

**INTRA OPERATIVE GALLBLADDER SCORING PREDICTS  
CONVERSION OF LAPAROSCOPIC TO OPEN  
CHOLECYSTECTOMY: A PROSPECTIVE STUDY**

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Dissertation submitted to

**BLDE (Deemed to be University) Vijayapur, Karnataka**



In partial fulfillment of the requirements for the degree of

**MASTER OF SURGERY**

**IN**

**GENERAL SURGERY**

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KARNATAKA

2020

**“INTRA OPERATIVE GALLBLADDER**  
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MASTER OF SURGERY In GENERAL SURGERY

## **6.1.1 INTRODUCTION**

- Laparoscopic cholecystectomy is the surgical resection of the gall bladder through laparoscopy. It is the most common method used and preferred by the majority in elective and emergency surgery. Its well-known advantages are smaller incisions, less pain, and early return to work, has made it popular as compared to open.<sup>(1)</sup>
- Cholecystitis, both acute and chronic, has varying patients and sometimes difficult presentation. This is one of the commonest reasons for admission to hospital with considerable morbidity and mortality depending on the severity of gallbladder disease. quite often, Preoperative and intraoperative findings of the gallbladder are different.
- Hence in 2-15% of cases, conversion from laparoscopic to open cholecystectomy was necessary, which also proved safer.<sup>(2)</sup>
- The American association for the surgery of trauma (AAST) scoring system is valid and superior to the 2013 Tokyo classification as it included a greater number of grades of cholecystitis.<sup>(3)</sup>
- Intraoperative G10 scoring system is a scoring system for intraoperative cholecystitis severity which has 10-point and can predict conversion of cholecystectomy from laparoscopic to open.<sup>(4)</sup>

## **6.1.2 INTRAOPERATIVE GALLBLADDER SCORING TABLE**

• <b>SEVERITY OF CHOLECYSTITIS</b>	Score
• <b>APPEARANCE</b>	
• Adhesions < 50% of GB	1
• Adhesions > 50%, but GB buried	2
• Completely buried GB	3 (max)
• <b>Distension/contraction</b>	
• Distended GB or contracted shrilled GB	1
• Inability to grasp without decompression	1
• Stone > 1 cm impacted in Hartmann's pouch	1
• <b>Access</b>	
• BMI > 30	1
• Adhesions from previous surgery limiting surgery	1
• <b>Sepsis and complications</b>	
• Free bile or pus outside the gallbladder	1
• Fistula	1
• Total possible	10

cholecystectomy - easy < 2, moderate ( $2 \leq 4$ ), difficult ( $5 \leq 7$ ), extremely difficult ( $8 \leq 10$ ). completion of the procedure and conversion to open is predicted early intraoperatively.

## ANNEXURE II

### 6.2 Need for Study

- Laparoscopic cholecystectomy, declared as the gold standard procedure by the National Institute of Health in 1992. It has many advantages over open, but there are a few other factors yet to be scrutinised, which lead to better surgical choices, performances and clinical outcomes in procedure approach and intraoperative findings, morbidity, duration of surgery and readmission to hospital. The Tokyo guidelines 2018 has extended the capacity of the scoring-grading system and has indicated a few, safe steps, but it is yet to be validated. <sup>(5)</sup>
- cholecystectomy procedure cannot be completed in all patients through the laparoscope, and conversion to open is often required. The conversion rate for acute and chronic cholecystitis was reported in many series and ranged from 2 to 20%, with an average of 5%. <sup>(6)</sup>
- A number of publications have reported new scoring and grading systems <sup>(7)</sup>
- Few of these scores are derived on preoperative clinical findings and imaging but focus only on actual operative findings restricting their use. <sup>(8,9)</sup>
- Intraoperative cholecystitis scoring system is precise and quite reproducible in cholecystitis severity grading, and this scoring system is simple, easy to implement, and clinically and operatively relevant.

### **6.3 Aim and Objective of the study**

- **AIM:**

Intra-operative gallbladder scoring predicts the conversion of laparoscopic to open cholecystectomy.

- **OBJECTIVE:** To Assess the ability of the intra-operative scoring system in terms of

(1) Severity of cholecystitis

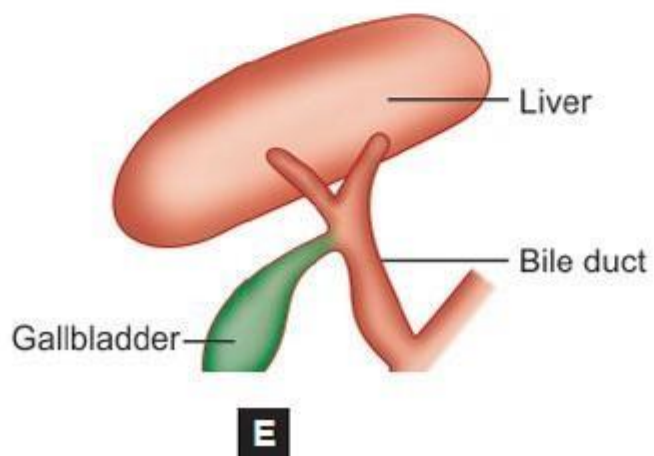
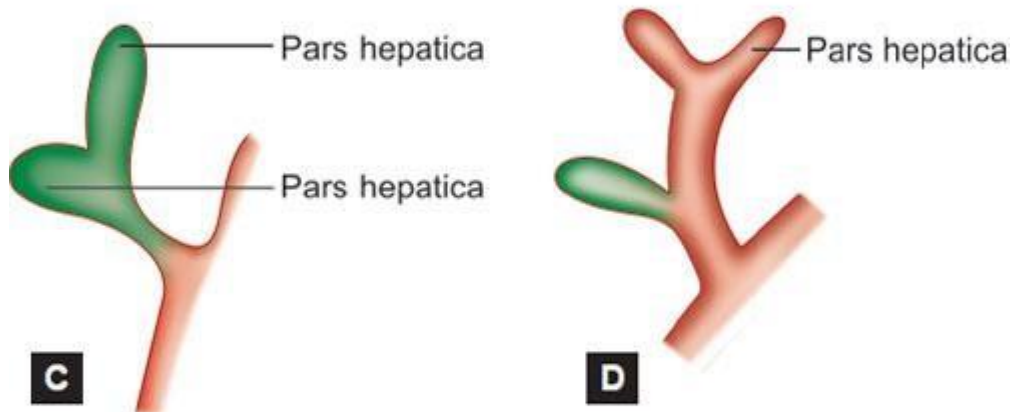
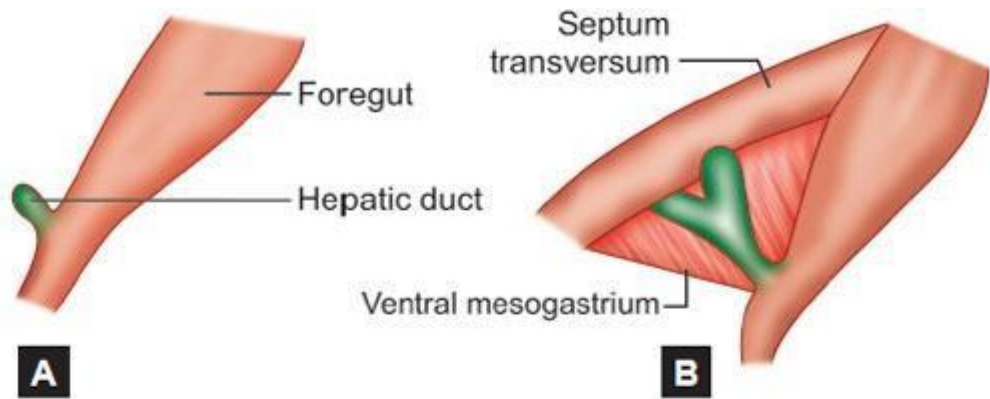
(2) difficulty of the procedure.

(3) Ability to estimate the necessity of the open cholecystectomy converting from laparoscopy.

# INTRODUCTION

## EMBRYOLOGY

- Hepatic bud is an endodermal derivative which arises from the gut at the junction of the foregut and midgut.  
This gives rise to liver and biliary passages.
- Liver primordium on the 25<sup>th</sup> day give rise to the hepatic diverticulum.
- the bile duct is seen between the duodenum and the hepatic diverticulum.
- **Pars cystica**-bile dgivesgive rise to pars cystica which forms the gallbladder and cystic duct.
- Hepatic bud proximal to the pars cystica gives rise to the bile duct.
- On the ventral side of duodenum bile duct opens initially.
- Later, The differential growth of the duodenum a causes shift of the bile duct open dorsomedial side. <sup>(10)</sup>





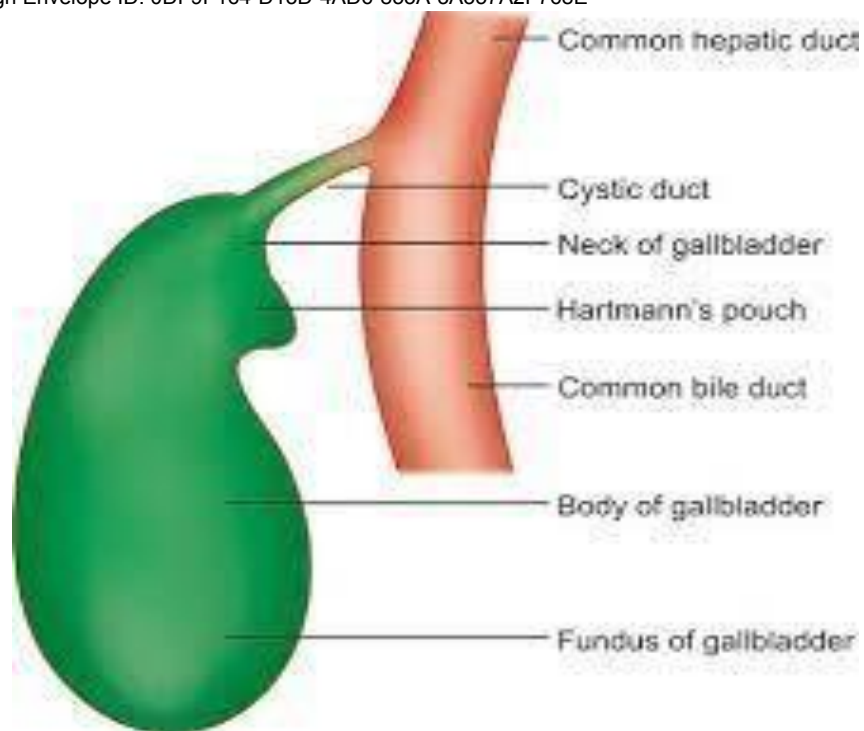
## ANATOMY

- The gall bladder is a pear-shaped, and acts as reservoir of bile.
- located in the visceral undersurface of segment of the right lobe of the liver segments IVB and V.
- **cystic plate** -attached to the liver by connective tissue of liver Glissons capsule.
- It is partly intra peritoneal, with the peritoneum covering the nonhepatic surface and fundus
- Visceral surface is related to the transverse colon and the first and upper part of the second part of duodenum
- Floating gallbladder- gallbladder has its own mesentery; its absence makes it floating/roving and can cause torsion and infarction
- Length-7cm to 10cm
- Width-2.5cm to 3.5cm
- Wall thickness 3mm
- Capacity-can hold 30-60ml of bile as reservoir. <sup>(11)</sup>

Parts of gall bladder :

- 1) Fundus- round shape and projects beyond the liver edge. It is fully covered with peritoneum reflecting from the liver surface
- 2) Body- is between fundus and infundibulum, situated between cystic fossa and transverse colon, duodenum
- 3) Infundibulum-narrowed part between body and neck
- 4) Neck-it is funnel shaped which continues with cystic duct. It lies in the free border of the hepatoduodenal ligament

Hartmann's pouch-it's a normal variant due to dilatation of the infundibulum or neck.It can be acquired because of prolonged resistance to the emptying of the gall bladder.



## HISTOLOGY

The gallbladder is made up of 3 layers

- 1) Mucous membrane
- 2) Muscularis
- 3) Serosa

### Mucus membrane-

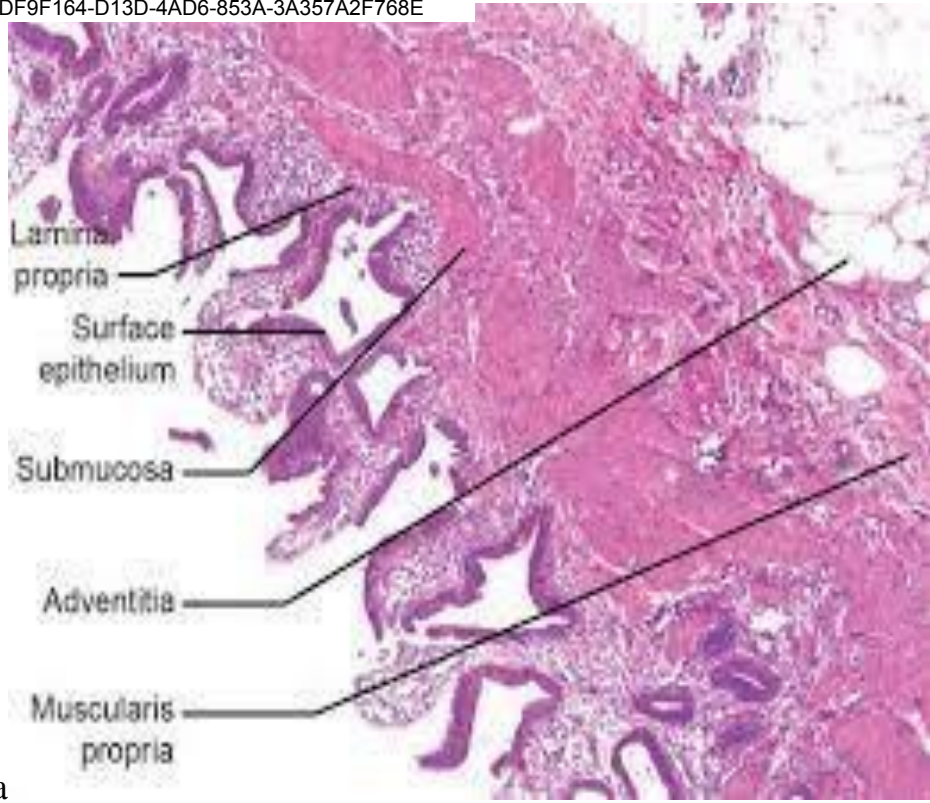
- multiple rugae when in the resting phase.
- Columnar Epithelial cells- have a basal nucleus which lines mucosa. they have an absorptive and secretory functions.
- Lamina propria-made up of loose connective tissue, elastic fibers, mast cell and macrophages with lymphatics.
- Spiral valve of Heister-in neck mucosa is elevated in forms this spiral valve.
- Rokitansky- Aschoff sinuses -found in 40% of normal gallbladder and all inflamed gallbladder. Invagination of epithelium all layers.

### Muscularis-

- there is absence of submucosa
- smooth muscles, collagenous tissue, elastic fibers, ganglia form the second layer.
- Ducts of Luschka-smallest bile ducts found in muscle layer in 10% of normal gallbladder.

### Serosa/adventitia



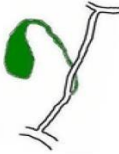







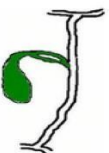
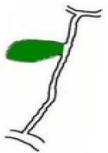
- The visceral surface has well-forme serosa which is continuous peritoneum. It has blood vessels and lymphatics.<sup>(12)</sup>



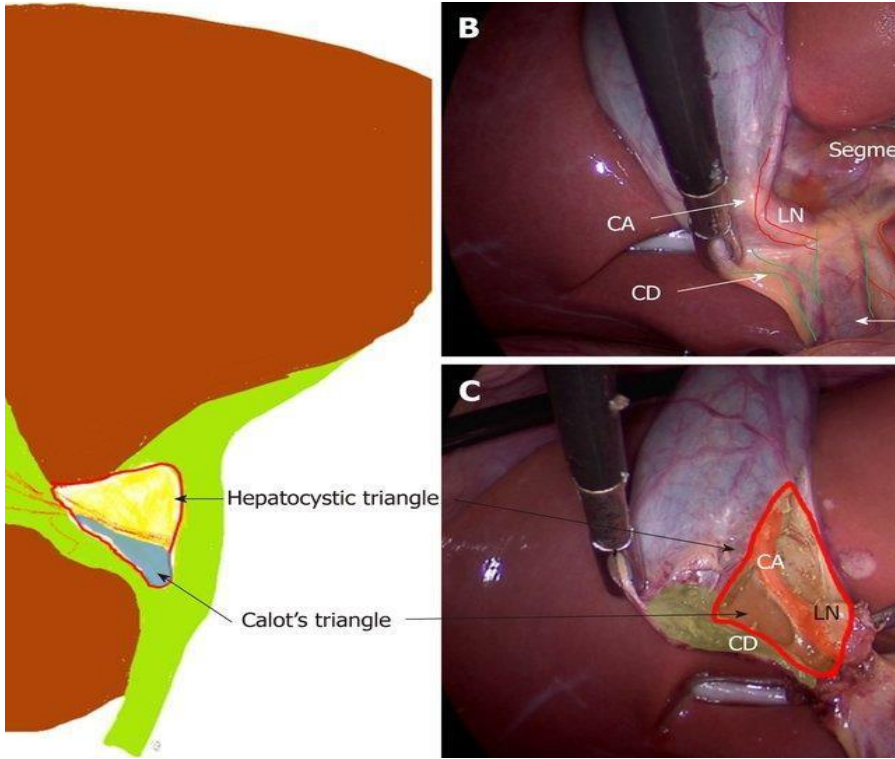
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## ○ **Cystic duct**

- Extends from the neck of the gall bladder to join common hepatic duct to form
- Common bile duct
- Length- 2cm-4cm (1cm to 6cm)
- Diameter- 1mm to 3mm
- Cystic duct variation courses normally or runs inferior-medially in the hepatic duodenal ligament for low union with a common hepatic duct. or can join the right hepatic duct <sup>(13)</sup>

		
Lateral angular insertion (75%)	Anterior spiral	Posterior spiral
		
Low insertion (10%)	Parallel with CBD with common sheath (14 - 23%)	Insertion into ampulla of Vater
		
High insertion	Insertion into right hepatic duct (0.006 - 0.01%)	Insertion into left hepatic duct
		
Cystohepatic duct (1 - 2%)	Double cystic duct	Absent cystic duct

- **HEPATOCYSTIC TRIANGLE/HEPATOBILIARY TRIANGLE-**
- Superiorly inferior margin of right lobe liver
- Medially common hepatic duct      Laterally- cystic duct



CALLOT'S triangle- Earlier JEAN FRANCOIS CALLOT described this as Medially-common hepatic duct, Laterally- cystic duct, Superiorly-cystic artery.

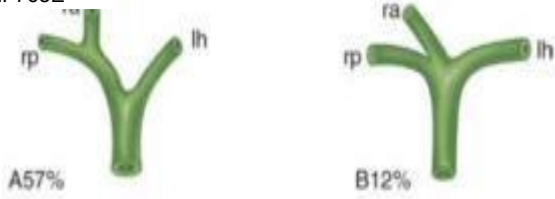
Later modified CALOTS TRIANGLE/HEPATOCYSTIC TRIANGLE contains The right hepatic artery, cystic artery, sometimes aberrant bile duct. All contents in this triangle must be clearly identified before clipping or ligation.<sup>(13)</sup>

# **HEPATIC DUCT**

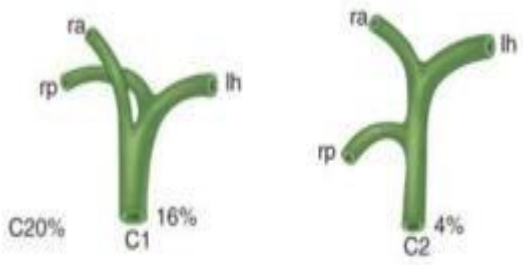
## **RIGHT and LEFT HEPATIC DUCT-**

- right hepatic duct- average length 0.9cm. It is formed by the right anterior and posterior sectorial branches.
- left hepatic duct- average length 1.7cm, has longer extrahepatic course after formation, over a quadrate lobe of the liver
  
- common hepatic duct –
- anterior to the right branch of the portal vein both right and left unite to the common hepatic duct. This junction lies 0.25 to 2.5 cm from the surface of the liver.
- length -1.5cm to 3.5cm

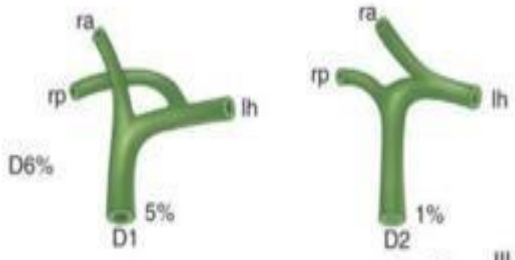
A: Normal bifurcation 57%  
B: Trifurcation of 3 ducts 12%



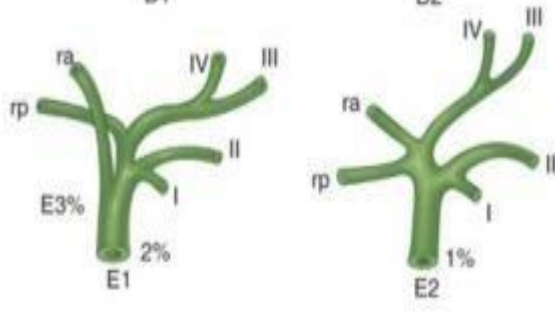
C: R anterior (C1, 16%) or R posterior (C2, 4%) duct draining into CHD



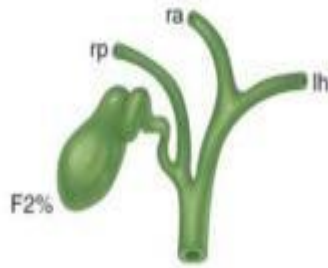
D: R posterior (D1, 5%) or R anterior duct (D2, 1%) draining into the left hepatic duct



E: Absence of hepatic duct confluence 3%



F: Drainage of R posterior duct into cystic duct 2%





○ **COMMON BILE DUCT**

It's formed by the union of the cystic duct with the common hepatic duct

Length-5cm to 15cm (average 8cm)

Diameter -4mm to 9mm(mean 6mm)

1. Supra duodenal/Upper third - is situated in the free edge of the lesser omentum, right to the hepatic artery proper and anterior to the portal vein.
2. Retroduodenal/middle third-posterior to first part of the duodenum, lateral to the portal vein and anterior to inferior vena cava.
3. Intrapancreatic/lower third- posterior to the pancreas in a groove or tunnel to enter 2 parts of the duodenum, where it is joined with the pancreatic duct. In duodenal wall it has oblique course to enter ampulla of Vater.

**Pancreaticobiliary junction**-this junction is variable.

Abnormal variations-

- Type 1-major pancreatic duct joins the side of the common bile duct
- Type 2- major pancreatic duct is joined from the side by common bile duct – the anatomic reason for pancreatitis

**HILAR PLATE**-it's a connective tissue that separates biliary confluence from liver

**SPHINCTER OF ODDI**- its terminal part of common bile duct and major pancreatic duct, made up of longitudinal and circular smooth muscle. Length-less than 1cm.<sup>(15)</sup>

○ **Blood supply**<sup>(16)</sup>

**Arterial supply** – cystic artery

It arises as a single branch most commonly from the right hepatic artery.

Its present in calots triangle runs parallel, medial and adjacent to cystic duct

It can arise less commonly from common hepatic, left hepatic, superior mesenteric and gastroduodenal artery also. If it lies close to the hepatic duct, then the chances of injury to the hepatic duct may increase.

It supplies cystic duct and gall bladder.

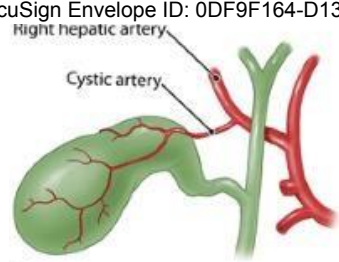
**Venous supply**

**The Hepatic vein drains the superior surface of gall bladder**

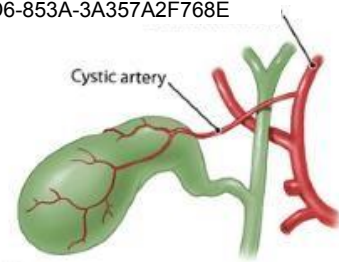
One or two cystic veins supply the remaining part of the gall bladder.

**Lymphatic drainage**

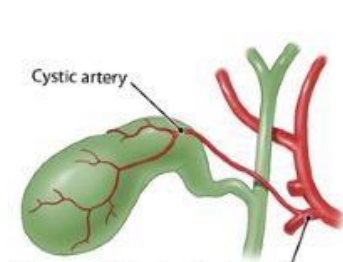
Cystic lymph node of Lund- lymphatics from gall bladder drain to this lymph node in calots triangle, later joins to lymph node of hiatus and posterior pancreatico-duodenal nodes.



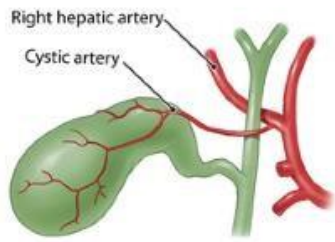
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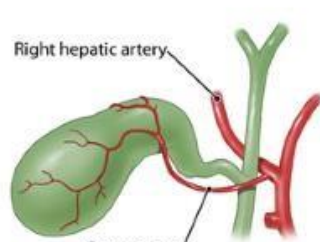
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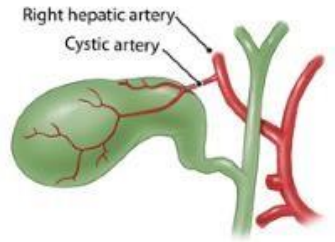
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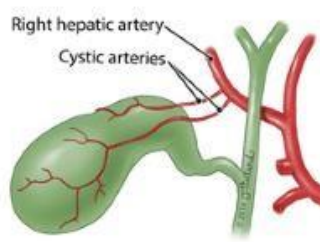
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E



F



G

# PHYSIOLOGY (11)

## FUNCTION OF BILE-

- excretion of bilirubin and cholesterol
- lipid and fat-soluble vitamins are absorbed in the presence of bile

## COMPOSITION OF BILE

CHARACTERISTICS	HEPATIC	GALLBLADDER
NA	160	270
K	5	10
CL	90	15
HCO <sub>3</sub>	45	10
CA	4	25
MG	2	4
BILIRUBIN	1.5	15
PROTEINS	150	200
BILE ACIDS	50	150
PHOSPHOLIPIDS	8	40
CHOLESTEROL	4	18
TOTAL SOLIDS	-	125
PH	7.8	7.2

phospholipids like Lecithin forms 95%.

Cholesterol forms a major solute for bile.

Bile secretion by liver-1litre per day

Water and electrolytes are absorbed.

The gallbladder stores bile during starvation/fasting and releases during meal.

Gallbladder capacity-40-50ml

Gallbladder mucosa has highest absorptive capacity per unit of any other structure in the body.

### **Factors affecting bile flow**

- Hormonal- hormones like secretin, gastrin, CCK, and glucagon increase water and electrolyte secretion.
- Neurogenic-vagal stimulation increases bile secretion and decreases with splanchnic stimulation
- Chemical-dietary fat

### **BILE –**

#### ○ secretion

- Hepatocyte/liver cells secrete bile.
- In the liver on a daily basis, bile salts cholic acid and deoxycholic acid are synthesized from cholesterol in the hepatic lobule are secreted to biliary canaliculi.
- Daily production-500-600mg

#### 2 major pathways

- 1) A classic pathway produces cholic acid
- 2) Alternate pathway-synthesis of cheno deoxycholic acid.

#### Transport

Bile acids are bound to albumin and lipoproteins and circulate. Bile salt uptake into hepatocytes is through space of Disse through 2 mechanism

- 1) sodium-dependent/cotransport
- 2) sodium independent

- Secretion is limited by ATP-dependent active bile salt transport across a canalicular membrane.

ENTEROHEPATIC CIRCULATION

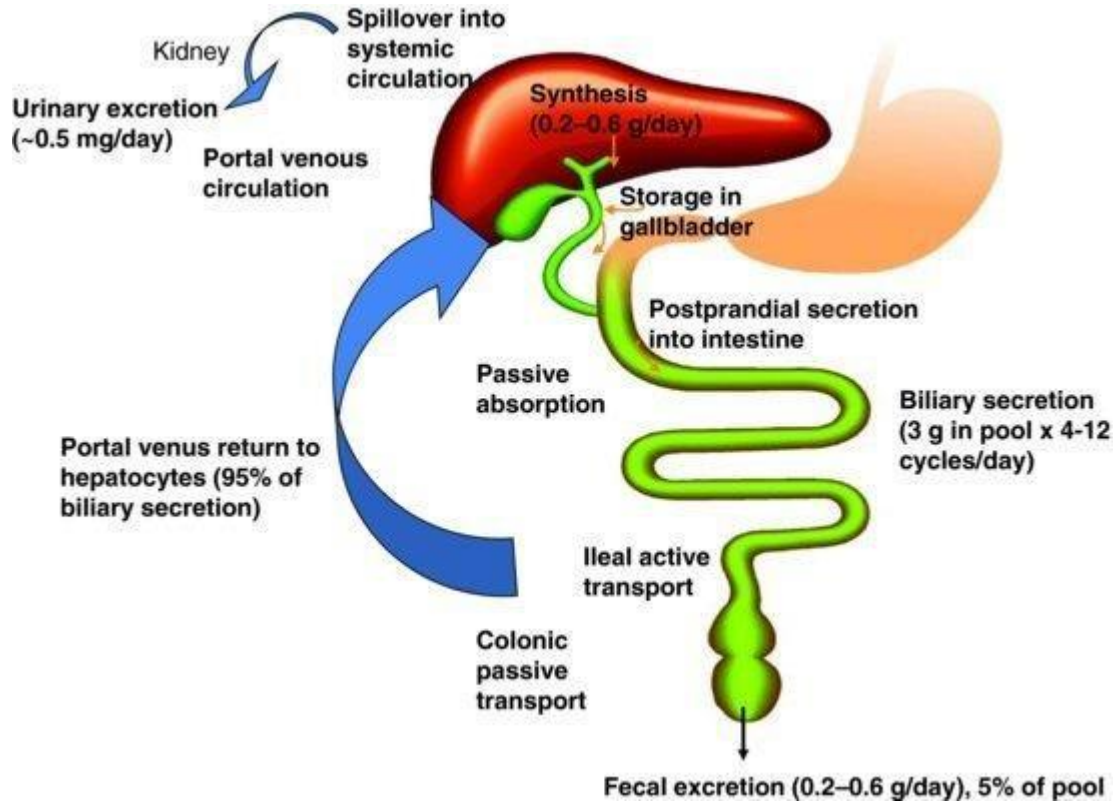
-In the intestinal terminal ileum lumen, most of the bile secreted is reabsorbed and transported back in albumin-bound form through the portal vein which forms 95% of bile.

-Cycle occurs 6-10times a day.

-daily loss- in faeces 600mg

In the colon, bacterial flora converts cholic acid of chenodeoxy cholic acid into deoxycholate and lithocholate.

Disease involving the distal ileum leads to the loss of bile salt excessively and there is a compensatory increase in the production of bile.

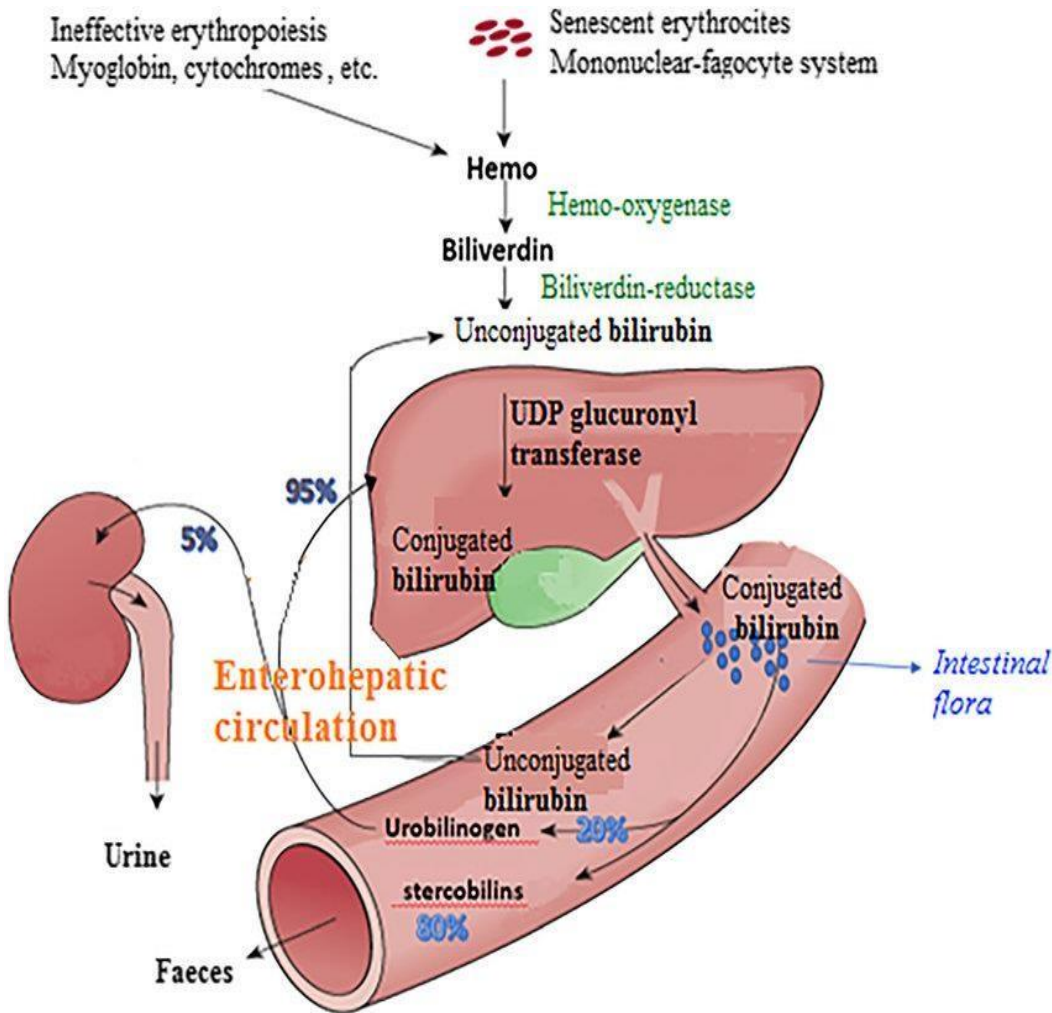


Cholesterol Saturation

- Cholesterol is stored in micelles which are phospholipid-cholesterol complex.
- Bile salts has two portions-outward hydrophilic and inward hydrophobic.
- Cholesterol is stored in the hydrophobic end.
- vesicles are bilaminar with phospholipids and cholesterol in which majority of cholesterol exists.
- crystal precipitation occurs when vesicle capacity gets saturated to transport.
- solubility depends on the concentration of cholesterol, bile salts, and phospholipids.

**BILIRUBIN METABOLISM**

- Bilirubin is formed from heme.
- Majority of heme (80-85%) is derived from degraded RBC by reticuloendothelial cells.





○ **Gallbladder function :**

- Storage and concentration of bile

- **Absorption-**

It is an active process via Na-Cl transport

Water is passively absorbed to the maximum.

Absorption of calcium is dependent on serum/hepatic bile calcium and bile salt concentration.

Phospholipids, cholesterol, and bilirubin are less absorbed.

Unconjugated bile salts are absorbed more than conjugated bile salt.

- **Secretion**

glycoprotein and hydrogen ions are secreted by epithelial cells.

Mucin secretion -stimulated by prostaglandin.

Hydrogen ion released maintains PH to 7.1-7.3.

- **Motility**

The ampulla is contracted to raise CBD pressure up to 10-15 mm.

This facilitates gallbladder filling.

After a meal, CCK stimulates the gallbladder, which contracts and empties bile with simultaneous relaxation of the sphincter of ODDI.

In 30-40min, About 60% of emptying is done.

Refilling occurs in the next 60-90minutes.

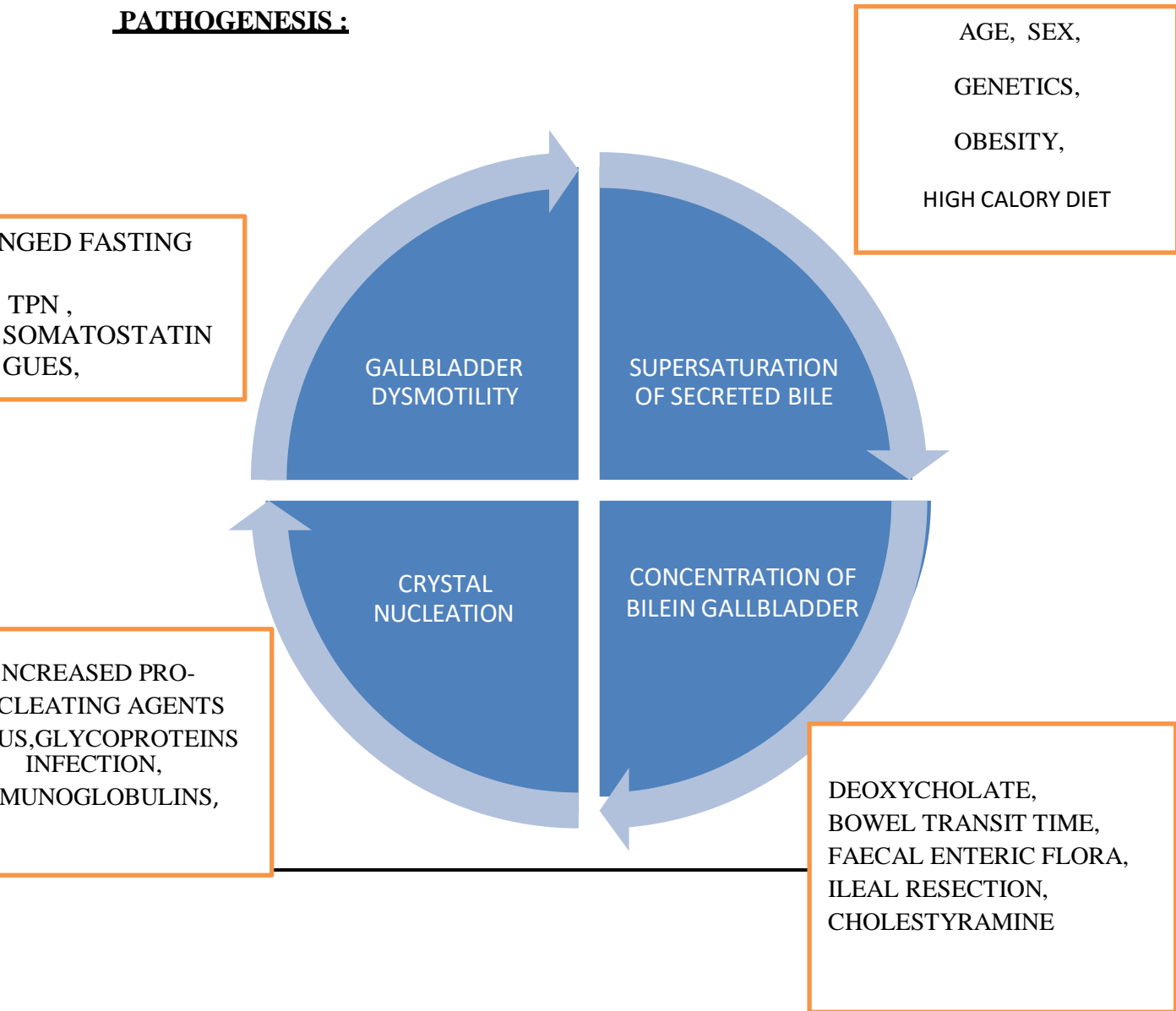
○ **Gall bladder stones/cholelithiasis**

- Very common in the western country 10-15% of the population.
- In India, 15% of the population has gallstones.
- Asymptomatic in 80% of cases. 1-2% of asymptomatic patients develop symptoms and need cholecystectomy.
- It's more common in the north (4.3%) compared to south India due to dietary and increased use of USG.
- Cholesterol stones are more in North India, whereas pigment stones are more in south India.

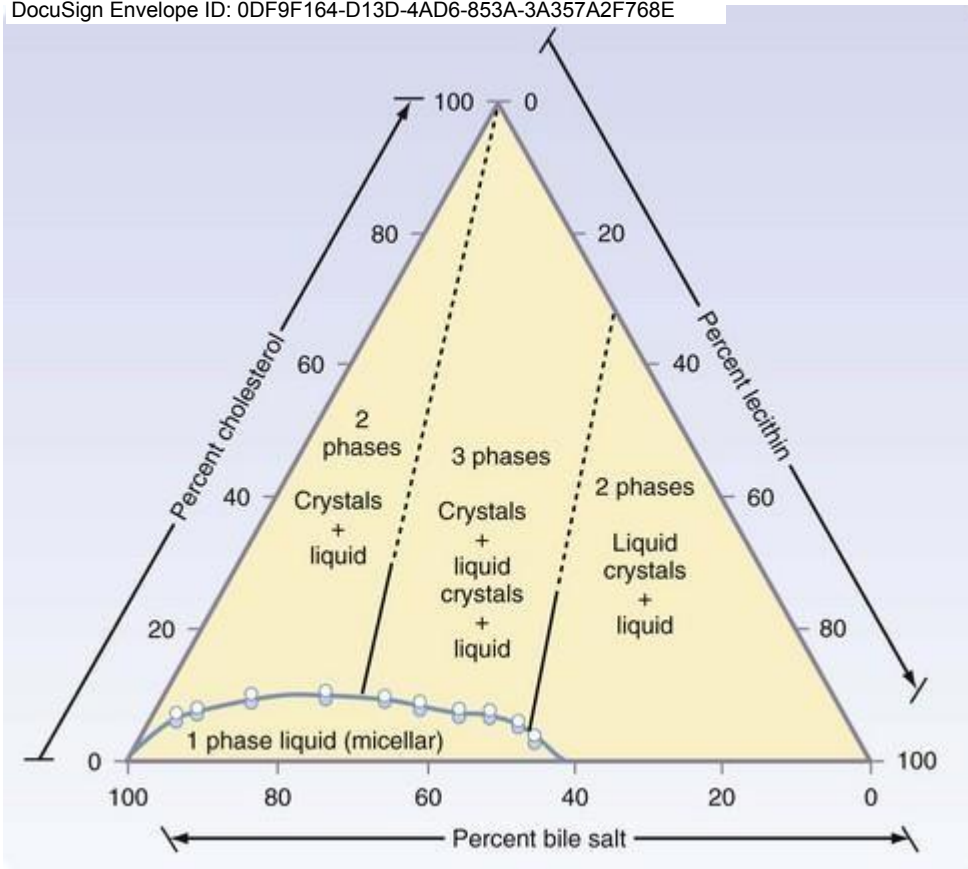
- **Incidence<sup>(21)</sup>**

- Punjabi-7.4%                      Gujarathi-7.4%    Bengali-4.4%
- South India 1.8%

**PATHOGENESIS :**



**TRIANGLE OF SOLUBILITY**



The 3 major components of bile that decide the solubility and stability of cholesterol each can be quantified through molar percentage to show a ratio relative to the other two.

In pictures, only the small area shown in the left lower corner cholesterol is completely soluble, and micellar solution clearly exists below the closed circles. Above this, where the area between the open and closed circles, stable though supersaturated cholesterol is seen, and hence only stasis induces crystallization.

Rest of area crystal formation occurs immediately as the cholesterol is supersaturated and unstable significantly<sup>(22)</sup>

**TYPES OF STONES**

- 1) Cholesterol stones
- 2) Pigment stone
- 3) Mixed stone

**CHOLESTEROL STONE:**

cholesterol is insoluble in water.

Phospholipid vesicles/micelles are secreted by canalicular membrane keeping cholesterol thermodynamically stable.

Depending upon Concentration and which Type of Bile acid phospholipids leads to cholesterol stone.

**PIGMENT STONES**

contain <30% of cholesterol.

**BLACK STONE:** contain insoluble bilirubin pigment polymer mixed with calcium phosphate and calcium bicarbonate.

Over 20-30% are black stone. seen in haemolytic conditions like sickle cell disease, Hereditary spherocytosis, and cirrhosis. They are found in the gallbladder as exclusively because of the concentration of bilirubin.

**BROWNSTONE:** these are more common in the bile duct. Contain calcium bilirubinate, calcium palmitate, calcium stearate and cholesterol.

Cholesterol concentration is responsible for this colour. Bacterial infections and bile stasis biliary motility disorders leads to the formation of stone in the bile duct. Bacterial beta-glucuronidase deconjugates bilirubin diglucuronide, and insoluble unconjugated bilirubinate precipitates.

A Foreign body such as endoprosthesis/stents or parasites like *ASCARIS LUMBRICOIDES* and *CLONORCHIS SINESIS*.

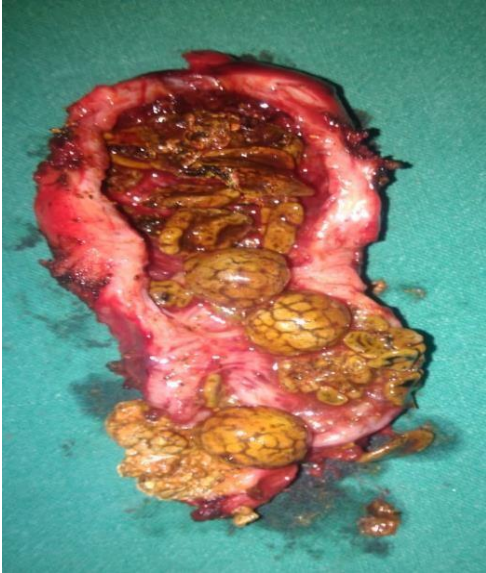
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**cholesterol stones**



**Black stone**



**Brown stone**

○ **RISK FACTOR FOR GALL STONES**

- Age more than 40years
- Estrogens
  - The female sex a has 2-3times higher risk compared to men
  - Pregnancy-risk increases with the number of pregnancies
  - OCPs-rich in estrogen
- Genetic/ethnic variation
- High fat, low fiber diet
- Obesity
- Hyperlipidemia
- Bile salt loss (ileal disease/resection/Crohn's disease)
- Cystic fibrosis
- Anti hyper lipidemic drugs
  
- Impaired gallbladder emptying
  - Truncal vagotomy
  - Type 1 diabetes
  - Octreotide
  - TPN
  - Starvation or rapid voluntary weight loss
  
- Pigment stone
  - Hemolytic disease
  - Biliary stasis
  - Biliary infection

-

CLINICAL PRESENTATION

- Asymptomatic in 80% cases
- 1 -2% of asymptomatic cases develop symptoms requiring cholecystectomy.
- Epigastric pain/right upper quadrant pain radiating to back, either Colicky or dull aching type present in 10-25%. pain may last for minutes to hours.
- Dyspepsia
- Flatulence
- Food intolerance to fat
- Alteration in bowel frequency
- Jaundice if stone migrates to CBD
- Acute cholecystitis
- Chronic cholecystitis

Complications of cholecystitis

- Biliary colic
- Acute calculous cholecystitis-calculous or gangrenous or empyema gallbladder, severe abdominal pain and tenderness in the right subcostal region- Murphy's sign- fever
- Chronic calculous cholecystitis- repeated episodes of pain right subcostal region with or without fever and vomiting.
- Empyema gallbladder-
- Mucocele-heaviness with the palpable gallbladder.
- Perforation of gallbladder-with localised collection abscess or septic peritonitis
- Biliary obstruction
- Acute cholangitis- Charcot's triad fever with chills/rigours, transient jaundice, and upper abdominal pain.
- Acute pancreatitis-gallstone-induced biliary pancreatitis
- Intestinal obstruction (gall stone ileus)
- Gallbladder carcinoma.<sup>(24)</sup>



○ **INVESTIGATIONS :**

- **Blood investigations**

Complete haemogram,

Liver function test,

Renal function test with serum electrolytes

Serum amylase and lipase.

Coagulation parameters like prothrombin time (PT)/ aPTT.

- **Xray abdomen plain**-10% of stones are radio-opaque

- **USG abdomen and pelvis**<sup>(21)</sup>-high sensitive 96%, rapid and noninvasive method, detects stones larger than 1-2mm, can detect CBD stones and dilatation of ducts.

Findings are- gallstones or sludge.

Gallbladder wall thickening >2-4mm

Gallbladder distension (diameter >4cm, length >10cm)

Pericholecystic fluid

Air in gallbladder-from perforation

Sonographic Murphy sign (86-92% sensitivity,35% specific)-pain when probe pressed directly on the gallbladder.

In chronic calculous cholecystitis- Wall echo shadow (WES)/double arc sign-two echogenic arcs of WES complex represent adjacent gallbladder.

Wall, echogenic gallstones which are separated by thin layer of anechoic bile.

Computed tomography (CT) and MRI- considered if USG is unequivocal and in cases of stones in gallbladder neck/cystic duct/gangrenous type/perforation or abscess.

Grade I (mild)	Grade II (moderate)	Grade III (severe)
<p>[•]No criteria for grade II or III</p> <ul style="list-style-type: none"> <li>• Acute cholecystitis in a previously healthy patient with no organ dysfunction and with mild inflammation of the gallbladder</li> </ul>	<p>Any of the following conditions:</p> <ul style="list-style-type: none"> <li>[•]Leukocytosis &gt;18,000/mm<sup>3</sup></li> <li>• Palpable tumor in the right upper quadrant</li> <li>• Symptom duration &gt; 72 h</li> <li>• Marked local inflammation (gangrenous cholecystitis, pericholecystic abscess, liver abscess, bile peritonitis, emphysematous cholecystitis)</li> </ul>	<p>Any of the following organ dysfunctions:</p> <ul style="list-style-type: none"> <li>[•]Cardiovascular: Low blood pressure with need for 5 µg/kg/min of dopamine or norepinephrine</li> <li>• Neurologic: decline in alertness.</li> <li>• Respiratory: PaO<sub>2</sub>/FiO<sub>2</sub> &gt; 300</li> <li>• Kidney: oliguria or creatinine &gt;2.0 mg/dl</li> <li>• Liver: INR &gt; 1.5</li> <li>• Hematologic: platelets &lt;100,000/mm<sup>3</sup></li> </ul>

TOKYO CONSENSUS GUIDELINES FOR SEVERITY GRADING OF ACUTE CHOLECYSTITIS-2018<sup>(25)</sup>

Laparoscopic Cholecystectomy

**Indications**

- 1) Symptomatic cholelithiasis causing
  - Biliary pain- repeated attacks
  - Mucocele
  - Choledocholithiasis with cholestasis
  - Biliary pancreatitis
  - Gallstone ileus
- 2) Calculous cholecystitis-Acute/Chronic,  
Empyema, Perforation, Gangrene
- 3) Gallbladder polyp more than 10mm  
And in young more than 5mm.

**CONTRAINDICATIONS**

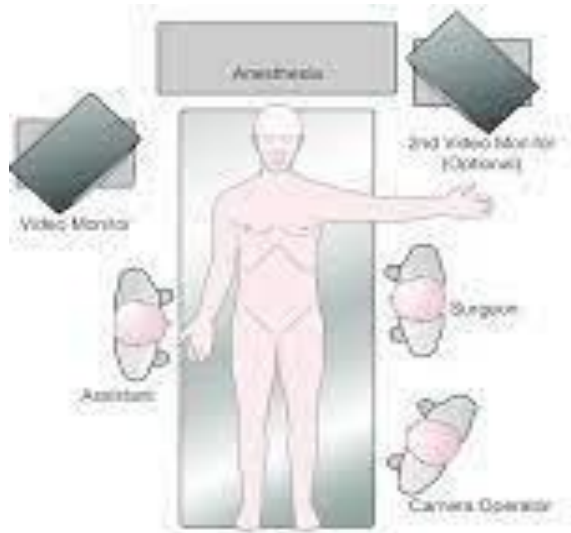
- The patient who are not eligible for general anaesthesia
- Portal hypertension
- Coagulopathy- sever
- Gallbladder cancer

## **CONVERSION FROM LAPAROSCOPY TO OPEN CHOLECYSTECTOMY**

- Previous history of multiple surgeries- difficulty in accessing peritoneal cavity
- Acute cholecystitis-severe grade inflammation leading to soft friable tissue, dense adhesions and oedema.
- Acute pancreatitis-
- Abnormal anatomy
- Cirrhosis of the liver
- Pregnancy-3 trimester
- Morbid obesity
- Generalised peritonitis
- Septic shock due to cholangitis

Steps in Laparoscopic Cholecystectomy

- General anaesthesia
- Supine -Reverse Trendelenburg position (15degree head-up tilt) with left lateral tilt (15-20)  
Bowel and omentum will move inferior and medially out of the operative site
- Left of patient- Operating surgeon  
camera surgeon
- Right of the patient-assistant surgeon



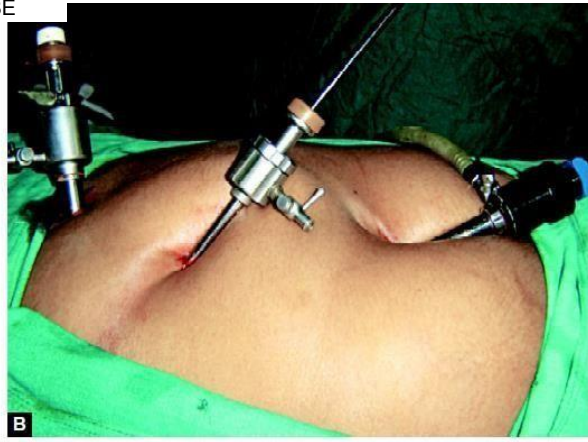
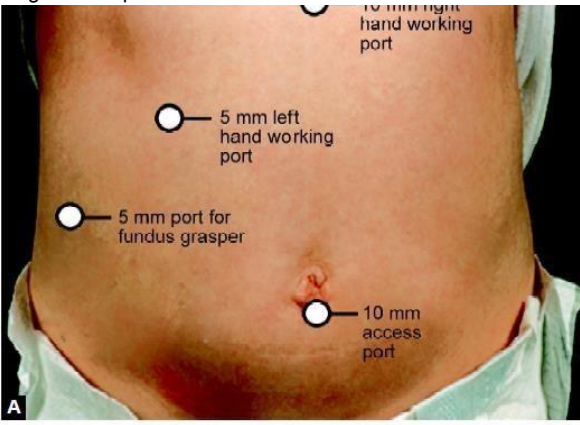
○

Eddie Reddick's 4 port technique

- A 10mm port in the infraumbilical region for the camera
- A 10mm port in midline in epigastrium

Right subcostal region ports

- 5mm in in midclavicular line
- 5mm in anterior axillary line

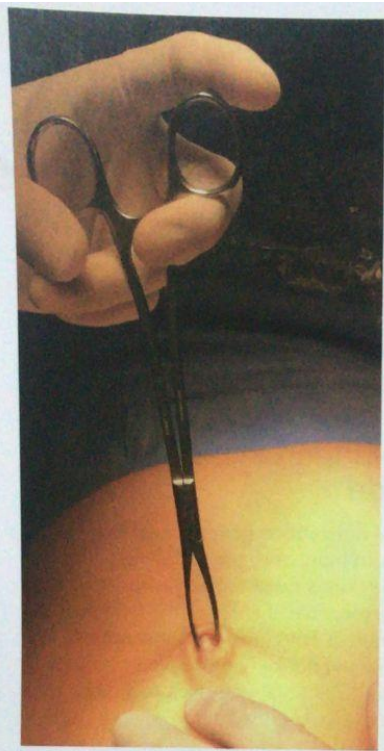


○ **PNEUMOPERITONEUM**

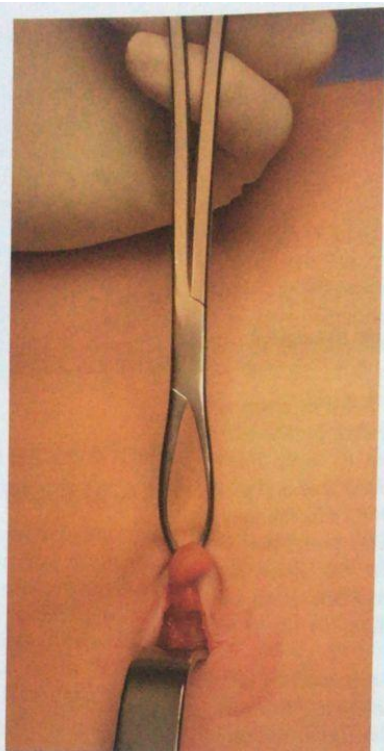
- Created by open Hasson technique/closed Verses technique
- Open technique- 1cm transverse incision is made infraumbilically, subcutaneous fat retracted, midline fascia incision of 1cm taken and peritoneum identified and opened.
- confirmed with the introduction of a finger which goes freely into the abdominal cavity
- blunt Hasson trocar is introduced
- laparoscope camera is introduced
- co2 insufflation-12-14mm of h20



# STEPS IN TROCAR PLACEMENT (29)



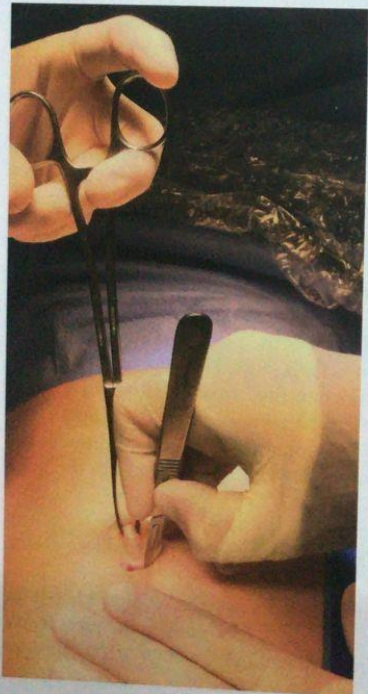
**Figure 7.5** The umbilical cicatrix is grasped with a tissue-grasping forceps (e.g. Littlewood's) and everted.



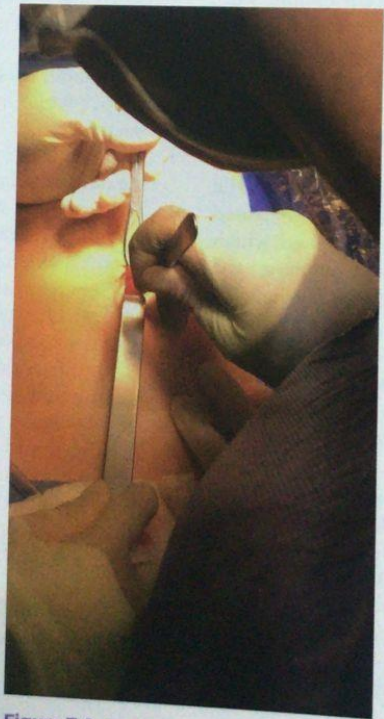
**Figure 7.7** The skin is retracted to reveal the junction of the stalk and the linea alba.



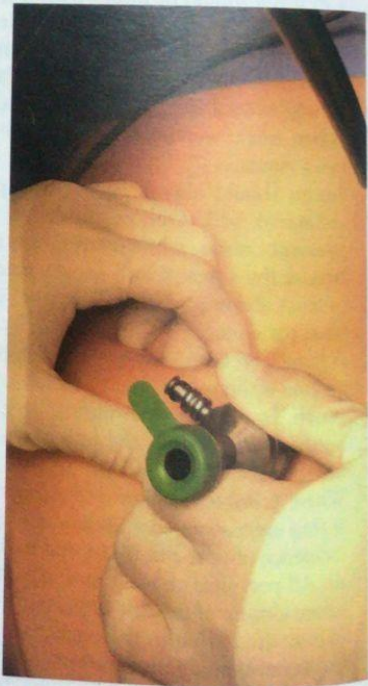
**Figure 7.9** A blunt, long haemostat is used to enter the peritoneum and enlarge the incision in the umbilical stalk.



**Figure 7.6** A curved subumbilical incision is made.



**Figure 7.8** A small vertical incision is made in the junction using an 11 bladed scalpel.



**Figure 7.10** A blunt primary trocar and cannula are inserted and their position is confirmed with the laparoscopic camera before insufflation.

## **Laparoscopic inspection**

The peritoneal cavity is inspected for

- 1) Detection of any unwanted or unexpected trauma that occurred during the insertion
- 2) Additional abdominal pathology like adhesion from previous surgery, other organ diseases which may or may not be detected preoperatively.
- 3) Assessment of the feasibility of the laparoscopic cholecystectomy

• <b>Cholecystitis severity</b>	
•	
• <b>Appearance</b>	score
• Adhesions < 50% of GB	1
• Adhesions > 50% but GB buried	2
• Completely buried GB	3
• <b>Distension/contraction</b>	
• Distended GB or contracted shrilled GB	1
• Inability to grasp without decompression	1
• Stone > 1 cm impacted in Hartmann's pouch	1
• <b>Access</b>	
• BMI > 30	1
• Adhesions from previous surgery limiting surgery	1
• <b>Sepsis and complications</b>	
• Free bile or pus outside the gallbladder	1
• Fistula	1
• Total possible	10

- **Depending upon intra operative assessment of gallbladder grading of difficulty is assessed.**

○ **STEPS IN LAPAROSCOPIC CHOLECYSTECTOMY**

- Fundus is first elevated and retracted in the cephalad direction and kept in the same.
- Adhesions around the body/infundibulum/neck are peeled
- **Flag technique-** Infundibulum is grasped laterally and lifted to the right and inferior direction to show the anterior aspects of the calots triangle

anteromedially infundibulum is held and retracted to expose the posterior aspect of the calots triangle

○ CALOT'S TRIANGLE DISSECTION

-dissection on the left side of the infundibulum done bluntly

-dissection around the neck with medial retraction of the Hartman pouch is carried

-cystic duct is isolated-always HUG THE GALLBLADDER- TO AVOID INJURY TO DUCT.

○ **Critical view of safety-described by STRASBERG**

- The triangle of Calot is dissected free of all tissue except

The cystic duct and cystic artery, and the base of the liver are exposed.

- Cystic duct identified and clipped-2clips on cystic site and one gall bladder site and cut
- Cystic artery identified and 2 on gallbladder site and one on cystic site clipped and cut
- Resection of the gallbladder from the liver bed - using a hook or scissors, bipolar cautery, or harmonic scalpel, the gallbladder is detached from the liver bed
- complete hemostasis achieved
- gallbladder extraction through a 10mm port at the epigastric region.
- After extraction, final inspection and irrigation were done
- Trocars are removed only under the vision
- Ports are closed with vicryl 2.0.
- Ryle's tube was placed in a 5mm port to drain any collection or bleeding<sup>(30)</sup>

To,

INSTITUTIONAL ETHICAL COMMITTEE(IEC)

B.L.DE (DU)

SHRI B.M PATIL MEDICAL COLLEGE HOSPITAL AND RESEARCH CENTRE,  
VIJAYAPUR.

Respected sir/madam

INTRA-OPERATIVE GALL BLADDER SCORING PREDICTS CONVERSION OF LAPAROSCOPIC TO  
OPEN CHOLECYSTECTOMY: A PROSPECTIVE STUDY.

I, Dr Krishna Prasad S V, P.G in general surgery, regarding the dissertation – INTRA OPERATIVE GALL  
BLADDER SCORING PREDICTS CONVERSION OF LAPAROSCOPIC TO OPEN CHOLECYSTECTOMY:  
A PROSPECTIVE STUDY, was asked about FINANCIAL DISCLOSURE SHEET. It is not applicable to my  
dissertation as this is an observational study, and there is no need for financial expenditure of any kind for this  
study.

Your sincerely

Dr Krishna Prasad S V,

P.G in general surgery

## ANNEXURE V

### 6.4.1 RESEARCH DESIGN

- **Design:** Prospective Observational study

### 6.4.2 RESEARCH HYPOTHESIS

- Intra-operative gallbladder scoring can predict the conversion from laparoscopic cholecystectomy to open cholecystectomy.

## ANNEXURE VI

### 6.5 DATA COLLECTION

- All cases planned for laparoscopic cholecystectomy in BLDE (DEEMED TO BE UNIVERSITY), SHRI B M PATIL MEDICAL COLLEGE HOSPITAL AND RESEARCH CENTRE, VIJAYAPUR.
- Period of study from JANUARY 2021 TO JULY 2022.
- Components of the G10 scoring system included: the appearance of gallbladder intraoperatively, whether shrilled or distended, access difficulty and intraperitoneal sepsis presence-pus or biliary peritonitis and/or a cholecysto-enteric fistula.
- The patients will be explained in detail about the procedure.
- Data collection will include -
  1. Elective or Emergency Laparoscopic cholecystectomy surgery.
  2. Age, sex, and socio-economic status.
  3. The operative time.
  4. BMI.



**6.5.1 STUDY DESIGN**

- Prospective Observational study

**6.5.2 SAMPLE SIZE**

With the anticipated Proportion of conversion occurring in patients with G10 scores of  $\geq 5$  scores, 33%<sup>(ref)</sup>, the study would require a sample size of 85 patients with a 95% confidence level and 10% absolute precision.

Formula used

- $$n = \frac{z^2 \cdot p \cdot q}{d^2}$$

Where Z= Z statistic at  $\alpha$  level of significance

$d^2$ = Absolute error

**P= Proportion rate**

$q = 100 - p$

**STATISTICAL ANALYSIS**

- The data obtained will be entered in a Microsoft Excel sheet, and statistical analysis will be performed using a statistical package for the social sciences (Verson20).
- Results will be presented as Mean (Median)  $\pm$ SD, counts and percentages and diagrams. For normally distributed continuous variables between two groups will be compared using The Independent t-test for not normally distributed variables Mann Whitney U test will be used. Pearson/Spearman's correlation will be used to find the relationship between the variables.
- ROC Curve will be performed to assess the precision of the G10 scoring system to predict laparoscopic cholecystectomy converting to open cholecystectomy.

### 7.2.3 **INCLUSION CRITERIA-**

All elective and emergency laparoscopic cholecystectomy surgery

### 7.2.4 **EXCLUSION CRITERIA –**

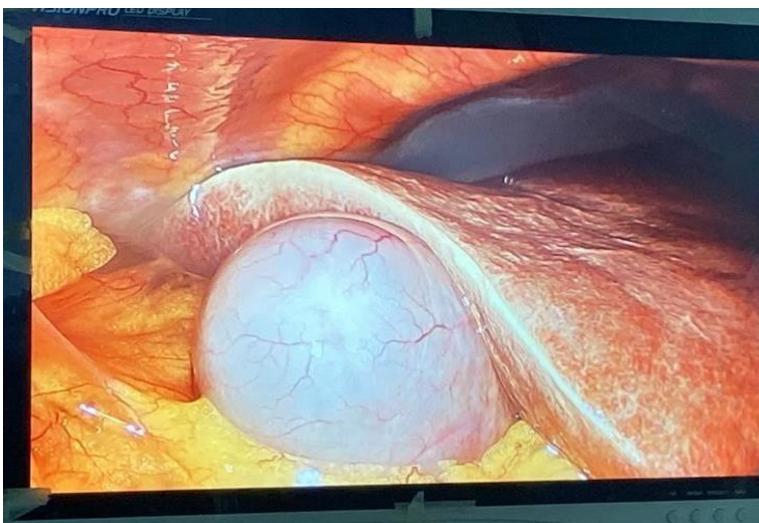
- Carcinoma gallbladder.
- Cholangiocarcinoma.
- Perihilar cholangiocarcinoma.



Mild degree <2 cholecystitis

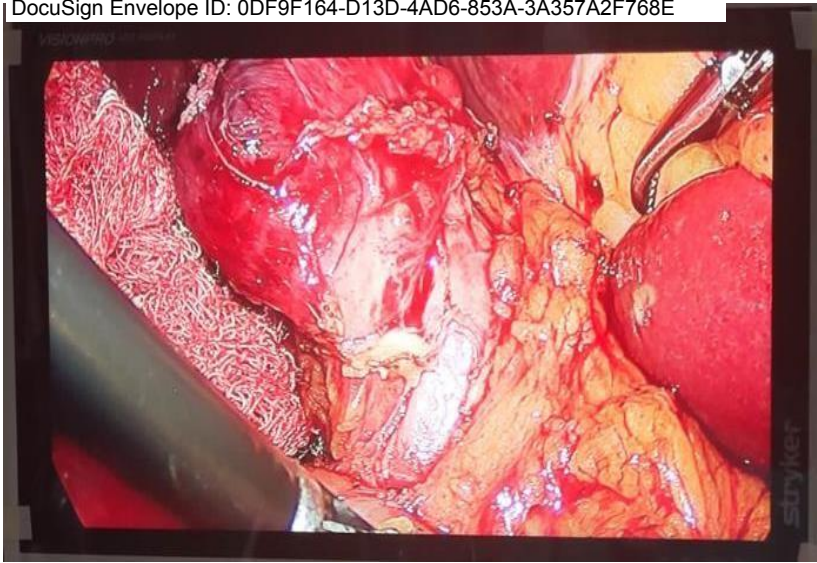


Adhesion <50%

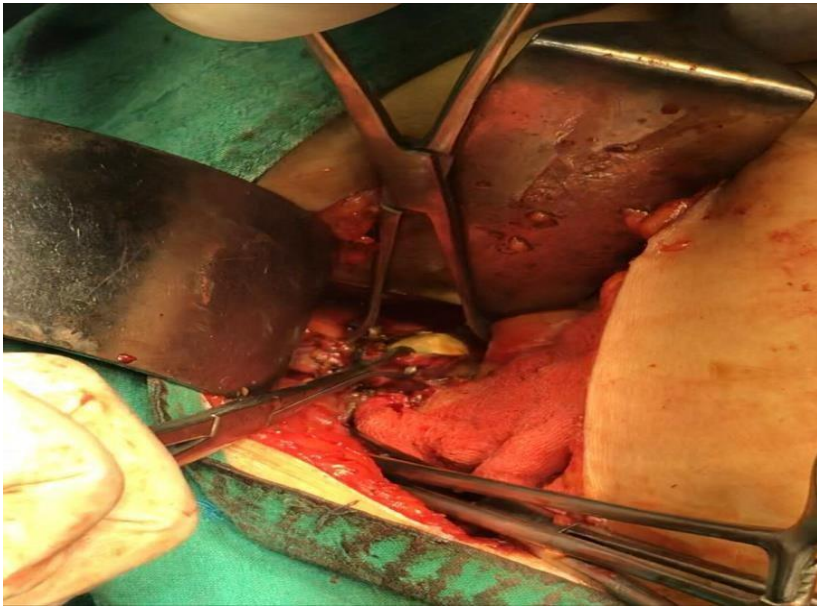


well distended GB





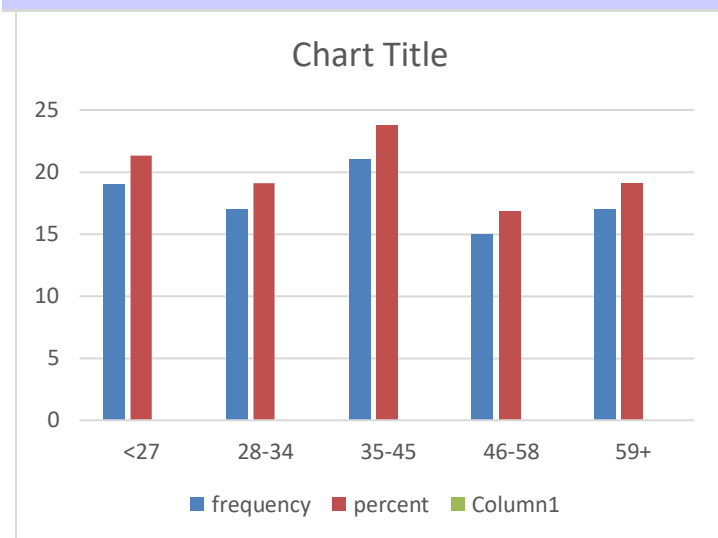
GANGRENOUS GB WITH ADHESION >50%



STONE >1.5CM IN CYSTIC DUCT

**RESULTS****AGE YEARS**

	Frequency	Per cent
<= 27	19	21.3
28 - 34	17	19.1
35 - 45	21	23.6
46 - 58	15	16.9
59+	17	19.1
Total	89	100.0



Age 35-45 had the highest number of 21 cases with 23.6%, 18-27 years was seen in 119 cases at 21.3% and 46-58years in 16.9%,59+ was seen in 19.1% cases.

**GENDER**

	Frequency	Per cent
FEMALE	59	66.3
MALE	30	33.7
Total	89	100.0

Out of 89 cases- 59 cases were female seen in 66.33% and male cases 30 in 33.7%

**SOCIOECONOMIC\_GROUP**

	Frequency	Per cent
LIG	44	49.4
MIG	44	49.4
UIG	1	1.1
Total	89	100.0

**SURGEON**

	Frequency	Per cent
I	10	11.2
II	13	14.6
III	12	13.5
IV	27	30.3
V	27	30.3
Total	89	100.0

**LAPAROSCOPIC CHOLECYSTECTOMY**

	Frequency	Per cent
YES	89	100.0

**CONVERTED TO OPEN**

	Frequency	Per cent
NO	86	96.6
YES	3	3.4
Total	89	100.0

**ELECTIVE**

	Frequency	Per cent
NO	0	0
YES	89	100.0
Total	89	100.0

**EMERGENCY**

	Frequency	Per cent
NO	89	100.0

All 89 were Elective cases

86 cases were completed laparoscopically with 96.6% an

3 cases were converted to open cholecystectomy with 3.4%

**ADHESIONS<50%**

	Frequency	Per cent
--	-----------	----------



yes	45	50.6
no	44	49.4
Total	89	100

**ADHESIONS >50%**

	Frequency	Per cent
yes	44	49.4
no	45	50.6
Total	89	100

**COMPLETELY BURIED GB**

	Frequency	Per cent
no	81	91.1
Yes	8	8.9
Total	89	100

**DISTENDED/SHRILLED GB**

	Frequency	Per cent
yes	4	4.5
no	85	95.5
Total	89	100.0

**INABILITY TO GRASP WITHOUT DECOMPRESSION**

	Frequency	Per cent
no	61	68.5
yes	28	31.5
Total	89	100.0

**STONE>1CM IN HARTMAN POUCH**

	Frequency	Per cent
no	78	87.6
Yes	11	12.4
Total	89	100.0

**BMI>30**

		Frequency	Per cent
Valid	no	68	76.4
	Yes	21	23.6
Total		89	100.0

**ADHESIONS FROM PREVIOUS SURGERY**

		Frequency	Per cent
		70	78.7
		19	21.3
Total		89	100.0

**SEPSIS\_FREE BILE\_PUS**

		Frequency	Per cent
		83	93.3
		6	6.7
Total		89	100.0

**FISTULA**

		Frequency	Per cent
		89	100.0

**TOTAL SCORE 10**

		Frequency	Per cent
		26	29.2
		29	32.6

	4	18	20.2
	5	9	10.1
	6	3	3.4
	7	1	1.1
	8	2	2.2
	9	1	1.1
	Total	89	100.0

**Mild <2**

	Frequency	Per cent
NO	59	66.3
YES	30	33.7
Total	89	100.0

**Moderate 3-4**

	Frequency	Per cent
NO	46	51.7
YES	43	48.3
Total	89	100.0

**Difficult 5-7**

	Frequency	Per cent
NO	75	84.3
YES	14	15.7
Total	89	100.0

**Extreme difficult 8-10**

	Frequency	Per cent
--	-----------	----------

NO	86	96.6
YES	3	3.4
Total	89	100.0

- Mild < 2degree was seen in 30 cases with 33.7%,
- moderate degree 3-4 in 43 cases, 48.3%,
- difficult 5-7 seen in 14 cases 15.7%
- extreme difficulty 8-10seen in 3 cases3.4%

## OPERATIVE TIME/MIN

	Frequency	Per cent
<= 70	21	23.6
71 - 80	20	22.5
81 - 90	19	21.3
91 - 105	16	18.0
106+	13	14.6
Total	89	100.0

An operative time of 70min was seen in 21 cases with 23.6%.

71-80 min in 22.5%,81-90 min in 19cases with 21.3%.

90-105min in 16 cases 18.0% and 106+ min in 14.6% in 13 cases.

**WEIGHT**

	Frequency	Per cent
<= 66	20	22.5
67 - 70	27	30.3
71 - 72	9	10.1
73 - 80	19	21.3
81+	14	15.7
Total	89	100.0

**HEIGHT**

	Frequency	Per cent
<= 156	23	25.8
157 - 158	17	19.1
159 - 162	21	23.6
163 - 165	12	13.5
166+	16	18.0
Total	89	100.0

**BMI**

	Frequency	Per cent
<= 24.14	18	20.2
24.15 - 26.56	21	23.6
26.57 - 28.34	15	16.9
28.35 - 31.00	19	21.3
31.01+	16	18.0
Total	89	100.0

Association between DIAGNOSIS and BMI								
		BMI					Total	
		<= 24.14	24.15 - 26.56	26.57 - 28.34	28.35 - 31.00	31.01+		
DIAGNOSIS	ACUTE CALCULOUS CHOLECYSTITIS	1	1	1	2	2	7	0.8
	CHOLELITHIASIS	12	17	11	14	10	64	
	CHRONIC CALCULOUS CHOLECYSTITIS	5	3	3	2	4	17	
	MIRIZZIS SYNDROME	0	0	0	1	0	1	
Total		18	21	15	19	16	89	

BMI value was between 24.15-26.56 in 21 cases, 19 cases had 28.35-31, and 16 cases >31.01

DIAGNOSIS *		OPERATIVE TIME in MIN					Total	P value
		OPERATIVE TIME in MIN					Total	
		<= 70	71 - 80	81 - 90	91 - 105	106+		
NOSIS	ACUTE CALCULOUS CHOLECYSTITIS	2	0	1	2	2	7	0.07
	CHOLELITHIASIS	17	19	13	12	3	64	
	CHRONIC CALCULOUS CHOLECYSTITIS	2	1	5	2	7	17	
	MIRIZZIS SYNDROME	0	0	0	0	1	1	
		21	20	19	16	13	89	

As table, Chronic calculous cholecystitis requires more Operative time

than acute calculous cholecystitis/cholelithiasis, which is statistically significant (p-value 0.007).

**Statistics**

	AGE _YEARS	WEIGHT_KG	HEIGHT_CM	BMI	OPERATIVE _TIME_MIN	TOTAL SCORE_10
N	89	89	89	89	89	89
	0	0	0	0	0	0
Mean	41.69	71.61	159.26	26.9804	88.97	3.44
Std. Error of Mean	1.608	1.508	1.364	0.44184	2.345	0.157
Median	39.00	70.00	160.00	28.0000	85.00	3.00
Mode	60	70	158	26.56	80 <sup>a</sup>	3
Std. Deviation	15.173	14.230	12.867	4.16833	22.120	1.477
Variance	230.218	202.491	165.557	17.375	489.306	2.181
Skewness	0.473	2.978	-7.052	-0.443	0.930	1.499
Std. Error of Skewness	0.255	0.255	0.255	0.255	0.255	0.255
Kurtosis	-0.773	20.400	60.234	-0.314	0.849	2.729
Std. Error of Kurtosis	0.506	0.506	0.506	0.506	0.506	0.506
Range	62	120	122	17.60	105	7
Minimum	18	45	50	18.20	45	2
Maximum	80	165	172	35.80	150	9

<b>ADHESIONS &gt; 50 * CONVERTED TO_OPEN</b>				P value			
		CONVERTED_TO_OPEN		Total	0.06	Not significant	
		NO	YES				
ADHESION S <50	0	43	3	46			
	1	43	0	43			
Total		86	3	89			
		CONVERTED_TO_OPEN		Total	0.001	Highly significant, Completely buried gallbladder has a high probability of converted to open	
<b>DIAGNOSIS</b>				<b>CONVERTED TO OPEN</b>		P value	Significant
		CONVERTED_TO_OPEN		Total			
		NO	YES		0.03	Yes chronic cholecystitis Have a probability to covert to Open	
DIAGNOSIS	ACUTE CALCULOUS CHOLECYSTITIS	6	1	7			
	CHOLELITHIASIS	64	0	64			
	CHRONIC CALCULOUS CHOLECYSTITIS	15	2	17			
	MIRIZZIS SYNDROME	1	0	1			
Total		86	3	89			



<b>ADHESIONS &gt; 50 - CONVERTED TO OPEN Crosstabulation</b>					p value	
		CONVERTED_TO_OPEN		Total		
		NO	YES			
ADHESIONS <50	0	43	3	46	0.06	Not significant
	1	43	0	43		
Total		86	3	89		
		CONVERTED_TO_OPEN		Total		
		NO	YES			
COMPLETELY BURIED GB	0	81	0	81	0.001	Highly significant, Completely buried gallbladder has a high probability of converted to open
	3	5	3	8		
Total		86	3	89		

		CONVERTED TO OPEN		Total	P value	
		NO	YES			
DISTENDED/ SHRILLED GB	0	4	0	4	0.8	Not significant
	1	82	3	85		
Total		86	3	89		
		CONVERTED TO OPEN		Total		
		NO	YES			
INABILITY TO GRASP WITHOUT DECOMPRESSI ON	0	61	0	61	0.02	Highly significant inability to grasp without decompression
	1	25	3	28		
Total		86	3	89		

		CONVERTED_TO_OPEN		Total	P value	
		NO	YES			
NE >1CM HARTMAN POUCH	0	77	1	78	0.03	Significant high chances of conversion if more than 1 cm in Hartman's pouch
	1	9	2	11		
Total		86	3	89		
		CONVERTED_TO_OPEN		Total		
		NO	YES			
ADHESIONS FROM PREVIOUS SURGERY	0	70	0	70	0.09	significant high chances of conversion if adhesions from previous surgery
	1	16	3	19		
Total		86	3	89		

### *Regression Statistics*

Multiple R	0.98036294
<b>R Square</b>	<b>0.961111495</b>
Adjusted R Square	0.956125789
Standard Error	0.309323029
Observations	89

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	10	184.4470149	18.44470149	192.7734073	1.06471E-50
Residual	78	7.463097411	0.095680736		
Total	88	191.9101124			

	<i>Confidence Intervals</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>	
	2.19385 7655	0.20847 6714	10.5232 7436	1.2577 5E-16	1.77881 2401	2.60890 291	1.77881 2401	2.60890 291
	-	-	-	-	-	-	-	-
NS less than 50	0.90769 9186	0.12519 6527	7.25019 4634	2.6226 9E-10	1.15694 6324	0.65845 2048	1.15694 6324	0.65845 2048
	-	-	-	-	-	-	-	-
NS more than 50	0.06235 3915	0.06188 365	1.00759 9172	0.3167 6251	0.06084 6969	0.18555 4798	0.06084 6969	0.18555 4798
ELY_BURIED_GB	0.50260 4405	0.06200 945	8.10528 7201	5.8831 6E-12	0.37915 3072	0.62605 5738	0.37915 3072	0.62605 5738
ED_SHRILLED_GB	0.72476 8512	0.16524 9766	4.38589 7354	3.5725 6E-05	0.39578 15	1.05375 5525	0.39578 15	1.05375 5525
Y_TO_GRASP_WITHOUT RESSION	0.73883 2436	0.08126 4021	9.09175 3376	7.1632 9E-14	0.57704 8198	0.90061 6674	0.57704 8198	0.90061 6674
ore than 1CM IN N POUCH	0.62188 309	0.11014 8063	5.64588 3105	2.5543 7E-07	0.40259 5141	0.84117 1039	0.40259 5141	0.84117 1039
than 30	0.93675 6381	0.08657 7968	10.8198 0094	3.4375 9E-17	0.76439 2887	1.10911 9875	0.76439 2887	1.10911 9875
NS FROM PREVIOUS	0.95217 1694	0.08643 5063	11.0160 3522	1.4630 6E-17	0.78009 2703	1.12425 0685	0.78009 2703	1.12425 0685
REE BILE_PUS	0.99252 1779	0.14832 9707	6.69132 1637	3.0276 7E-09	0.69722 0016	1.28782 3541	0.69722 0016	1.28782 3541
			#NUM					
	0	0	65535	!	0	0	0	0

➤ The Gall bladder score is the dependent variable, and the others are the independent variable.

➤ The regression analysis displays a significant relationship between the independent variable and dependent variables.

➤ In the present analysis, The gall bladder score is **significantly affected** by

- ❖ Adhesions less 50(Beta coefficient =-0.90 p=<0.01),
- ❖ Completely buried gall bladder GB (beta coefficient=0.5,p=<0.01),
- ❖ Distended shrilled GB (Beta coefficient =0.7,p=<0.01),
- ❖ Inability to grasp (beta coefficient=0.7,p=<0.01) ,
- ❖ stone more than 1 cm (beta coefficient=0.6,p<0.01) ,
- ❖ BMI more than 30 (beta coefficient = 0.93,p=<0.01) ,
- ❖ Adhesions from previous surgery (beta coefficient =0.95,p<0.01)
- ❖ sepsis pus in bile (beat coefficient =0.9,p<0.01).

This concludes that the following factors affect the Total GB score.

Gallbladder disease has a mortality rate of 0.45% to 6%, and cholecystectomy is one of the most common procedures, which requires hospital admission. <sup>(31)</sup>

It requires experienced surgeons and demands meticulous technique while performing surgery to achieve less complication rate. <sup>(32)</sup>

Longer duration of surgery with bile or stone spillage and conversion to open can make laparoscopic cholecystectomy a challenging procedure sometimes.

Preoperatively it's very difficult to predict. Currently, there is no standard, reliable scoring system to predict this difficulty. <sup>(33)</sup>

In our study, we found higher the severity of cholecystitis, the chances of difficulty in proceeding and conversion from laparoscopy to open increased, which often couldn't be predicted preoperatively as compared with a study conducted by Ewen Griffith et al. in the utilisation of an operative difficulty grading scale for laparoscopic cholecystectomy studied the Nassar scale. In this study, they found higher difficulty grades in surgery with a poor postoperative outcome, increased duration of stay with a median of 0-4 days, and 30 days complication rate 7.6-24.4% as difficulty raised from grade I to IV. The conversion rate and 30-day mortality rate were high as severity increased. <sup>(34)</sup>

In a similar study conducted by Reshma Bharamgoudar et al., the development and validation of a scoring tool to predict the operative duration of elective laparoscopic cholecystectomy studied important factors that increased operative hours >90min, whereas, in our study, we found operative hours increased to > 88.97min.

Ten factors like ASA, age, previous surgical admissions, BMI, GB wall thickness, and CBD diameters were significant factors which independently affected operative time. The risk score of these factors had AUROC 0.708 (se=0.013, p<0001). The scoring tool was significantly predictive of the long duration of surgery, and our study had Completely buried GB - 5 cases (p < 0.001 very significant) Inability to grasp - 25 cases (p < 0.02) Stone greater than 1 cm in Hartman pouch in 9 cases (p < 0.03 highly significant). <sup>(35)</sup>

A comprehensive predictive scoring method for difficult laparoscopic cholecystectomy analysed elderly patients, males, recurrent cholecystitis, obesity, previous surgery history, preop ERCP, abnormal liver function test and pancreatic function test, the appearance of gallbladder-like distended or shrilled, intra peritoneal adhesions, anatomical structure abnormality or distortions and cirrhosis.

AUCROC analysis of 0.956 with a difficulty level score above 9 had a sensitivity of 85% and specificity of 97.8%, concluded that predicting difficulty in laparoscopic cholecystectomy is possible with their scoring system.

As compared to the above study, In the present analysis, The gall bladder score is **significantly affected** by Adhesions < 50 (  $p < 0.01$ ), Completely buried gall bladder GB ( $p < 0.01$ ), Distended shrilled GB ( $p < 0.01$ ), Inability to grasp ( $p < 0.01$ ), stone more than 1 cm ( $p < 0.01$ ), BMI more than 30 ( $p < 0.01$ ), Adhesions from previous surgery ( $p < 0.01$ ) sepsis pus in bile (beata coefficient =0.9, $p < 0.01$ ). didn't include any preoperative ERCP.<sup>(36)</sup>

As compared to Masamichi yoke et al, in their study TG13 diagnostic criteria and severity grading of acute cholecystitis, did a multicentre analysis of TG13 diagnostic criteria, suggesting a sensitivity of 91.2% and specificity of 96.9% are favourable and diagnostic capacity is almost the same as TG07. And set a new standard for diagnosis, severity grading, and management of acute cholecystitis.

our study was the single center and had comparable diagnostic capacity. This concludes that the following factors affect Total GB score<sup>(37)</sup>



**SUMMARY**

- We studied 89 patients undergoing elective laparoscopic cholecystectomy for acute/chronic calculous cholecystitis/cholelithiasis. Aged between years 18 to 27 was seen in 19 patients, between 28-34 years was seen in 17 patients, age between 35 to 45 years was seen in 21 cases, Age between years 46 to 58 was seen in 21, Age between years 58+ was seen in 17 cases.
- male patients were 30 and female 59,
- socioeconomic group LIG-44, MIG-44, UIG-1 case
- laparoscopic cholecystectomy in 86 cases with conversion in 3 cases
- adhesion <50% in 45 cases (50.6%) and adhesion 50% in 49 cases (55.1%), Completely buried gall bladder GB 8 (8.9%), gallbladder shrilled or distended was observed in 4 (4.5%), grasping is not possible without decompression 28 (31.4%), stone more than 1 cm was found in 11 (12.3%), BMI 18 to 24 in 18 (20.2%), 24.15 to 26.56 in 21 (23.6%) cases, 26.57 to 28.34 in 15 (16.9%) cases, 28.35-31.00 in 19 (21.3%) cases, 31.01+ in 16 (18.0%) cases, sepsis/pus in bile seen in 6 (6.7%) cases.
- Mild < 2 degree was seen in 30 cases with 33.7%, moderate degree 3-4 in 43 cases, 48.3%, difficult 5-7 seen in 14 cases with 15.7%, and extreme difficulty 8-10 seen in 3 cases 3.4%
- An operative time of 70 min was seen in 21 cases with 23.6%, 71-80 min in 22.5%, 81-90 min in 19 cases with 21.3%, 90-105 min in 16 cases with 18.0% and 106+ min in 14.6% in 13 cases.

In the present analysis, we summarise that the following factors affect total G10. The gall bladder score is **significantly affected** by

- Adhesions,
- Completely buried gall bladder GB,
- gallbladder shrilled or distended,
- grasping is not possible without decompression,
- stone more than 1 cm,
- BMI more than 30,
- Adhesions from previous surgery,
- sepsis/pus in bile.

**CONCLUSION**

G10 intraoperative scoring system is a precise and reproducible in assessing intraoperative cholecystitis severity grading, difficulty and need for conversion which are predicted early. It is simple, effective and easy to implement during laparoscopic cholecystectomy.

Laparoscopic cholecystectomy outcome depends significantly upon intraoperative appearance like adhesions, completely buried gallbladder, distended or shrilled gallbladder, unable to grasp without decompression, stone more than 1cm, BMI more than 30, sepsis/bile/peritonitis.

Intraoperative G10 scoring system can predict conversion of laparoscopic to open cholecystectomy.

# ANNEXURE VII

## REFERENCES

1. Tomohide hori, Fumitaka oike, Hiraoaki FURYAMA. protocol for laparoscopic cholecystectomy: is it rocket science, world journal of Gastroenterology,2016,3-33
2. Nikhil Agarwal, sumitoj s, Sudhir k. preoperative prediction of difficult laparoscopy: A scoring method. n journal of surgery,2015;1:1-7.
3. Sammy siada, David jeffcoach, Rachel c dirks. A predictive grading scale for acute cholecystitis. Trauma surgery and Acute care open, volume4, Issue1,2020.1-12.
4. Michel sugrue, Fabrico coccolini etal. In 2019 Intra-operative gallbladder scoring predicts conversion of laparoscopic to open cholecystectomy: a WSES prospective collaborative study.
5. Wakabayashi G, Iwashita Y, Hibi T, Takada T, Strasberg S, Asbun H, Endo I, Umezawa A, Asai K, Suzuki K, Mori Y. Tokyo Guidelines 2018: surgical management of acute cholecystitis: safe steps in laparoscopic cholecystectomy for acute cholecystitis (with videos). J Hepatobiliary Pancreat Sci. 2018;25(1):73–86.
6. Sameer A.Kanaan,M.D, Kenric M. Murayama M.D, Louis T.Merriam M.D, Lillian G. Dawes M.D, Risk factors for conversion of Laparoscopic to open cholecystectomy. Journal of surgical Research106.2002;20-25.
7. Madni T, Leshikar D, Minshall C, Nakonezny P, Cornelius C, Imran J, Clark A, Williams B, Eastman A, Minei J, Phelan H. The Parkland grading scale for cholecystitis. Am J Surg. 2018;215(4):625–30.
8. Dr.S.T.Bhondave, Dr.Niranjan Dash, Dr Mrs.V.J.Thipse, Dr.J.M.Gadekar. proposed diagnostic scoring system to predict difficult laparoscopic cholecystectomy. Journal of medical science and clinical research. December 2017.vol 05, issue 12, page 31682-31688.
9. Ekici U,Tatli F, Kanlioz M. preoperative and postoperative risk factors in laparoscopic cholecystectomy converted to open surgery.Adv clin exp med.2019;28(7):857-860.
10. Inderbirsingh human embryology,7<sup>th</sup> edition, new Delhi. Macmillan India limited;2006,pp 186-8
11. Hesham aabdeldayem hepatic surgery essential functional hepatic biliary anatomy-available on [www.intechopen.com/books/hepatic-surgery/essential-functional hepatic-and-biliary-anatomy for surgeon](http://www.intechopen.com/books/hepatic-surgery/essential-functional-hepatic-and-biliary-anatomy-for-surgeon)
12. Henry A pitt, Thomas R Gadacz. anatomy embryology anomalies and physiology. Shackelford's surgery of alimental tract7th edition

13. Doushemi R, Husain F, Saleem A, Ashrafian M, Alimamadi F, Mohammad K. Congenital absence of the cystic duct: Case report of a rare anomaly and review of the literature. *International Journal of Surgery Case Reports*. 2022 Jul 1;96:107353.

14. Specht M.J. Calot's triangle. *JAMA: Journal of the AMERICAN MEDICAL ASSOCIATION*,200(13). doi :10.1001/jama.1967.03120260082023.

15. Joshi MP, Hossain AZ. Choledochal cyst with aberrant right posterior duct. *journal of paediatric surgery case reports*.2020 Dec 1;63:101687

16. PK Mishra textbook of Surgical gastroenterology 1<sup>st</sup> edition 2016 page no 579-580

17. Andall RG, Matusz P, Du Plessis M, Ward R, Tubbs RS, Loukas M. The clinical anatomy of cystic artery variations: a review of 9800 cases. *surgical and radiological anatomy*.2016 jul;38(5)529-39.

18. Pitt HA, Gadacz TR. Anatomy, embryology, anomalies, and physiology. In *Shackelford's surgery of the alimentary tract* 2013 Jan 1 (pp. 1286-1302). WB Saunders.

19. Chiang JY. Bile acid metabolism and signaling. *Comprehensive physiology*. 2013 Jul;3(3):1191.

20. Tandon RK. Prevalence and type of biliary stones in India. *World J Gastroenterol Suppl*. 2000;4:4-5.

21. Admirand WH, Small DM. The physicochemical basis of cholesterol gallstone formation in man. *The Journal of clinical investigation*. 1968 May 1;47(5):1043-52.

22. Williams ns, bullstrode cj, O'connell PR, Bailey and love's short practice of surgery. *Annals of the Royal college of surgeons of England*.2010 Mar;92(2):178.

23. Beckingham IJ. Gallstone disease. *Bmj*. 2001 Jan 13;322(7278):91-4.

24. Marton KI, Doubilet P. How to image the gallbladder in suspected cholecystitis. *Annals of internal medicine*. 1988 Nov 1;109(9):722-9.

25. Morales-Maza J, Rodríguez-Quintero JH, Santes O, Hernández-Villegas AC, Clemente-Gutiérrez U, Sánchez-Morales GE, Mier S, Pantoja JP, Mercado MA. Percutaneous cholecystostomy as treatment for acute cholecystitis: What has happened over the last five years? A literature review. *Revista de Gastroenterología de México (English Edition)*. 2019 Oct 1;84(4):482-91.

26. Takada T, Strasberg SM, Solomkin JS, Pitt HA, Gomi H, BUCHLER MW. TG13: updated Tokyo Guidelines for the management of acute cholangitis and cholecystitis. *Journal of hepatobiliary pancreatic sciences*.2013 jan;20(1):1-7

27. palanivelu c Laparoscopic cholecystectomy. in: palanivelu (ED) *CIGES Atlas of laparoscopic surgery*, 2<sup>nd</sup> edition. 2003-pp39-43

28. palanivelu c Laparoscopic cholecystectomy. in: palanivelu (ED) *Textbook of surgical laparoscopy*. coimbatore: GEM digestive diseases foundation.

27. Hinchey S. Time-point vs standard time-point laparoscopic cholecystectomy. *Surgical Endoscopy and Other Interventional Techniques*. 2003 Sep;17(9):1434-6.

30. De Mestral C, Rotstein OD, Laupacis A, Hoch JS, Zagorski B, Alali AS, Nathens AB. Comparative operative outcomes of early and delayed cholecystectomy for acute cholecystitis: a population-based propensity score analysis. *Annals of surgery*. 2014 Jan 1;259(1):10-5.

31. Williams ns, bullstrode cj, O'connell PR, Bailey and love's short practice of surgery. *Annals of the Royal college of surgeons of England*. 2018 Mar;92(2):88

32. Kuldip S, Ashish O. Difficult laparoscopic cholecystectomy: A large series from north India. *Indian Journal of Surgery*. 2006;68(4):205-8.

33. Jaskiran S. Randhawa; Aswini K. Pujahari (2009). Preoperative prediction of difficult lap chole: a scoring method. , 71(4), 198–201. doi:10.1007/s12262-009-0055-y

34. Griffiths EA, Hodson J, Vohra RS, Marriott P, Katbeh T, Zino S, Nassar AHM; West Midlands Research Collaborative. Utilisation of an operative difficulty grading scale for laparoscopic cholecystectomy. *Surg Endosc*. 2019 Jan;33(1):110-121. doi: 10.1007/s00464-018-6281-2. Epub 2018 Jun 28. Erratum in: *Surg Endosc*. 2018 Aug 22;: PMID: 29956029; PMCID: PMC6336748.

35. Bharamgoudar, R, Sonsale, A., Hodson, J. *et al*. The development and validation of a scoring tool to predict the operative duration of elective laparoscopic cholecystectomy. *Surg Endosc* **32**, 3149–3157 (2018). <https://doi.org/10.1007/s00464-018-6030-6>

36. Vivek MA, Augustine AJ, Rao R. A comprehensive predictive scoring method for difficult laparoscopic cholecystectomy. *Journal of minimal access surgery*. 2014 Apr;10(2):62.

37. Yokoe M, Takada T, Strasberg SM, Solomkin JS, Mayumi T, Gomi H, Pitt HA, Garden OJ, Kiriyama S, Hata J, Gabata T. TG13 diagnostic criteria and severity grading of acute cholecystitis (with videos). *Journal of hepato-biliary-pancreatic sciences*. 2013 Jan;20(1):35-46.

## ANNEXURE VIII

### SAMPLE INFORMED CONSENT FORM

**B.L.D.E.(Deemed to be university) SHRI B.M. PATIL MEDICAL COLLEGE HOSPITAL AND RESEARCH CENTRE, VIJAYAPUR – 586103, KARNATAKA**

**TITLE OF THE PROJECT:** Intra-operative gallbladder scoring predicts conversion of laparoscopic to open cholecystectomy: a prospective study

**PRINCIPAL INVESTIGATOR:**

**DR KRISHNA PRASAD S V**

**POSTGRADUATE**

**DEPARTMENT OF GENERAL SURGERY**

**PGGUIDE**

**DR. RAMAKANTH BALOORKAR**

**M.S. (GENERAL SURGERY),**

**PROFESSOR**

**DEPARTMENT OF GENERAL SURGERY.**

**CONFIDENTIALITY:**

I understand that medical information produced by this study will become a part of this hospital records and will be subjected to the confidentiality and privacy regulation of this hospital. Information of a sensitive, personal nature will not be a part of the medical records, but will be stored in the investigator's research file and identified only by a code number. The code key connecting name to numbers will be kept in a separate secure location.

If the data are used for publication in the medical literature or for teaching purpose, no names will be used and other identifiers such as photographs and audio or video tapes will be used only with my special written permission. I understand that I may see the photograph and videotapes and hear audiotapes before giving this permission.

## **REQUEST FOR MORE INFORMATION:**

I understand that I may ask more questions about the study at any time. Dr KRISHNA PRASAD S V is available to answer my questions or concerns. I understand that I will be informed of any significant new findings discovered during the course of this study, which might influence my continued participation.

If during this study, or later, I wish to discuss my participation in or concerns regarding this study with a person not directly involved, I am aware that the social worker of the hospital is available to talk with me.

And that a copy of this consent form will be given to me to keep it and for careful reading.

## **REFUSAL OR WITHDRAWL OF PARTICIPATION:**



I understand that my participation is voluntary and I may refuse to participate or may withdraw consent and discontinue participation in the study at any time without prejudice to my present or future care at this hospital.

I also understand that Dr. KRISHNA PRASAD S V will terminate my participation in this study at any time after he has explained the reasons for doing so and has helped arrange for my continued care by my own physician or therapist, if this is appropriate.

**INJURY STATEMENT:**



I ~~COMPLIANT WITH DURING THE RESEARCH~~ has explained to me the purpose of this research, the study procedure that I will undergo and the possible discomforts and benefits that I may experience, in my own language.

I have been explained all the above in detail in my own language and I understand the same. Therefore, I agree to give my consent to participate as a subject in this research project.

(Participant)

Date

# ANNEXURE IX

## PROFORMA

SL NO

NAME

PHONE NO

AGE

IP NO

SEX

UNIT

RELIGION

DOA

OCCUPATION

WARD

ADDRESS

DOD

SOCIO-ECONOMIC STATUS

MIG

LIG

UIG

SURGEON NAME-

Operative time-

PROVISIONAL DIAGNOSIS-

FINAL DIAGNOSIS-

OPERATIVE PROCEDURE –

FINAL OPERATIVE PROCEDURE-

CONVERTED TO OPEN CHOLECYSTECTOMY- YES/NO

REASON FOR CONVERSION-

**CHIEF COMPLAINTS:**

**HISTORY OF PRESENT ILLNESS**

**PAST HISTORY:**H/O previous abdominal surgery.

**PERSONAL HISTORY:**

**GENERAL PHYSICAL EXAMINATION**

**BUILT:** WELL/MODERATE/POOR

**NOURISHMENT:** WELL/MODERATE/POOR    **HEIGHT:**                      **WEIGHT:**                      **BMI:**

]

PALLOR

ICTERUS

CYANOSIS

CLUBBING

PEDAL EDEMA

GENERAL

LYMPHADENOPATHY

**VITAL DATA:**

TEMPERATURE:

PULSE

RESPIRATORY RATE

BLOOD PRESSURE:

**SYSTEMIC EXAMINATION**

**PER ABDOMEN:**

**RESPIRATORY SYSTEM**

**CARDIOVASCULAR SYSTEM**

**CENTRAL NERVOUS SYSTEM**



**CLINICAL DIAGNOSIS:**

INVESTIGATIONS

**CBC**

HB%

TOTAL COUNT

DIFFERENTIAL COUNT

N/L/E/B/M

**LIVER FUNCTION TEST**

TOTAL BILIRUBIN

DIRECT BILRUBIN

INDIRECT BILIRUBIN

SERUM ALBUMIN

SGOT

SGPT

ALKALINE PHOSPHATASE

HIV

HBsAG

HCV

**RENAL FUNCTION TEST**

BLOOD UREA

SERUM CREATININE

SERUM SODIUM

POTASSIUM

CHLORIDE

CHEST X RAY

USG ABDOMEN

CT ABDOMEN (IF DONE)

SYSTEMIC ANTIBIOTICS USED

DEFINITIVE PROCEDURE:

**Cholecystitis severity scoring G10**

<b>Cholecystitis severity</b>	<b>Score</b>
Appearance Adhesions < 50% of GB	1
Adhesions > 50% but GB buried	2
Completely buried GB	3 (max)
<b>Distension/contraction</b>	
Distended GB or contracted shrilled GB	1
Inability to grasp without decompression	1
Stone > 1 cm impacted in Hartmann's pouch	1
<b>ACCESS</b>	
BMI > 30	1
Adhesions from previous surgery limiting surgery	1
Sepsis and complications Free bile or pus outside the gallbladder	1
<b>FISTULA</b>	1
<b>TOTAL POSSIBLE SCORE</b>	<b>10</b>

SCORE BASED ON INTROP FINDINGS-

# KEY TO MASTER CHART

Age-in years    Sex    Secg-Socioeconomic group    Wt-weight in kg    Ht-height in cm    BMI

diagnosis-chole-cholelithiasis acc-acute calculous cholecystitis ccc-chronic calculous cholecystitis    unit    optim- operating time

lap- laparoscopic cholecystectomy                    con.op- converted to open    ele-elective    eme-emergency                    <50%-adhesion<50%,    >50%- adhesion>50%

cbg-completely buried    d/sgb-distended/shrilled gallbladder,    ingrde- inability to grasp without decompression    st>1-stone>1cm in Hartmann pouch

,BMI>30                    adpr-adhesion from previous surgery,                    sp/bl- sepsis/free bile/pus,                    fit- fistula,                    scre- totalscore10,                    mil- mild<2

mod-moderate3-4,                    sev-severly difficult 5-7,                    extr-extreme difficult 8-10

	Age	sex	secg	wt	ht	bmi	diagnosis	unit	optim	lap	con.op	ele	eme	<50%	>50%	cbg	d/sgb	Ingrde	st>1	bmi>30	adpr	sp/bl	fit	scre	mil	mod	sev	extr
29	FEMALE	MIG	70	156	28	chole	II	60	YES	NO	YES	NO	1	0	0	1	0	0	0	0	0	0	2	YES	NO	NO	NO	
70	MALE	MIG	70	168	20.00	Ccc	V	120	YES	NO	YES	NO	0	2	0	0	1	0	0	1	0	0	4	NO	YES	NO	NO	
58	MALE	MIG	82	170	31.00	ccc	IV	150	YES	YES	YES	NO	0	0	3	1	1	1	1	1	1	0	9	NO	NO	NO	YES	
36	FEMALE	MIG	70	158	28.00	ccc	II	90	YES	NO	YES	NO	0	2	0	1	0	0	0	1	0	0	4	NO	YES	NO	NO	
56	MALE	MIG	82	170	26.00	ccc	IV	120	YES	NO	YES	NO	0	2	0	1	0	0	0	0	0	0	3	NO	YES	NO	NO	
58	MALE	MIG	78	156	32.00	ccc	IV	90	YES	NO	YES	NO	0	0	3	1	0	0	1	0	0	0	5	NO	NO	YES	NO	
32	FEMALE	MIG	54	150	22.00	ccc	I	82	YES	NO	YES	NO	0	2	0	1	0	0	0	0	0	0	3	NO	YES	NO	NO	
27	FEMALE	LIG	57	156	23.40	chole	V	90	YES	NO	YES	NO	1	0	0	1	0	0	0	0	0	0	2	YES	NO	NO	NO	
26	FEMALE	LIG	74	150	32.90	ccc	IV	120	YES	YES	YES	NO	0	0	3	1	1	0	1	1	1	0	8	NO	NO	NO	YES	
33	FEMALE	UIG	76	154	32.00	acc	IV	120	YES	YES	YES	NO	0	0	3	1	1	1	1	1	0	0	8	NO	NO	NO	YES	
45	FEMALE	LIG	50	155	21.00	chole	IV	80	YES	NO	YES	NO	0	2	0	1	0	0	0	0	0	0	3	NO	YES	NO	NO	
60	FEMALE	LIG	68	160	26.56	acc	V	150	YES	NO	YES	NO	0	2	0	1	1	0	0	0	1	0	5	NO	NO	YES	NO	
57	FEMALE	LIG	68	168	20.00	Ccc	V	75	YES	NO	YES	NO	1	0	0	1	0	0	0	1	0	0	3	NO	YES	NO	NO	
23	FEMALE	LIG	56	154	18.20	chole	IV	150	YES	NO	YES	NO	1	0	0	1	0	0	0	0	0	0	2	YES	NO	NO	NO	
50	FEMALE	LIG	48	165	18.20	Ccc	IV	150	YES	NO	YES	NO	1	0	0	1	0	0	0	0	1	0	3	NO	YES	NO	NO	
40	FEMALE	LIG	50	165	19.20	Ccc	IV	120	YES	NO	YES	NO	0	2	0	1	0	0	0	1	0	0	4	NO	YES	NO	NO	
36	FEMALE	LIG	70	158	28.04	chole	III	90	YES	NO	YES	NO	0	2	0	1	0	1	0	0	0	0	4	NO	YES	NO	NO	
27	FEMALE	LIG	72	164	26.02	chole	II	105	YES	NO	YES	NO	1	0	0	1	0	0	0	0	0	0	2	YES	NO	NO	NO	
60	FEMALE	LIG	70	156	28.20	Ccc	IV	85	YES	NO	YES	NO	1	0	0	1	0	0	0	0	0	0	2	YES	NO	NO	NO	
80	FEMALE	LIG	72	165	26.40	chole	III	80	YES	NO	YES	NO	0	2	0	1	0	0	0	0	0	0	3	NO	YES	NO	NO	
30	FEMALE	LIG	78	162	29.72	chole	I	95	YES	NO	YES	NO	1	0	0	1	0	0	0	1	0	0	3	NO	YES	NO	NO	
27	FEMALE	LIG	72	158	28.83	mirizizs	V	120	YES	NO	YES	NO	0	0	3	1	1	1	0	0	1	0	7	NO	NO	YES	NO	
30	FEMALE	LIG	84	168	31.23	chole	III	100	YES	NO	YES	NO	0	2	0	1	1	0	0	1	0	0	5	NO	NO	YES	NO	

27	MALE	LIG	70	162	21.20	acc	IV	90	YES	NO	YES	NO	1	0	0	1	0	0	0	0	0	0	2	YES	NO	NO	NO
35	FEMALE	LIG	76	172	25.68	Ccc	IV	60	YES	NO	YES	NO	1	0	0	1	0	0	0	0	0	0	2	YES	NO	NO	NO
60	FEMALE	MIG	56	152	20.00	chole	IV	120	YES	NO	YES	NO	1	0	0	1	0	0	0	0	0	0	2	YES	NO	NO	NO
30	FEMALE	LIG	68	160	26.56	chole	V	80	YES	NO	YES	NO	1	0	0	1	0	0	0	0	0	0	2	YES	NO	NO	NO
50	FEMALE	LIG	66	152	28.56	chole	V	85	YES	NO	YES	NO	0	2	0	1	0	0	0	0	0	0	3	NO	YES	NO	NO
19	FEMALE	LIG	68	154	28.67	acc	IV	100	YES	NO	YES	NO	0	2	0	1	0	0	1	0	0	0	4	NO	YES	NO	NO
39	FEMALE	MIG	45	156	19.00	chole	IV	60	YES	NO	YES	NO	1	0	0	1	0	0	0	0	0	0	2	YES	NO	NO	NO
60	FEMALE	MIG	76	162	28.95	chole	IV	60	YES	NO	YES	NO	0	2	0	1	0	0	0	0	0	0	3	NO	YES	NO	NO
30	FEMALE	MIG	70	165	28.28	ccc	II	120	YES	NO	YES	NO	1	0	0	1	0	1	0	0	0	0	3	NO	YES	NO	NO
32	FEMALE	LIG	58	155	24.14	chole	IV	90	YES	NO	YES	NO	0	2	0	1	1	0	0	1	0	0	5	NO	NO	YES	NO
60	FEMALE	MIG	70	168	24.80	chole	V	90	YES	NO	YES	NO	1	0	0	1	0	0	0	0	0	0	2	YES	NO	NO	NO
45	FEMALE	MIG	50	166	19.00	chole	V	70	YES	NO	YES	NO	0	2	0	1	1	0	0	0	0	0	4	NO	YES	NO	NO
46	FEMALE	MIG	92	162	35.80	chole	V	105	YES	NO	YES	NO	1	0	0	1	0	0	1	0	0	0	3	NO	YES	NO	NO
31	FEMALE	LIG	68	158	27.23	chole	III	80	YES	NO	YES	NO	1	0	0	1	0	0	0	0	0	0	2	YES	NO	NO	NO
70	MALE	MIG	76	172	25.68	ccc	IV	105	YES	NO	YES	NO	0	0	0	1	0	0	0	0	0	0	3	NO	YES	NO	NO
49	MALE	MIG	72	170	24.91	chole	IV	90	YES	NO	YES	NO	1	0	0	1	0	0	0	0	0	0	2	YES	NO	NO	NO
22	MALE	LIG	68	160	26.56	chole	II	80	YES	NO	YES	NO	1	2	0	1	0	0	0	0	0	0	2	YES	NO	NO	NO
24	FEMALE	MIG	70	158	28.81	chole	II	75	YES	NO	YES	NO	1	0	0	1	1	1	0	0	0	0	3	NO	YES	YES	NO
60	FEMALE	MIG	72	158	28.04	acc	I	105	YES	NO	YES	NO	0	2	0	1	1	0	0	0	0	0	3	NO	YES	NO	NO
58	MALE	MIG	80	168	28.34	chole	V	130	YES	NO	YES	NO	1	0	0	1	1	0	0	0	0	0	3	NO	NO	NO	NO
27	FEMALE	MIG	66	158	26.61	chole	V	70	YES	NO	YES	NO	1	0	0	1	0	0	0	0	0	0	2	YES	NO	NO	NO
60	FEMALE	LIG	62	160	23.62	chole	V	105	YES	NO	YES	NO	0	2	0	1	0	0	0	0	0	0	3	YES	NO	NO	NO
37	FEMALE	MIG	78	158	30.60	chole	II	70	YES	NO	YES	NO	0	2	0	1	0	0	1	0	0	0	4	NO	YES	NO	NO

65	FEMALE	LIG	60	156	24.65	chole	V	90	YES	NO	NO	NO	1	0	0	0	0	0	0	0	0	2	YES	NO	NO	NO	
36	FEMALE	LIG	70	158	28.04	chole	III	90	YES	NO	YES	NO	0	2	0	1	0	1	0	0	0	0	4	NO	YES	NO	NO
31	FEMALE	MIG	68	160	26.56	chole	V	105	YES	NO	YES	NO	1	2	0	0	1	0	0	0	0	0	2	YES	NO	NO	NO
45	MALE	MIG	80	168	28.34	chole	IV	105	YES	NO	YES	NO	0	2	0	1	0	0	0	0	0	0	2	YES	NO	NO	NO
33	FEMALE	MIG	46	152	18.50	chole	II	100	YES	NO	YES	NO	1	0	0	1	0	0	0	0	0	0	2	YES	NO	NO	NO
37	FEMALE	MIG	82	162	31.26	Ccc	IV	85	YES	NO	YES	NO	0	2	0	1	1	0	1	1	0	0	6	NO	NO	YES	NO
62	MALE	LIG	82	162	31.24	acc	III	60	YES	NO	YES	NO	0	0	0	0	1	0	0	0	0	0	3	NO	YES	NO	NO
49	MALE	LIG	78	152	33.76	chole	I	75	YES	NO	YES	NO	1	0	0	1	0	0	1	0	0	0	3	NO	YES	NO	NO
23	FEMALE	MIG	79	158	31.70	chole	V	95	YES	NO	YES	NO	0	2	0	1	0	0	1	0	0	0	4	NO	YES	NO	NO
40	MALE	MIG	60	156	24.65	chole	IV	69	YES	NO	YES	NO	0	2	0	1	1	0	0	0	0	0	4	NO	YES	NO	NO








B.L.D.E. (DEEMED TO BE UNIVERSITY)

(Declared vide notification No. F.9-37/2007-U.3 (A) Dated. 29-2-2008 of the MHRD, Government of India under Section 3 of the UGC Act, 1956)

The Constituent College

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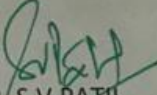
### INSTITUTIONAL ETHICAL CLEARANCE CERTIFICATE

The Institutional ethical committee of this college met on 11-01-2021 at 11-00 am to scrutinize the synopsis of Postgraduate students of this college from Ethical Clearance point of view. After scrutiny the following original/corrected and revised version synopsis of the Thesis has been accorded Ethical Clearance

**Title:** Intra –operative gall bladder scoring predicts conversion to laparoscopic to open

**Name of PG student:** Dr Krishna Prasad S V, Department of Surgery

**Name of Guide/Co-investigator:** Dr Ramakant S Baloorkar Associate Professor  
Department of Surgery

  
DR. S.V. PATIL  
CHAIRMAN, IEC

Institutional Ethical Committee  
B.L.D.E (Deemed to be University)  
Shri B.M. Patil Medical College,  
VIJAYAPUR-586103 (Karnataka)

Following documents were placed before Ethical Committee for Scrutinization:

1. Copy of Synopsis / Research project
2. Copy of informed consent form



# 20BMSUR007-KRISHNAPRASAD-INTRA OPERATIVE GALLBLADDER SCORING PREDICTS CONVERSION OF LAPAROSCOPIC TO OPEN CHOLECYSTECTOMY: A PROSPECTIVE STUDY

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