAUSE	SITE	PROCEDURE
15	MUTHU	36	M	10404	MULTIPLE GB CALCULI WITH CBD STONE	DISTAL CBD	CHOLEDOCHODUODENOSTOMY
16	LAKSHMI	50	F	81119	MULTIPLE GB CALCULI WITH CBD STONE	DISTAL CBD	CHOLEDOCHODUODENOSTOMY
17	MUNIYAMMAL	42	F	22381	MULTIPLE GB CALCULI WITH CBD STONE	DISTAL CBD	CHOLEDOCHODUODENOSTOMY
18	MANI	75	M	498816	MULTIPLE GB CALCULI WITH CBD STONE	AMPULLA OF VATER	CHOLEDOCHODUODENOSTOMY
19	RAJU	68	M	15685	PERIAMPULLARY CARCINOMA	DISTAL CBD	CHOLECYSTOJEJUNOSTOMY
20	PONNUSAMY	60	M	3297	PERIAMPULLARY CARCINOMA	HEAD OF PANCREAS	CHOLECYSTOJEJUNOSTOMY
21	VIJAYALAKSHMI	52	F	45963	PERIAMPULLARY CARCINOMA	AMPULLA OF VATER	CHOLECYSTOJEJUNOSTOMY
22	JEYAKODI	57	F	63153	PERIAMPULLARY CARCINOMA	DISTAL CBD	CHOLECYSTOJEJUNOSTOMY
23	SUBRAMANI	67	M	72901	PERIAMPULLARY CARCINOMA	DISTAL CBD	CHOLECYSTOJEJUNOSTOMY
24	KARUPPIAH	50	M	66576	PERIAMPULLARY CARCINOMA	DISTAL CBD	CHOLECYSTOJEJUNOSTOMY
25	NALLAMMAL	30	F	487609	PERIAMPULLARY CARCINOMA	DISTAL CBD	CHOLECYSTOJEJUNOSTOMY
26	RANGANAYAKI	58	F	53940	PERIAMPULLARY CARCINOMA	HEAD OF PANCREAS	CHOLECYSTOJEJUNOSTOMY
27	RAJATHI	32	F	458201	PERIAMPULLARY CARCINOMA	AMPULLA OF VATER	CHOLECYSTOJEJUNOSTOMY
28	MUTHAMMAL	65	F	28733	PERIAMPULLARY CARCINOMA	AMPULLA OF VATER	CHOLECYSTOJEJUNOSTOMY

S. NO	NAME	AGE	SEX	IP.NO	CAUSE	SITE	PROCEDURE
29	RAMU	60	M	39630	PERIAMPULLARY CARCINOMA	AMPULLA OF VATER	CHOLECYSTOJEJUNOSTOMY
30	ANDIAMMAL	60	F	51005	PERIAMPULLARY CARCINOMA	DISTAL CBD	CHOLECYSTOJEJUNOSTOMY
31	SUDALAI MUTHU	59	M	5895	PERIAMPULLARY CARCINOMA	DISTAL CBD	CHOLECYSTOJEJUNOSTOMY
32	ARASAPPAN	41	M	384611	PERIAMPULLARY CARCINOMA	AMPULLA OF VATER	CHOLECYSTOJEJUNOSTOMY
33	CHANDRAN	44	M	645990	PERIAMPULLARY CARCINOMA	DISTAL CBD	CHOLECYSTOJEJUNOSTOMY
34	PAUL GANESAN	60	M	418795	PERIAMPULLARY CARCINOMA	HEAD OF PANCREAS	CHOLECYSTOJEJUNOSTOMY
35	MANI	45	M	475068	PERIAMPULLARY CARCINOMA	DISTAL CBD	CHOLECYSTOJEJUNOSTOMY
36	CHINNA PONNU	55	F	26360	PERIAMPULLARY CARCINOMA	AMPULLA OF VATER	CHOLECYSTOJEJUNOSTOMY
37	RAJA LAKSHMI	45	F	452127	PERIAMPULLARY CARCINOMA	DUODENUM NEAR AMPULLA	CHOLECYSTOJEJUNOSTOMY
38	KAMALAM	54	F	443447	PERIAMPULLARY CARCINOMA	DISTAL CBD	CHOLECYSTOJEJUNOSTOMY
39	MAHESWARI	22	F	448268	POST CHOLECYSTECTOMY STRICTURE CBD	COMMON HEPATIC DUCT	HEPATICOJEJUNOSTOMY
40	SUBBIAH	65	M	471639	STRICTURE CBD	CBD, CYSTIC DUCT JUNCTION	HEPATICOJEJUNOSTOMY
41	SELVI	35	F	37744	CHOLEDOCHAL CYST	TYPE - I	HEPATICOJEJUNOSTOMY
42	LAKSHMI	34	F	63216	CHOLEDOCHAL CYST	TYPE - I	HEPATICOJEJUNOSTOMY

S. NO	NAME	AGE	SEX	IP.NO	CAUSE	SITE	PROCEDURE
43	MUTHUSAMY	61	M	15035	CHOLANGIO CARCINOMA	CBD	HEPATICOJEJUNOSTOMY
44	SARANYA	16	F	3744	CHOLEDOCHAL CYST	TYPE - I	HEPATICOJEJUNOSTOMY
45	CHITHRADEVI	11	F	449328	CHOLEDOCHAL CYST	TYPE - I	HEPATICOJEJUNOSTOMY
46	RAJINISH	29	M	395893	STRICTURE CBD	COMMON HEPATIC DUCT	HEPATICOJEJUNOSTOMY
47	GNANASKAR	52	M	48015	POST CHOLECYSTECTOMY STRICTURE CBD	COMMON HEPATIC DUCT	HEPATICOJEJUNOSTOMY
48	SONAI	70	M	7668	CHOLANGIO CARCINOMA	CBD	HEPATICOJEJUNOSTOMY
49	B/O. ALAGUJOTHI	3/12	FCH	469839	BILIARY ATRESIA	EXTRA HEPATIC	KASAI PROCEDURE
50	B/O. NAGU	2/12	MCH	478389	BILIARY ATRESIA	EXTRA HEPATIC	KASAI PROCEDURE