A PROSPECTIVE STUDY OF PRE OPERATIVE PREDICTORS OF DIFFICULT LAPAROSCOPIC CHOLECYSTECTOMY

Dissertation submitted to
The Tamil Nadu Dr. M.G.R. Medical University,Chennai.

With fulfillment of the regulations for the award of the degree of

MASTER OF SURGERY
(GENERAL SURGERY) Branch-I

DEPARTMENT OF GENERAL SURGERY

GOVT KILPAUK MEDICAL COLLEGE

CHENNAI -600010

MAY-2020

CERTIFICATE

This is to certify that the dissertation entitled **"A PROSPECTIVE STUDY OF PRE OPERATIVE PREDICTORS OF DIFFICULT LAPAROSCOPIC CHOLECYSTECTOMY**" is the bonafide work done by **Dr. S. SELVAKUMAR**, Post Graduate student in the Department of General Surgery, Government Kilpauk Medical College and Hospital, Chennai, 2017- 2020 under my direct guidance and supervision, in partial fulfillment of the regulations of The Tamil Nadu Dr. M.G.R Medical University, Chennai for the award of M.S., Degree (General Surgery) Branch - I, Examination to be held in May 2020.

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DECLARATION

I, **Dr. S.SELVAKUMAR,** declare that, I carried out this work on, "A PROSPECTIVE STUDY OF PRE-OPERATIVE PREDICTORS OF DIFFICULT LAPAROSCOPIC CHOLECYSTECTOMY" at the Department of General Surgery, Kilpauk Medical College during the period of April 2019 to October 2019. I also declare that this bonafide work or a part of this work was not submitted by me or any others for any award, degree, diploma to any other University, Board either in India or abroad. This is submitted to The Tamilnadu Dr. M.G.R. Medical University, Chennai in partial fulfillment of the rules and regulations for the M.S. degree examination in General Surgery.

Place: Chennai **Dr. S.SELVAKUMAR.**

Date:

ENDORSEMENT BY THE HOD/DEAN HEAD OF THE INSTITUTION

This is to certify that this dissertation titled **"A PROSPECTIVE STUDY OF PRE-OPERATIVE PREDICTORS OF DIFFICULT LAPAROSCOPIC CHOLECYSTECTOMY**" is a bonafide work,under the guidance and supervision of **Dr.V.VIJAYALAKSHMI**, Professor, Department of Surgery, Govt.Kilpauk Medical College, Chennai

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My acknowledgment will be incomplete if I do not thank all **my Patients** without whose co-operation, I would not have been able to conduct this study.

Finally nothing is possible without the blessings of the omnipotent **Almighty.**

Place: Chennai **Dr. S. SELVAKUMAR**
Date:

LIST OF ABBREVIATIONS USED

CHD	Common Hepatic Duct
CBD	Common Bile Duct
LC	Laparoscopic Cholecystectomy
TPN	Total parentralnutrition
USG	Ultrasonography
RHA	Right Hepatic Artery
GB	Gall Bladder
ERCP	EndoscopicRetrogradeCholangiopancreatography
P/C	Pericholecysticcollection
Pvalue	Predictivevalue
SGOT	SerumGlutamicOxaloaceticTransaminase
SGPT	SerumGlutamicPyruvateTransaminase

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GOVT. KILPAUK MEDICAL COLLEGE,
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Protocol ID. No.175/2019 Meeting held on 09/04/2019

The Institutional Ethical Committee of Govt. Kilpauk Medical College, Chennai reviewed and discussed the application for approval "A PROSPECTIVE STUDY ON PRE-OPERATIVE PREDICTORS OF DIFFICULT LAPAROSCOPIC CHOLECYSTECTOMY" submitted by Dr.S.Selvakumar, P.G. Student-General Surgery, Department of General Surgery, Government Kilpauk Medical College, Chennai - 10.

The Proposal is APPROVED.

The Institutional Ethical Committee expects to be informed about the progress of the study any Adverse Drug Reaction Occurring in the Course of the study any change in the protocol and patient information /informed consent and asks to be provided a copy of the final report.

14.5.2019.

DEAN
Govt. Kilpauk Medical College,
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10/5/19

<u>சுய ஒப்புதல் படிவம் (Consent Form)</u>

ஆய்வு செய்யப்படும் தலைப்பு :

“ நுண்துளை மூலம் பித்தப்பை அகற்றும் அறுவை சிகிச்சையில் சிக்கல்களை ஏற்படுத்தும் காரணிகளை கண்டறிவதற்கான ஆய்வு”

“A Prospective Study on pre-operative predictors of difficult laparoscopic cholecystectomy”,

ஆய்வு செய்யபடும் துறை : பொது அறுவைச்சிகிச்சை துறை
ஆய்வு செய்யபடும் மருத்துவமனை : அரசு கீழ்பாக்கம் மருத்துவக்கல்லூரி மருத்துவமனையில்

பங்கு பெறுபவரின் பெயர் :
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1. நான் இந்த ஆய்வில் தனிச்சையாகதான் பங்கேற்கிறேன். எந்தகாரணத்தினாலோ நான் இந்த ஆய்வில் இருந்து விலக ஆசைப்பட்டால் எந்த பிரச்சனையும் இன்றி விலகலாம் என்றும் அறிந்து கொண்டேன். ( )
2. இந்த ஆய்வு சம்பந்தமாகவோ இவை சார்ந்த மேலும் ஆய்வு மேற்கொள்ளும்பொழுதோ இந்த ஆய்வில் பங்குபெரும் மருத்துவர் என்னுடைய மருத்துவ அறிக்கைகளை பார்ப்பதற்கு என் அனுமதி தேவையில்லை என அறிந்தேன். ( )
3. இந்த ஆய்வில் பங்கு கொள்ள நான் சுயநினைவோடும் முழுசம்மதத்தோடும் ஒப்புக்கொள்கிறேன் ( )

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INTRODUCTION

Biliary tract surgeries are amongst the most commonly performed ones in the abdomen.Open cholecystectomy (OC), ever since described by Carl Langenbuch in 1882, has been the prime modality of treating gallstone disease for about a century.

The introduction of Laparoscopic cholecystectomy (LC) in 1985, by Mühe of Böblingen, Germany has revolutionised the treatment of gallstones. Having been recognised as the "gold standard" for treating gallstone disease, this has supplanted open cholecystectomy, and also ended attempts towards noninvasive management like extracorporeal shock wave lithotripsy and bile salt therapy.

In 1992, the National Institutes of Health (NIH) Consensus Development Conference stated that LC provides a safe and effective treatment for most patients with symptomatic gallstones.

The advantages of LC over OC are immediately appreciated; earlier return of bowel function, less postoperative pain, improved cosmesis, shorter hospital stay, earlier return to normal activity and decreased overall cost. Currently it is estimated that 90% ofcholecystectomies are performed by the laparoscopic approach. Indeed, LC as a mature mode of therapy has introduced

the general surgical world to the advantages and unique perspectives of minimal access surgery.

Despite the charm of endoscopic surgery, the slightly higher rate of certain complications associated with laparoscopic surgery as compared to the open one, remains a setback and is a cause of scepticism among the general public.

Therefore it would be worthwhile to evaluate the possibilities of predicting the chances of a difficult laparoscopic cholecystectomy, which would ensure safety to the patient and also avoid litigation.

There have been many attempts to this approach and various parameters, clinical and radiological have been analysed and many scoring systems developed.

The answer is an emphatic yes, when it comes to the question of whether a difficulty could be predicted preoperatively.An ideal system should encompass factors proven to have an influence on the outcome, should include investigations at an optimumcost, and the prediction should be individualised based on clinical judgement.Much more than the score itself, it is the impact of certain factors which would ultimately determine the outcome.

The preoperative prediction aims at patient counselling and also guiding the surgeon to decide on an early conversion, should difficulty arise and also involve an experienced surgeon in the task and thereby ensure patient safety.

AIMS AND OBJECTIVES OF THE STUDY

To determine the predictive factors for difficult laparoscopic cholecystectomy.

To study the clinical presentation of cholelithiasis.

To determine the factor which significantly predict the outcome

To identify patient at risk in an elective setting and thereby enable patient counselling

REVIEW OF LITERATURE

HISTORICAL ASPECTS

The Roman Celsus in his text, De Medicina (translated by W.G. Spencer in 1935), mentioned the liver and described itsanatomic location in an accurate form: "The liver, which starts from the actual partition under the precordia on the right side, is concave within (that is on the inferior surface) and convex without; its projecting part rests lightly on the stomach and it is divided into four lobes. Outside its lower part, the gallbladder adheres to it."Vesalius found (that he had) a hemoperitoneum coming from an abscess which had eroded the portal vein. The gallbladder was yellow and contained 18 calculi. Very light, of a triangular shape with even edges and surfaces everywhere, green by color somewhat blackish. The spleen was very large."Morgagni published in 1769 an analysis of disease under the title Seats and Causes of Disease, among which are those of the liver and biliary tract.Vater (1684-1751) was the first to describe the papilla of the duodenum.Pettit introduced the term biliary colic

1878: Kocher performed a cholecystostomy in two stages (Glenn,

1971). In the first stage, he packed the wound with gauze to the bottom of the gallbladder, and 8 days later he emptied the residual stones from the gallbladder.

1885: Tait performed first cholecystostomy for gallbladder lithiasis in one stage.

1882: Langenbuch performed first elective cholecystectomy

1882: Von Winiwarter developed Cholecystenterostomy.

1895: Kocher wrote an article on internal choledochoduodenostomy to remove supra-ampullary choledochal calculi.

1897: Kehr placed a rubber tube in the common bile duct through the cystic duct; this was the first systematic use of biliary intubation. 1898: Thornton performed the first removal of a stone from the common bile duct.

1898: MacBurney published his experience with duodenostomy and papillotomy in patients with impacted periampullary calculi. 1898: Buxbaum observed biliary calculi on plain x-rays.

1912: Kehr developed T-tube.

1923: Bakes developed choledochoscopy.

1924: Graham developed oral cholecystography.

1932: Mirizzi developed Postoperative cholangiography.

1937: Mirizzi developed Intraoperative cholangiography.

1989: Dubois in Paris published the first series of laparoscopic cholecystectomies (Dubois et al).

HISTORY OF LAPAROSCOPY AND LAPAROSCOPIC CHOLECYSTECTOMY

Laparoscopy(from the Greek, Laparo meaning the flank and Skopein meaning to examine), was first performed in 1901 by George killing of Dresden, Germany using room air filtered through sterile cotton for pneumoperitoneum and a wide

cystoscope to veiw the abdominal cavity of dog.The use of carbon dioxide (co2) for pneumoperitoneum was first recommended by Richard Zollikofer of Switzerland in 1924

The primary mode of insufflation was the Veress needle which was introduced by Janos Veress of Hungary in 1938.

In 1933, A German general surgeon, Feowers, was the first to report laparoscopic lysis of abdominal adhesions for the diagnosis of bowel obstructions.

Kurt Semm incorporated new aspects of fiber optic and used automatic gas insufflator which allowed precise controlled intra abdominal pressure.

In 1983, Lukichev and colleagues described laparoscopic cholecystectomy for acute cholecystitis.

In 1985, Muhe of Boblinger, Germany performed the first laparoscopic assisted cholecystectomy.

ANATOMY

A. Embryology

The caudal region of the foregut gives rise to what is called the hepatic diverticulum hepatic diverticulum during the 4th week of intrauterine life gives rise to the pars hepatica and pars cystica Gall bladder develops from the latter, while the former develops into liver and extrahepatic biliary radicals and they luminise by 8th week ofintrautrine life.

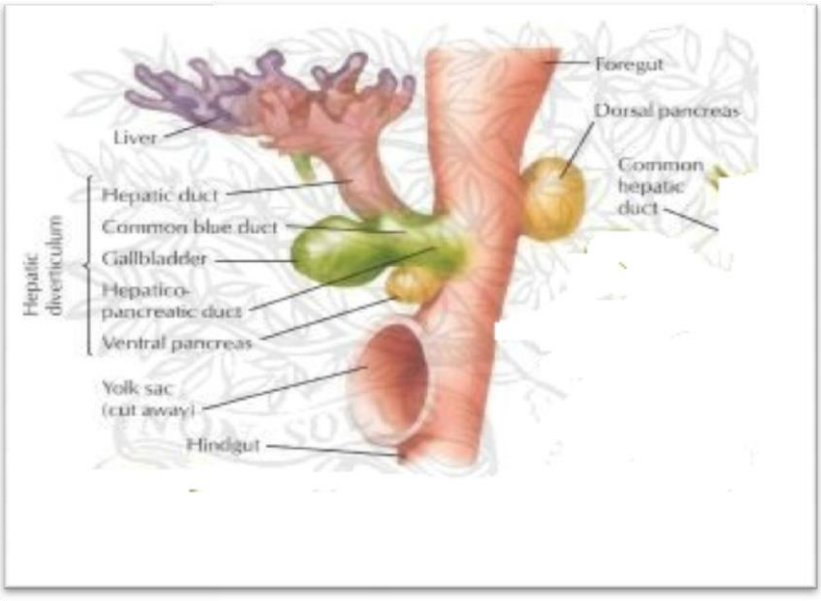


Figure 1. Embryology of Gall Bladder

HISTOLOGY

The gallbladder wall consists of five layers,

i) columnar epithelium

ii) lamin smooth muscle – with ganglia in between the smooth muscle bundles

iii) subserosal connective tissue, and

iv) serosa.

v) a propria,

vi)

The gallbladder lacks submucosa[6,7]. Rokitansky-Aschoff sinuses are the invaginations of epithelium into the lamina propria, muscle, and subserosal connective tissue [6, 7]. They are present in about 40% of normal gallbladders and in abundance in most in The ducts of Luschka are tiny bile ducts that are found around the muscle layer on the hepatic side of the gallbladder, in about 10% of normal gallbladders. They have no relation to the Rokitansky-Aschoff sinuses or

C.GROSS ANATOMY:

The gallbladder, a pear-shaped organ lies on the inferior surface of the liver at the junction of the left and right hepatic lobes between Couinaud's segments IV and V.to cholecystitis.flamed gallbladders.

The gallbladder ranges from 7 to 10 cm in length and from 2.5 to 3.5 cm in width. The gallbladder's volume varies considerably between fasting

states and after a meal. A moderate gallbladder has a capacity of 50 to 60 ml.

The gallbladder has been divided into four areas: the fundus, body, infundibulum, and neck. The Hartmann's pouch is an asymmetrical bulge of the infundibulum which lies close to the gallbladder's neck.

The cystic duct arises from the gallbladder, courses downward in the hepatoduodenal ligament and joins the lateral aspect of the supraduodenal portion of the common hepatic duct at an acute angle to form the common bile duct. The length of the cystic duct varies between 2 and 4 cm [6,7].

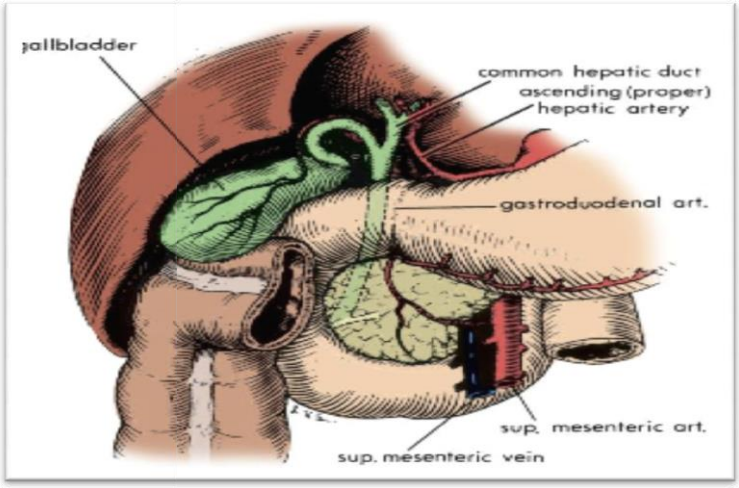


Figure 2. Biliary Anatomy

The Triangle Of Calot and The Hepatocystic Triangle Of Moosman:

Jean Francois Calot in 1891 described a triangular region havingcystic artery as

the superior border, common hepatic duct as the medialborder and cystic duct as the lateral border [8]. Moosman's triangle onthe other hand has its upper boundary formed by liver [6, 7].

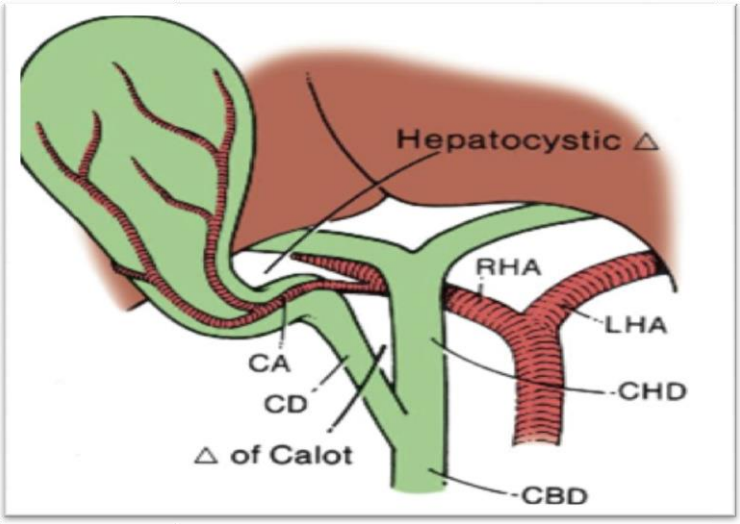


Figure 3.Calot's triangle

An aberrant right hepatic artery arising from the superiormesenteric artery may course through the medial aspect of the triangle,posterior to the cystic duct. A clear visualization of the hepatocystictriangle is essential while performing a cholecystectomy.

ARTERIAL SUPPLY AND VENOUS DRAINAGE:

Cystic artery arises from right hepatic artery and supplies thegallbladder. Rarely, it may also arise from the common hepatic, lefthepatic or gastroduodenal artery. Venous drainage is by cystic veinspredominantly, while some portions, especially the superior surfacedrain directly into hepatic veins. Occasionally, the cystic vein may drain into the right branch of portal vein [6].

NERVE SUPPLY:

The gallbladder and biliary tree receive sympathetic and parasympathetic nerve fibres from the celiac plexus. Parasympathetic is by way of the hepatic branch of the left (anterior) vagal trunk. Sympathetic fibres arising from the 5th to the 9th thoracic segments pass through the greater splanchnic nerves to the celiac ganglion. Postganglionic sympathetic fibres accompany the hepatic artery to innervate the gallbladder, bile duct and liver [10].Sensory fibres from the right phrenic nerve, through communications between the phrenic plexus and the celiac plexus also innervate the gallbladder, which explains the phenomenon of referred shoulder pain in patients with gallbladder disease.

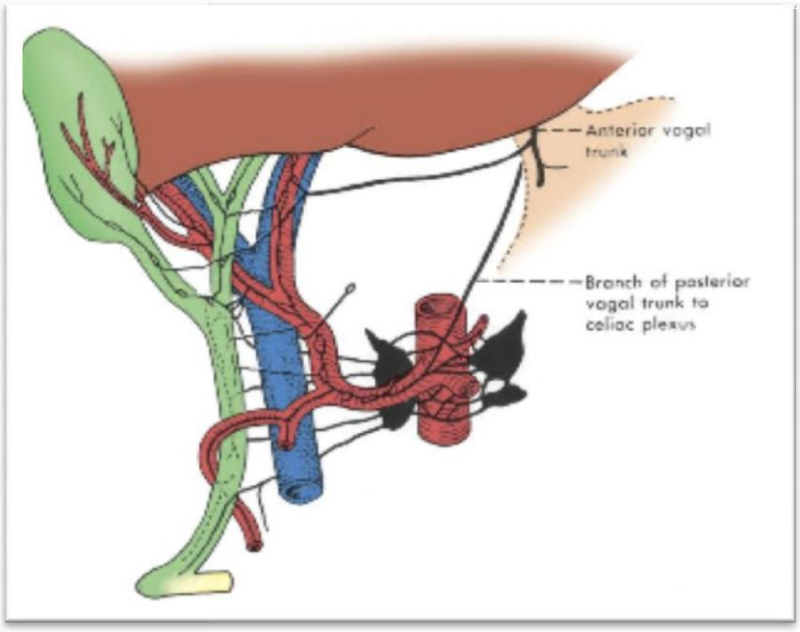
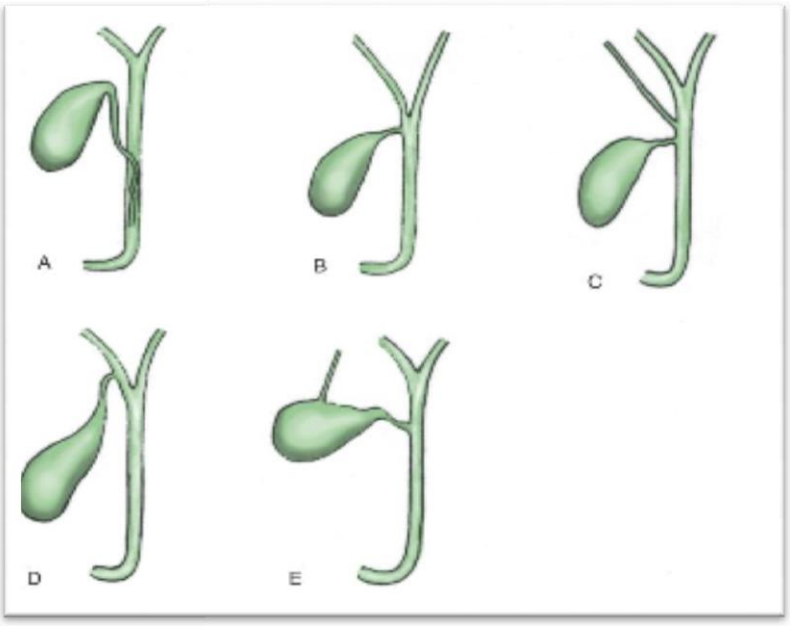


Figure 4. Innervation of the Gallbladder

ANOMALIES

A)Cystic duct

The anomalies of cystic duct which are important during a cholecystectomy were described by Benson and Page in 1976. The cystic duct may run parallel to the common hepatic duct for a variable distance (15%), or it may spiral anterior or posterior to the common hepatic duct to form a left-sided union (8%). The cystic duct may join the right hepatic duct or segmental duct. Occasionally, the gallbladder may join the a right common hepatic duct with a short or virtually nonexistent cystic duct. During ligation of a short cystic duct, care must be taken not to compromise the lumen of the common bile duct. [9]



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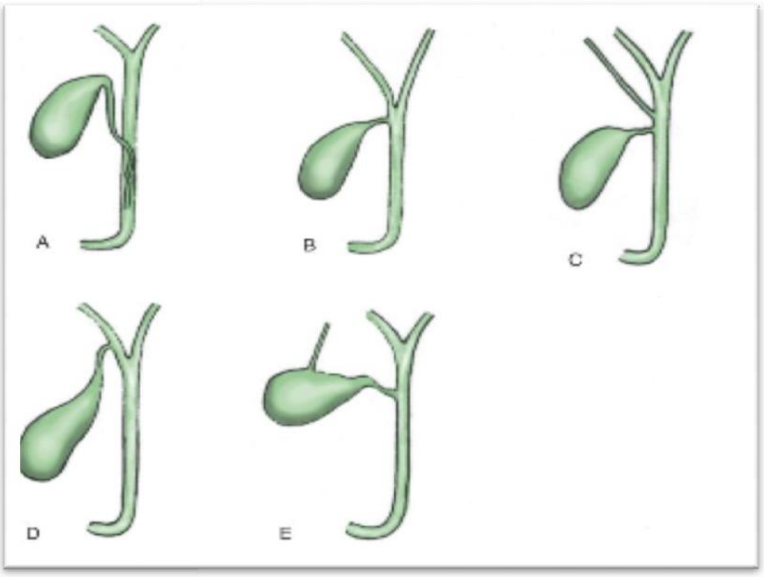


Figure 5. Cystic duct anomalies

A) Gall bladder

- Formation
    a. Phrygian cap
    b. Bilobed gallbladder
    c. Hourglass gallbladder
    d. Diverticulum of the gallbladder
    e. Rudimentary gallbladder
- Number
    a. Absence of the gallbladder (agenesis)
    b. Duplication of the gallbladder

- Position
    a. Floating gallbladder
    b. Intrahepatic gallbladder
    c. Left-sided gallbladder
    d. Transverse gallbladder
    e. Retrodisplaced gallbladder [8]

Phrygian Cap

This is the most common anomaly of the gallbladder in which the deformity is created by an infolding of a septum between the body and the fundus. It is found more commonly in women. Boyden identified this anomaly in 18% of patients with a normally functioning gallbladder and is not an indication for cholecystectomy.

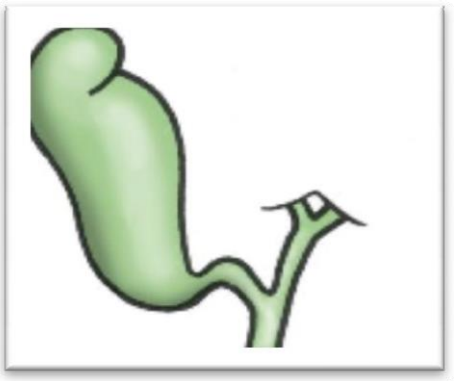


Figure 6. Phrygian cap

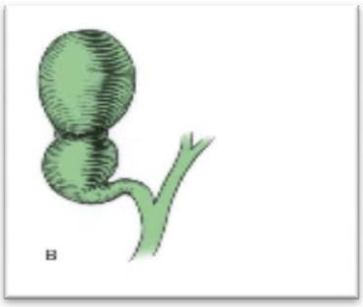


Figure 7. Hour glass Gall Bladder

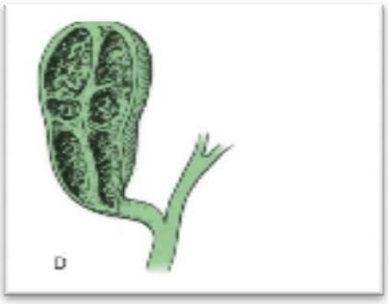


Figure 8. Bilobed Gallbladder

Bilobed Gallbladder

This occurs in two forms-one that is divided internally by a longitudinal fibrous septum, the other type appears like two separate gallbladders fused at the neck. It has no clinical importance.

Hourglass Gallbladder

This occurs as a congenital anomaly in children whereas in adults, it usually occurs as a result of chronic cholecystitis. The latter type, though not the former, requires removal.

Diverticulum of the Gallbladder

Congenital diverticula vary between 0.5 – 9cm and can arise from any part of the gallbladder. They assume significance when they contain stones, become inflamed, or perforate. On the contrary, Hartmann's pouch is an acquired diverticulum which occurs at the infundibulum or neck of the gallbladder in conditions of chronic obstruction to emptying.

ABSENCE OF THE GALLBLADDER (AGENESIS)

Around 200 cases have been reported so far. Most patients die within 6 months after birth owing to other associated anomalies. In a citation reviewing 185 such cases, 70 (38%) were completely absent, 60 (32%) were rudimentary, and 55 (30%) were a fibrous structure.

DUPLICATION

The reported incidence is 1 in 4000 persons. A true duplicated gallbladder is found to have 2 distinct cavities each drained by aseparate cystic duct. The two cystic ducts may either unite or enter the common bile duct separately.

FLOATING GALLBLADDER

This type of gallbladder is entirely surrounded by peritoneum and is attached to the liver bed by a peritoneal reflection. It has 5% incidence. This attachment if includes only the cystic duct, the gallbladder remains unsupported. Torsion of such a gallbladder may occur in seventh decade and presents as an emergency which requires removal.

B) Vascular

Around 50% of people have variations in arterial anatomy. Double cystic arteries are found in 15-20% of people, which course through Calot's triangle and can be inadvertently injured during cholecystectomy. Triple cystic arteries are much rarer with an incidence of less than 1%.

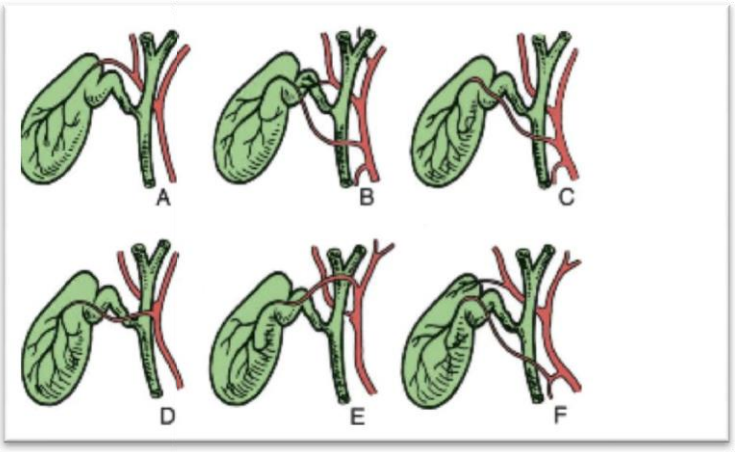


Figure 9. Anomalies of cystic artery

PHYSIOLOGY

Bile is made up of bile salts, bile pigments and other substances dissolved in an alkaline medium. About 500 ml is secreted daily. The glucuronides of the bile pigments, bilirubin and biliverdin are responsible for golden yellow colour.

BILIRUBIN METABOLISM AND EXCRETION

Most of the bilirubin in the body is formed by the breakdown of hemoglobin. it is bound to cytoplasmic proteins. It is conjugated to glucuronic acid by UDP-glucuronyl transferase, This diglucuronide is water soluble and is transported actively against concentration gradient into bile canaliculi. A small amount of bilirubin glucuronide escapes into blood, where it is bound to albumin and excreted in urine.The intestinal mucosa is relatively

impermeable to conjugated bilirubin but is permeable to unconjugated bilirubin and to urobilinogen. Small amounts of urobilinogen enters the general circulation through portal circulation and is excreted in urine.

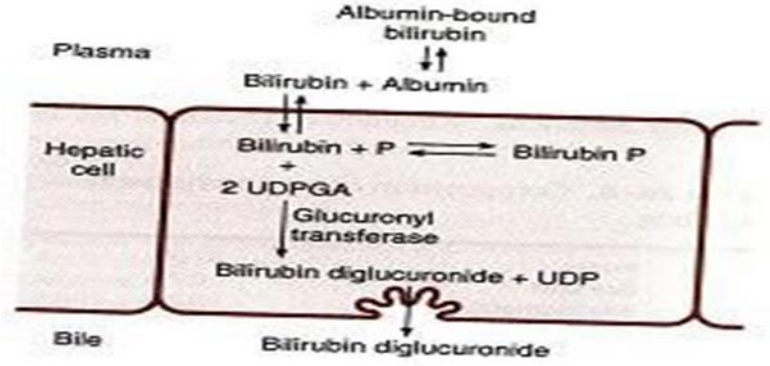


FIGURE 12: Metabolism of bilirubin in liver. p-intracellular binding protein, udpga-uridine diphosphate glucuronic acid, udp-uridine diphosphate.

REGULATION OF BILIARY SECRETION:

The tone of sphincter of Oddi decreases when food enters mouth. Fatty acids and amino acids in the duodenum release CCK, which cause gall bladder contraction. Substances that cause contraction of gallbladder are called cholagogues.

PATHOGENESIS

In the west, about 80% are cholesterol stones, containing more than 50% of crystalline cholesterol monohydrate. The remainder are composed predominantly of bilirubin calcium salts and are designated pigment stones.

CHOLESTROL STONES

Cholesterol is rendered soluble in bile by aggregation with water soluble bile salts and water insoluble lecithin, both of which act as detergents. When cholesterol concentration, exceed the solubilizing capacity of bile (supersaturation)

1. Bile must be supersaturated with cholesterol: this appears to be a primary defect, mediated by abnormal regulation of hepatic mechanisms for delivering cholesterol to bile. The excess free cholesterol is toxic to gallbladder, penetrating the wall and exceeding the ability of the mucosa to detoxify it by esterification. Gallbladder hypo motility ensues. Muscular stasis appears to result both from intrinsic neuromuscular dysmotility and decreased response neuromuscular response to CCK.
2. Gallbladder hypomotility promotes nucleation
3. Cholestrol nucleation in bile is accelerated: due to shift in balance between antinucleating and pronucleating proteins and presence of micro precipitates of inorganic or organic calcium salts
4. Mucus hypersecretion in the GB traps the crystals, permitting their aggregation into stones.

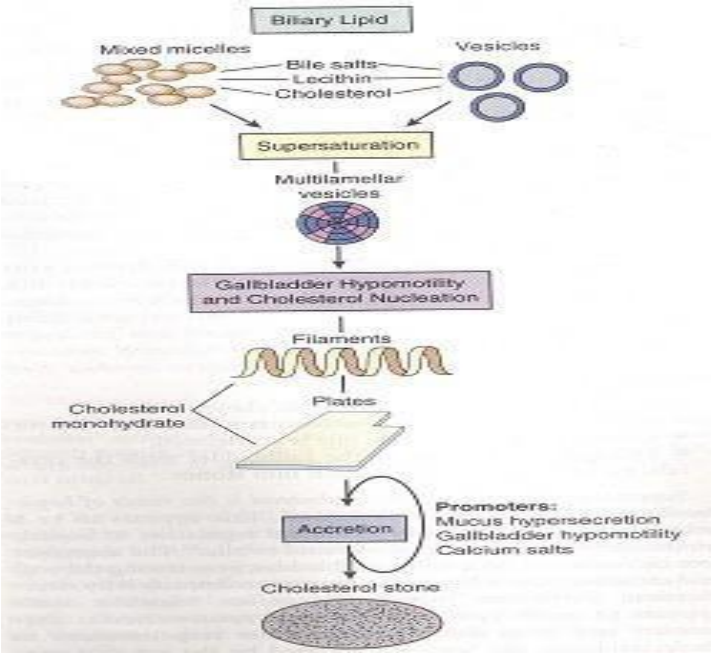


FIGURE 13: Schematic representation of four contributory factors for cholelithiasis: supersaturation, gallbladder hypomotility, crystal nucleation and accretion within the gallbladder mucous layer.

TABLE 2: Superimposed conditions that exacerbate defective GB emptying and cholesterol stone formation

Prolonged fasting	Total parentral nutrition
Pregnancy	Spinal cord injury
Rapid weight loss	

PIGMENT STONES

Pigment stones are complex mixtures of abnormal insoluble calcium salts of unconjugated bilirubin along with inorganic calcium salts. Infection of biliary tract with E.coli or ascaris lumbricoids or by the liver flukes opisthorchis sinensis leads to release of microbial β-glucuronidase, which hydrolyses bilirubin glucuronides to unconjugated bilirubin.

MORPHOLOGY

CHOLESTROL STONES

Arises exclusively in GB and are composed of cholesterol ranging from 100 to 50%. Pure cholesterol stones are pale yellow, round to ovoid and have a fine granular, hard external surface which on transection reveals a glistening radiating crystalline palisade. With increasing proportions of calcium carbonate, phosphates and bilirubin, the stones exhibit discolouration and may be lamellated and gray white to black on transection.

Most often multiple stones are present that range upto several centimeters in diameter. Surfaces of multiple stones may be rounded or faceted, owing to tight apposition. Stones composed largely of cholesterol are radiolucent; sufficient calcium carbonate is found in 10 to 20% of cholesterol stone to render them radiopaque.

PIGMENT STONES

Are classified as black and brown stones. Black pigment stones are found in sterile gallbladder bile, and brown in infected intrahepatic and extrahepatic ducts.Mucin glycoproteins act as binding proteins in both cholesterol and pigment stones.

THE NATURAL HISTORY OF GALLSTONES

In 1992, it was estimated that 10% to 15% of the adult population in the United States had gallstones, about 1 million patients are newly diagnosed annually. Gallstones are the most common digestive disease

EPIDEMIOLOGY:

Gallstones are most common gastrointestinal illness with a prevalence of 11 to 36% in autopsy reports. Only first degree relatives of the patients with gallstones and obesity (BMI >30 kg/m^2) have been identified as strong risk factors for the development of symptomatic gallstone disease.

TABLE 3: Risk factors for gallstones

Obesity	First degree relatives
Rapid weight loss	Drugs: ceftriaxone,postmenopausal estrogens, total parenteral nutrition
Childbearing	Ethnicity: Native American(Pima Indian) , Scandinavian
Multiparity	Ileal disease, resection or bypass
Female sex	Increasing age

CLINICAL PRESENTATION

Most patients remain asymptomatic from their gallstones. Although the mechanism unclear, some patients develop symptomatic gallstones with biliary colic caused by a stone obstructing the cystic duct. Only 1% to 2% of asymptomatic individuals with gallstones develop serious symptoms or complication related to their gallstones per year; therefore only about 1% require cholecystectomy. Once symptomatic, patients tend to have recurring symptoms, usually repeated episodes of biliary colic. Nonspecific gastrointestinal symptoms develop in 10 to 30% of patients and 5 to 10% of patients develop classic biliary symptoms.

BILIARY COLIC

Acute obstruction of the gallbladder by calculi results in biliary colic, a common misnomer because the pain is not colicky in the epigastrium or right upper quadrant. Biliary colic is a constant pain that builds in intensity and can radiate to the back, interscapular area or right shoulder. The pain is described as a band-like tightness of the upper abdomen that may be associated with nausea and vomiting. This is due to a normal gallbladder contracting against a luminal obstruction, such as a gallstone impacted in the neck of the neck of the gallbladder, the cystic duct or the CBD. The pain is most commonly triggered by fatty foods, but it can also be initiated by other types of food or even occur spontaneously. An association with meal is present in only 50% of patients, and in these patients, the pain often develops more than 1 hour after eating.

INVESTIGATIONS

LIVER FUNCTION TEST

Biliary colic, in the absence of gallbladder pathology or common bile duct obstruction don't produceabnormal laboratorvalues. Obstructive holedocholithiasis have raised direct bilirubin and elevated alkaline phosphatase levels.Leukocytosis predominantly neutrophils are present in a Cholecystitis and cholangitis.

PT-INR

Prolonged PT is present in liver dysfunction which needs to be normalized before surgery.

ROUTINE BLOOD INVESTIGATIONS

Includes complete haemogram, renal function tests and ECG.

IMAGING STUDIES PLAIN RADIOGRAPHS

Only about 15% of gallstones contain enough calcium to render them radiopaque and therefore visible on plain abdominal films. Plain films are important are important to exclude perforated ulcer with free intraperitoneal air, bowel obstruction with dilated loops, or right lower lobe pneumonia.

ULTRASONOGRAPHY

An ultrasound is the initial investigation of any patient suspected of disease of the biliary tree. Abdominal ultrasound is a part of routine evaluation in patients withcholelithiasis and has a sensitivity of >98% and sensitivity of >95%.[10] In addition to identifying gallstones, ultrasound can also detail signs of cholecystitis such as thickening of the gallbladder wall, pericholecystic fluid, and impacted stone in the neck of the gallbladder. Dilation of the extrahepatic (>10 mm) or intrahepatic (>4 mm) bile ducts suggests biliary obstruction

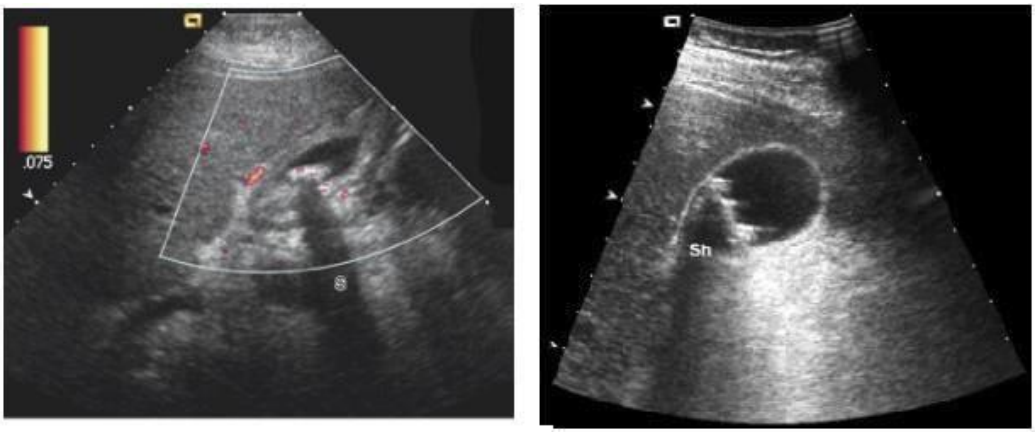


FIGURE 14: A, Echogenic foci in the gallbladder with acoustic shadowing (S) are characteristic of gallstones. In this patient, the gallbladder wall is thickened, but not hypervascular. Features suggest chronic cholecystitis. B, Multiple stones are layered in the dependent portion of the gallbladder, but the wall is not thickened. .

ORAL CHOLECYSTOGRAPHY

Identifies filling defects in a visualized, opacified gallbladder after oral administration of a radioopaque compound that passes into the gallbladder It is contraindicated in patients with vomiting, biliary obstruction, jaundice, or hepatic failure.

COMPUTED TOMOGRAPHY

CT identifies gallstones within the biliary tree and gallbladder with a sensitivity of only about 55% to 65%. This is because both gallstone and bile are isodense and stones are identified only if they are calcified.

SCINTOGRAPHY

Scintography is useful to visualize the biliary tree, assess liver and gallbladder function. Nonvisualization of the gallbladder at 2 hours after injection is reliable evidence of cystic duct obstruction. Biliary scintography followed by CCK administration is helpful for documenting biliary dyskinesia when gallbladder contraction accompanies biliary track pain in patients without evidence of stones (CCK hepatobiliary 2,6- dimethyl-iminodiacetic acid (HIDA).

INTRAOPERATIVE CHOLANGIOGRAPHY

The first operative cholangiogram was reported in 1936 by Micken. Mirizzi in 1937 performed the first cystic duct cholangiography and this procedure remains the most accepted method for performing (IOC) today.

MANAGEMENT OF CHOLELITHIASIS

The non operative management of gall stones has long fascinated physicians. the idea of dissolving gall stones attracted early interest with Durande in 1782. In 1975, Makino reported gall stone dissolution by administering ursodeoxycholic acid.

EXTRACORPOREAL SHOCK WAVE LITHOTRIPSY(ESWL)

ESWL is in use since 1986. It is used to fragment stones. Patient selection is very crucial for success and are selected according to criteria laid down in Munich study.

The criteria are functioning of gall bladder and stone should be

i. Cholestrol stone
ii. Less than 3 in number
iii. Less than 3 cm.

Recurrence rate is 5-7% at 12 months and 15% at 24 months.

MEDICAL MANAGEMENT

Ursodiol (urosodeoxy cholic acid) contitutes less than 5% of total bile salt pool.

CLINICAL USES

1. Dissolution of small cholesterol gallstones in patients withsymptomatic gallstones who refuse cholecystectomy or who are poor surgical candidates. At a dosage of 10 mg/kg/day for 12 -24 m, dissolution occurs in upto 50% of patientswith small (<5-10 mm)non calcified gallstones.

2. Prevention of gallstones in obese patients undergoing rapid weight loss therapy.

3. At a dosage of 13-15mg/kg/d is helpful for patients with early stage primary biliary cirrhosis, reducing liver function abnormalities and improving liver histology.

ADVERSE EFFECTS

Ursodiol is practically free of serious adverse effects.

Bile salt induced diarrhea is uncommon.

PREOPERATIVE PREPARATION

1. Blood coagulation should be normalized in patients with prior, by giving vitamin K (IM in 3 doses)
2. A prophylactic antibiotic either with premedication or at the time of anesthesia induction is given. A second generation cephalosporin is appropriate.
3. Subcutaneous heparin or antiembolic stocking are used to prevent deep vein thrombosis.

OPEN CHOLECYSTECTOMY

Indications for OC

- Poor pulmonary or cardiac reserve
- Suspected or known gallbladder cancer
- Cirrhosis and portal hypertension
- Third-trimester pregnancy Combined procedure
- Conversion from laparoscopic approach.

A short right upper transverse incision is made centered over the lateral border of the rectus muscle-kocher's incision. The gallbladder is appropriately exposed and packs placed on the hepatic flexure of the colon, the duodenum, and the lesser Omentum to clear view of the anatomy of the porta hepatis. This packs are retracted using the left hand of the assistant, or a stabilized ring retractor is used to keep the pack in position. A duval forceps is placed on the infundibulum of the gallbladder and the peritoneum overlying calot's triangle is stretched. The calot's triangle is dissected to expose the cystic duct and the cystic artery. These are confirmed by tracing them to enter the gallbladder. The cystic artery is ligated and cut. The cystic duct is then ligated and divided. A suction drain is placed before closure.

When there is doubt about anatomy, a fundus first or retrograde cholecystectomy dissecting on the gallbladder wall down to the cystic duct can be helpful.

OPERATIVE MANAGEMENT OF GALLSTONES:

CHOLECYSTECTOMY

ANATOMIC CONSIDERATIONS

The success of any surgery lies upon the adequacy and accuracy of anatomical knowledge and this holds true here as well. Iatrogenic injuries most often occur due to unidentified anomalies.

One has to identify the Calot's and the Moosman's triangles, ensure the identity of the structures passing through, before intervening. An aberrant right hepatic artery arising from the superior mesenteric artery can courses through the medial aspect of the Calot's triangle, with cystic duct lying anterior to it. Accessory hepatic ducts may also traverse the Calot's triangle. Hence adequate visualisation of the anatomy is of paramount importance in any form of cholecystectomy. The origin of the cystic artery, the junction of cystic duct with common hepatic duct may be anomalous many a time and should be looked for. An intra-operative cholangiogram can be helpful in difficult situations.

Indications and Relative Indications for an Open Cholecystectomy

Severe cholecystitis (relative)

Inability to delineate anatomy during laparoscopic cholecystectomy Emphysematous gallbladder (relative)

Suspicion for gallbladder cancer Perforation of gallbladder/abscess

Fistulization of gallbladder gallstone ileus (relative) Cholangitis (relative)

Multiple past abdominal procedures (relative) Pregnancy (relative)

Cirrhosis/portal hypertension (relative) Blood dyscrasias (relative) Contraindication for laparoscopy

Relative Indications for Prophylactic Cholecystectomy

Cardiac transplant recipients

Lung transplant recipients

Chronic total parenteral nutrition requirement

Recipients of biliopancreatic diversion (bariatric patients)

Family history of gallbladder cancer and asymptomatic stones

Children with hemoglobinopathy (sickle cell, thalassemia, spherocytosis)

Cholelithiasis encountered during elective abdominal procedures

INDICATIONS FOR LAPAROSCOPIC CHOLECYSTECTOMY

A) Symptomatic gallstones

- Biliary colic
- Acutecholecystitis
- Chronic cholecystitis
- Gallstone pancreatitis

B) Asymptomatic Gallstones

- Total parenteral nutrition
- Sickle cell anemia
- Chronic immunosuppression
- Lack of immediate access to tertiary care (military personnel, relief workers)
- Biliary dyskinesia
- Polyp > 10mm
- Porcelain gall bladder

CONTRAINDICATIONS TOLAPAROSCOPIC CHOLECYSTECTOMY

A) ABSOLUTE

- Contraindication to general anaesthesia
- Bleeding disorder
- Gallbladder malignancy in doubt

B) RELATIVE

- Morbid obesity
- Peritonitis
- Cholangitis
- Chronic obstructive lung disease
- Liver cirrhosis
- Pregnancy
- History of upper abdominal surgery

LAPAROSCOPIC CHOLECYSTECTOMY OPERATING ROOM SET UP

Two techniques have been described, the American and the French technique. The Americans advocate the surgeon to approach from the patient's left side and the first assistant to be on the patient's right side.

The French technique is the one in which the surgeon stands in between the patient's abducted legs.

PNEUMOPERITONEUM

This again could be achieved by either the closed or the open Hasson's technique.CO_2, the non-combustible gas is quite safe, though there are reported incidences of hypercarbia secondary to cardiopulmonary disease.

PORT PLACEMENT AND EXPOSURE

In the conventional technique, two 5mm and two 10mm ports are used. The 10 mm ports are made, one each in the umbilical and epigastric regions, and the 5mm ports are made in the right subcostal region, one each in anterior axillary line and midclavicular line.

PROCEDURE

With a cephalad traction at the fundus and a lateral traction at the infundibulum, Calot's triangle comes into view and one has to stay parallel to cystic duct. Once the cystic duct and artery are identified andskeletonised, it would be ideal to visualise the Rouviere's sulcus anddissection should not proceed any further. After clearing the structuresin the Calot's triangle, the Strasberg's Crtical View of Safety isidentified to prevent bile duct injury.

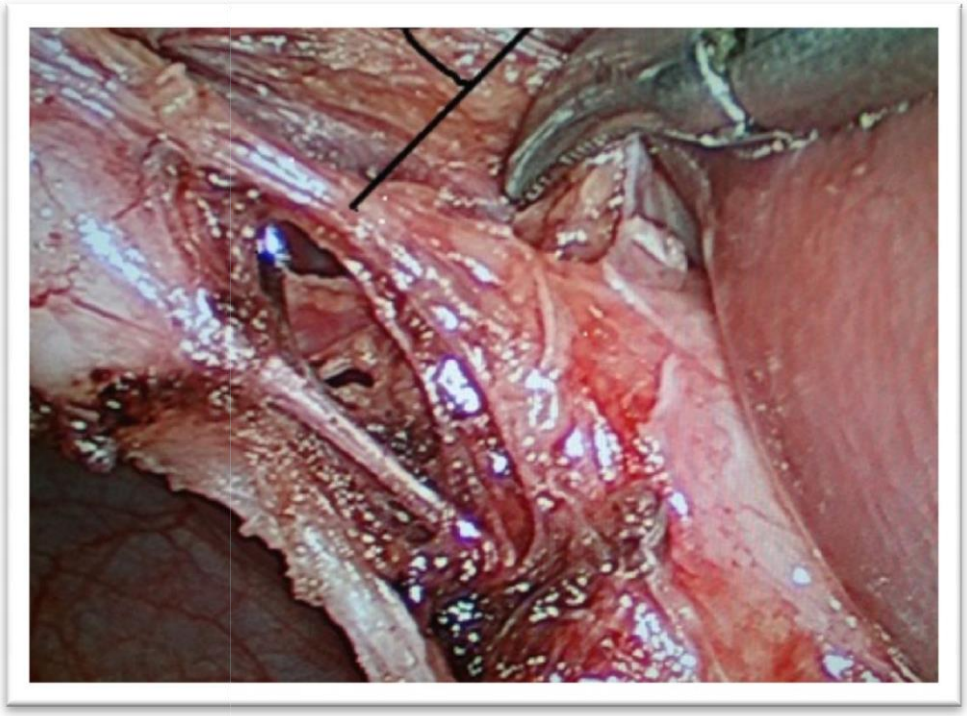


Figure 14 A View of Calot's Triangle

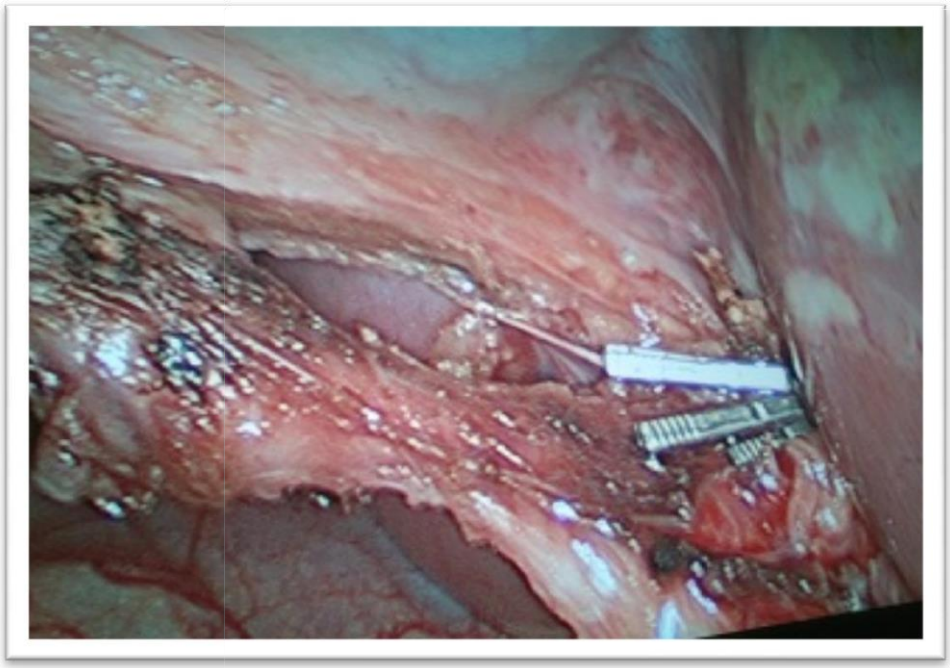


Figure 15 Strasberg's Critical View of Safety

Clips are applied over the cystic artery and duct. Essentially the artery should be divided first for two reasons : 1- division of the artery results in lengthening of the cystic duct by a few mm which can be safely divided, 2- if bleeding occurs, one might mistake common bile duct for cystic duct while clamping. Gallbladder is dissected off the liver bed and hemostasis ensured. Following port closure, analgesic infiltration is given at the post sites for postoperative pain relief.

INTRAOPERATIVE GALLBLADDER PERFORATION

Perforation of the gallbladder occurs due to excessive traction or by electrocautery and can lead to spillage of bile and stones. The spilled stones if contain cholesterol predominantly carry little risk of infection which is not true with pigment stones [36].

Studies have shown no significant increase in morbidity with spillage of stones, except for an increased operating time.

LAPAROSCOPIC APPROACH- THE SAFETY CHECKLIST:

1. Optimal visualisation- 30 degree scope
2. Clear view of Calot's triangle and cystic duct – Gallbladder junction
3. Lateral retraction of infundibulum and cranial retraction of fundus

4. To establish Strasberg's Critical view
5. To minimise electrocautery dissection close to Common bile duct
6. To visualise cystic duct before clip application.

COMPLICATIONS OF LAPAROSCOPIC CHOLECYSTECTOMY

Intra operative

i) Related to pneumoperitoneum

- CO_2 embolism
- Vasovagal reflex
- Cardiac arrhythmia
- Hypercarbic acidosis

ii) Trocar related

- Bowel injury
- Vascular injury

iii) Dissection related

- Injury to cystic artery
- Injury to bile duct
- Retained stones
- Bile leakage

iv) Post operative

- Wound infection
- Bile leak
- Basal atelectasis
- Incisional hernia

COMPARISON OF VARIOUS SERIES OF LAPAROSCOPIC CHOLECYSTECTOMY

SERIES	YEAR	CONVERSION RATE %	BILE DUCT INJURIES %
Cushieri, et al	1991	2.6	0.3
Scott, et al	1992	4.3	0.4
Litwin, et al	1992	4.3	0.1
Orlando, et al,	1993	6.9	0.3
Fullarton, et al	1994	17	0.7
Brune, et al	1994	1.2	0.2

PROSPECTIVE TRIALS COMPARING LAP VS OPEN CHOLECYSTECTOMY

Series	Year	Complications (%)	Duration of hospitalisation (days)	Time taken to return to duty (days)
Barkun,et al,	1992			
OC		8.0	4*	20*
LC		2.7	3	12
lsen, et al	1993			
OC		20	4*	34*
LC		17	3	11
gren, et al	1994			
OC		—	3*	24*
LC		—	2	12
iuto, et al	1998			
OC		23*	6*	30
LC		3	4	14

LAPAROSCOPIC VS OPEN APPROACH- COMPARED AND CONTRASTED:

Laparoscopic cholecystectomy (LC) has its own merits and demerits. Though the rate of complications were much higher than open surgery during the early periods after its introduction, say in the 1990's, as reported by Fletcher et al in 1999 of an increase in the intraoperative complication from 0.67% to 1.33% [34]. But recent evidence states that LC entails lower morbidity and mortality rates than open operation. The morbidity rate for an open cholecystectomy ranges from 5% to 20% as compared to 1.5-8.6% with laparoscopic cholecystectomy. Jatzko et al in a mutivaraiate analysis came out with a report of 7.7% morbidity rate from open surgery as compared to 1.9% for LC and5% mortality rate vs 1% for LC [37, 38, 39]. But the same is not applicable for bile duct injuries as is evident from various studies. Roslyn et al had shown an incidence of 0.2% bile duct injuries [35] from 42,000 open cases as against 0.4-1.3% from laparoscopic cholecystectomies

ADVANTAGES OF LAPAROSCOPIC CHOLECYSTECTOMY

Better cosmesis Less pain
Decreased length of hospital stay
Earlier return to work
Less overall cost

DISADVANTAGES

Decreased tactile discrimination
Bleeding difficult to control
View control lies in hands of camera operator
Complications of pneumoperitoneum

Despite the positive trend in the number of surgeries performed and the favourable outcomes, open surgery or an early conversion to open is the choice when it comes to complicated cases. In patients presenting with minimal symptoms, the chances of a difficult outcome needs to be predicted as the

complications, if occur are difficult to manage. This indeed would enable a beginner to approach the cases with more confidence and also lessen the avoidable morbidity to the patient.

WHAT'S NEW?

OUT PATIENT LAPAROSCOPIC CHOLECYSTECTOMY:

The concept of Out Patient laparoscopic cholecystectomy (LC) has been in practise for about a decade. Bueno et al in 2006, shared his experience from 504 cases of outpatient LC and reported an ambulatory percentage of 88.8% with a mean hospital stay of 6.1 hours. The complication rate was 11.6% and 10.1% of them required overnight stay [40].

In spite of promising results, the acceptance rate remains low and the potential barriers evaluated are found to be medical and institutional, with medical barriers being patient comorbidities. Forrest et al in 2001 formulated a consensus protocol incorporating comprehensive health education and a multidisciplinary approach to overcome such barriers which promoted a significant increase in the acceptance rate from 21% to 72%.

Voyles et al formulated selection criteria to ensure safety of the procedure which included age less than 65, absence of upper abdominal operations, and

elective operations in healthy patients at low risk forcommon bile duct stones. Therefore with a careful patient selection and adequate surgical expertise, LC can be a safe outpatient surgery [42].

MINILAP

Mini port laparoscopic surgery was another step towards improved cosmesis. It involves the use of 10-mm umbilical, 5-mm epigastric, 2-mm subcostal, and 2-mm lateral ports. The results of Novitsky et al showed decreased early postoperative incisional pain, late incisional discomfort and superior cosmetic results, though not statistically significant [43,44].

SILS

Yet another less invasive surgical procedure in the era of minimal access surgery is SILS. Using a single 12mm incision at the umbilicus and a 5mm trocar introduced through the same, peritoneal cavity is viewed with a 5mm, 30degree optic. The 2^{nd} and 3^{rd} trocars are introduced to the left and right of the 5 mm trocar. With two sutures to suspend GB, Calot's triangle evaluated and dissection performed using endoshear roticulator on the left and an endograsp roticulator on the right. Tacchino et al in 2009 reported a decrease in operating time from an initial 3 hours to 50 min after the first five cases in his series of 12cases [45].A recent study states that the improved cosmesis associated with SILS happens so at

the cost of increased port site hernia rates of 8.4% as compared to 4% with conventional LC (Marks et al , 2013). Yet cosmesis scores continue to favour SILS [45].

RISK FACTORS OF DIFFICULT LAPAROSCOPIC CHOLECYSTECTOMY

i) CLINICAL RISK FACTORS

Stocky male patients due to difficulty in initial port placement

Multiparous women with flabby abdomen due to thinned out Previous upper abdominal surgery

Cirrhosis of liver

Present or previous acute cholecystitis or acute severe pancreatitis

Previous treatment: percutaneous drainage / cholecystostomy

II) ULTRASOUND CRITERIAS

Thick walled gallbladder(>4 mm)

Contracted (nonfunctioning) gallbladder

Packed stones and large calcified GB.

Polyp or mass lesion without acoustic shadow

Evidence of acute cholecystitis:-impacted stones

Edematous gallbladder wall

Pericholecystic fluid collection

Emphysematous cholecystitis

Subphrenic collection

Intraperitoneal fluid collection due to perforated GB

Fatty liver with hepatomegaly

Cirrhosis of liver

SAFETY MEASURES

Selective open technique of pneumoperitoneum

Intraoperative cholangiography to identify biliary anatomy and the CBD stones.

Laparoscopic ultrasound is useful in mapping biliary and vascular anatomy and is superior to operative cholangiogram.

Adequate instrumentation:

i. Toothed graspers to grasp and retract thick walled gallbladder.
ii. Specialized needle drivers and holders
iii. Five pronged retractors.

Hydrodissection

Preliminary decompression

Additional ports for retraction to get adequate exposure

Caudal traction of the hepatoduodenal ligament using multipronged retractor. The port is placed in the left midclavicular line, midway between the camera port and the epigastric port.

Dipping retractor for quadrate lobe lifting (French technique)

PROBLEMS IN DIFFICULT CHOLECYSTECTOMY ACCESS

PROBLEMS

a) ADHESIONS

Post-operative adhesions: In lower abdominal scars, the veress needle is inserted at the site of proposed epigastric port. The umbilical port is inserted under visual guidance. In open appendicectomy scar, Hasson method is the ideal technique for creating pneumoperitoneum. In case of upper abdominal scars present in the midline or right Para median position, the left subcostal veress needle insertion(palmer's point) is used to create pneumoperitoneum. Conversion rate as high as 25% has been reported in patients with extensive upper abdominal adhesions.

Inflammatory adhesions: is usually due to acute cholecystitis or acute severe pancreatitis. These adhesions can easily be removed using suction nozzle. But if the adhesions are organized then sharp dissection is done.

b) INCISIONAL HERNIA

In cases of lower abdominal incisional hernias, appropriate repair could be accomplished after completing laparoscopic cholecystectomy either by open or laparoscopic technique.

c) OBESITY

The veress needle insertion and the insertion of first trocar is difficult. Cystic artery and cystic duct are covered with thick fat hence dissection is difficult.

d) CIRRHOSIS

Due to adhesions with increased vascularity, difficult traction of liver, inadequate exposure of hilum, high risk of GB bleed and high risk hilum.

CONCOMITANT PATHOLOGY

a) MUCOCOELE

Mucocoele is difficult to retract and apply grasping forceps. It is managed by decompression of the GB, using toothed forceps for retraction of GB, removal of the impacted stone either by dislodging into the GB or through an incision over the cystic duct after applying distal clip.

b) GANGRENOUS GB

Due to difficulty in grasping, loss of tissue plane, difficulty in exposure of calot's triangle, performance of intraoperative cholangiogram is difficult, spillage of stones and infected bile; gangrenous GB is difficult to operate.

c) EMPYEMA

d) SCLEROATROPIC GB

The GB is contracted, fibrosed and densely covered with extensive adhesions. Adhesions of the duodenum and the colon are very common and access to calot's triangle is difficult due to fibrous scarring.

e) MIRRIZZI'S SYNDROME

LC is difficult in Mirrizzi's syndrome due to contracted GB with extensive adhesions, CBD may be mistaken for cystic duct and chances of CBD injuries are more and if fistula is not recognized during surgery, biliary peritonitis may occur.

f) PORCELAIN GB

The prevalence of porcelain GB in cholecystectomy specimen ranges from 0.06% to 0.8%.[30] Decompression of the gallbladder and traction is difficult due to calcified wall. Toothed forceps can be used for cranial traction of the GB. Calcification of the cystic duct may require endosuturing or application of endoloops to the cystic duct.

g) CHOLECYSTOENTERIC FISTULAS

Cholecystoenteric fistula is an incidental finding in 0.5 to 0.7% of cases of laparoscopic cholecystectomy for biliary disease.The diagnosis suspected by the presence of air in GB. Problems arise due to difficulty in identification of the anatomy, difficulty in performing cholangiography and due to therequirement of intracorporeal suturing for closure of perforation.

h) ACUTE BILIARY PANCREATITIS

Difficulty in performing LC in acute biliary pancreatitis is due to- extensive adhesions, inflammatory phlegmon at the head of pancreas, edematous cystic duct and hepatoduodenal ligament, presence of ascites, pseudocyst pancreas in retrogastric position.

NEWER APPROACHES IN LAPAROSCOPIC CHOLECYSTECTOMY

a) GASLESS LAPAROSCOPIC CHOLECYSTECTOMY

Gasless LC is especially useful in patients with cardiorespiratory problems. Here the abdominal wall is lifted mechanically allowing an adequate space for laparoscopic surgery.

b) SPA (SINGLE PORT ACCESS) CHOLECYSTECTOMY.

METHODOLOGY

The materials for the present study on "A CLINICAL STUDY TO DETERMINE PREDICTIVE FACTORS FOR DIFFICULT LAPAROSCOPIC CHOLECYSTECTOMY"comprises of 51 cases admitted to Govt kilpauk medical college from April 2019 to october 2019 a period of 6 months.

The method for the study included screening of patients who presented with upper abdominal pain, or vomiting or dyspepsia or jaundice. Such patients were studied in detail clinically and investigated as per the proforma detailed below. Ultrasound abdomen was done in all patients.

Routine haematological and biochemical investigations were done. Investigations like OCG, PTC, PT-INR could not be done routinely due to lack of facilities. LFT was done in all patients. ERCP done in indicated patients, The patients confirmed by USG examination were evaluated with following factors: age, sex, h/o previous hospitalization, BMI wt (kg)/ ht (mt^2), abdominal scar- supraumbilical or infraumbilical, palpable gall bladder, sonographic findings- wall thickness, Pericholecystic collection, impacted stone.

All the patients were received symptomatic treatment and vitamin K for 3 days preoperatively.

Following evaluation the patient will be subjected to laparoscopic cholecystectomy and time taken, biliary / stone spillage, injury to duct/ artery or conversion were noted. All the patients were operated by one surgical unit. Post operatively cases were followed up for any complication. Drain was removed between 2^{nd} and 5^{th} post OP day depending on the drainage, and Suture removal was done 8^{th} post OP day. All cases were followed up for any recurrent symptoms.

INCLUSION CRITERIA:

The patients aged between 16 and 60 yrs

presenting with symptoms/ signs of Cholelithiasis / Cholecystitis

USG imaging shows cholelithiasis/cholecystitis in surgical ward of GKMCH - Kilpauk

EXCLUSION CRITERIA:

Age below 15 years .

CBD calculus, dilated CBD, where CBD exploration was needed.

Raised ALP

features of obstructive jaundice.

Open cholecystectomy

not willing for laparoscopic cholecystectomy.

The collected data were analysed with IBM.SPSS statistics software 23.0 Version.To describe about the data descriptive statistics frequency analysis, percentage analysis were used for categorical variables and the mean & S.D were used for continuous variables.To find the significance in categorical data Chi-Square test was used. In the above statistical tool the probability value .05 is considered as significant level.

RESULTS

This study included 51 cases that were studied prospectively over a period of 6 months, from April 2019 to October 2019

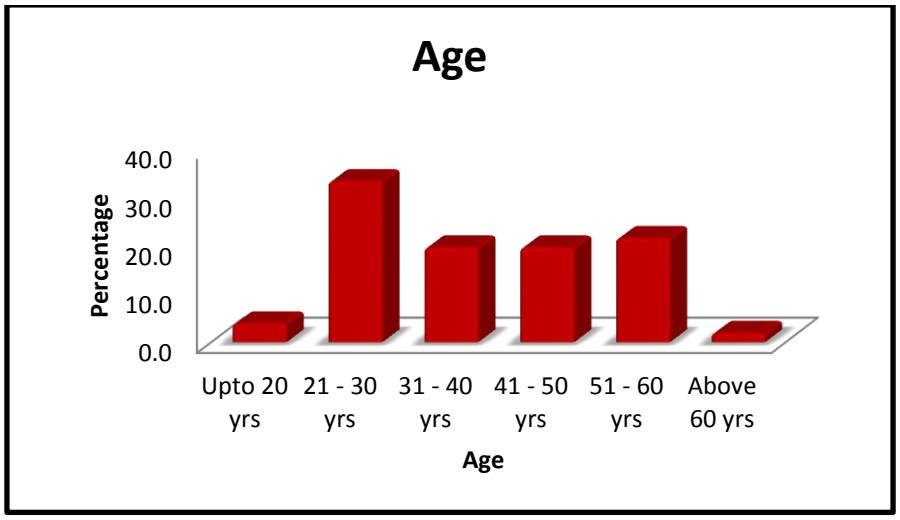
AGE DISTRIBUTION

In the present series the youngest patient was 19 yrs of age and the oldest was 60 yrs of age. Majority of the patients in the present series were in the age group of 21-30 yrs of age

TABLE 10: Showing the age wise distribution of cholelithiasis.

Age			
		Frequency	Percent
	Upto 20 yrs	2	3.9
	21 - 30 yrs	17	33.3
	31 - 40 yrs	10	19.6
	41 - 50 yrs	10	19.6
	51 - 60 yrs	11	21.6
	Above 60 yrs	1	2.0
	Total	51	100.0

FIGURE 17: Graph showing age wise distribution of cholelithiasis.



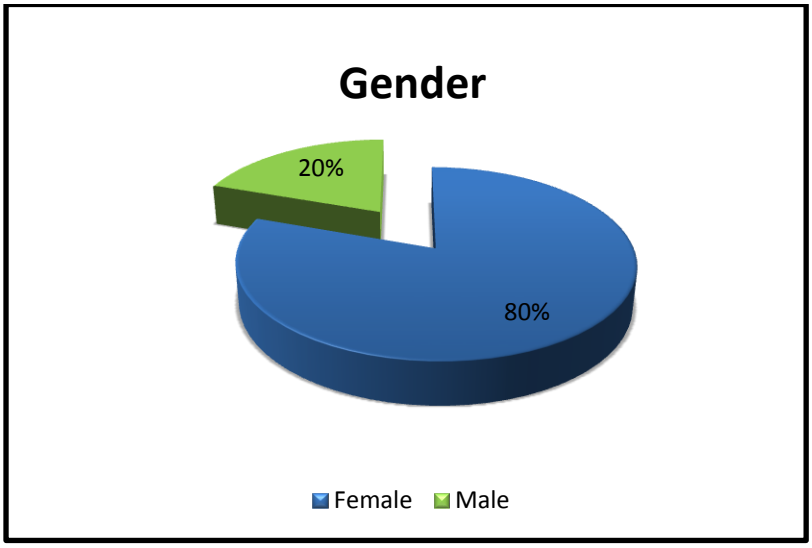
SEX DISTRIBUTION

Out of 51 patients 41 were females and 10 were male patients. The male:female ratio is 4:1

TABLE 11: Showing sex wise distribution of cholelithiasis

SEX			
		Frequency	Percent
	Female	41	80.4
	Male	10	19.6
	Total	51	100.0

FIGURE 18: Pie diagram showing sex wise distribution of cholelithiasis



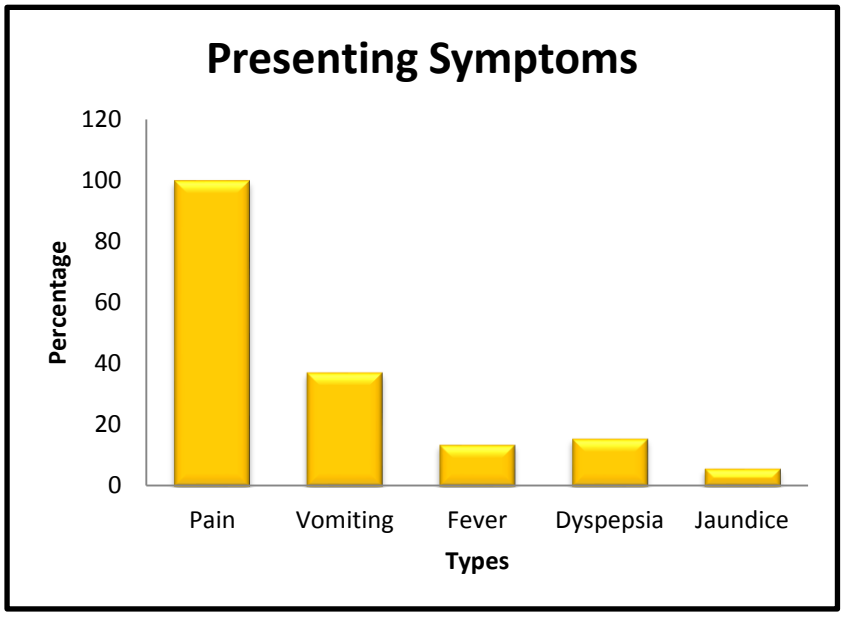
PRESENTING SYMPTOMS

Pain was the predominant symptom seen in all 51(100%) patients. Vomiting was present in 19 (37.3%) of the patients with pain. 3(5.9%) patients had jaundice and 8(15.7%) patients had dyspepsia.

TABLE 12: Showing presenting symptoms

Presenting symptoms			
		Frequency	Percent
	Pain	51	100
	Vomiting	19	37.3
	Fever	7	13.7
	Dyspepsia	8	15.7
	Jaundice	3	5.9

FIGURE 19: Graph showing presenting symptoms



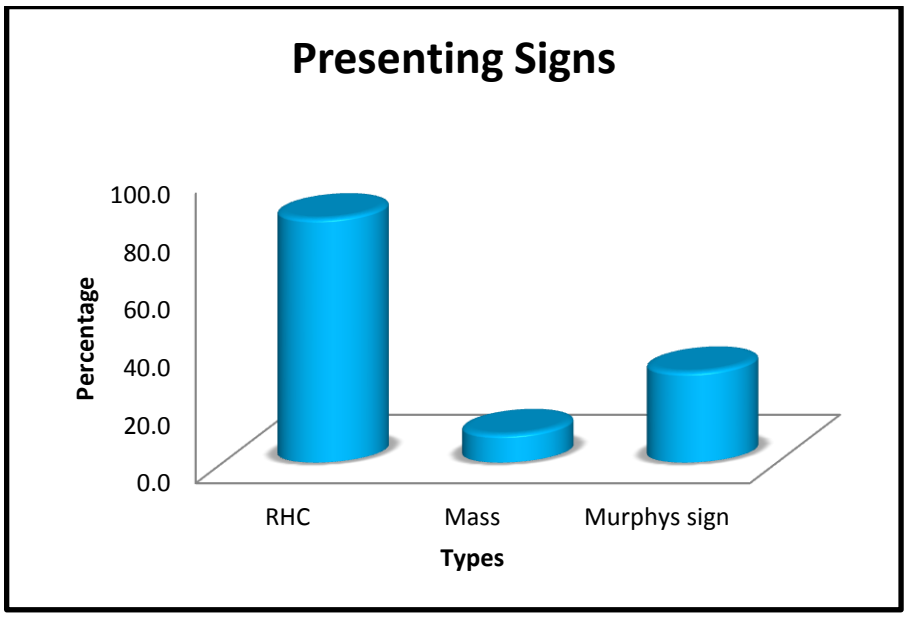
PRESENTING SIGNS

Tenderness in right hypochodrium was present in 43(84.3%) patients, Guarding and rigidity in 16 (31.4%) patients and a mass was palpable in 5 (9.8%) patients.

TABLE 13: Showing presenting signs

Presenting signs			
		Frequency	Percent
	RHC	43	84.3
	Mass	5	9.8
	Murphys sign	16	31.4

FIGURE 20: Graph showing presenting signs



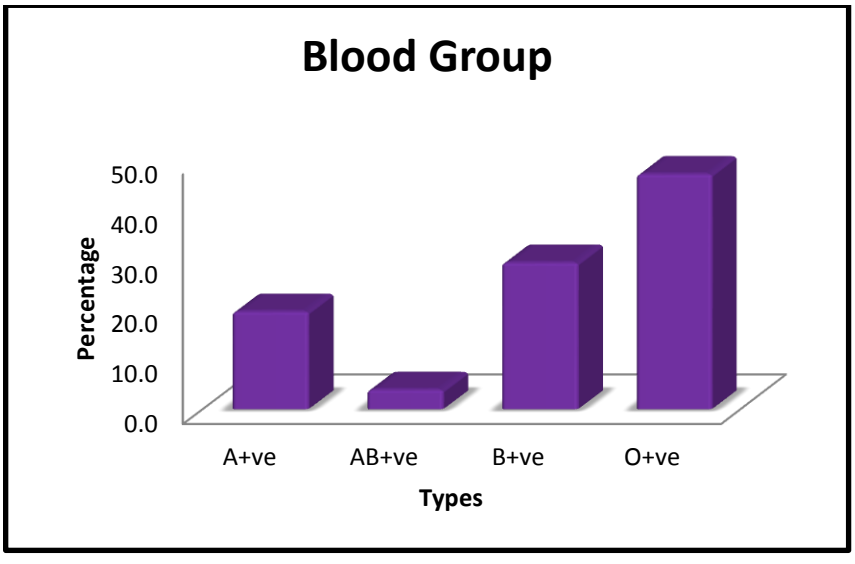
CORRELATION WITH BLOOD GROUP

Of the 51 patients 24 patients had of blood group ‘O’, 15 patients had of blood group ‘B’, 10 patients had of blood group ‘A’ and 2 patients had blood group AB.

TABLE 14: Showing correlation with blood group

Blood group			
		Frequency	Percent
	A+ve	10	19.6
	AB+ve	2	3.9
	B+ve	15	29.4
	O+ve	24	47.1
	Total	51	100.0

FIGURE 21: Graph showing correlation with blood group

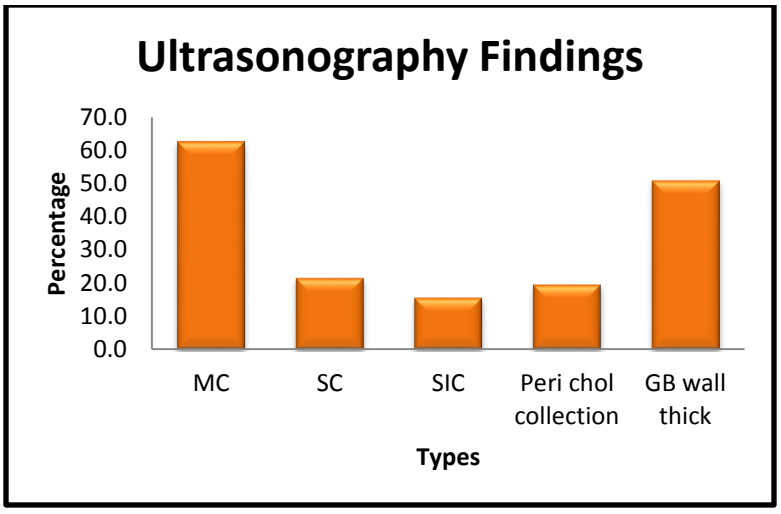


ULTRASONOGRAPHY.

TABLE 15: Showing ultrasonography findings

ultrasonography findings			
		Frequency	Percent
	MC	32	62.7
	SC	11	21.6
	SIC	8	15.7
	Peri chol collection	10	19.6
	GB wall thick	26	51.0

FIGURE 21: Graph showing correlation with USG finding



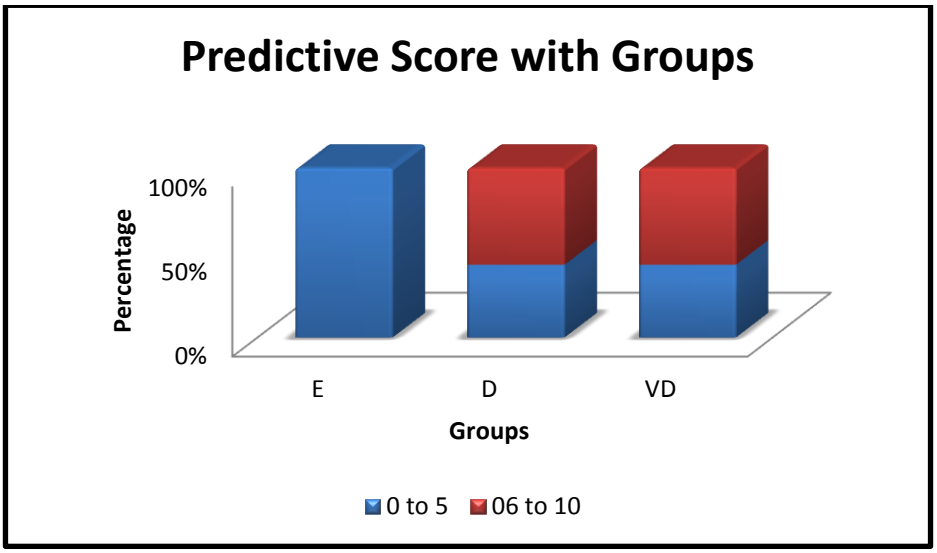
All the 51 patients had stones in gallbladder, 32 patients had multiple calculi, 11 had solitary calculi and 8 had solitary impacted calculi. , 26 patients had wall thickening and 10 had pericholecystic collection

CORRELATION OF PREDICTIVE SCORE AND THE GROUP

TABLE 16: Showing correlation of predictive score with groups

Predictive Score with Groups							
			Groups			Total	P-value
			E	D	VD		
Predictive Score	0 - 5	Count	37	3	3	43	0.0005 **
		% of Total	72.5%	5.9%	5.9%	84.3%	
	6 - 10	Count	0	4	4	8	
		% of Total	0.0%	7.8%	7.8%	15.7%	
Total		Count	37	7	7	51	
		% of Total	72.5%	13.7%	13.7%	100.0%	
** Highly Significant at P < 0.01 level							

FIGURE 23: Graph showing correlation of preop score and the outcome



SCORING FACTORS AND EASY/DIFFICULT CRITERIA-ANNEXURE II/III

ANALYSIS OF PRE-OPERATIVE OUTCOME WITH THE RISK FACTORS

TABLE 17:Showing the analysis of pre-operative outcome with the risk factors

Analysis of pre-operative outcome with the risk factors					
RISK FACTORS		Groups			P-value
		E	D	VD	
Age	<=50yrs	28	5	6	0.801 #
	> 50 yrs	9	2	1	
SEX	F	30	5	6	0.781
	M	7	2	1	
BMI	<=25	26	1	1	0.0005 **
	25.1- 27.5	10	2	0	
	> 27.5	1	4	6	
Surgery	No	23	4	4	0.948 #
	Yes	14	3	3	
GB wall thick	No	24	1	0	0.001 **
	Yes	13	6	7	
Peri chol collec	No	32	5	4	0.163 #
	Yes	5	2	3	
Impacted stone	No	35	5	4	0.014 *
	Yes	2	2	3	
Hospital stay	No	37	5	6	0.008 **
	Yes	0	2	1	
** Highly Sig P < 0.01, * Sig P < 0.05 and # No Sig P > 0.05					

if $p < 0.05$ significant and $p < 0.01$ Highly significant if $p > 0.05$ no significant D-Difficult, E-Easy, VD-very difficult, P value-Predictive value. In the present study prior hospitalization, BMI >27.5, Thick GB wall,impacted stones were significant predictors of difficult laparoscopic cholecystectomy. Fischer exact test was used to find the significant association of findings of preoperative score with per operative outcome.

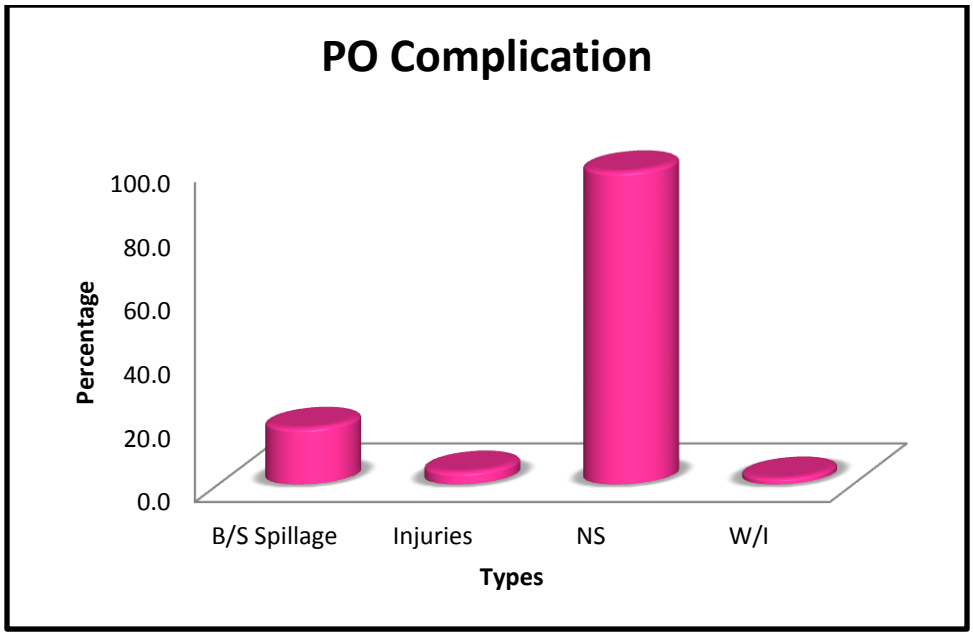
POST-OPERATIVE COMPLICATION

Only 1 patient had infection of the epigastric port site which require cleaning and dressing;9 had biliary/stone spillag eand 2 had injuries.98%of patients had no significant complication.

TABLE 18: Showing postoperative complications

PO Complication			
		Frequency	Percent
	B/S Spillage	9	17.6
	Injuries	2	3.9
	NS	50	98.0
	W/I	1	2.0

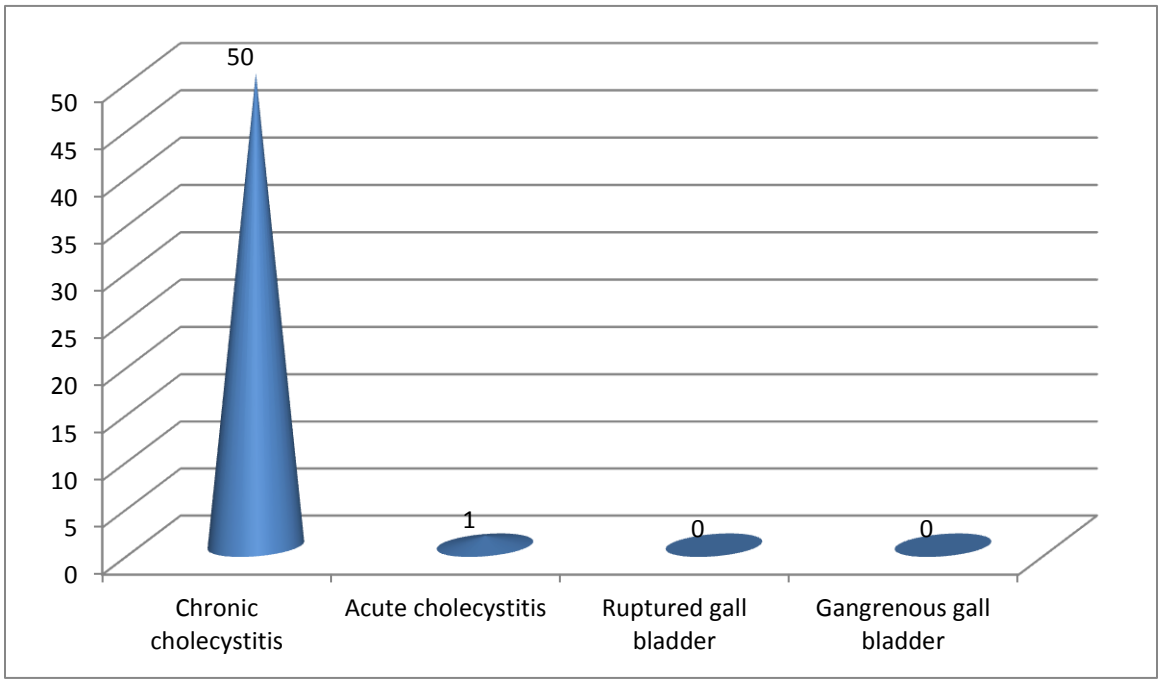
FIGURE 24: Graph showing post operative complication



HISTOPATHOLOGICAL EXAMINATION

50 cases were reported as chronic cholecystitis, while one was reported as acute cholecystitis. No case of malignancy of the GB was detected

HISTOPATHOLOGIC EXAMINATION	NO. OF CASES
Chronic cholecystitis	50
Acute cholecystitis	1
Ruptured gall bladder	0
Gangrenous gall bladder	0



DISCUSSION

AGE DISTRIBUTION

In my study majority of the patients in the present series were in the age group of 21-30 yrs of age, and 80% 0f the patients came under the age group from 31-60 years

According to my study age is not a significant predictor since majority of the patients had easy cholecystectomy irrespective of age

SEX DISTRIBUTION

In the present series, out of 51 patients 41 were females and 10 were male patients. The male : female ratio is 1:4.

Endogenous estrogen and progestin are attributed to this phenomenon

Sex is not a significant predictor in my study

PRESENTING SYMPTOMS

PAIN

Pain was the predominant symptom seen in all 51 patients. All the 51 patients presented with chronic recurring pain. In 82% (41) of patients pain was in the right hypochondrium. Of the 41 patients, 72% (36) patients had colicky type of pain, 28%(14) patients had gripping type of pain and 18% (9) patients had dull

aching type of pain. In 18% (9) patients, pain was in epigastrium predominantly. Radiation of pain to back was seen in 28%.

No asymptomatic patients in my study group

VOMITING

Vomiting was present in 38% (19) of the patients with pain. Vomiting was spontaneous and occurred mostly during the attack of pain. It indicates severity of disease in my study group

JAUNDICE

Jaundice was present in 3 patient, which was obstructive in nature associated with pain and fever, The patient underwent ERCP with CBD stenting. It was followed by cholecystectomy after 6 weeks which was easy as predicted.

It stated that 6 weeks duration required to settle inflammation significantly.

DYSPEPSIA

Dyspepsia was present in 8 (15.7%) of the patients. On endoscopy 3 of them had duodenal ulceration.

Dyspepsia of another cause may coincide with cholelithiasis FEVER

Fever was present in 7 (13.7%) of the patients which was of moderate degree and was associated with chills.

In my study patients with fever invariably associated with increased gall bladder wall thickness and pericholecystic fluid collection those patients had difficult cholecystectomy, hence fever is a strong predictor of difficulty

PAST HISTORY

Of the 51 patients, 14 had undergone tubectomy, 2 had undergone LSCS, 1 had undergone appendicectomy, and 1 had undergone hysterectomy. 1 patient presented with obstructive jaundice due to CBD calculus, and he underwent ERCP with CBD stenting. 2 patients had attack of acute cholecystitis which required hospitalization and were managed conservatively. One patient had acute pancreatitis and was treated conservatively with hospitalization.

Previous surgeries didn't affect the per operative outcome significantly, since patients in my study underwent lower abdominal surgeries rather than upper abdominal surgeries

According to my study patients with history of previous hospitalisation had difficult cholecystectomy, hence it is a significant predictor of difficulty

PERSONAL HISTORY

Only 2 patients in the present series were purely vegetarian in their diet, while the remaining had mixed dietary habits. 9(60%) of the 15 male patients consumed alcohol regularly.

None of the female patients consumed alcohol. It stated that Alcohol is a important risk factor

FAMILY HISTORY

None of the patients in the present series had a family history of cholelithiasis.

GENERAL PHYSICAL EXAMINATION

General survey revealed that 28(54%) patients had BMI < 25, 12 (22%) had BMI in the range of 25-27.5, and 11 (24%) had BMI >27.5

Among 12 patients 4 patients were hypertensive and 2 were diabetic. 1 patient had LRI . 1 patient was a known case of hypothyroidism and was on thyroid hormone supplementation.

On inspection, scar due to previous surgery was seen in 17(34%) of the patients. Out of this all were infraumbilical scar.

According to my study Obese patients had difficult cholecystectomy and BMI is a strong predictor and obesity associated with other co morbid conditions

like diabetes and hypertension

PRESENTING SIGNS

Tenderness in right hypochondrium was present in 40(80%) patients. guarding and rigidity was present in 2(4%) patients Murphy's sign was present in 11(22%) patients. Mass was palpable in 2(4%) patients

Guarding and rigidity with mass was a sign of acute inflammation, associated with ultrasonagram findings favour for difficult cholecystectomy.

INVESTIGATION

Routine biochemical and hematological investigations like Hb%, Urine examination, Blood grouping, B.urea, S.ceatinine, RBS and LFT were done in all cases.

Hb% of patients ranged from 10 to 13 gm%. FBS and PPBS were done for diabetic patients. B.urea and S.creatinine were within normal limits.

One patient had deranged LFT with raised SGOT and SGPT levels. Majority of patients in present series belonged to Blood group 'O' constituting about 47.1%, 29.4% and 19.6% had blood group 'B' and 'A' repectively, Only 3.9% had blood group 'AB'.

Patient with deranged LFT had CBD stone, that patient sudjected to ERCP and after 6 weeks interval cholecystectomy done which was easy

It stated that Gall stone disease with deranged LFT need further investigation and delayed cholecystectomy also influences the per operative outcome

ULTRASONOGRAPHY

Ultrasound was done as a routine investigation in all the patients. The sonologic criteria used to diagnose gall stones were acoustic shadowing of the opacities in the gall bladder and change in the position of the opacity with the change in patient position.

All the 51 patients had stones in gallbladder, 26 patients had wall thickening and 10 had pericholecystic fluid collection.

32 patients had multiple calculi, 11 had solitary calculus and 8 had solitary impacted calculi.

As per my study GB wall thickness and pericholecystic fluid collection are strong predictors of difficulty

EVALUATION OF PREDICTIVE FACTORS FOR DIFFICULT LAPAROSCOPIC CHOLECYSTECTOMY:

The factors included were age, sex, prior H/O hospitalization for acute cholecystitis/ biliary pancreatitis/ obstructive jaundice due to CBD calculus, BMI, abdominal scar due to previous surgery, clinically palpable GB, wall thickness, pericholecystic fluid collection, impacted stone.

CORRELATION OF PRE-OP SCORE AND THE OUTCOME

Out of the 6 patients lap converted to open in 6 patients since 5 had extensive adhesions, another 1 had mass formation

The positive predictive value was 100% and negative prediction value was 86.05%, sensitivity was 67.14%, specificity was 100%.

Conversion rate from lap. cholecystectomy to open cholecystectomy was 10% in the present series.

POST-OPERATIVE TREATMENT

a. Nasogastric aspiration till the patient recovered from the postoperative ileus evidenced from appearance of bowel sounds and passage of flatus.

b. I-V fluids continued till oral liquid diet was started, ie following removal of Ryle's tube.
c. Broad spectrum antibiotic for 5 days
d. Analgesics as and when required
e. Drainage tube was removed between 1st and 5th post OP day.

POST-OPERATIVE COMPLICATION

Only 1 patient had infection of the epigastric port site which required clean and dressing daily. It healed by secondary intention.

As per my study all patients received better post operative care, Since Difficulties predicted already major complications avoided

HISTOPATHOLOGICAL EXAMINATION

49 cases were reported as chronic cholecystitis (includes acute on chronic), while 2 were reported as acute cholecystitis. No case of malignancy of the GB was detected

FOLLOW UP

All patients were followed up for a period of 1 month and no significant complication was noted.

CONCLUSION

According to my study

1. Age and sex of the patients are not a significant predictors
2. The incidence of gall stones was found to be more in patients with blood group O
3. Pain was the predominant symptom seen in all (100%) the patients.
4. BMI ($p<0.001$)is a strong significant predictor, obesity associated with other co morbid conditions also
5. Previous history of hospitalisation ($p<0.0008$) for acute cholecystitis, acute pancreatitis, and obstructive jaundice are significant predictors of difficult lap cholecystectomy.
6. Previous surgeries not a significant predictor
7. Alcohol is a important risk factor in gall stone disease
8. Palpable GB ($p<0.0364$) is a significant predictor
9. USG findings of GB wall thickness, ($p<0.001$) is strong predictors of difficult surgery.
10. The conversion rate from laparoscopic cholecystectomy to open cholecystectomy was 10%
11. The incidence of port site infections was 2%
12. Histopathological examination revealed chronic cholecystitis in 98% of cases and acute cholecystitis in 2%.

In the present study, BMI >27.5 (P<0.001), history of prior hospitalization (P<0.0008) impacted stone (P<0.014) were significant predictors of difficult laparoscopic cholecystectomy. The positive predictive value was 100% and negative prediction value was 86.05%, sensitivity was 67.14%, specificity was 100%.

SUMMARY

Cholelithiasis is the most common biliary pathology. Gall stone are present in10 to 15% of the general population and asymptomatic in the majority of them, of about >80%. Approximately 1-2% of asymptomatic patients will develop symptoms requiring cholecystectomy every year, making it one of the most common operations performed.

In 1992, The National Institute of Health (NIH) consensus development Conference stated that laparoscopic cholecystectomy "Provides a safe and effective treatment for most patients with symptomatic gallstones".

In about 5 to 10% of the cases of laparoscopic cholecystectomy, conversion to open cholecystectomy may be needed for safe removal of gallbladder.

Therefore it is necessary to analyse the risk factors that predict difficult laparoscopic cholecystectomy.

The following risk factors were considered- age>50 years, male sex, H/O prior hospitalization for acute cholecystitis/ biliary pancreatitis, BMI 25-27.5 and >27.5, abdominal scar, palpable GB, wall thickening, impacted stone, and

pericholecystic collection. Out of this BMI >27.5, H/O prior hospitalization for acute cholecystitis/acute pancreatitis, palpable GB, wall thickening, impacted stone, and pericholecystic fluid collection were significant predictors of difficult laparoscopic cholecystectomy, as per present study.

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ANNEXURE-I PROFORMA

NAME	IP NO
AGE	DOA
SEX	DOO
RELIGION	DOD

OCCUPATION ADDRESS

I. PRESENTING COMPLAINTS

A. PAIN

B. FLATULENT DYSPEPSIA

C. NAUSEA AND VOMITING

D. JAUNDICE

E. APPETITE

F. FEVER

G. MASS PER ABDOMEN

H. BOWEL HABITS

II. HISTORY OF PRESENTING ILLNESS

a. PAIN

Site Duration Character Radiation

Relation to Food

Aggravating and relieving factors

b. FLATULENT DYSPEPSIA

Epigastric discomfort Belching

Heart burn

c. NAUSEA AND VOMITING Frequency

Character (whether bilious or not) Relief after vomiting

Relationship to food

d. JAUNDICE

Mode of onset (gradual or sudden) Intermitent or persistent Duration

Progression/Painless Or Painful/Depth High coloured urine

Pruritis

e. APPETITE

Dislike for fatty foods

f. FEVER

Intermitent with rigors

g. MASS PER ABDOMEN Site

Duration

Association with pain

h.BOWEL HABITS

Colour of stools (white or clay coloured stools) Constipation

III. PAST HISTORY

H/O similar complaints in the past

H/O of acute cholecystitis and previous hospitalisation H/O jaundice

H/O ocp ingestion

H/O previous surgery or ERCP

IV.PERSONAL HISTORY

Appetite Sleep Diet

Bowel/Bladder Habits Menstrual H/O No of children

V.FAMILY HISTORY

H/O Any family members suffering from similar complaints Family H/O DM, HTN

VI. GENERAL PHYSICAL EXAMINATION BMI

Pulse BP Temperature Pallor Icterus Cyanosis Clubbing Koilonychia Lymphadenopathy Pedal Edema

VII. PER-ABDOMEN EXAMINATION

INSPECTION

Contour

Movement with respiration

Skin

Visible swelling

Visible peristalsis

Umbilicus

Site Size

Shape Borders

Surface

Operative scars/ Sinuses/ Dilated veins/ Visible pulsations Hernial orifices

External genitalia

PALPATION

Tenderness Murphy's sign Boa's sign

Palpable mass

Present/ Absent: if present Tenderness

Local rise of temperature

Site Surface Mobility

Border

Plane of the swelling Consistency

Movement with respiration

Other masses

PERCUSSION

Liver dullness and span

Percussion note over the mass (if present) Shifting dullness

AUSCULTATION

Bowel sounds BACK

PV/PR

VII.SYSTEMIC EXAMINATION

Cardiovascular system

Respiratory system

Nervous system

INVESTIGATIONS

Hb% BT, CT

Total count and Differential count ESR

Urine Albumin

Sugar Microscopy

Bile salts/ Bile pigments

FBS

B. Urea

S. Creatinine Blood group

PT-INR LFT

Total bilirubin Direct bilirubin SGOT

SGPT

Albumin

Alkaline phosphatase

ECG

Ultrasound abdomen

Stone or Sludge Impacted stone Post ERCP status

Wall thickness Pericholecystic collection

CBD & intrahepatic biliary radicals

Portal vein Liver

DIAGNOSIS

OPERATIVE DETAILS

Anaesthesia Time taken

Bile/stone spillage Injury to duct/artery Conversion to open

Reason for conversion

POST-OPERATIVE PERIOD

Drain removal Suture removal

Wound infection/ hemarrhage / Bile leak / Prolonged ileus / Retained stone

FOLLOW UP

All patients were followed up for a period of one month.

ANNEXURE-II SCORING FACTORS

HISTORY			**MAX. SCORE**
AGE	<50y(0)	>50y(1)	1
SEX	Female(0)	Male(1)	1
H/O HOSPITALIZATION	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-imbilical(1) Supra-umbilical(2)	1
PALPABLE GB	N (0)	Y (1)	1
SONOGRAPHY			
WALL THICKNESS	Thin (0)	Thick >4mm(2)	2
PERICHOLECYSTIC COLLECTION	N (0)	Y (1)	1
IMPACTED STONE	N (0)	Y (1)	1

TOTAL MAXIMUM SCORE - 15

N – NO, Y – YES, H/O - HISTORY OF.

ANNEXURE-III EASY/DIFFICULT CRITERIA

EASY	Time taken <60 min No bile spillage No injury to duct, artery
DIFFICULLT	Time taken 60-120 min Bile/stone spillage Injury to duct No conversion
VERY DIFFICULT	Time taken >120 min Conversion

KEY TO MASTER CHART

Alb	-Albumin		
ALP	-Alkaline Phosphatase		
Age(yrs)	-Age in Years		
Appen.	-Appendicectomy	Acute Cho.	-Acute cholecystitis
Br.Asthama	-Bronchial Asthama	BMI	-Body Mass Index
BiT	-Total Bilirubin		
BiD	-Direct Bilirubin	B/S Spillage	-Bile/Stone Spillage
CBD	-Common Bile Duct		
D	-Difficult Category		
DM	-Diabetes Mellitus		
E	-Easy Category		
Epg	-Epigastrium		
ERCP	-Endoscopic Retrograde Cholangiopancreatography		
F	-Female		
GB	-Gall Bladder		
GDM	-Gestational Diabetes Mellitus		
GPE	-General Physical Examination		
Hysterect.	-Hysterectomy		
Hb	-Haemoglobin		
HTN	-Hypertension		

Lap. LFT	-Laparoscopy
LSCS	-Liver Function Test
	-Lower Segment Caesarean Section
M	-Male
M/C	-Multiple Calculi
Mi	-Mixed diet
NS	-Nothing Significant
N	-Normal
P/A	-Per Abdomen
PT-INR	-Prothrombin International Normalized Ratio
POD	-Post Operative Day
RHC	-Right Hypochondrium
S/C	-Solitary Calculus
S/I/C	-Solitary Impacted Calculus
SGOT	-Serum Glutamic Oxaloacetic Transaminase
SGPT	- Serum Glutamic Pyruvate Transaminase
Sl.No.	-Serial Number
Splenec.	-Splenectomy
TP	-Total Protein
V	-Vegetarian Diet
VD	-Very Difficult Category

W/I	-Wound Infection
+	-Present
-	-Absent

S. No	Name	Age	SEX	IP No.	Pain				Vomiting	Fever	Dyspepsia	Past History			Personal History		GPE	P/A	Palpation			Hb	Blood g	LFT	USG			Lap Cholecystectomy details						LapChole Cat
					Duration	Location	Character	Radiation				Jaund	Surgery	Co Morb	Alcohol	Diet	BMI	Inspection	Tendern	Mass	murphys s				No of calculi	GB w	Peri c	Adhes	Time tak	B/S Sp	Injurie	Conve	Post op p	Predictiv	
1	Sasaiya	47	M	32131	4y	EPI	dull	-	+	-			A/c Pancrea		+	mi	24.81	Nad	RHC			11.2	A+ve	N	MC	+		+	HR 5 mi	-	-	-	NS	7	D
2	Kavitha	34	F	46035	6m	RHC	Colicky	Back	+							mi	20.16	Nad	RHC			11.6	O+ve	N	MC				45min	-	-	-	NS	1	E
3	Trisha	25	F	56168	1y	RHC	Colicky	Back								mi	22.06	Nad	RHC			10	A+ve	N	MC	+		+	40min	-	-	-	NS	2	E
4	Sivakami	24	F	59048	6m	RHC	Gripping		+							mi	27.65	Nad	RHC	+	+	12	B+ve	N	SIC	+			1hr	+	-	-	NS	5	D
5	Rajeshwari	27	F	44760	1y	RHC	Colicky	Back	+		+		Iscs Tubectomy			mi	17.48	Scar +	RHC			10.2	B+ve	N	MC	+		+	50min	-	-	-	NS	3	E
6	Sumathi	39	F	43605	1y	RHC	Colicky	-	+				Tubectomy			Veg	22.18	Scar +	RHC		+	10.6	O+ve	N	SIC	+	+	+	55min	-	-	-	NS	5	E
7	Inbavathi	27	F	47761	4m	EPI	dull				+		tubectomy			mi	24.75	Scar +	EPI			11	A+ve	N	MC			+	50min	-	-		NS	2	E
8	Ramsekar	17	M	32769	6m	RHC	Colicky	-	+					DM, HT	+	mi	25.16	Nad	RHC	-	+	11	A +ve	N	MC	+	-	+	50min	+	-	-	NS	5	D
9	Dilshad Begum	26	F	40084	8m	RHC	Colicky	Back	-	+			A/c cholecystitis			mi	34.24	Nad	RHC	+		11.6	A +ve	N	SIC	+		+		-	+	+	NS	10	VD
10	Vijayalakshmi	36	F	39468	5m	RHC	Colicky									mi	24.15	Nad	RHC			10.4	O+ve	N	MC				40min	-	-		NS	1	E
11	Mariyammal	35	F	38878	6m	RHC	Colicky									mi	19.53	Nad	RHC			10.8	O +ve	N	SC	+			40 min		-	-	NS	2	E
12	Arokyamary	75	F	40520	5M	EPI	dull			+		+	Tubectomy			mi	26.09	Scar +	EPI			10	B +ve	N	MC			+	50 min	-			NS	2	E
13	Gothainapage	29	F	8721	5m	RHC	Colicky						Tubectomy			mi	24	Scar +	RHC		+	10	O+ve	N	MC				40min	-	-	-	NS	1	E
14	Amsa	25	F	38097	6m	RHC	Colicky	Back						htn		mi	22.49	Nad	RHC		+	10.8	A +ve	N	SC			+	55min	-	-	-	NS	0	E
15	Uma Maheshwari	30	F	39710	8m	RHC	Colicky	Back	+	+	-	+	ERCP	dm		mi	28.9	Nad				10	B+ve	N	SIC	+	-	+	1hr 15mi	+	-	-	NS	8	VD
16	Vijaykumar	60	M	38198	6m	RHC	Colicky								+	mi	20.06	Nad	RHC			12.8	O+ve	N	MC	-			40min	-	-	-	NS	1	E
17	Jeyachandran	54	M	57259	1y	RHC	Colicky								+	mi	22.47	Nad	RHC			11	O+ve	N	SC	+			45min		-	-	NS	2	E
18	Thangaraj	45	M	27626	3m	RHC	Colicky						Appendicectomy			mi	25.39	Scar +	RHC			12	B +ve	N	MC			+	55min	-	-	-	NS	5	E
19	Renuka	45	F	46741	6m	RHC	Colicky									mi	26.06	Nad	RHC			10.5	B+ve	N	MC				45min		-	-	NS	1	E
20	Ramya	19	F	32769	4m	RHC	Colicky									mi	19.53	Nad	RHC			11.6	B +ve	N	MC		+		45min	-	-	-	NS	2	E
21	Preetha	60	F	42453	7m	RHC	Colicky		+							mi	28.88	Nad	RHC	+	+	10.6	O+ve	N	SC	+		+		-	-	+	NS	5	VD
22	Mohana	40	F	28537	8m	RHC	Colicky				+	-	Tubecto	HTN		mi	25	Scar +	RHC			9.6	A +ve	N	MC				55 min	-	-	-	NS	3	E
23	Govind	54	M	46306	1y	RHC	Colicky	Back	+		+					mi	24.08	Nad	RHC		+	11	B+ve	N	SC			+	55min	+	-	-	NS	1	E
24	Jamaliya	22	F	34853	9m	RHC	Colicky	Back								mi	17.96	Nad	RHC			10.6	B +ve	N	MC	+			40min		-	-	NS	1	E
25	Mani	30	M	12471	6m	RHC	Colicky	Back								mi	23.12	Nad	RHC			12	O +ve	N	MC	+			45 min	-	-	-	NS	2	E
26	Kanniyamma	30	F	2839	2y	EPI	dull				+			DM, HTN		mi	28.57	Nad	EPI			11	O+ve	N	MC				55min	-	-	-	NS	3	E
27	Chellamma	60	F	32898	6m	RHC	Colicky		+						+	mi	25.22	Nad	RHC		+	11.8	O +ve	N	SC	+		+	55min	-	-	-	NS	3	E
28	Kavitha	60	F	33311	5m	RHC	Colicky									mi	20.93	Nad	RHC			10.6	O +ve	N	MC	+	+	+	55min	+	-	-	NS	5	E
29	Anjalam	51	F	10020	5m	EPI	dull					+	Hysterectomy			mi	20.44	Scar +	EPI			11	B +ve	N	MC				55min	-	-	-	NS	1	E
30	Thahira Begam	50	F	31517	1y	EPI	dull				+		Tubectomy			mi	20.44	Scar +	EPI			10	B +ve	N	SC				40min	-	-	-	NS	1	E
31	Mumtaz Begum	43	F	30076	6m	RHC	Colicky		+	+						mi	25.77	Nad	RHC		+	11	A+ve	N	MC	+		+	50min	+	-	-	NS	2	E
32	Megala	30	F	29711	6m	RHC	Colicky									mi	25.39	Nad	RHC			11	O+ve	N	MC				45	-	-	-	NS	1	E
33	Velakanni	36	F	52028	6m	EPI	dull				+					mi	23.45	Nad	EPI			11	O+ve	N	SC	+			45min	-	-	-	NS	1	E
34	Habbebunnisa	57	F	25588	6m	RHC	Colicky						tubectomy			mi	20.54	Scar +	RHC			10.2	O+ve	N	SIC	+	+		40min		-	-	NS	4	E
35	Natrajan	43	M	7896	5m	RHC	Colicky								+	mi	27.34	Nad	RHC			12	A+ve	N	MC				50min	-	-	-	NS	2	E
36	Sagayam	31	F	20513	6m	RHC	Colicky									mi	22.63	Nad	RHC			11	A+ve	N	MC				40min	-	-	-	NS	1	E
37	Nandhini	23	F	1614	4m	RHC	Colicky		+							mi	24.16	Nad	RHC			12	O+ve	N	MC	+		+	55min	-	-	-	NS	3	E
38	Saraswathi	34	F	20966	5m	RHC	Colicky									mi	25.82	Nad	RHC			10.5	O+ve	N	SC				45min	-	-	-	NS	2	E
39	Bala Ambiga	43	F	27981	6M	RHC	Colicky	Back	+				Tubectomy			Veg	28.06	Scar +	RHC		+	11	B+ve	N	MC	+			1HR	+	-	-	NS	6	D
40	Brinda	23	F	20470	1Y	RHC	Colicky						a/c cholecystitis			mi	27	Nad	RHC	+	+	11	O+ve	N	SIC	+	+		1hr 5mir	-	-	-	NS	10	D
41	Vijayalakshmi	42	F	19896	7m	RHC	Colicky						Tubectomy			mi	20.88	Scar +	RHC			10	B +ve	N	MC		+		40min		-	-	NS	2	E
42	Jennifer	25	F	16657	5m	RHC	Colicky						Tubectomy			mi	27.34	Scar +	RHC			11	O+ve	N	sc				55min		-	-	NS	2	E
43	Kanchana	52	F	23852	8m	EPI	dull				+		tubectomy			mi	27.91	Scar +	EPI			10	O+ve	N	MC			+	1hr10mir	-	-	-	NS	3	D
44	Kasthuri	55	F	8437	4m	RHC	Colicky	Back	+							mi	30.61	Nad	RHC		+	10	O+ve	N	SIC	+	+	+	1hr	+	-	-	NS	6	D
45	Uma Maheshwari	35	F	5110	7m	RHC	Colicky	Back	+	+						mi	28.88	Nad	RHC		+	10.6	AB+ve	N	MC	+		+			+	+	W/I	4	VD
46	Parvathy	60	F	47463	6m	RHC	Colicky						tubectomy			mi	25.42	Scar +	RHC			10	O+ve	N	MC				45min	-	-	-	NS	3	E
47	Revathy	23	F	47209	4m	RHC	Colicky		+	+						mi	23.55	Nad	RHC	+	+	11	O+ve	N	SIC	+	+	+		-	-	+	NS	4	VD
48	Nafiya	31	F	43009	1y	RHC	Colicky	Back	+	+			LSCS tubectomy			mi	30.08	Scar +	RHC		+	11	B+ve	N	MC	+	+	+		-	-	+	NS	10	VD
49	Balaji	30	M	41784	1y	RHC	Colicky	Back	+						+	mi	28.71	Nad	RHC		+	12	AB+ve	increased	MC	+	+	+		-	-	+	NS	7	VD

50	Arunachalam	47	M	28574	6m	RHC	Colicky								mi	21.06	Nad	RHC			12.4	B +ve	N	SC				45min	-	-	-	NS	2	E
51	kokila	43	F	37892	4m	RHC	Colicky		+				Tubectomy		mi	24	Scar +	RHC			10.6	O+ve	N	MC				55	+			NS	2	E