

**PREOPERATIVE PREDICTION OF DIFFICULT LAPAROSCOPIC
CHOLECYSTECTOMY USING RANDHAWA AND PUJAHARI
SCORING SYSTEM**



**Dissertation submitted in partial fulfillment of regulation for the award of
M.S. Degree in General Surgery (BRANCH I)**

REGISTRATION NO: 221711310



The Tamil Nadu

Dr.M.G.R. Medical University

Chennai APRIL 2020

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

CHENNAI

APRIL 2020

Coimbatore Medical College

Coimbatore - 641 014

CERTIFICATE

This is to certify that this dissertation titled "**PREOPERATIVE PREDICTION OF DIFFICULT LAPAROSCOPIC CHOLECYSTECTOMY USING RNANDHAWA AND PUJAHARI SCORING SYSTEM**" is the bonafide work done by **DR D.M.MOHANARAJA** and submitted in partial fulfilment of the requirements for the Degree of M.S., General Surgery, The Tamil Nadu Dr.M.G.R. Medical University, Chennai.00

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DECLARATION

I certainly declare that this dissertation titled **“PREOPERATIVE PREDICTION OF DIFFICULT LAPAROSCOPIC CHOLECYSTECTOMY USING RANDHAWA AND PUJAHARI SCORING SYSTEM”** is a genuine work of mine. The contributions of any supervisors to the research are consistent with normal supervisory practice and are acknowledged.

I also affirm that this bonafide work or part of this work was not submitted by me or any others for any award, degree or diploma to any other university board, neither in India or abroad. This is submitted to The Tamil Nadu Dr.MGR Medical University, Chennai in partial fulfillment of the rules and regulation for the award of Master of Degree in General Surgery.

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Dear **Dr.D.M.Mohanaraja**

The Institutional Ethics Committee of Coimbatore Medical College, reviewed and discussed your application for approval of the proposal entitled **"Preoperative Prediction of Difficult Laparoscopic Cholecystectomy using Randhawa and Pajahari Scoring System"** No.0121/2017.

The following members of Ethics Committee were present in the meeting held on 05.01.2018, conducted at MM - II Seminar Hall, Coimbatore Medical College Hospital Coimbatore-18

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We approve the Proposal to be conducted in its presented form.

Sd/Chairman & Other Members

The Institutional Ethics Committee expects to be informed about the progress of the study, and SAE occurring in the course of the study, any changes in the protocol and patients information/informed consent and asks to be provided a copy of the final report.


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LIST OF ABBREVIATIONS

SAGES	-	Society of American Gastrointestinal & Endoscopic Surgeons
CBD	-	Common Bile Duct
CHD	-	Common Hepatic Duct
LC	-	Laparoscopic Cholecystectomy
ERCP	-	Endoscopic Retrograde Cholangio Pancreatography
MRCP	-	Magnetic Resonance Cholangio Pancreatography
BMI	-	Body Mass Index
OCP	-	Oral Contraceptive Pills
LFT	-	Liver Function Test
HIDA	-	Hepato Biliary Immuno Diacetic Acid

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INTRODUCTION

Laparoscopic cholecystectomy has become the procedure of choice for the management of symptomatic gallstone disease, because it is minimally invasive, causes less pain and early recovery. Sometimes laparoscopic cholecystectomy becomes difficult. It may take a longer time and occasionally requires conversion to open cholecystectomy. It is very difficult to predict preoperatively whether it is going to be easy or difficult. The degree of difficulties is again impossible to predict.

Gall stone disease is a common problem affecting human being. Over the past two decades, laparoscopic cholecystectomy has become the gold standard for the surgical treatment of gallbladder disease.

The advantages of laparoscopic cholecystectomy are many, but not without complications. The complications during laparoscopic cholecystectomy, some are specific to the unique technique and some are common to laparoscopic surgery in general.

Approximately 2% to 15% of patients require conversion to open surgery for various reasons. Because of conversion to open technique time, cost & morbidity are increased.

J.S. Randhawa & A.K. Pujahari, from the department of general surgery in Indian Air Force hospital Bangalore formed a scoring system for preoperative prediction of difficult laparoscopic cholecystectomy.

In the present study, the preoperative factors that predict the chances of conversion from laparoscopic to open cholecystectomy as per Randhawa and Pujahari scoring system are assessed.

AIMS AND OBJECTIVES

1. The aim of this study is to evaluate the factors determining the preoperative prediction of difficult laparoscopic cholecystectomy.
2. To reduce the conversion ratio of laparoscopic to open cholecystectomy.
3. To assess the validity of Randhawa & Pujahari scoring system in predicting preoperative difficult laparoscopic cholecystectomy.

REVIEW OF LITERATURE

In 1882, the first open cholecystectomy was performed in Berlin by Carl Langenbuch to treat a 42-year-old man with long-standing biliary colic; however cholecystectomy was not commonly accepted as a treatment for gallstone disease until the turn of the century. The first two laparoscopic cholecystectomies (LC) in the world were performed by Eric Muhe in Boblingen, Germany, in 1985 and Philippe Mouret in Lyon, France, in 1987. Working independently, two groups of American surgeons performed the first LC in the United States in 1988.

In 1990, 10% of cholecystectomies were being performed laparoscopically in the United States. This figure has risen dramatically over the past two decades and stands at 90.5% in 2010. Never before had a surgical revolution occurred so quickly.

The major advantage of the laparoscopic approach was improved recovery, which allowed patients to have better quality of life in the immediate postoperative period. Although prospective randomized trials came late, they showed the clear advantages of LC over open cholecystectomies. Training of surgeons to perform the highly technical procedure was frequently inadequate, and early complications gave birth to the phrase learning curve.

Professor Muhe of Boblingen, Germany performed the first laparoscopic cholecystectomy on September 12, 1985. His procedure involved the use of a side-viewing endoscope with an instrumentation channel inserted through the umbilicus after a pneumoperitoneum was established by a Veress needle technique.

After six procedures using a pneumoperitoneum, he adapted the technique using an access channel and a 2.5 cm incision at the costal margin without the use of a pneumoperitoneum. SAGES recognized his early contributions in 1999, and he was invited to give the annual Karl Storz Lecture in New Technology which he entitled “The First Cholecystectomy: Overcoming the Roadblocks on the Road to the Future,” in San Antonio, Texas that year.

Although laparoscopic cholecystectomy has become well established in the surgical treatment of gallstone disease in the last 25 years, it is evident from large population studies that open cholecystectomy continues to be performed by some surgeons preferentially or when the minimal access approach fails. Open cholecystectomy may be necessary as an incidental undemanding procedure during more complex surgery of the liver, bile duct, or pancreas.

However, a more challenging procedure may result in patient undergoing conversion following failed laparoscopic dissection due to difficult anatomy or more severe gallbladder disease. Some surgeons may prefer for an open approach if difficulties with laparoscopic access and dissection are anticipated. The modern surgeon may have acquired greater expertise in the minimally invasive procedure and have little experience of open cholecystectomy. However, there is a need to apply the same safe principles in circumstances that may be more challenging.

EMBRYOLOGY

A hepatic diverticulum appears in the ventral wall of the primitive midgut early in the 4th week of intrauterine life in the development of the human embryo. This small diverticulum is the anlage for the development of the liver, extrahepatic biliary ducts, gallbladder, and ventral pancreas. By the 5th week, all elements of the biliary tree are recognizable. Marked elongation of the common duct occurs with plugging of the lumen by epithelial cells. Recanalization of the lumen of the common duct starts at the end of the 5th week and moves slowly distally. By the 6th week, the common duct and ventral pancreatic bud rotate 180 degrees clockwise around the duodenum. Early in the 7th week, the bile and pancreatic ducts end in closed cavities of the duodenum. Between the early 8th and 12th week, hepatopancreatic ducts have both superior and inferior orifices. Of these two orifices, the inferior one is usually suppressed. The muscle of the sphincter of Oddi develops from a concentric ring of mesenchyme surrounding the preampullary portion of the bile and pancreatic ducts. At about the 10th week, the muscle of the sphincter of Oddi undergoes differentiation. In the 16th week, the muscularis propria extends from just outside the fenestra to the upper end of the ampulla. By the 28th week, the muscularis propria is differentiated almost to the distal end of the ampulla.

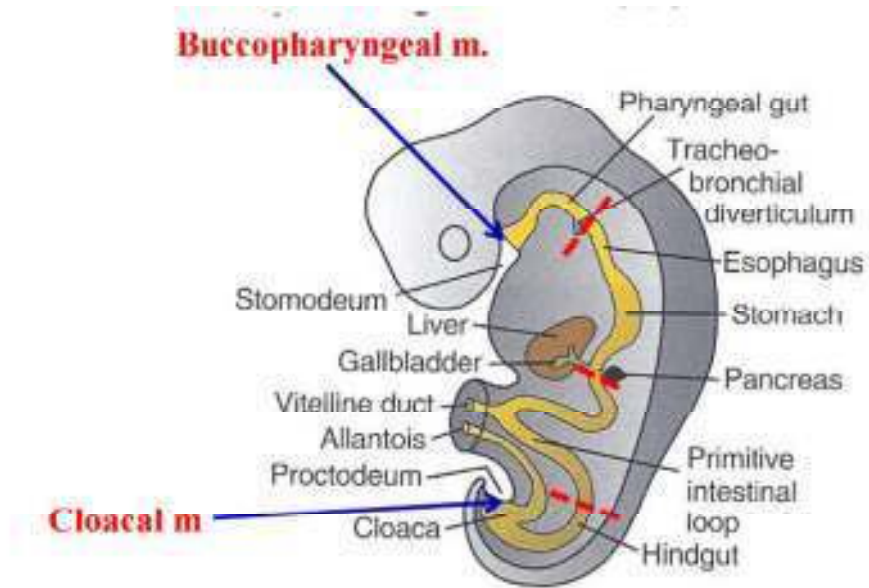
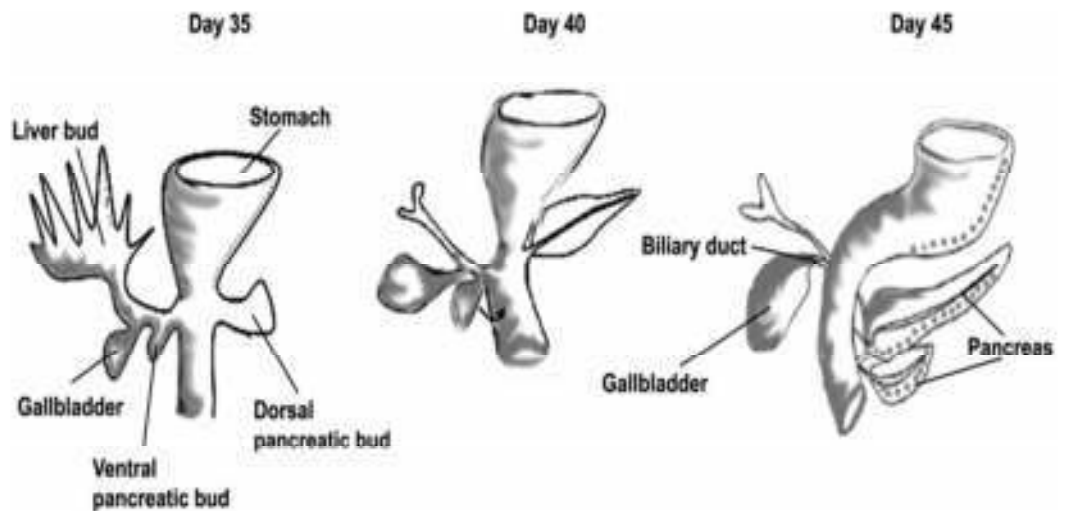


FIG.1 EMBRYOLOGY OF GALL BLADDER



SURGICAL ANATOMY

GALLBLADDER

It is a pear-shaped (size is 5-12 cm) reservoir, located in a fossa on the inferior surface of the liver.

It is under segment IVB and V of the liver. Cystic plate, a fibroareolar condensed tissue is more evident under the body of the gallbladder. Ducts of Luschka may drain directly from the liver to the gallbladder through cystic plate across the gall bladder-bed. Submucosa and muscularis mucosa are absent in gallbladder.

Gallbladder is supplied by cystic artery, which is a branch of right hepatic artery. Venous drainage is through direct veins entering into the segment IV and V through gallbladder bed and also through cystic veins into portal vein.

FIG.2 GALL BLADDER ANATOMY

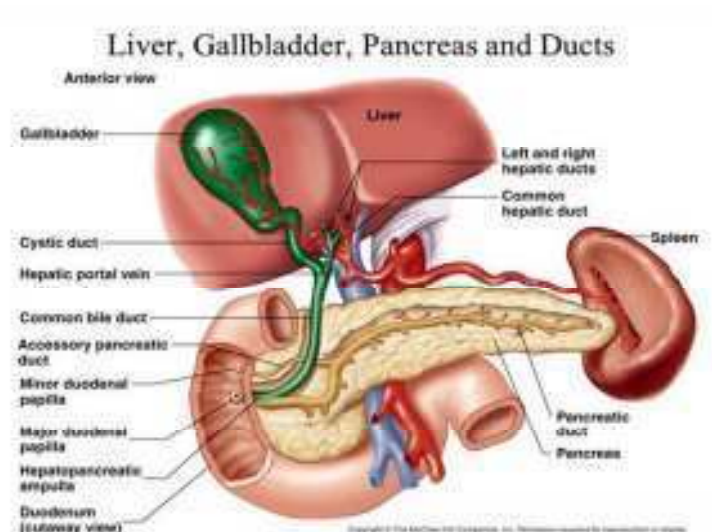


FIG.3 Cystic Duct and Cystic Artery in calot's triangle

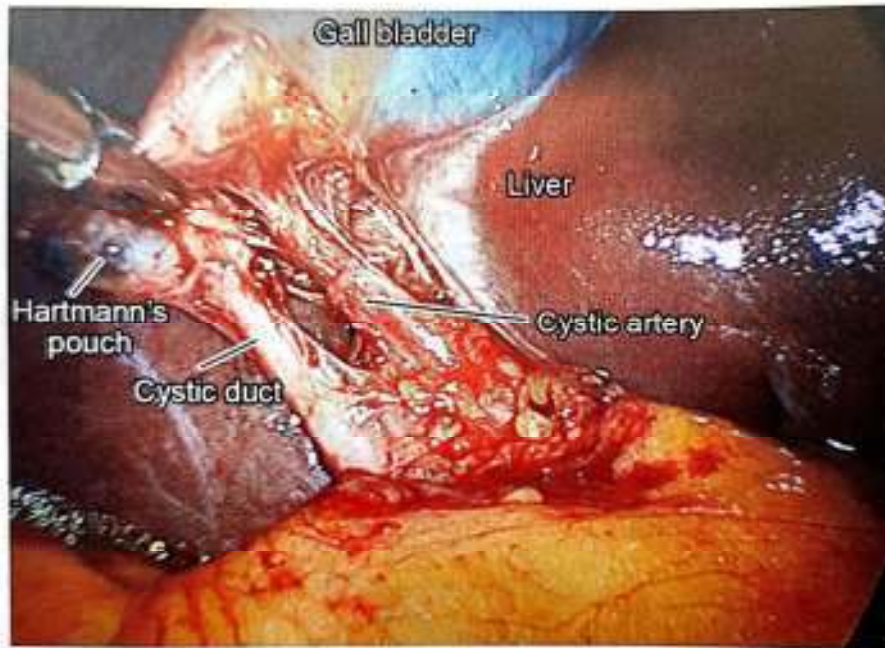


FIG.4 Calot's triangle in open cholecystectomy

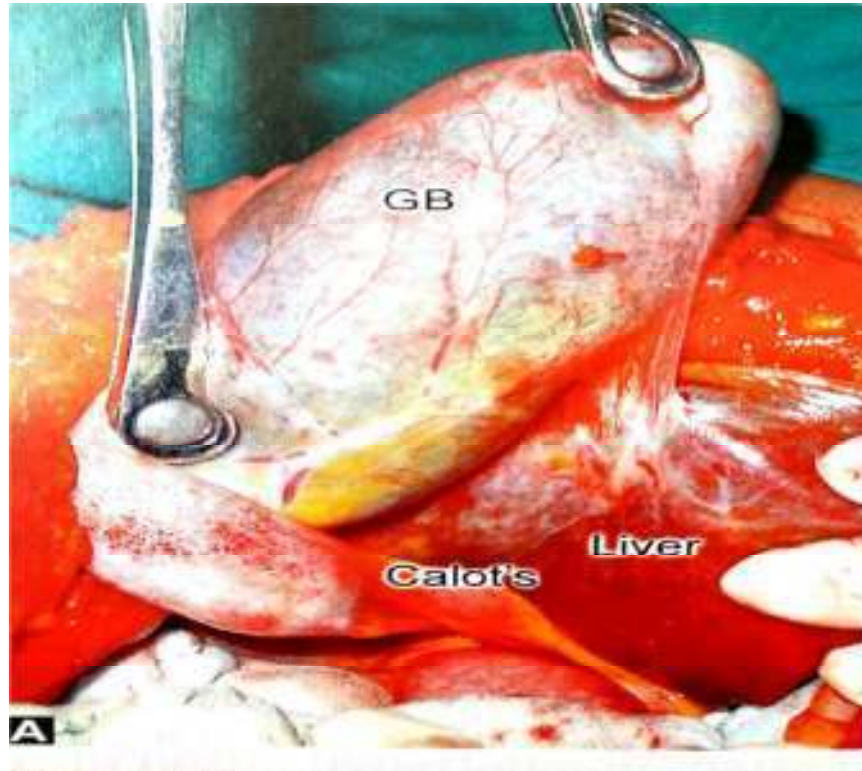
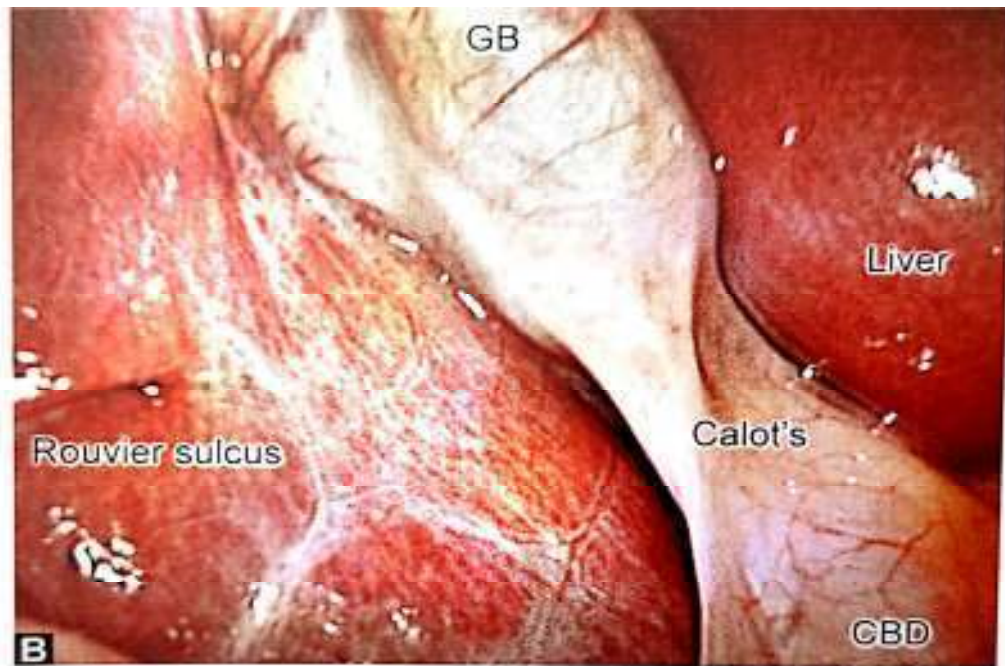


FIG.5 Calots Triangle in Laparoscopic Cholecystectomy

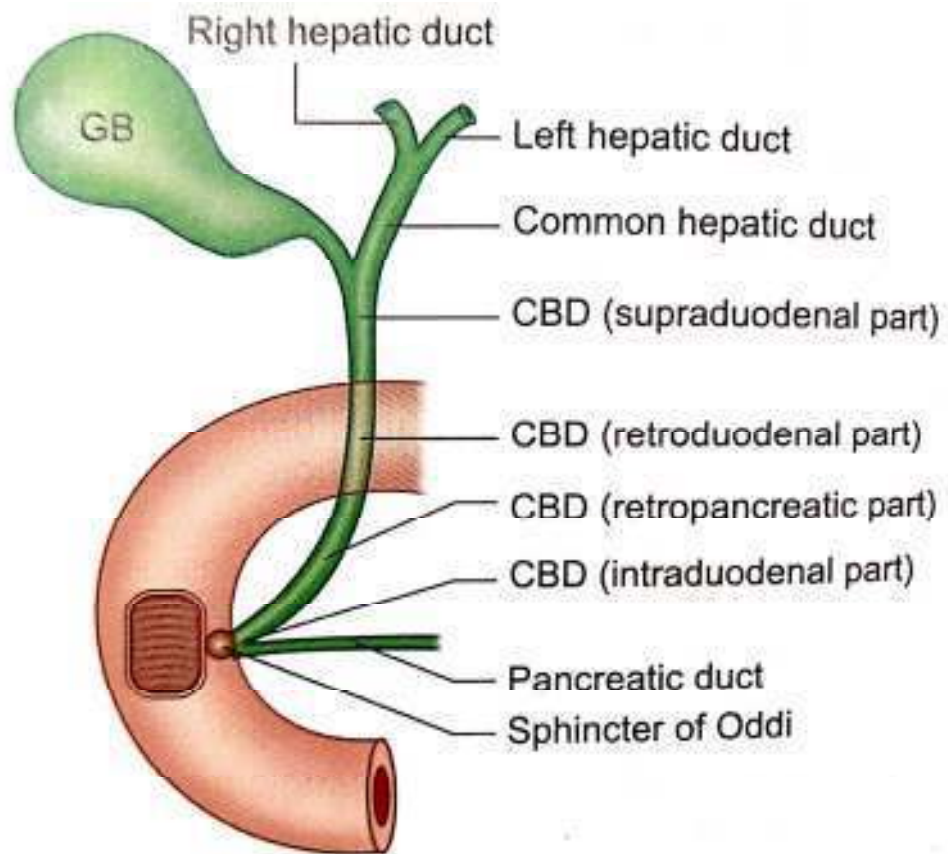


- Fundus, body, infundibulum and neck are the parts of gall bladder. Hartmann's Pouch is pathological one located in the infundibular region created by gallstones.
- Gallbladder drains through cystic duct into common hepatic duct to form common bile duct. Cystic duct is 3 cm in length having 1-3 mm diameter lumen. Duct is covered by sphincter of Lutkens, lumen contains spiral valves of Heister.
- Gallbladder is supplied by cystic artery, a branch of right hepatic artery. Calot's triangle (Cystohepatic/Cystobiliary-J R Calot, France, 1891) is formed by common hepatic duct to the left, cystic duct below, and inferior surface of liver/cystic artery above. Cystic artery originating from right hepatic artery passes behind the common hepatic duct, enters

the Calot's triangle to reach the gallbladder. It contains lymph node of 'Lund' (Fred Bates Lund)-Mascagni's node.

- Often cystic artery, hepatic artery, cystic duct have anomalous positions and anomalous origins

FIG.6 Parts of Common bile duct



EXTRAHEPATIC BILIARY TREE

- The left hepatic duct is formed by the ducts draining II, III, IV segments of the liver. The right hepatic duct is formed by the ducts draining V, VI, VII, VIII segments of the liver. Both join to form the common hepatic duct, which joins with the cystic duct to form the common bile duct.
- Common bile duct is normally 10-12 cm in length and 6-8 mm in diameter. It joins the major pancreatic duct in the wall of the 2nd part of duodenum to form the ampulla of Vater. Intraduodenal part of common bile duct (CBD) is surrounded by smooth muscle fibers called as sphincter of oddi.

BLOOD SUPPLY

- From gastroduodenal, retroduodenal, superior pancreaticoduodenal arteries.

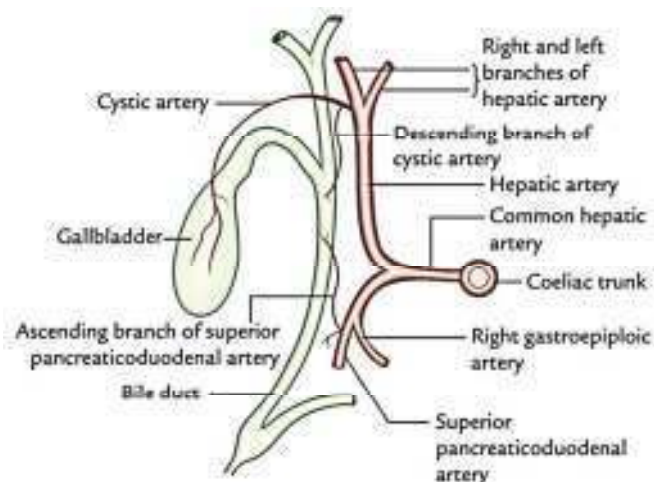


FIG.7 Blood supply of extrahepatic biliary tree

BILE

- Daily up to about 500 ml of bile is secreted from the liver which contains water (98%), bile salts, bile pigments, fatty acids, lecithin, cholesterol, and electrolytes (sodium, potassium, chloride, bicarbonate, calcium, magnesium) with a pH more than 7. 0.
- Main function of gallbladder is to concentrate and store the bile. Capacity of gallbladder is 30-60 ml
- Conjugated bilirubin from the liver is secreted into the bile, which in the bowel is converted into urobilinogen by bacteria. Urobilinogen gets absorbed in the bowel, enters the liver for resecretion again and part of it is excreted in the urine. Absence of urobilinogen in the urine signifies obstructive jaundice.
- In the absence of gall stones or any other disease, bile is sterile. Symptomatic gall stone disease shows positive culture for bacteria, commonest being E. coli and Klebsiella.

GALLSTONES

TYPES

1. Cholesterol stones are less common (only 6%), often solitary.
2. Mixed stones are most common(90%). It contains cholesterol, calcium salts of phosphate, carbonate, palmitate, proteins, and are multiple faceted.
3. Pigment stones are small, black or greenish black, multiple. Often they can be sludge like.

Common in “Fat, Fertile, Forty, Flatulent, Female”.

Common in western countries and in north India



FIG.8 Thickened Gall Bladder due to chronic cholecystitis

PATHOGENESIS

I. Metabolic:

- Cholesterol is synthesised in liver. Its solubility is determined by relative concentration of cholesterol, bile salts and lecithin. Altered levels of cholesterol, lecithin, and bile salts in bile, reduces the micelle concentration in the bile leading to precipitation of insoluble cholesterol, hence, the stone formation (Lithogenic bile).
- Normal ratio of bile salt and lecithin to cholesterol is 25:1. Ratio below 13:1 leads to precipitation of cholesterol. Insoluble cholesterol is within the soluble micelle which is formed by lecithin and bile salts. If cholesterol component increases, bile gets supersaturated and inadequate micelle makes insoluble cholesterol to undergo crystallisation and cholesterol monohydrate stone formation (Admiron's triangular hypothesis).
- Some cholesterol remains as bilayered lipid vesicles which are soluble. A specific heat labile glycoprotein in bile induces cholesterol monohydrate crystal formation in the vesicle and causes their aggregation. It is called as nucleation.
- Eventual precipitation and stone formation occurs by infection infestation, pancreatic fluid reflux into CBD causing conversion of toxic

lecithin to lysolecithin which is also toxic (causes supersaturated bile); bile stasis or altered enterohepatic circulation.

- Any condition which either increases the cholesterol secretion in the bile or reduces the bile salt concentration causes cholesterol stone formation.
- The following factors causes increase cholesterol secretion: old age, OCP, obesity, clofibrate.
- Oestrogen, ileal resection and cholestyramine reduce the bile salt concentration.
- Chenodeoxycholic acid and ursodeoxycholic acid prevent cholesterol stone formation by maintaining bile acid pool, reducing cholesterol synthesis and secretion, converting supersaturated bile into normal bile.

II. Infections and Infestations:

- Bacteria like E. coli, Salmonella
- Parasites like Clonorchis sinensis and Ascaris lumbricoides are often associated.
- Moynihan's aphorism: "A gallstone is a tomb stone erected to the memory of the organism within it."

III. Bile stasis:

- Occurs due to estrogen therapy, pregnancy, vagotomy and in patients who are on long-term intravenous fluids or TPN.

IV. Increased bilirubin production

- Due to any of the causes of haemolysis as in hereditary spherocytosis, sickle cell anaemia, thalassaemia, malaria, cirrhosis. Here pigment stones are common.
- Rarely centre of the stone contains radiolucent gas which is either triradiate (Mercedes Benz sign) or biradiate (Seagull sign).
- Sometimes gallbladder may be filled by 'toothpaste like' material which is a mixture of calcium carbonate and phosphate, which on plain X-ray looks like an opacified gallbladder, so called as Limey gallbladder.
- Only 10% of gallstones are radio-opaque, 90% are radiolucent.
- Black pigment stones are common in gallbladder. It is usually calcium bilirubinate, calcium phosphate and bicarbonate stone with a matrix. It is common in haemolytic disorders. They are usually multiple, small black and hard in consistency. Mucin A and Mucin C5 secreted by biliary glands may be the aetiology. Cholesterol component here is less than 30%. It is often seen in cirrhosis. They almost always form in gallbladder. They are common in Asia and Japan.

- Brown pigment stones are formed in biliary tree as primary biliary stones. It is commonly due to infection like *Escherichia coli* and *bacteroides* (98%) with bacterial nidus at the center (often *Ascaris lumbricoides* or *Clonorchis sinensis* infestation or foreign body or stents). They secrete β glucuronidase to cause hydrolysis of soluble conjugated bilirubin to insoluble calcium bilirubinate. It also contains calcium palmitate, calcium stearate and cholesterol. They are brownish yellow, soft and mushy.



FIG.9 Thickened gall bladder wall with multiple gall stones.

EFFECTS OF THE GALLSTONES

a. In the gallbladder

- Silent asymptomatic stones occur in 10% of males and 20% of females.
- Biliary colic with periodicity, severe within hours after meal (commonest presentation). Biliary colic is spasmodic pain often severe, in right upper quadrant and epigastrium radiating to chest, upper back and shoulder. It is self-limiting recurs unpredictably, often precipitated by a fatty heavy meal. Fever and increased WBC count may be observed.
- Acute cholecystitis.
- Chronic cholecystitis.
- Empyema gallbladder.
- Perforation causing biliary peritonitis or pericholecystic abscess.
- Mucocele of gallbladder.
- Limey gallbladder.
- Carcinoma gallbladder.

b. In the CBD

- Secondary CBD stones (occurs in 10% of gallstones).
- Cholangitis.

- Pancreatitis.
- Mirizzi syndrome (compression of CHD/CBD by stone from cystic duct or cholecysto-choledochal fistula).

C. In the intestine

- Cholecystoduodenal fistula causing gallstone ileus and so intestinal obstruction.

Flatulent Dyspepsia

- It is discomfort in the abdomen, belching, heartburn, fat intolerance sensation of fullness in the abdomen usually observed in fatty, fertile, flatulent female.

Gallstone Colic

- It is sudden, severe colicky abdominal pain in right upper quadrant which radiates to back and shoulder. This pain is due to sudden spasm of gallbladder wall when gallstone moves towards the neck of the gallbladder or cystic duct and gets impacted. Tachycardia and restlessness are common. Right hypochondrium is tender.
- It is precipitated by supine position while sleeping at night. It lasts for few hours and is episodic. It may precipitate acute cholecystitis or empyema gallbladder.
- There is reflex pylorospasm causing vomiting.

GALLSTONE ILEUS

It is a type of acute intestinal obstruction, often seen in elderly and is due to blockage by a bolus or mass of gallstones which commonly enter the intestine through cholecystoduodenal fistula (75%) or rarely through cholecystointestinal or gastric fistulas.

Gallstones in the gallbladder (stone > 2.5 cm)



Cholecystitis



Suppuration and adhesion over the duodenal wall



Communication of gallbladder into the duodenum (Spontaneous bilioenteric fistula)



Gallstones pass into the duodenum forms a bolus ('Rolling stone gather mass')

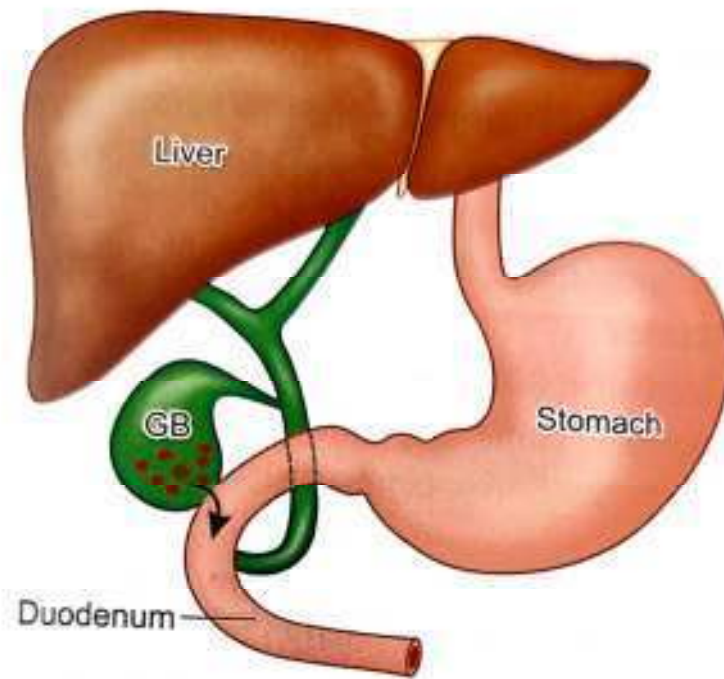


Blocks narrow part in the ileum.



Gallstone ileus

FIG.10. Gall stone Ileus



Clinical Features

- Pain abdomen and features of intestinal obstruction.
- Stones may perforate the ileum to cause peritonitis.
- It is 1% of all intestinal obstruction overall, 25% of obstruction in elderly.
- Recurrent episodic obstruction due to moving stone bolus is typical-tumbling obstruction.

Investigations

- Plain X-ray abdomen in erect posture shows air in the biliary tract (branching gas pattern, pneumobilia) and multiple air fluid levels.

- USG abdomen.
- CT is diagnostic.

Treatment

- Laparotomy, enterotomy, removal of gallstones and closure of enterotomy is done. Enterotomy is done not at the site of obstruction but more proximal to the site of obstruction and stones are milked towards the enterotomy site. If bowel is found ischemic at the impacted area, resection and anastomosis is done.
- Laparotomy and crushing of stones with fingers to relieve the obstruction is only occasionally useful.
- Cholecystectomy, correction of fistula with T-tube drainage can be done in same sitting if patient's general condition is good. Otherwise it is done after 12 weeks.

MIRIZZI SYNDROME

- Mirizzi syndrome is seen in 1% of gall stone disease.
- In Mirizzi syndrome, gallstone impacts in the gallbladder wall and compresses it causing pressure necrosis which further gets adherent to CHD/CBD wall. It eventually causes compression and later occasionally leads into cholecystocholedochal fistula. It occurs either from Hartmann's pouch into CHD/CBD (common) or from fundus of gallbladder into the CBD.
- Presentations are—fever, abdominal pain, obstructive jaundice, upper abdominal tenderness on right side. Soft, enlarged liver may be palpable.
- Investigations – USG, CT scan, ERCP/MRCP to delineate duct anatomy, dilatation of intrahepatic biliary system with block at CHD is found. HIDA scan is useful.

Fig 11: Types of Mirizzi Syndrome

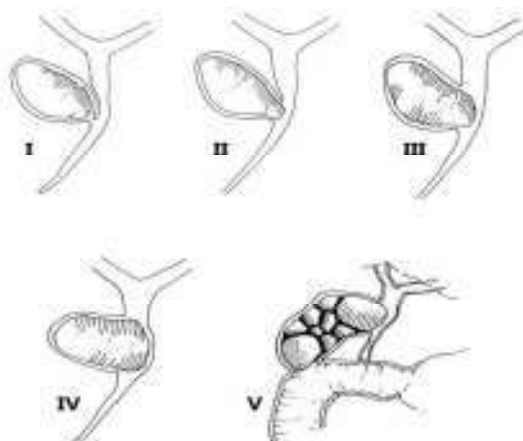


FIG.11. Types of Mirizzi's Syndrome

MIRIZZI'S TYPES	FEATURES (CSENDES CLASSIFICATION MODIFIED IN 2008)	MANAGEMENT
Type I -10%	<p>Extrinsic compression of CBD/CHD by a large impacted stone in Hartmann's pouch;</p> <p>IA – presence of cystic duct</p> <p>IB – obliterated cystic duct</p>	ERCP – STENTING-subtotal/partial cholecystectomy
TYPE II – 40-50% (most common)	Stone has eroded the CBD/CHD less than 1/3 circumference of the CBD/CHD forming a fistula	subtotal cholecystectomy with CBD explorartion
TYPE III – 20-30%	Involving upto 2/3 rd of circumference of the CBD/CHD	subtotal cholecystectomy with CBD explorartion
TYPE IV -2 -4%	Cholecystocholedochal fistula (>2/3 rd) involving entire circumference of the CBD/CHD	Cholecystectomy with Hepatico jejunostomy
TYPE V – 15-25%	<p>Cholecystocholedochal fistula with cholecystoenteric fistula</p> <p>Va - without gallstone ileus</p> <p>Vb – with gallstone ileus</p>	Cholecystectomy with Hepatico jejunostomy

Treatment:

- Open approach is ideal for Mirizzi syndrome even though laparoscopic approach is done in few centres
- Mirizzi syndrome is suspected on CT scan, but usually identified on table. It needs cholecystectomy, on table cholangiogram, and exploration of CBD. It often needs Roux-en Y hepaticojejunostomy.
- Subtotal/ Partial cholecystectomy is done with ERCP stenting is done in type I
- Partial/ Subtotal cholecystectomy with primary closure of CHD/CBD is done with a T-tube insertion through a separate choledochotomy in type2.
- Choledochoplasty using retained gall bladder flap after subtotal/ partial cholecystectomy is often used successfully in many centers.
- Partial cholecystectomy with closure of gallbladder flaps is done with T-tube insertion through a separate choledochotomy in type 3. Cholecystectomy with duodenal/jejunal anastomosis (hepaticojejunostomy) is done in type 4 and 5 when difficulty arises in type I, II, III.
- Postoperative surgical mortality is 8-10% in Mirizzi syndrome.

COURVOISIER'S LAW (SIGN)

'In a patient with jaundice if there is palpable gallbladder, it is not due to stones'.

In obstruction due to CBD stone, gallbladder does not distend because it is chronically inflamed, thickened, fibrotic, contracted and non distensible.

In malignancy, like carcinoma of head of the pancreas or periampullary carcinoma, gallbladder will be distended and palpable to the right of rectus muscle in the right hypochondrium, as non-tender, globular, smooth, soft, dull mass which moves with respiration and with horizontal mobility.

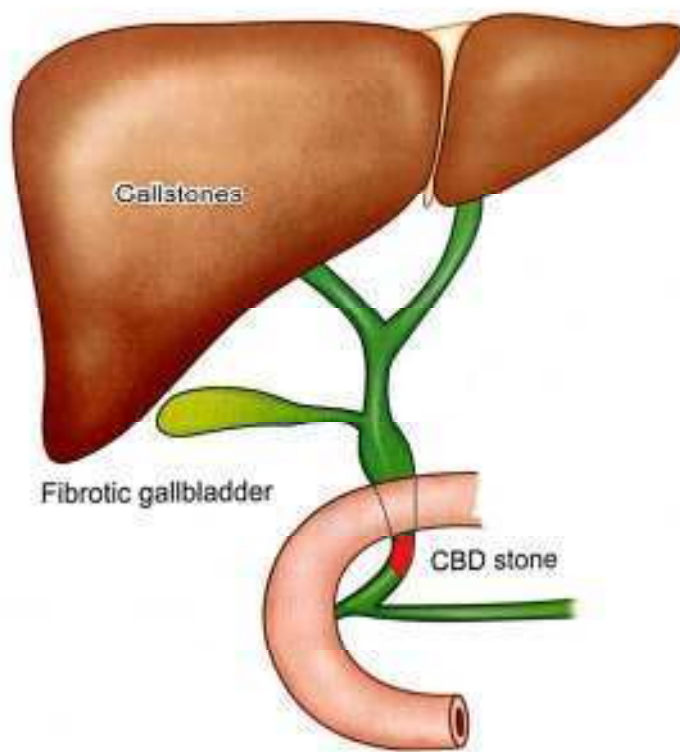


FIG.12. In gall stone disease gall bladder is contracted, fibrotic and Non distensible.

Rule may not be useful in

- Absence of gallbladder
- Intrahepatic gallbladder

Exceptions to the rule are:

- Double impacted stone—one in CBD and one in cystic duct, with mucocele of gallbladder.
- Large stone in Hartmann's pouch.
- Empyema gallbladder with CBD stone.

MANAGEMENT OF GALLSTONES

- Ultrasound abdomen (gallstones are seen with posterior acoustic shadowing); plain X-ray abdomen; LFT; total WBC count.

FIG.13. Ultrasound image showing posterior acoustic shadow

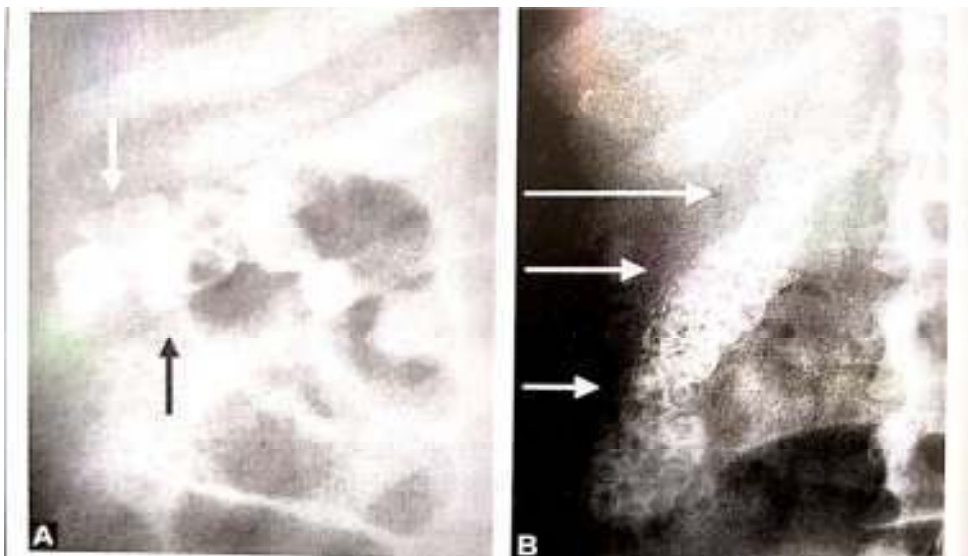


- CT scan abdomen to rule out presence of CBD stones
- Laparoscopic cholecystectomy is ideal.
- Open cholecystectomy is done through right subcostal Kocher's incision. Open approach is used if patient is not fit for laparoscopic surgery (anaesthesia), in suspected CBD stones, Mirizzi syndrome & suspected carcinoma gallbladder.

- During laparoscopic cholecystectomy, if there is on table difficulty in dissection at Calot's triangle, then conversion into open approach may be required.
- Dissolution therapy for asymptomatic cholesterol stones using ursodeoxycholic acid can be tried. It is not very successful.



FIG.14. MULTIPLE GALL STONES IN PLAIN X RAY



DISSOLUTION THERAPY FOR GALLSTONES

INDICATIONS

- Functioning gallbladder with cholesterol stone.
- Single stone less than 1.5 cm.
- Radiolucent stone.
- Old age.
- Patients who are unfit for surgery.

CONTRAINDICATIONS

- Non-functioning gallbladder
- Stone more than 1.5 cm
- Radio-opaque stone
- Multiple stones

DRUGS USED

- Chenodeoxycholic acid (for 2 years).
- Ursodeoxycholic acid (15 mg/kg/day).

They inhibit absorption of cholesterol from the gut and synthesis of cholesterol in the liver. They inhibit HMG CoA reductase- a rate limiting step in cholesterol synthesis. Ursodeoxycholic acid also inhibits absorption of cholesterol in GIT.

OTHER METHODS USED

- Citrate
- Monoterpenes
- Percutaneous infusion of methyl-tertiary butyl ether (MTBE) into the gallbladder using a catheter
- Extracorporeal shock wave lithotripsy (ESWL)—not popular

PROBLEMS WITH DISSOLUTION THERAPY

- Drugs should be given for a long time.
- Results are not good.
- Expensive.
- Causes side effects like diarrhoea, pruritus.
- Hepatic dysfunction.

Overall results are not good by dissolution therapy.

CHOLECYSTECTOMY

It is the surgical removal of gallbladder.

INDICATIONS OF PROPHYLACTIC CHOLECYSTECTOMY

- Diabetic patients
- Congenital haemolytic anaemia
- Patients who has underwent bariatric surgery

INDICATIONS

- Gallstones—symptomatic.
- Cholecystitis—acute, chronic.
- Acalculous cholecystitis.
- Empyema gallbladder.
- Mucocele gallbladder.

APPROACH

1. OPEN

- ❖ Right subcostal incision (Kocher's).

FIG.15. KOCHER'S INCISION



- ❖ Right paramedian.
- ❖ Horizontal incision.
- ❖ Mayo-Robson incision.

2. LAPAROSCOPIC APPROACH.

OPEN APPROACH CHOLECYSTECTOMY

Technique

After opening the abdomen, colon is pushed downwards and stomach medially.

- Duct—first method: Here Calot's triangle is dissected. Cystic artery is identified and ligated and divided. Cystic duct is ligated close to the gallbladder and divided. Gallbladder is separated from gallbladder fossa and removed. Haemostasis is maintained.
- Fundus—first method: It is done in difficult gallbladder due to dense adhesions. Fundus is separated from the liver bed. Dissection is carried then ligated.

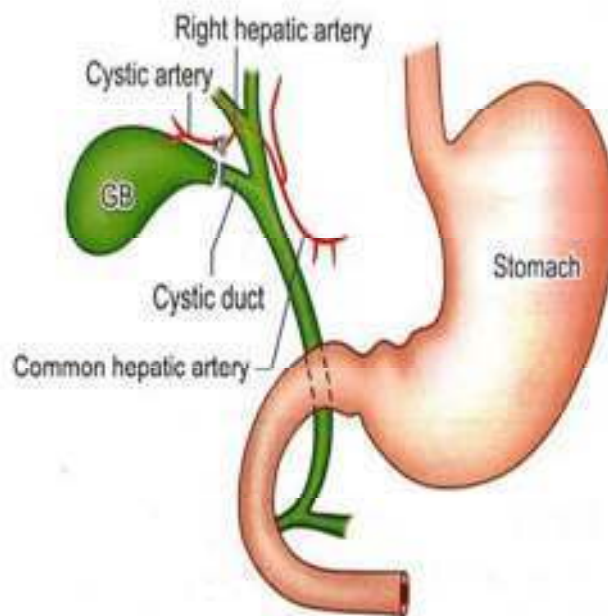


FIG.16. OPEN CHOLECYSTECTOMY

- Drain is placed, which is removed after 72 hours

Complications of Cholecystectomy

- Complications can occur either in open method or in laparoscopic method.
- Open method is done through either right paramedian incision or Kocher's incision (right subcostal).
- Complications which can occur in both:
 - Infection and subphrenic abscess
 - Bleeding from cystic artery and from liver bed.
 - Injury to CBD or Hepatic duct.
 - Bile leak and biliary fistula formation.
 - Biliary stricture formation.
 - Injuries to colon, duodenum, mesentery.

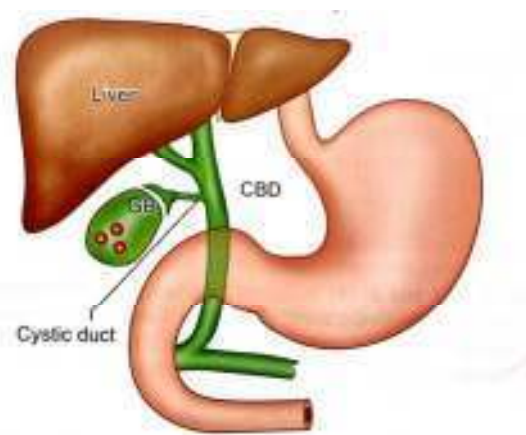


FIG.17. PARTIAL CHOLECYSTECTOMY

LAPAROSCOPIC CHOLECYSTECTOMY

It is the most popular method to remove gallbladder. It is the gold standard treatment for gallstone.

POSITION

Supine, head end up and right side tilt.

Anaesthesia - General anaesthesia.

PORTS

10 mm port in umbilicus to pass 10 mm 30 degree telescope.

10 mm port in midline epigastrium as working channel.

Two 5 mm ports, one at midclavicular line and another one at anterior axillary line in subcostal region.

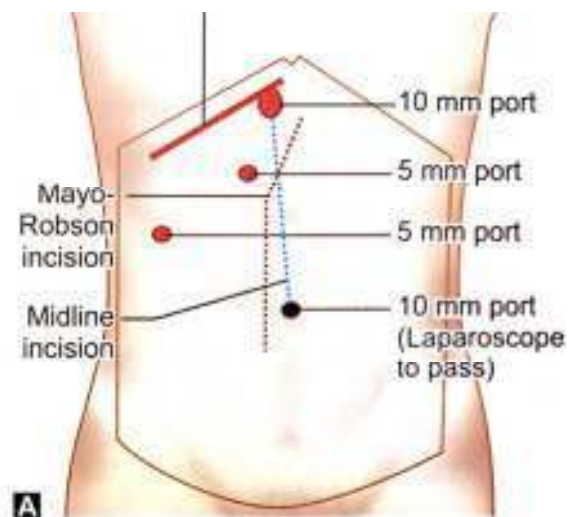
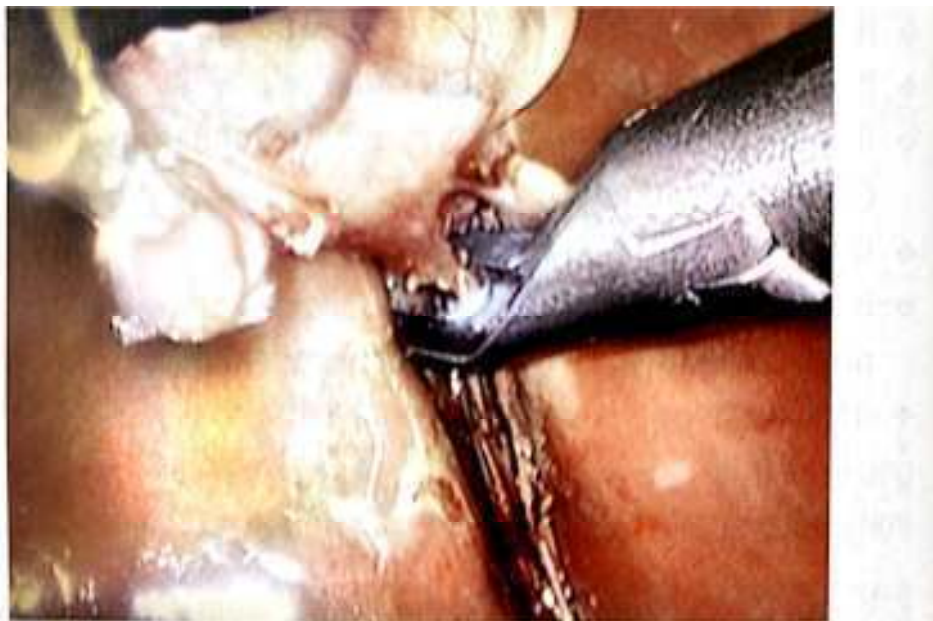


FIG.18. PORT PLACEMENT IN LAPAROSCOPIC CHOLECYSTECTOMY

PROCEDURE

- Creation of pneumoperitoneum with co2 & pressure maintained at 12–14 mm ,
- 10 mm umbilical port is inserted. 30 degree telescope is passed.
- Under vision remaining ports are passed.
- Through lateral 5 mm port, gallbladder grasper forceps is passed and fundus of gallbladder is held and pushed up towards the diaphragm.
- With middle 5 mm port grasper is passed to hold Hartmann’s pouch.
- With 10 mm port dissector is passed using reducer.

FIG.19. APPLICATION OF CLIP TO CYSTIC DUCT



- Adhesions are released
- Peritoneum is teased & stripped till the posterior surface of gall bladder & cystic duct
- Calot's triangle is identified & dissected.
- Cystic duct is identified.
- Cystic artery is above and deep to cystic duct. Cystic duct is clipped or ligated & divided.
- Cystic artery is also clipped or ligated & divided.
- Gallbladder is dissected off the liver bed using cautery (hook) harmonic scalpel.
- Gallbladder is removed through 10 mm working port with reducer or using a sterile bag.
- Any bleeding points are coagulated.
- If needed, saline wash is given to the bed.
- A tube drain is placed through lateral 5 mm port, whenever the gallbladder infected, adhesion causing difficulty in dissection, inadvertent injury to gallbladder with bile leak.
- All ports are removed.

- Umbilical port is sutured in layers.
- Other ports are sutured.
- Patient is asked to take oral diet after bowel movements probably 8- 24 hours and can be discharged in 24–48 hours.

PROBLEMS

- Difficulty in identifying Calot's triangle.
- Dense adhesions.
- Bleeding.
- Anomalies of hepatobiliary tree.

COMPLICATIONS

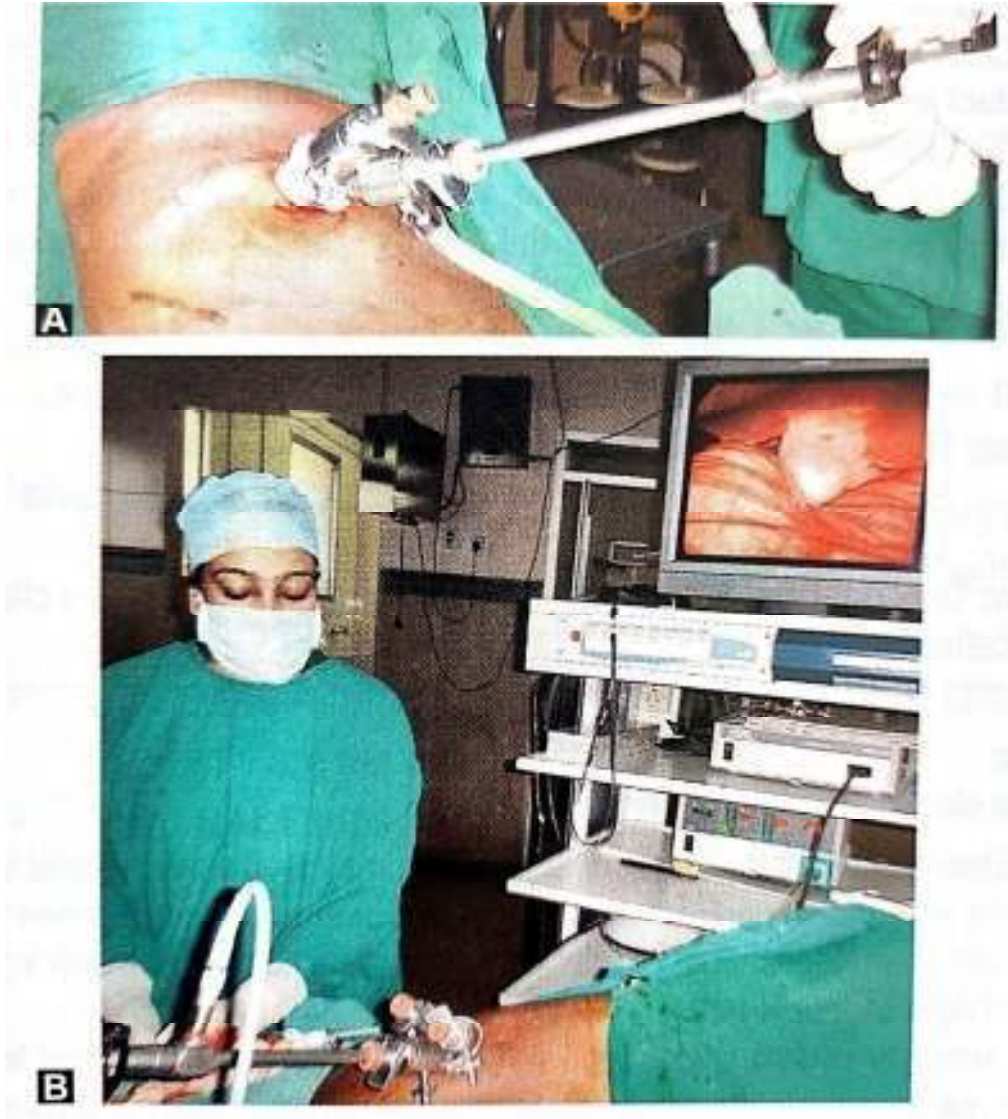
- Bile duct injury—0.8%.
- Bleeding.
- Bile leak.
- Infection, cholangitis, septicaemia.
- Subphrenic abscess formation.
- Injury to colon, duodenum, mesentery.

SINGLE INCISION LAPAROSCOPIC SURGERY (SILS) IN CHOLECYSTECTOMY

SILS is an advanced minimally invasive surgical procedure wherein surgeon operates exclusively through a single umbilical entry port. It is also called as single port access surgery (SPA), one port umbilical surgery (OPUS), and single port incision less conventional equipment-utilising surgery (SPICES), natural orifice trans umbilical surgery (NOTUS).

It needs general anaesthesia, specialised umbilical large trocars which accommodates working instruments along with flexible laparoscope, rotatable reticulaters instruments, articulating handles, harmonic scalpel.

Here through a large 2.5 cm umbilical vertical incision dissection is done by open method to reach peritoneal cavity. Specialized port in which one can pass 10 mm telescope and two 5 mm instruments for work is used. Instruments are angled and flexible to meet the ergonomic principles (Reticulation) to certain extent. Dissection of gallbladder is done in similar fashion like four-port technique. Specimen is easily retrieved through umbilical port as it is wide enough. If difficulty arises any time, one can add additional ports as required



**FIG.20. SINGLE INCISION LAPAROSCOPIC SURGERY (SILS) IN
CHOLECYSTECTOMY**

Advantages

- There is no visible scar like a traditional multiport,
- Faster recovery time,
- Early return to work,
- Cosmetically better.

Disadvantages

- Expensive trocars and instruments-cost factor,
- Skilled work, long learning curve,
- Dissection against normal surgical ergonomics.

Complications

- Umbilical wound pain,
- Infection,
- Umbilical hernia,
- Because of limited visibility time consuming,

During learning curve complications of cholecystectomy and conversion rate may be more.

MATERIALS AND METHODS

STUDY DESIGN: Prospective study

STUDY PERIOD: ONE YEAR - JANUARY TO DECEMBER 2018

STUDY POPULATION & SAMPLE SIZE: Patients with symptomatic gall stone disease & sample size of 30 Pts.

STUDY PLACE: Department of General Surgery, Coimbatore Medical College & Hospital, Coimbatore.

Serial 30 patients admitted with symptomatic gall stone disease planned for laparoscopic cholecystectomy, in our hospital, subjected to our study. After the OPD workup, the scores are given on history, clinical examination and sonological findings one-day prior to surgery on the basis of Randhawa & Pujahari scoring system.

Score up to 5 is defined as easy, 6-10 as difficult and 11-15 as very difficult. We preoperatively defined the level of difficulty such as easy, difficult and very difficult. Laparoscopic cholecystectomy is done using CO₂ pneumoperitoneum with 12-14 mm Hg pressure and using standard two 5 mm and two 10 mm ports. The timing was noted from the first port site incision till the last ports closure. All the intra operative events were recorded. The entire cases received standard postoperative care & follow up. The following operative parameters are going to be recorded for all the patients undergoing laparoscopic Cholecystectomy:

- Time taken for surgery
- Bile/stone spillage
- Injury to cystic duct or cystic artery
- Conversion to open cholecystectomy

Table1. RANDHAWA & PUJAHARI SCORING FACTORS

HISTORY			MAX SCORE
Age	<50yrs(0)	>50yrs(1)	1
SEX	Female(0)	Male(1)	1
H/O Hospitalistion	N(0)	Y(4)	4
CLINICAL			
BMI wt(kg)/ht(m ²)	<25(0)	25-27.5(1) >27.5(2)	2
Abdominal scar	N(0)	Infra umbilical(1) Supra umbilical(2)	2
Palpable gall bladder	N(0)	Y(10)	1
SONOGRAPHY			
Wall thickness	Thin(0)	Thick >4mm(2)	2
Pericholecystic collection	N(0)	Y(1)	1
Impacted stone	N(0)	Y(1)	1

H/0 = history of,

N = NO, Y = YES

Total maximum score -15

Table 2. Easy / difficult criteria

FACTORS	EASY	DIFFICULT	VERY DIFFICULT
Time taken	<60 min	60-120	>120 min
Bile / stone spillage	No	Yes	Yes
Injury to duct or artery	No	Duct only	Both
Conversion to open	No	No	Yes

P value of <0.05 is considered to be significant according to kruskal wallis test

INCLUSION CRITERIA

1. Gall bladder stone disease.
2. Age more than 18 years.

EXCLUSION CRITERIA

1. Carcinoma gall bladder,
2. CBD stone,
3. Dilated CBD,
4. Obstructive jaundice, and
5. Age less than 18 years &
6. Equipment failure.

JUSTIFICATION OF THE STUDY:

Preoperative identification of factors causing difficult laparoscopic Cholecystectomy help in categorising this patient from easy to very difficult procedure & necessary counselling can be given to the patients.

Thereby we can reduce the morbidity, complication, rate of conversion and overall cost of therapy.

We can anticipate preoperative period itself difficult laparoscopic cholecystectomy procedure & can be ready to manage accordingly. From this study patient compliance & outcome are improved

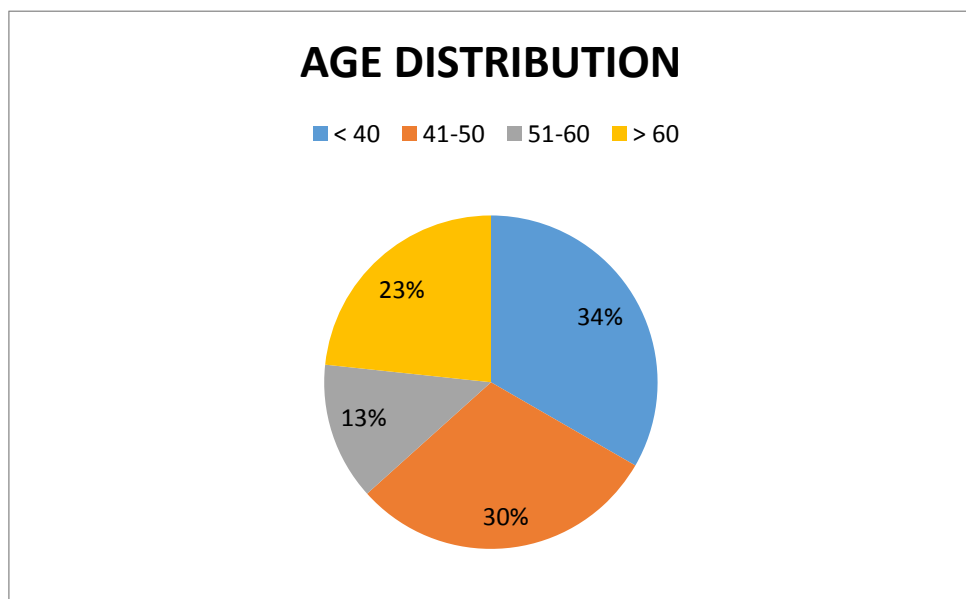
RESULTS

TABLE 1

AGE DISTRIBUTION

AGE IN YEARS	NO OF PATIENTS	PERCENTAGE
< 40	10	34%
41-50	9	30%
51-60	4	13%
> 60	7	23%

DIAGRAM 1



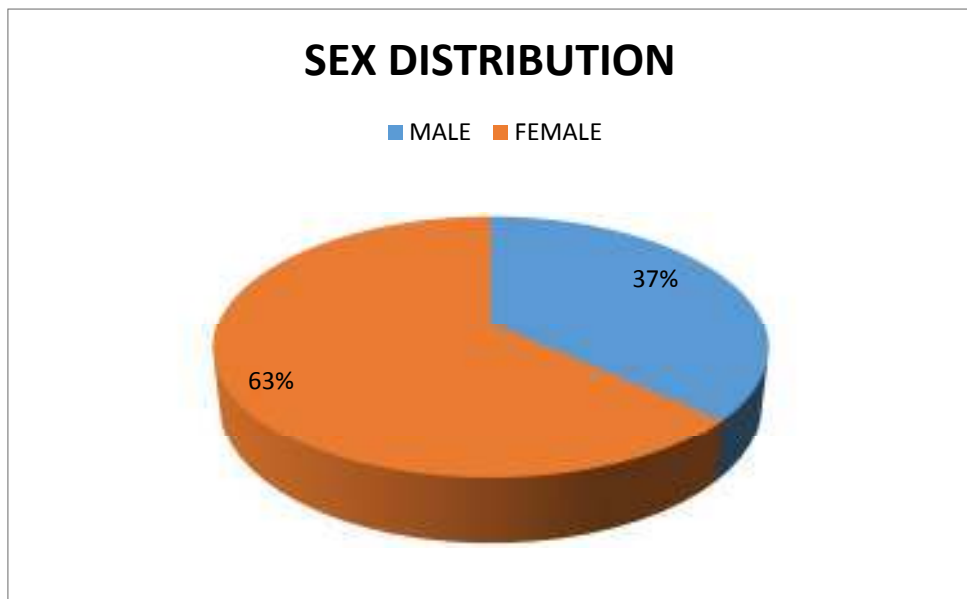
Majority of patients in my study were less than 40 years of age

TABLE 2

SEX DISTRIBUTION

SEX	NO OF PATIENTS	PERCENTAGE
MALE	11	37%
FEMALE	19	63%

DIAGRAM 2



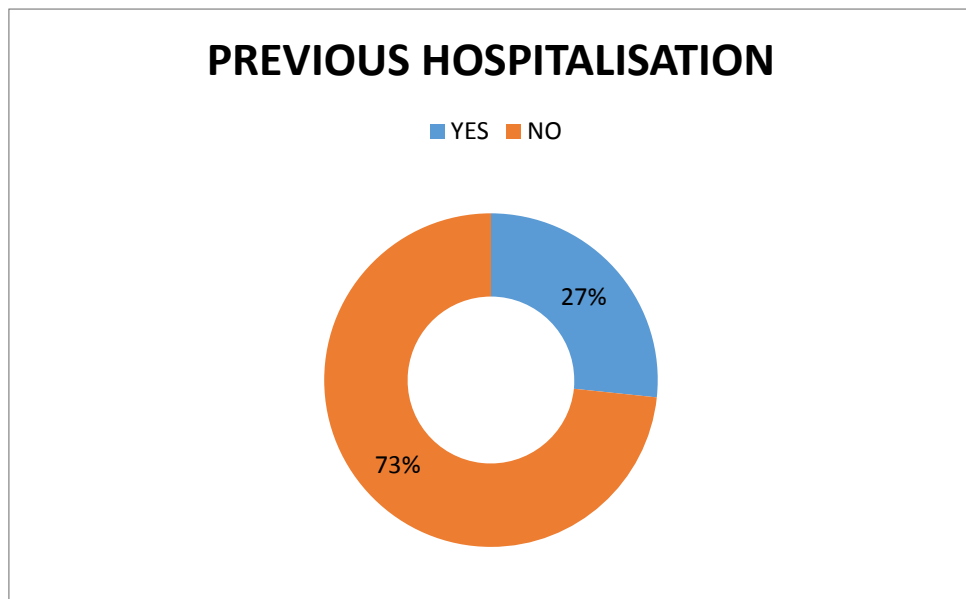
Majority of patients were female in my study group

TABLE 3

PREVIOUS HOSPITALISATION

PREVIOUS HOSPITALISATION	NO OF PATIENTS	PERCENTAGE
YES	8	27%
NO	22	73%

DIAGRAM 3



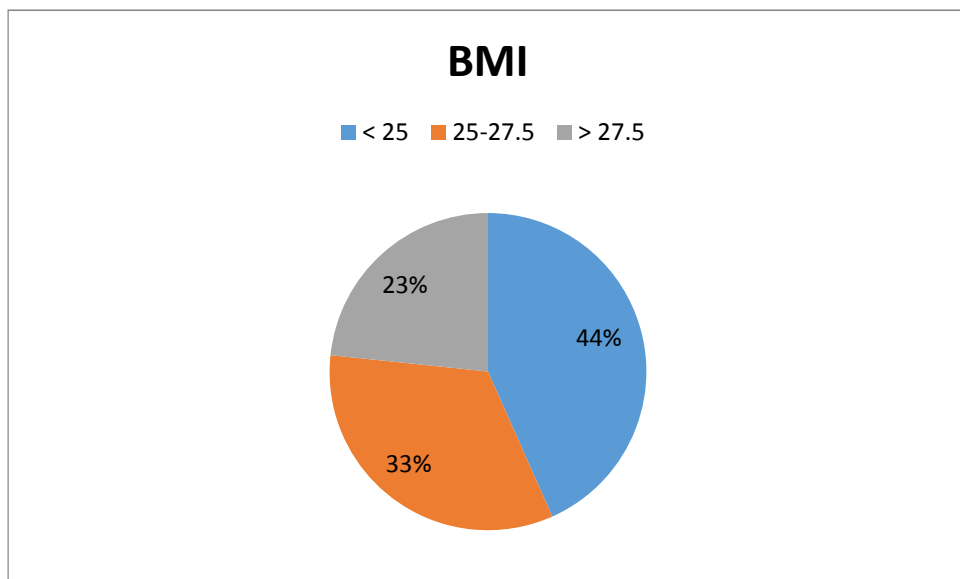
Majority of patients (73%) had no previous hospitalisation in my study.

TABLE 4

BODY MASS INDEX

BMI	NO OF PATIENTS	PERCENTAGE
< 25	13	44%
25-27.5	10	33%
> 27.5	7	23%

DIAGRAM 4



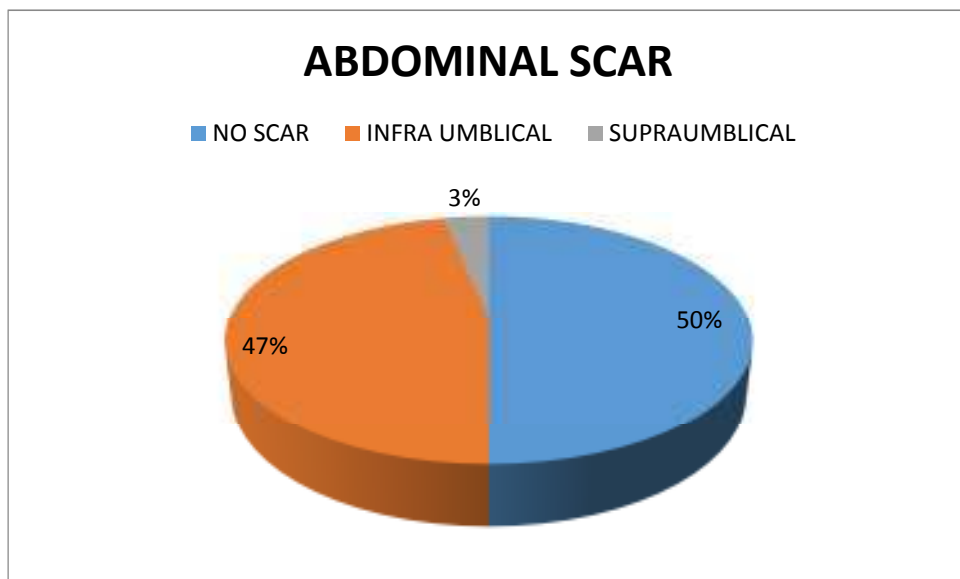
BMI of 44% of patients were <25.

TABLE 5

ABDOMINAL SCAR

ABDOMINAL SCAR	NO OF PATIENTS	PERCENTAGE
NO SCAR	15	50%
INFRA UMBLICAL	14	47%
SUPRA UMBLICAL	1	3%

DIAGRAM 5



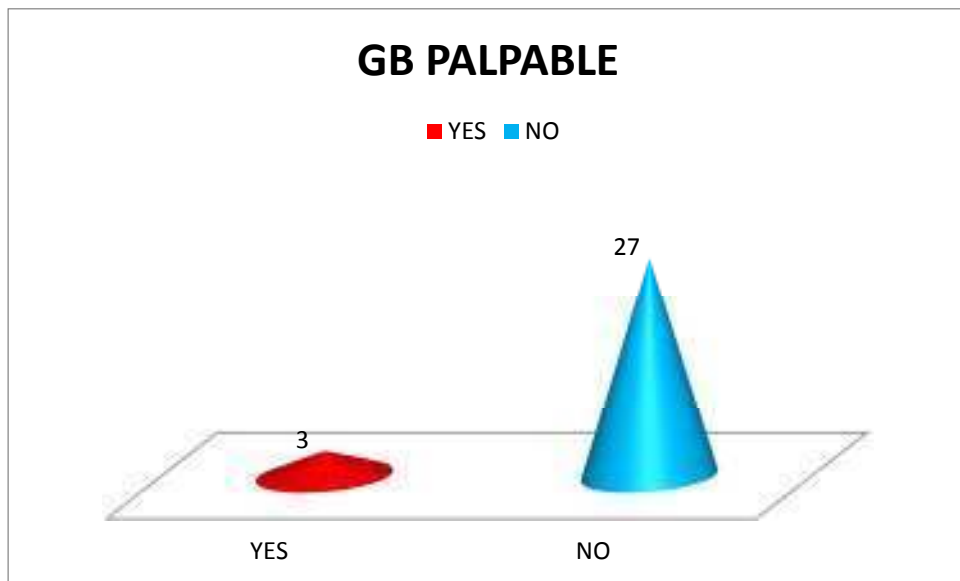
Around 50% of patients had no abdominal scars, while 47% had Infra umbilical scar

TABLE 6

GB PALPABLE

GB PALPABLE	NO OF PATIENTS	PERCENTAGE
YES	3	10%
NO	27	90%

DIAGRAM 6

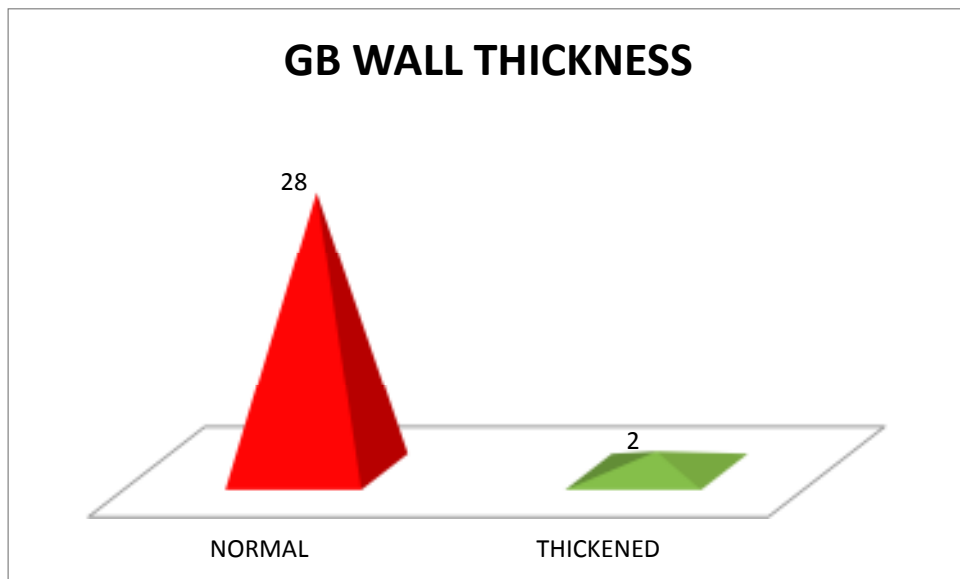


Gall bladder was not palpable in 90% of individuals in my study.

TABLE 7

GB WALL THICKNESS

GB WALL THICKNESS	NO OF PATIENTS	PERCENTAGE
NORMAL	28	94%
THICKENED	2	6%



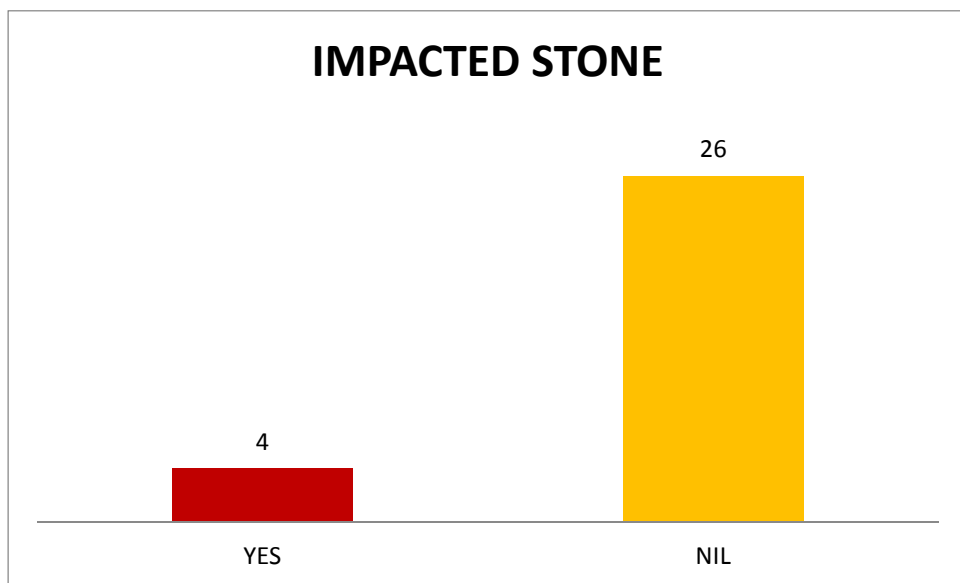
Gall bladder wall thickness was normal in 94%, while only in 6% of Individuals wall thickening was noted.

TABLE 7

IMPACTED STONE

IMPACTED STONE	NO OF PATIENTS	PERCENTAGE
YES	4	12%
NIL	26	88%

DIAGRAM 7



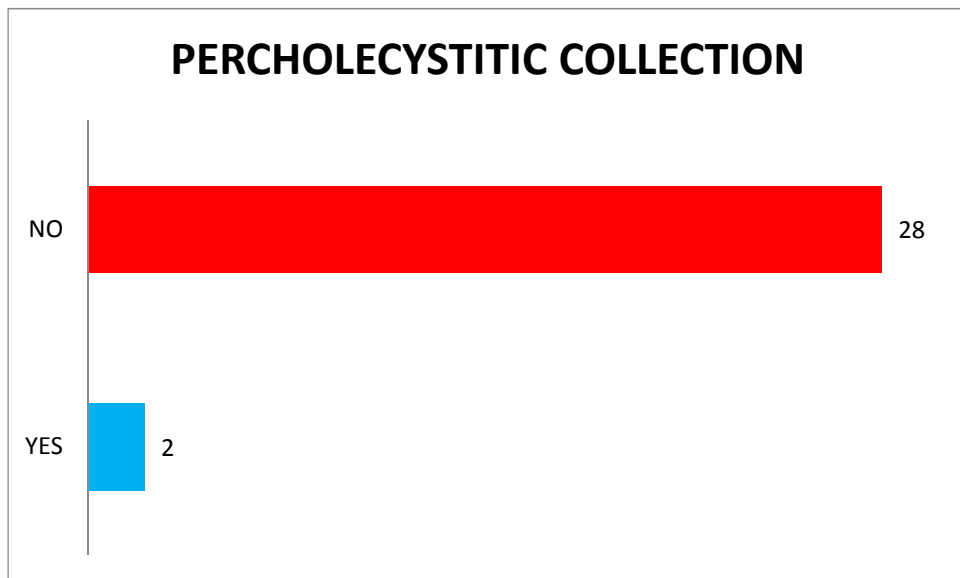
Impacted gallstones were present in around 12% of individuals in my study

TABLE 8

PERICHOLECYSTITIC COLLECTION

PERICHOLECYSTITIC COLLECTION	NO OF PATIENTS	PERCENTAGE
YES	2	6%
NO	28	94%

DIAGRAM 8



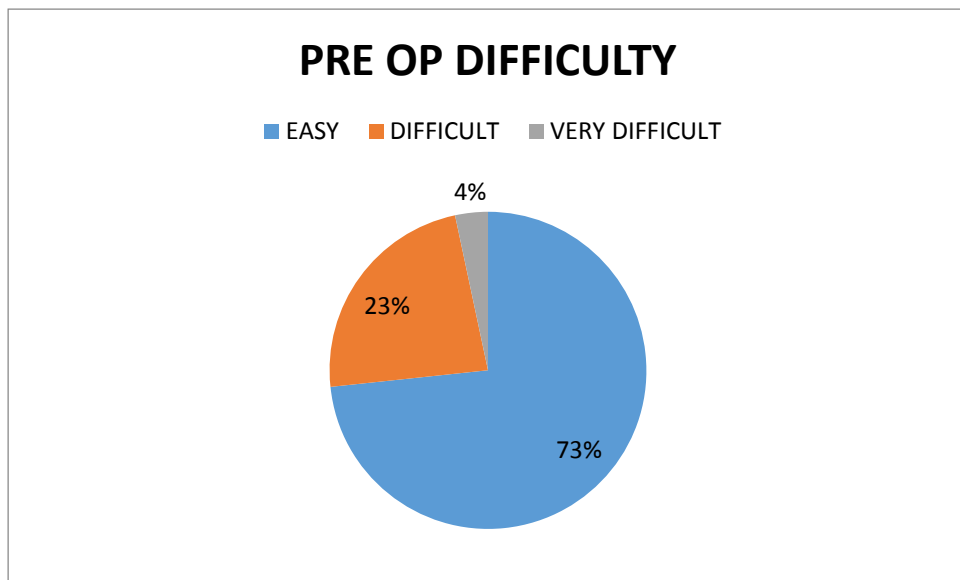
Pericholecystic fluid collection was present in only 6% of patients.

TABLE 9

PRE OP SCORING

PRE OP SCORING	NO OF PATIENTS	PERCENTAGE
EASY	22	73%
DIFFICULT	7	23%
VERY DIFFICULT	1	4%

DIAGRAM 9



Preoperative scoring predicted around cholecystectomy to be easy in 73%

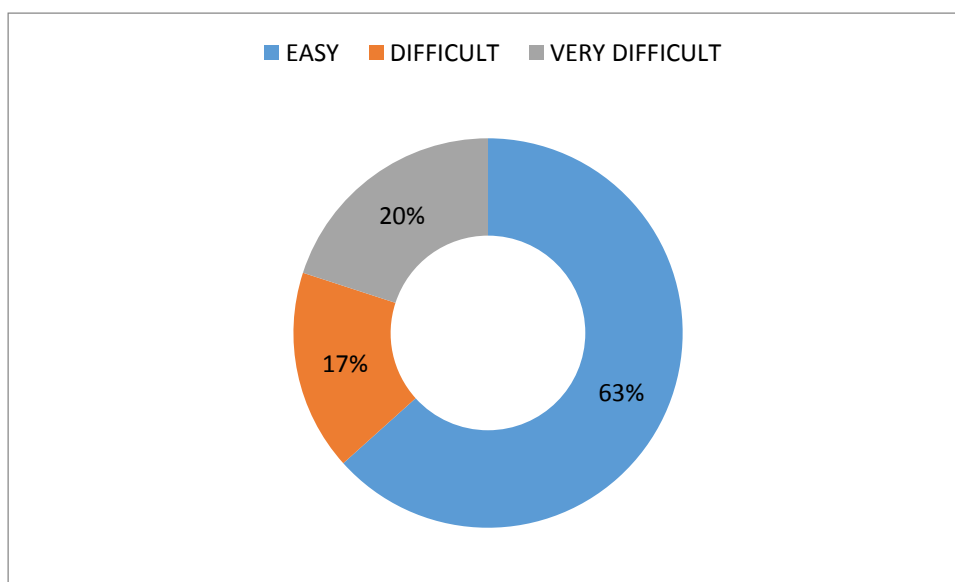
Difficult in 23% and very difficult in 4% of patients.

TABLE 10

SURGICAL OUTCOME

SURGICAL OUTCOME	NO OF PATIENTS	PERCENTAGE
EASY	19	63%
DIFFICULT	5	17%
VERY DIFFICULT	6	20%

DIAGRAM 10



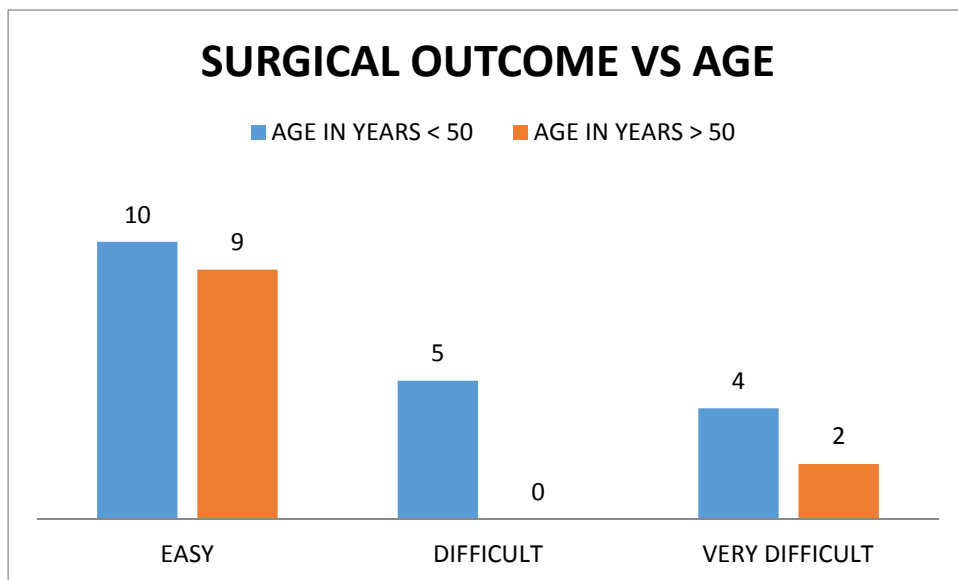
Surgical outcome came out to be easy in 63%, difficult in 17% and very difficult in 20% of patients

TABLE 11

SURGICAL OUTCOME VS AGE

SURGICAL OUTCOME	AGE IN YEARS	
	< 50	> 50
EASY	10	9
DIFFICULT	5	0
VERY DIFFICULT	4	2
KRUSKAL WALLIS TEST		
P VALUE - 0.370		
NON SIGNIFICANT		

DIAGRAM 11



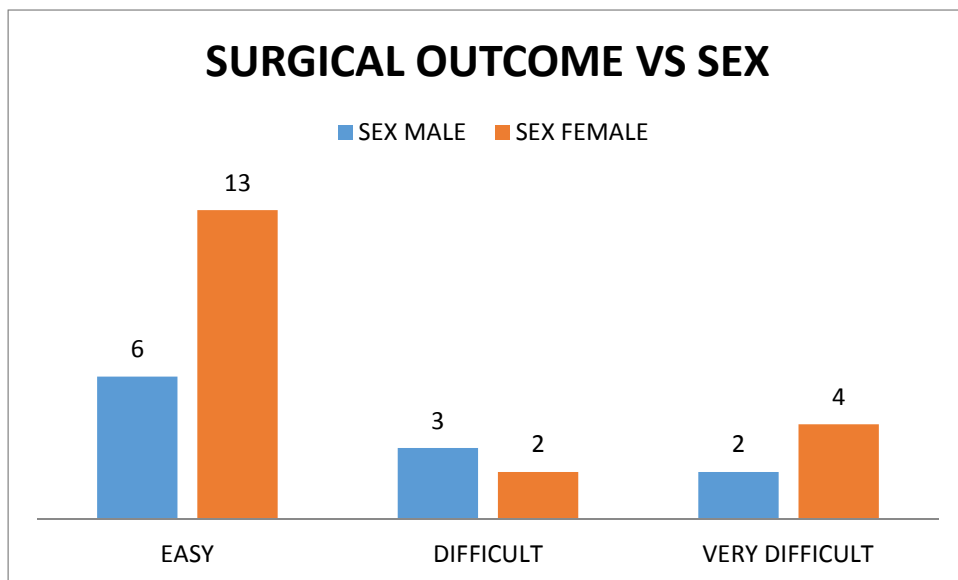
There is no statistical significance of age in predicting difficult laparoscopic cholecystectomy. (P value of 0.370)

TABLE 12

SURGICAL OUTCOME VS SEX

SURGICAL OUTCOME	SEX	
	MALE	FEMALE
EASY	6	13
DIFFICULT	3	2
VERY DIFFICULT	2	4
KRUSKAL WALLIS TEST		
P VALUE - 0.493		
NON SIGNIFICANT		

DIAGRAM 12



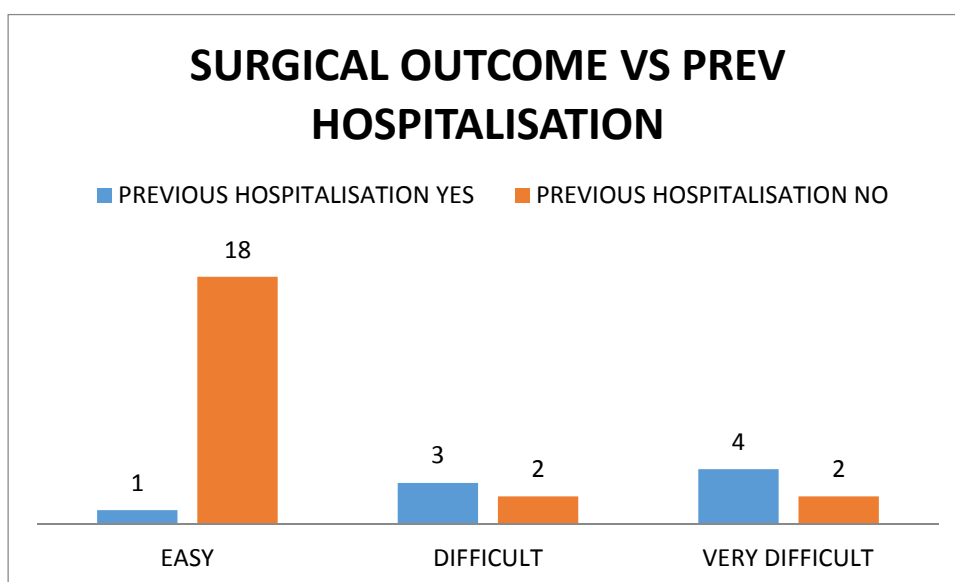
There is no statistical significance of sex in predicting difficult laparoscopic cholecystectomy

TABLE 13

SURGICAL OUTCOME VS PREVIOUS HOSPITALISATION

SURGICAL OUTCOME	PREVIOUS HOSPITALISATION	
	YES	NO
EASY	1	18
DIFFICULT	3	2
VERY DIFFICULT	4	2
KRUSKAL WALLIS TEST		
P VALUE - 0.002		
SIGNIFICANT		

DIAGRAM 13



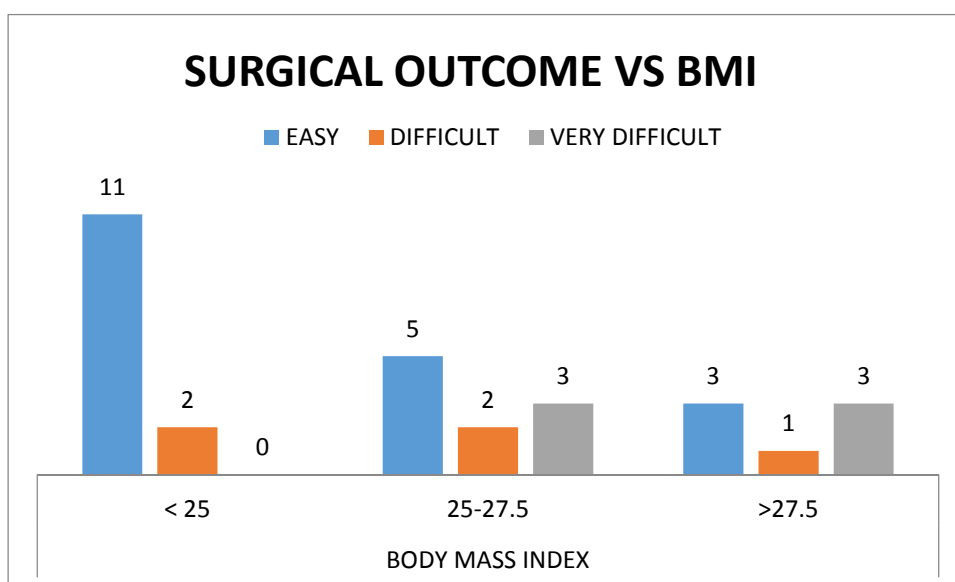
There is a statistical significance of previous hospitalisation in predicting difficult laparoscopic cholecystectomy.

TABLE 14

SURGICAL OUTCOME VS BODY MASS INDEX

SURGICAL OUTCOME	BODY MASS INDEX		
	< 25	25-27.5	>27.5
EASY	11	5	3
DIFFICULT	2	2	1
VERY DIFFICULT	0	3	3
KRUSKAL WALLIS TEST			
P VALUE - 0.031			
SIGNIFICANT			

DIAGRAM 14



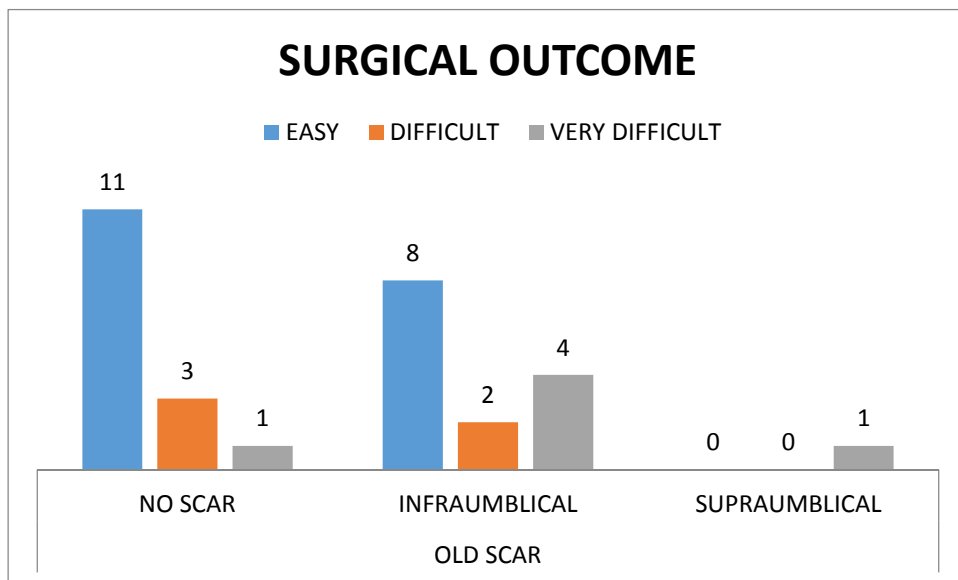
There is a statistical significance of BMI in predicting difficult laparoscopic cholecystectomy.

TABLE 15

SURGICAL OUTCOME VS OLD SCAR

SURGICAL OUTCOME	OLD SCAR		
	NO SCAR	INFRAUMBILICAL	SUPRAUMBILICAL
EASY	11	8	0
DIFFICULT	3	2	0
VERY DIFFICULT	1	4	1
KRUSKAL WALLIS TEST			
P VALUE - 0.177			
NON SIGNIFICANT			

DIAGRAM 15



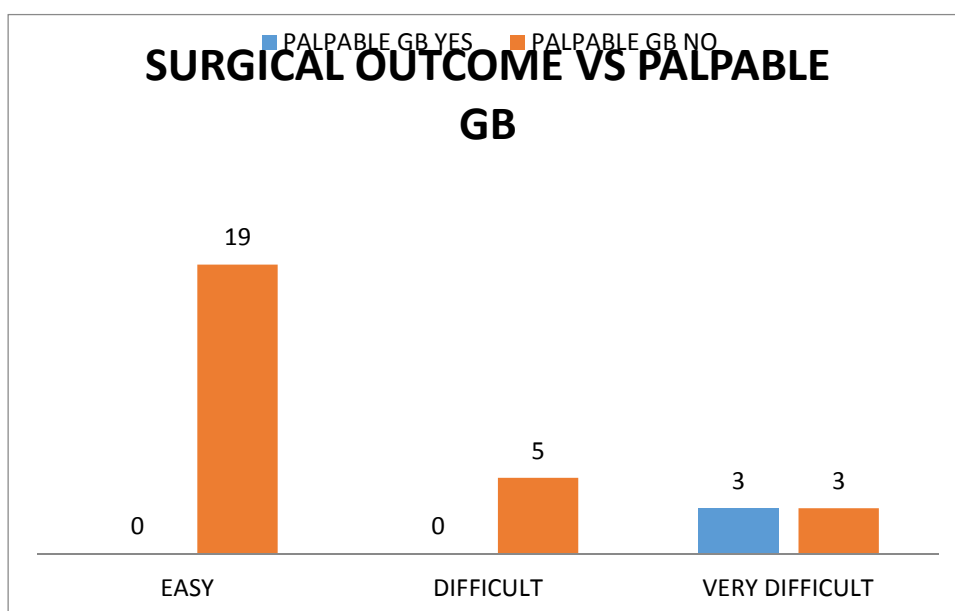
There is no statistical significance when comparing surgical outcome in patients with Old scar.

TABLE 16

SURGICAL OUTCOME VS PALPABLE GB

SURGICAL OUTCOME	PALPABLE GB	
	YES	NO
EASY	0	19
DIFFICULT	0	5
VERY DIFFICULT	3	3
KRUSKAL WALLIS TEST		
P VALUE - 0.001		
SIGNIFICANT		

DIAGRAM 16



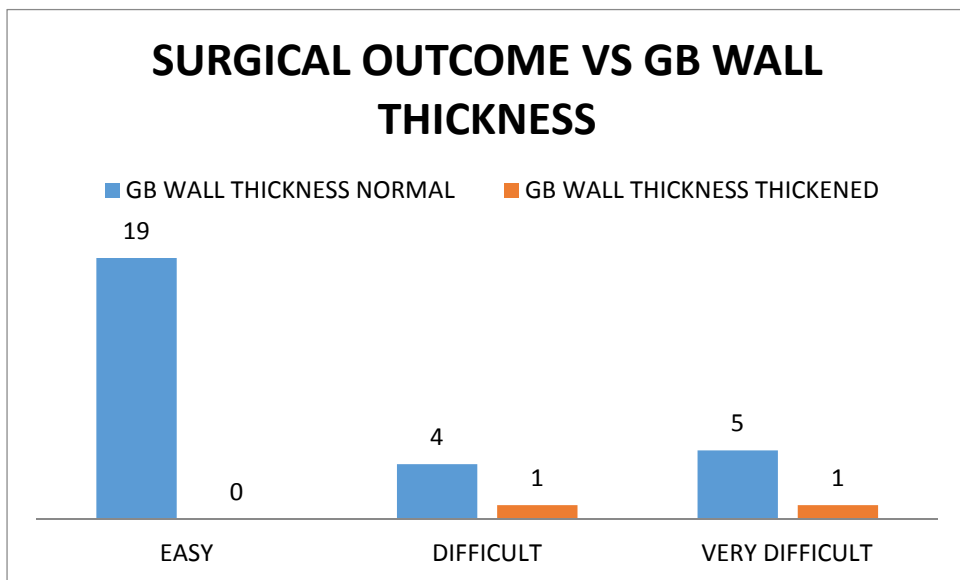
The surgical outcome was difficult in patients with palpable gallbladder (p value 0.001). Hence the data is statistically significant.

TABLE 17

SURGICAL OUTCOME VS GB WALL THICKNESS

SURGICAL OUTCOME	GB WALL THICKNESS	
	NORMAL	THICKENED
EASY	19	0
DIFFICULT	4	1
VERY DIFFICULT	5	1
KRUSKAL WALLIS TEST		
P VALUE - 0.035		
SIGNIFICANT		

DIAGRAM 17



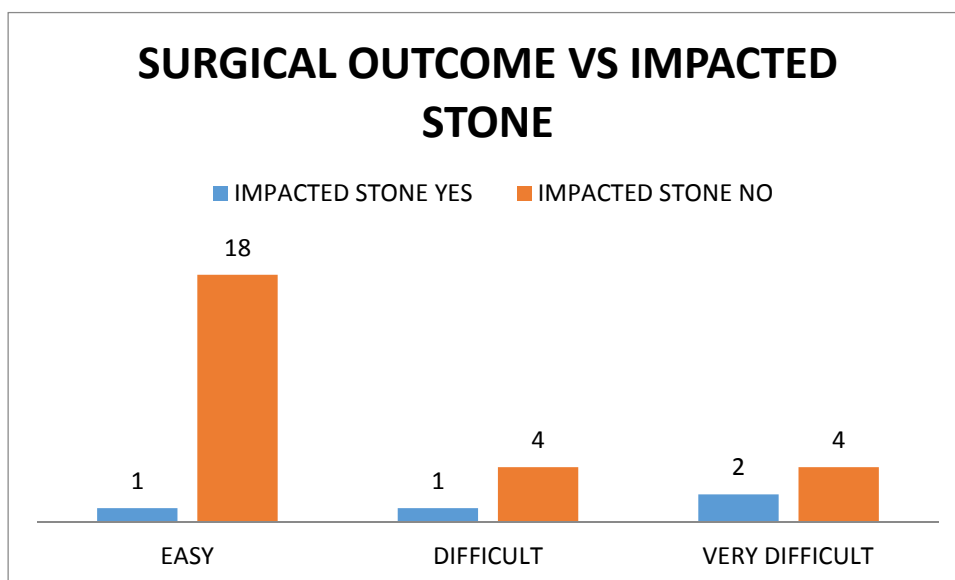
Laparoscopic Cholecystectomy was very difficult in patients with thickened gall bladder wall (p value 0.035).hence data is statistically significant.

TABLE 18

SURGICAL OUTCOME VS IMPACTED STONE

SURGICAL OUTCOME	IMPACTED STONE	
	YES	NO
EASY	1	18
DIFFICULT	1	4
VERY DIFFICULT	2	4
KRUSKAL WALLIS TEST		
P VALUE - 0.188		
NON SIGNIFICANT		

DIAGRAM 18



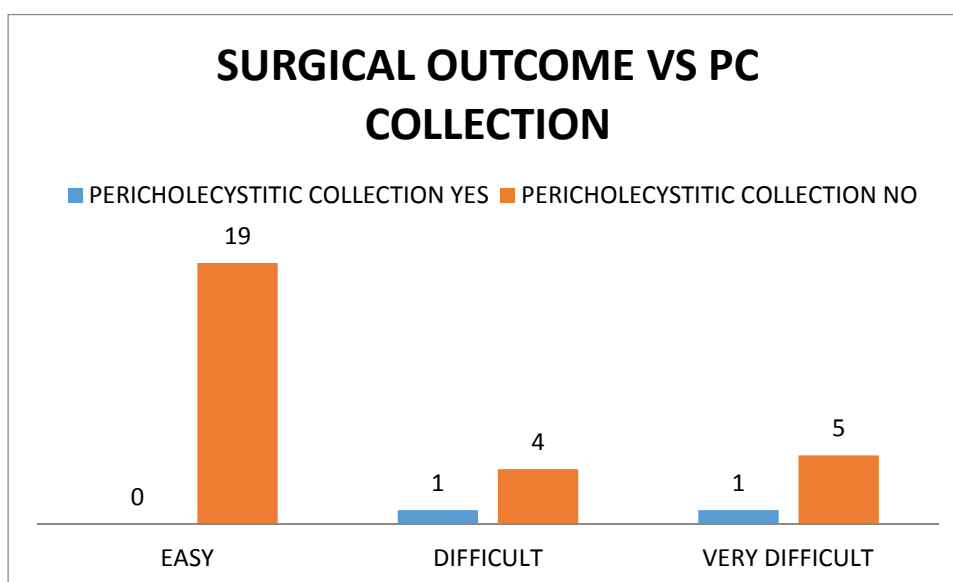
There is no statistical significance when comparing surgical outcome in patients with impacted stones.

TABLE 19

SURGICAL OUTCOME VS PERICHOLECYSTITIC COLLECTION

SURGICAL OUTCOME	PERICHOLECYSTITIC COLLECTION	
	YES	NO
EASY	0	19
DIFFICULT	1	4
VERY DIFFICULT	1	5
KRUSKAL WALLIS TEST		
P VALUE - 0.153		
NON SIGNIFICANT		

DIAGRAM 19



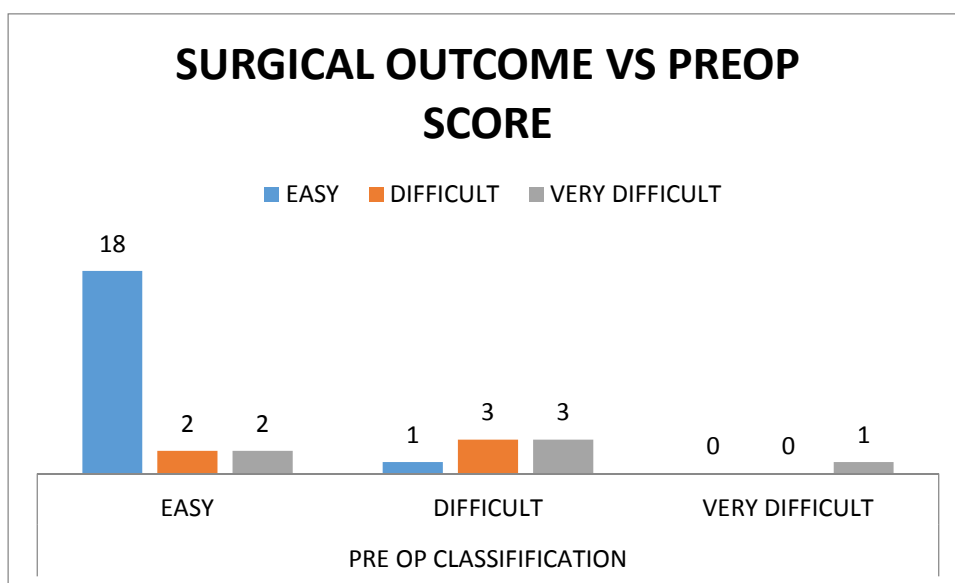
There is no statistical significance when comparing surgical outcome in patients with Pericholecystic fluid collection

TABLE 20

SURGICAL OUTCOME VS PRE OP SCORING

SURGICAL OUTCOME	PRE OP CLASSIFICATION		
	EASY	DIFFICULT	VERY DIFFICULT
EASY	18	1	0
DIFFICULT	2	3	0
VERY DIFFICULT	2	3	1
KRUSKAL WALLIS TEST			
P VALUE - 0.370			
NON SIGNIFICANT			

DIAGRAM 20



Pre op scoring is not statistically significant in predicting the surgical outcome

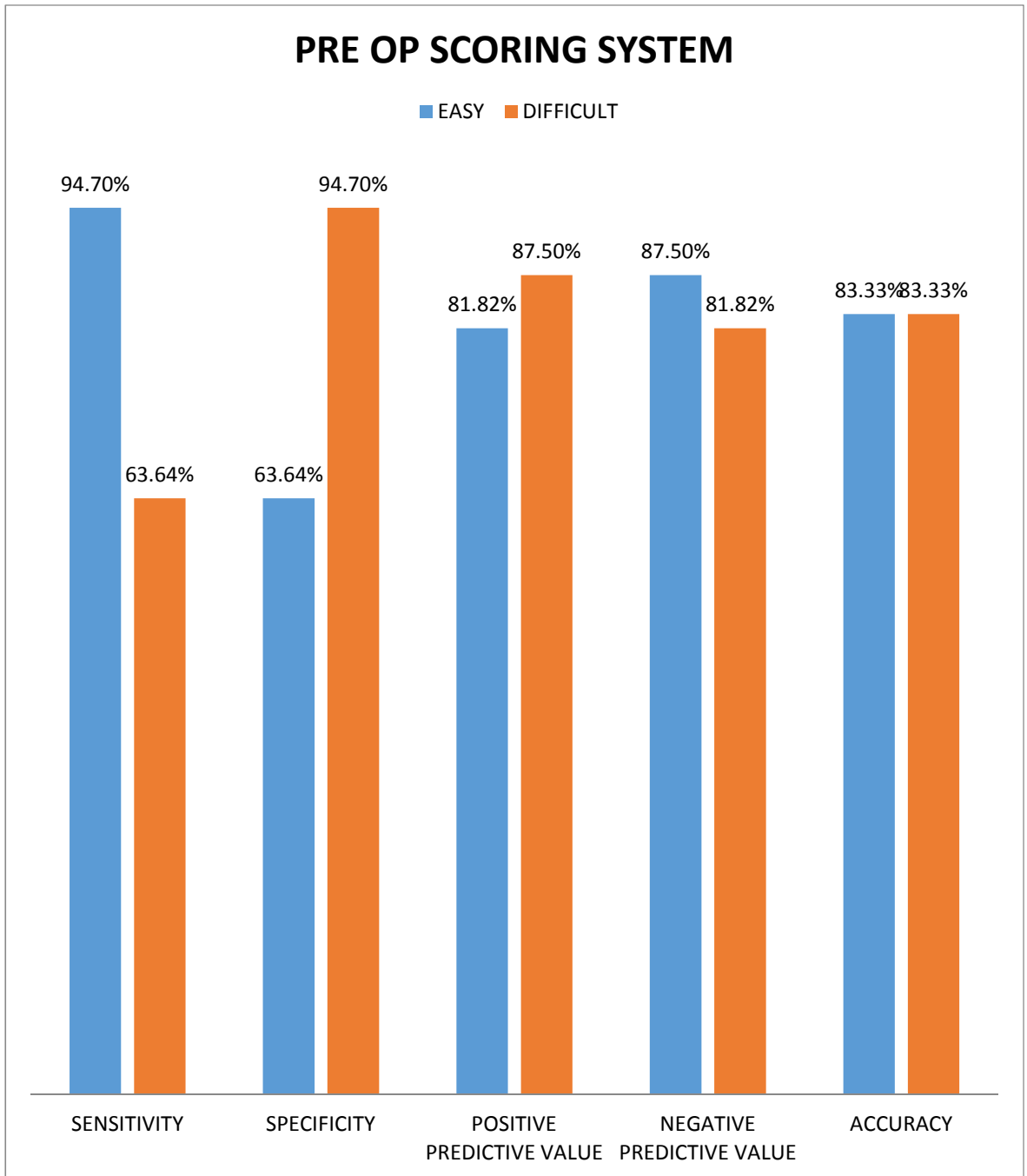
TABLE 21

USEFULLNESS OF PRE OP SCORING SYSTEM

PARAMETERS	EASY	DIFFICULT
SENSITIVITY	94.70%	63.64%
SPECIFICITY	63.64%	94.70%
POSITIVE PREDICTIVE VALUE	81.82%	87.50%
NEGATIVE PREDICTIVE VALUE	87.50%	81.82%
ACCURACY	83.33%	83.33%

The scoring system is useful as it predicts very difficult surgical outcome requiring conversion with a sensitivity of 63.64% and a specificity of 94.70%. Also the positive predictive value is 87.50%. This scoring system predicts difficult surgical outcomes requiring conversion with an accuracy of 83.33%.

DIAGRAM 21



DISCUSSION

AGE & SEX:

In this study, out of 30 patients - 11 patients were above the age of 50 years. Out of 30 patients, 11 are male and 19 are female. Overall female and male ratio is 1.72. Gall stone disease is found to be more common in females as compared to males in this study. Age and sex was not significant in this study as compared to that done by Randhawa and pujhari et al.

PREVIOUS HOSPITALIZATION:

In this study, 8 patients were found to have history of previous hospitalization for the treatment of acute cholecystitis. Out of those 8 patients, the surgical outcome was very difficult in 4 patients who underwent conversion to open cholecystectomy. According to this study history of previous hospitalization was found to be significant.

BMI:

BMI has been found to be a significant factor, resulting in very difficult surgical outcome in this study. Out of 30 patients, 7 patients had BMI > 27.5, out of which 3 patients had very difficult surgical outcome resulting in conversion to open cholecystectomy.

PALPABLE GALL BLADDER:

Palpable gall bladder found to be a significant factor in this study. Out of 30 patients, 3 patients had palpable gall bladder. All the 3 patients had difficult surgical outcome resulting in conversion.

OLD SCAR:

Out of 30 patients, 15 patients had visible scar in abdominal wall, giving indication of previous surgery. Out of which, 14 patients had infraumbilical scar and one patient had supraumbilical scar. Only 4 patients with old scar had difficult surgical outcome requiring conversion. In this study old scar versus difficult surgical outcome is not significant.

ULTRASOUND:

Ultrasonography is a very important tool not only for diagnosis of gall bladder pathology but also for predicting the difficulty in surgical outcome.

It is mandatory for a surgeon to know about gall bladder wall thickness, status of gall bladder (Contracted or distended), number of stones, cystic duct length, acute inflammation, pericholecystic fluid, emphysematous gall bladder.

Severe inflammation or fibrosis of gall bladder, thick wall gall bladder and frozen calot's triangle, Mirizzi's syndrome, portal hypertension, liver disease will make completion of laparoscopic cholecystectomy unsafe or impossible.

In this study, Ultrasonography falls as an important tool that have helped in anticipating difficulty preoperatively and on Ultrasonography ground we could plan on standard protocol of management.

In this study, 2 patients had thickened gall bladder wall. Out of which 1 patient had difficult surgical outcome and the other patient had very difficult surgical outcome requiring conversion. Thickened Gall bladder is a significant factor in this study.

On the other hand, factors such as Pericholecystic collection and impacted stone was found to be insignificant.

SCORING SYSTEM:

Preoperative scoring versus surgical outcome was found to be not significant according to this study & it is match with Randhawa & Pujahari original study. This may be due to high surgical experience of the operating surgeon. However the scoring system is useful as it predicts very difficult surgical outcome requiring conversion with a sensitivity of 63.64% and a specificity of 94.70%. Also the positive predictive value is 87.50%. This scoring system predicts difficult surgical outcomes requiring conversion with an accuracy of 83.33%. Hence this scoring system is an useful parameter which can be used to predict very difficult surgical outcome which would result in conversion of laparoscopic cholecystectomy to open cholecystectomy.

CONCLUSION

Laparoscopic cholecystectomy is a safe procedure for management of gall stone diseases.

From our study we can conclude the following

- Gall stone disease found to be more common in females than in males. However it has no significant effect on the surgical outcome of laparoscopic cholecystectomy. No specific age distribution found to be difficult for laparoscopic cholecystectomy.
- BMI is an important indicator for prediction of surgical outcome. Patients with high BMI found to have increased risk of developing gall stone disease and also they have high chances of conversion of laparoscopic to open cholecystectomy due to difficult surgical outcome.
- Difficult gall stone disease found to have an association with patients with previous history of cholecystitis. However no association found between difficult gall stone disease and previous abdominal surgeries.
- Palpable Gall bladder is also an important indicator for difficult laparoscopic cholecystectomy which results in conversion.
- Amongst USG findings, only gall bladder wall thickness found to be an important indicator for prediction of difficult surgical outcome requiring

conversion. Pericholecystic collection and impacted stone does not affect the surgical outcome according to this study.

- Overall Randhawa & Pujahari scoring system is useful for preoperative assessment of a patient with gall stone disease and planned for laparoscopic cholecystectomy as it helps to assess the probability of difficulty and the need for conversion to open cholecystectomy.

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PROFORMA

NAME:

AGE:

IP NO:

ADDRESS:

DATE OF EXAMINATION:

OBSTERTIC SCORE:

HISTORY OF PRESENTING ILLNESS:

MENSTRUAL HISTORY:

MARITAL HISTORY:

OBSTETRICS HISTORY:

PAST HISTORY:

FAMILY HISTORY:

GENERAL EXAMINATION:

HEIGHT:

WEIGHT:

RESPIRATORY RATE:

PULSE RATE:

BLOOD PRESSURE:

TEMPERATURE:

PALLOR:

PEDAL EDEMA:

ICTERUS:

BREAST:

THYROID:

SYSTEMIC EXAMINATION

CVS:

RESPIRATORY SYSTEM:

PER ABDOMEN:

PER VAGINAL EXAMINATION:

PROVISIONAL DIAGNOSIS:

USG FINDINGS

CONSENT FORM

I Mr/Mrs hereby volunteer to participate in the study
**"COMPARATIVE STUDY OF EXTRA AMNIOTIC SALINE
INFUSION THROUGH INTRACERVICAL BALLOON
CATHETER AND FOLEYS BULB INDUCTION FOR
INDUCTION OF LABOUR"**. I was explained about the nature of the
study by the doctor, knowing which I fully give my consent to participate
in this study. I also give consent to take clinical photographs for the
purpose of the study.

Date :

Place :

Signature of the Patient

ஒப்புதல் படிவம்

பெயர் :

வயது/ பாலினம் :

முகவரி :

அரசு கோவை மருத்துவக் கல்லூரி மருத்துவமனையில் மகளிர் மற்றும் மகப்பேறு மருத்துவப் பிரிவில் பட்டமேற்படிப்பு பயிலும் மாணவி **மரு.கீதா இராஜகோபாலன்** அவர்கள் மேற்கொள்ளும் “**COMPARATIVE STUDY OF EXTRA AMNIOTIC SALINE INFUSION THROUGH INTRACERVICAL BALLOON CATHETER AND FOLEYS BULB INDUCTION FOR INDUCTION OF LABOUR**” குறித்த ஆய்வில் செய்முறை மற்றும் அனைத்து விபரங்களையும் கேட்டுக் கொண்டு எனது சந்தேகங்களை தெளிவுப்படுத்திக் கொண்டேன் என்பதை தெரிவித்துக் கொள்கிறேன்.

எனது இந்த ஆய்வில் கலந்துகொள்ள முழு சம்மமத்துடனும், சுய சிந்தனையுடனும் சம்மதிக்கிறேன்.

இந்த ஆய்வில் என்னுடைய விபரங்கள் பாதுகாக்கப்படுவதுடன் இதன் முடிவுகள் ஆய்விதழில் வெளியிடப்படுவதில் ஆட்சேபனை இல்லை என்பதை தெரிவித்துக் கொள்கிறேன். எந்த நேரத்திலும் இந்த ஆய்விலிருந்து நான் விலகிக் கொள்ள எனக்கு உரிமை உண்டு என்பதையும் அறிவேன்.

இடம் :

கையொப்பம்

நாள் :

KEY TO MASTER CHART

Age	in years			
MH	Menstrual History	Regular	1	
		Irregular	0	
GRAVIDA	Obstetric Formula	Primi	1	
		Second	2	
		Third	3	
US	Uterus Size in weeks			
IFI	Indication for	Post EDD	1	
		Induction	PIH	2
			IUD	3
			Oligohydramnios	4
BISHOP SCORE	0 HRS	BS 0		
	6 HRS	BS 6		
	12 HRS	BS 12		
	18 HRS	BS 18		
MOI	Mode of Induction	Cerviprime	0	
		Balloon Dilatation	1	
OXY	Oxytocin	Used	1	
		Not used	0	
Lab. Int	Labour Interval	in hours	II I	
Del. Int.	Delivery Interval	in hours	IDI	
MOD	Mode of Delivery	Lab. Natural	0	
		LSCS	1	
		Forceps	2	
		Vacuum	3	

Ind. For LSCS	Indication for LSCS	Fetal distress	0
		Failed induction	1
		Severe PIH	2
		CPD	3
		Cervical Dystocia	4
		Others	5

NEONATAL OUTCOME			GOOD	ADM
Int. MD	Intrapartum	Maternal Distress	Yes	1
			No	0
Int. PPH	Intrapartum	PPH	Yes	1
			No	0
Int. Pyrexia.	Intrapartum	Pyrexia	Yes	1
			No	0
Post. Sep.	Postpartum	Sepsis	Yes	1
			No	0
Post. Pyrexia.	Postpartum	Pyrexia	Yes	1
			No	0

Sr. No.	Name	Age	Sex	Previous Hospitalization	IP No.	BMI	Abdominal Scar	GB Palpable	USG wall Thickness	Impacted Stone	Pericholecystic Collection	Total score	Easy	Difficult	Very Difficult
1	RANGAMMAL	66	F	NO	368	25	NO SCAR	NO	NORMAL	NIL	NO	2	YES		
2	SELVI	36	F	YES	2320	26	INFRAUMBILICAL	NO	THICKENED	NIL	NO	8		YES	
3	ANNAPOORANI	29	F	NO	9825	27	NO SCAR	NO	NORMAL	NIL	NO	1	YES		
4	GANDHI	70	F	NO	9675	24	INFRAUMBILICAL	NO	NORMAL	NIL	NO	2	YES		
5	ROBY K GEORGE	47	M	YES	171666	27	NO SCAR	NO	NORMAL	NIL	NO	6		YES	
6	RAJAN	35	M	NO	185567	25	NO SCAR	NO	NORMAL	NIL	NO	2	YES		
7	PERUMAL	50	M	YES	186647	32	SUPRAUMBILICAL	YES	THICKENED	YES	NO	14			YES
8	ARUMUGAM	49	M	NO	183555	28	NO SCAR	NO	NORMAL	NIL	NO	3	YES		
9	KAMESHWARI	48	F	NO	184520	25	NO SCAR	NO	NORMAL	YES	NO	2	YES		
10	YASEEN	33	M	NO	189422	27	NO SCAR	NO	NORMAL	NIL	NO	2		YES	
11	SARASWATHY	36	F	YES	206891	30	INFRAUMBILICAL	NO	NORMAL	NIL	NO	7			YES
12	YASHODHA	45	F	NO	207884	24	NO SCAR	NO	NORMAL	NIL	NO	0	YES		
13	SRINIVASAN	33	M	NO	219319	28	NO SCAR	NO	NORMAL	YES	NO	4			YES
14	JAMELA	58	F	NO	22327	27	INFRAUMBILICAL	NO	NORMAL	NIL	YES	4			YES
15	ANNALAKSHMI	45	F	NO	231623	25	INFRAUMBILICAL	NO	NORMAL	YES	NO	3		YES	
16	KUPPAMMAL	40	F	NO	240198	27	INFRAUMBILICAL	NO	NORMAL	NIL	NO	2	YES		
17	SRINIVASAN	74	F	YES	7887	25	INFRAUMBILICAL	NO	NORMAL	NIL	NO	7	YES		
18	SUBRAMANIYAN	55	M	NO	19209	26	NO SCAR	NO	NORMAL	NIL	NO	3	YES		
19	KUPPALAM	50	F	YES	23024	28	INFRAUMBILICAL	YES	NORMAL	NIL	NO	9			YES
20	BALAMOHAN	65	M	NO	26931	25	NO SCAR	NO	NORMAL	NIL	NO	3	YES		
21	PREMA	58	F	NO	36481	27	INFRAUMBILICAL	NO	NORMAL	NIL	NO	3	YES		

22	MALAR	34	F	NO	36506	26	INFRAUMBILICAL	NO	NORMAL	NIL	NO	2	YES		
23	MURUGESAN	45	M	YES	36708	25	NO SCAR	NO	NORMAL	NIL	YES	7		YES	
24	VALIYAMMAL	60	F	NO	38550	28	NO SCAR	NO	NORMAL	NIL	NO	3	YES		
25	SATHYAMOORTHI	34	M	NO	46181	25	NO SCAR	NO	NORMAL	NIL	NO	2	YES		
26	MUTHUSAMY	64	M	NO	46186	24	INFRAUMBILICAL	NO	NORMAL	NIL	NO	3	YES		
27	LAKSHMI	62	F	NO	46233	25	INFRAUMBILICAL	NO	NORMAL	NIL	NO	3	YES		
28	KARNADEVI	69	F	YES	50252	28	INFRAUMBILICAL	YES	NORMAL	NIL	NO	9			YES
29	MARAGATHAM	31	F	NO	57243	27	INFRAUMBILICAL	NO	NORMAL	NIL	NO	2	YES		
30	MALLIKA	45	F	NO	61942	25	NO SCAR	NO	NORMAL	NIL	NO	1	YES		