

CORRELATION OF PRE OPERATIVE AND INTRA OPERATIVE FINDINGS IN GALL STONE DISEASE

General Surgery

Dr. Selwyn J Kumar

Associate Professor of General Surgery, Kanyakumari Govt. Medical College

Dr. J. Ajin Manovah

Assistant Professor of General Surgery, Kanyakumari Govt. Medical College

Dr. P. Ajin Daniel

Assistant Professor of General Surgery, Kanyakumari Govt. Medical College

Dr. T. Rajarajan

Post Graduate of General Surgery, Kanyakumari Govt. Medical College

ABSTRACT

Background: Gallstone disease (GD) is a chronic recurrent hepatobiliary disease, the basis for which is the impaired metabolism of cholesterol, bilirubin and bile acids which is characterized by the formation of gallstones in the hepatic bile duct, common bile duct or gallbladder. GD is one of the most prevalent gastrointestinal diseases with a substantial burden to health care systems. GD can result in serious outcomes such as acute gallstone pancreatitis and gallbladder cancer. The epidemiology, correlation with USG findings and anatomical variants encountered during cholecystectomy are discussed in this study. **Aims and objectives:** To compare preoperative and intraoperative findings of gall stone disease in patients who underwent cholecystectomy. **Materials and methods:** 104 patients who underwent cholecystectomy in Kanyakumari Government Medical College from January 2019 to December 2022. **Results:** Majority of the patients were in age group between 19 to 78 years of age with a mean age of 42.5. Female predominance was reported in our study comprising 65% of total study participants. The study identified a sensitivity of 0.84 and a specificity of 1 for ultrasound in the identification of gallstones. 10 % of the study population had different anatomical variants which were encountered during cholecystectomy. <4% of study population was intraoperatively converted from laparoscopic to open cholecystectomy. 78% of stones are pigment stones based on dry weight analysis. **Summary:** Reproductive Age and female sex are profoundly associated with the incidence of gallstone disease. This study suggests that despite an evolution in the resolution of ultrasound imaging, there has not been a corresponding improvement in sensitivity. Knowledge of Variation in cystic duct anatomy is important to avoid inadvertent injury to the biliary tree during Cholecystectomy. The study population have a predominance of pigment stones based on dry weight analysis.

KEYWORDS

Gall stones, Cholecystectomy, Gall stone disease.

INTRODUCTION:

Cholelithiasis is the most common biliary pathology. It is estimated that gallstones affect 10-15% of the general population. Gallstones may remain asymptomatic, being detected incidentally when imaging is performed for other symptoms. Patients may typically complain of right upper quadrant or epigastric pain, which may radiate to the back.

Other symptoms include dyspepsia, flatulence, food intolerance particularly to fat^[1]. Gallstones become symptomatic when they obstruct a visceral structure such as cystic duct^[2]. Laparoscopic cholecystectomy remains the gold standard of care for acute cholecystitis and symptomatic cholelithiasis^[3].

MATERIALS AND METHODS:

In the period from January 2019 to December 2022, a total of 104 patients who were admitted in the general surgery wards of the Kanyakumari Government Medical College in Tamilnadu and underwent Cholecystectomy were included in the study. All patients were subjected to ultrasound examination prior to the surgery and histopathological analysis of gallbladder postoperatively.

Retrospective analysis of these patients was carried out comparing their preoperative ultrasound and their postoperative histopathology report for the type of gallstones. Cholesterol gallstones were defined as those which contained more than 50% of their dry weight as cholesterol and pigment gallstones were defined as those containing less than 20% of their dry weight as cholesterol.

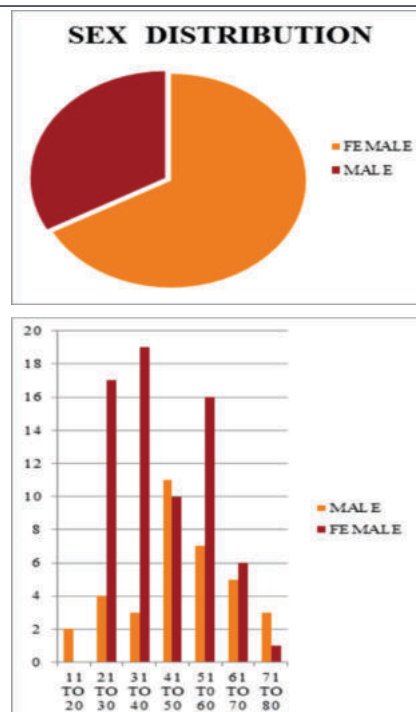
RESULTS:

Sex distribution:

Female predominance was noted in this study (68 patients) comprising of 65% of the study population. 35% (36 patients) of the study population were male.

Age Distribution:

Most of the patients are within the age group of 19 to 78 and the mean age is 42.5. Gallstone disease are common in female around reproductive age group peaking between 21 to 40 years of age. In males, slight predominance is seen between 41 to 50 years of age.



Correlation between preoperative USG scan and postoperative histopathological findings:

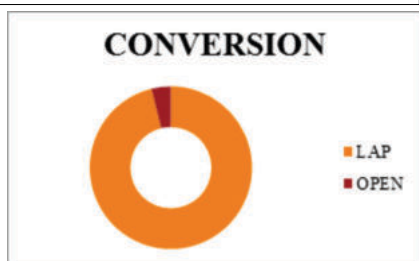
The total of 104 ultrasound scans were performed of which 102 were positive and 2 were negative for gallstones. Of the positive group, 85 were confirmed to have gallstones on histopathology, whilst 17 were found to have no gallstones on histopathology. Of the 2 ultrasound scans found to be negative for gallstone, the histopathological specimens also turned out to be absent gallstones in both. This provided a positive predictive value (PPV) of 0.84 and negative predictive value (NPV) of 1.



Conversion from laparoscopic to open cholecystectomy:

Among 104 patients who underwent laparoscopic cholecystectomy, 4 patients (3.8%) were converted to open cholecystectomy due to the following reasons.

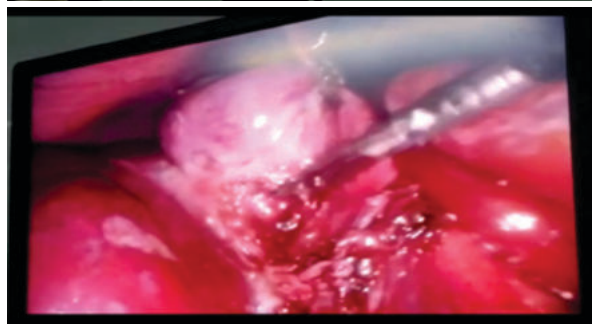
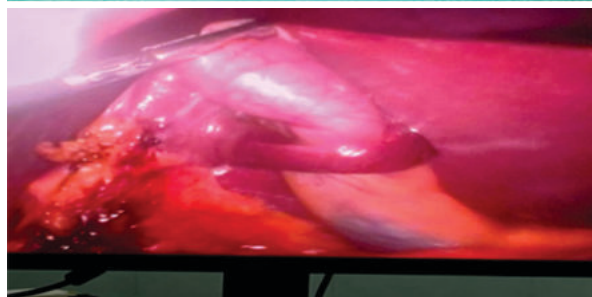
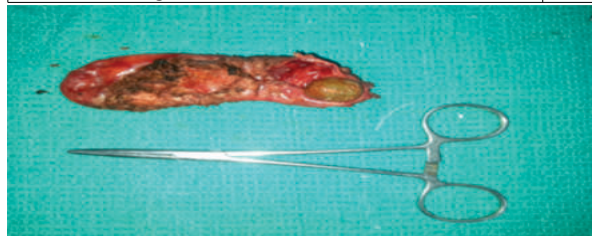
Cystic artery injury/bleed	1
Bile duct injury	1
Severe Adhesions	2



Anatomical variants encountered:

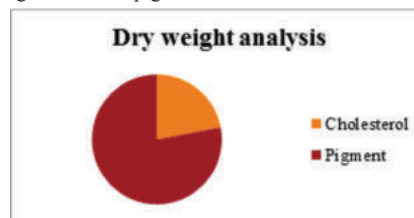
Total of 10 cases were found to have anatomical variants intraoperatively which comprises 9.6% of the study population. The various anatomical variants encountered are listed below

Aberrant cystic artery	4
Absent cystic duct	2
Low insertion of cystic duct	1
Accessory hepatic lobe	1
Sigmoid gallbladder	1
Diverticulum of gallbladder	1



Histopathological findings:

Based on dry weight analysis, 22% of gallstones are cholesterol stones and 78% of gallstones are pigment stones.



DISCUSSION:

The sex and age distribution in our study had a female predominance comprising 65% of the total study population and peaking around the reproductive age groups between 21 to 40 years of age. This result is similar to literature^[4] suggesting that female have two to three fold higher risk for gallstone disease than male.

Women had clearly increased incidence rates only at the age of up to 40 years due to extraneous risk factors such as pregnancy and sex hormones. This age-related difference between male and female was confirmed by similar results of the GREPCO study which found a female-to-male ratio of 2.9 between the ages of 30 to 39 years^[5], but the ratio narrowed to 1.6 between the ages of 40 to 49 years and to 1.2 between the ages of 50 to 59 years.

Ultrasound scanning has been the modality of choice for the clinical diagnosis of gallstone disease. Ultrasound technology has undergone a period of transformation. With progress in technology, one would assume that the sensitivity of the diagnostic tool would also increase. Meta analysis of studies between 1966–1992 assessing the diagnosis of biliary disease produced figures of the adjusted sensitivity of ultrasound for the diagnosis of gallstones at 0.84 and a specificity of 0.99^[6]. Retrospective analysis of patients who underwent cholecystectomy during 2010 at UK had a sensitivity of 0.85 and specificity of 1^[7]. The result in our study is similar to both the studies producing figures of sensitivity at 0.84 and specificity of 1. There is a possibility that stones may have passed out during cholecystectomy which accounts for non correlation with our findings. The incidence of spillage of stones is difficult to quantify but varies from as low as 3.3% to 17% and non-retrieval of 0.3%.^[8] Magnetic resonance cholangiopancreatography (MRCP) has been widely accepted for its sensitivity in the diagnosis of choledocholithiasis but has never been proven superior to ultrasound in cholelithiasis^[9].

Laparoscopic cholecystectomy has 0.1% to 0.5% mortality and 2% to 3% morbidity^[1]. 3.8% of the study population who underwent laparoscopic cholecystectomy were converted to open cholecystectomy due to difficulty or complications during dissection.

The blood supply of the common hepatic duct and CBD comes from right hepatic and cystic artery. The cystic artery takes off from the right hepatic artery in calots triangle, which is at risk for injury during cholecystectomy^[1]. In this study, 4 cases were found to have aberrant cystic artery and about 9.6% were found to have anatomical variants.

Pigment stones were found to be 78% predominant in study population based on dry weight analysis which is found to be similar to the study in which pigment stones accounts for 80% in South Indian population^[10].

SUMMARY:

Reproductive age and female sex are profoundly associated with the incidence of gallstone disease. This study suggests that despite an evolution in the resolution of ultrasound imaging, there has not been a corresponding improvement in sensitivity. Knowledge of variation in cystic duct anatomy is important to avoid inadvertent injury to the biliary tree during Cholecystectomy.

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