



Unveiling Hidden Culprits: An Observational Study of Upper Gastrointestinal Endoscopy Findings in Symptomatic Cholelithiasis Patients

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Abstract

Background: Cholelithiasis, commonly known as gallstone disease, is often managed surgically through cholecystectomy. However, many patients continue to experience persistent gastrointestinal symptoms post-surgery, raising questions about hidden upper GI pathologies that may mimic gallstone-related discomfort. Could these overlooked conditions be the true culprits behind lingering symptoms?

Aim & Objectives: 1. to analyze the role of upper gastrointestinal endoscopy (UGIE) as a routine pre-operative investigation in cholelithiasis patients with typical biliary colic or atypical upper abdominal symptoms undergoing elective cholecystectomy. 2. to find out co existing pathologies in symptomatic cholelithiasis patients.

Methods: An observational study was conducted on 80 patients diagnosed with symptomatic cholelithiasis. All patients underwent preoperative UGIE to assess for associated GI abnormalities. The findings were analyzed and correlated with symptom presentation, demographic factors, and postoperative outcomes.

Statistical Analysis: Descriptive statistics were used to analyze the prevalence of pathological upper gastrointestinal endoscopy (UGIE) findings, including gastritis, hiatus hernia, peptic ulcer disease, polyps, and malignancy, expressed as percentages. Data were recorded and processed using Microsoft Excel for preliminary analysis. The Chi-square test was applied to assess the association between the type of pain (typical vs. atypical) and endoscopic findings. Statistical analysis was conducted using IBM SPSS Statistics (Version 27), with significance level set at 0.05 for all tests.

Results: This prospective study was conducted at a tertiary care medical college hospital in Mangalore, Karnataka, India. It included 80 patients diagnosed with gallbladder stones via ultrasound, who subsequently underwent upper gastrointestinal endoscopy (UGIE) to evaluate coexisting GI pathology. UGIE detected abnormalities in a significant proportion of patients, with gastritis being the most prevalent finding, followed by reflux esophagitis and peptic ulcer disease. A subset of patients tested positive for Helicobacter pylori infection. Notably, patients with abnormal UGIE findings had a higher incidence of persistent

postoperative symptoms compared to those with normal UGIE results. The study observed a higher prevalence of gallstones in females compared to males, with a female-to-male ratio of 1:0.45. Gallstones were more commonly found in individuals over 40 years of age, with the majority of female patients being above 60 years. A subset of patients with inflammatory GI pathology tested positive on the rapid urease test and were treated with an H. pylori eradication regimen, leading to symptom improvement. Furthermore, upper GI abnormalities were more frequently observed in patients with a single gallstone compared to those with multiple calculi. Additionally, all patients with a normal UGIE had a normal gallbladder wall thickness. This study highlights the importance of evaluating upper GI pathology in patients with gallstones to optimize management and improve postoperative outcomes.

Conclusion: This study highlights the critical role of upper gastrointestinal endoscopy (UGIE) in the preoperative evaluation of symptomatic cholelithiasis. Findings suggest that gastrointestinal inflammatory conditions, rather than gallstones, are often the primary cause of symptoms. Laparoscopic cholecystectomy should be deferred until after GI treatment; if symptoms resolve, surgery may not be needed.

Keywords: Gallstones; Cholelithiasis; Ugi Endoscopy (Ugie); Laparoscopic Cholecystectomy; Minimal Access Surgery; H.Pylori; Post Cholecystectomy Syndrome; Observational Study

Abbreviations

PCS: Post-Cholecystectomy Syndrome; GI: Gastrointestinal; PUD: Peptic Ulcer Disease; GERD: Gastroesophageal Reflux Disease; UGE: Upper GI Endoscopy; RAT: Rapid Urease Test; PPIs: Proton Pump Inhibitors.

Introduction

Gallstones, also referred to as cholelithiasis, are among the most common conditions encountered in surgical practice [1,2]. It is estimated that approximately 5–10% of the Asian population is affected by gallstones. In the Asian subcontinent, cholelithiasis is more prevalent in females and individuals over the age of 40 [3,4]. In contrast, gallbladder disease affects approximately 15–16.6% of females and 5–7.9% of males in Western countries [5-8]. Risk factors for gallstone formation include obesity, high-fat diet, sedentary lifestyle, genetic predisposition, and metabolic disorders such as diabetes mellitus and hyperlipidemia [9,10].

Over the past few years, there has been an increase in the diagnosis of gallstones due to changes in dietary habits, widespread use of imaging technology for abdominal evaluations, and greater awareness among the general population regarding various diseases [2,8]. The primary mode of management for symptomatic gallstones is cholecystectomy [11]. Approximately 85–90% of patients with symptomatic cholelithiasis experience significant symptom relief following gallbladder removal. However, a subset of patients continues to experience persistent symptoms postoperatively, a condition referred to as post-cholecystectomy syndrome (PCS) [12].

Research indicates that underlying upper gastrointestinal (GI) pathology is often responsible for these persistent symptoms. Studies have shown that in patients who underwent cholecystectomy but had no stones detected intraoperatively, the incidence of persistent symptoms post-surgery was as high as 40% [13-15].

Although laparoscopic cholecystectomy is a routine procedure, it is not without risks. The procedure requires general anesthesia, which carries its own risks and complications. Additionally, the creation of pneumoperitoneum during surgery places a burden on the cardiopulmonary system, particularly in patients with pre-existing cardiac or respiratory conditions [16,17]. The procedure itself is associated with complications such as bile duct injury, bleeding, infection, and postoperative adhesions, which can contribute to long-term morbidity [18,19].

Identifying patients with concurrent upper GI pathology and treating them prior to surgery could reduce the number of unnecessary cholecystectomies. This is particularly important because upper GI symptoms often mimic those of biliary tract disease [20,21]. Gastritis, reflux esophagitis, and peptic ulcer disease are common upper GI conditions that can present with symptoms similar to gallstone disease, such as epigastric pain, bloating, nausea, and dyspepsia [22]. Helicobacter pylori infection is frequently implicated in these conditions, and its eradication has been shown to significantly improve symptoms in affected patients [23].

The coexistence of upper GI disorders in patients with gallstone disease may contribute to PCS [24,25].

Although gallstone disease is asymptomatic in the majority of individuals, cholecystectomy is frequently regarded as the best treatment for symptomatic cases. However, accurately determining whether gallstones are the true cause of a patient's symptoms remains a challenge [26]. Several studies have demonstrated that patients who

experience persistent symptoms following cholecystectomy often have findings on upper GI endoscopy [27,28]. Treatment of these underlying GI conditions has been shown to alleviate dyspeptic symptoms and pain after surgery [29,30]. Upper GI pathologies are frequently the actual cause of symptoms that are mistakenly attributed to gallbladder disease [15–20].

Given the overlap in symptoms between gallstone disease and upper GI disorders, preoperative upper GI evaluation, including endoscopy, should be considered in selected patients. This approach may help in avoiding unnecessary surgeries and improving patient outcomes by addressing the actual underlying pathology. Many patients present with persistent dyspeptic symptoms after cholecystectomy, highlighting the need for a thorough evaluation of these symptoms. This study was undertaken to assess the prevalence of concurrent upper GI pathology in patients with gallstone disease and to determine whether targeted treatment of these conditions could improve symptom relief, potentially reducing the need for unnecessary surgical intervention.

Materials and Method

The study was conducted in the Department of General Surgery at A J Institute of Medical Sciences and Research Centre, Mangalore. It was designed as an observational study and was carried out over a period of two years, from August 2022 to July 2024. The study utilized purposive sampling, and the sample size was determined based on a study conducted by H. Diettrich et al.,³¹ with a minimum requirement of 80 subjects.

Inclusion Criteria

- Patients above 18 Years Of Age
- Radiologically proven diagnosis Of Cholelithiasis
- Patients with Typical or Atypical symptoms of Cholelithiasis

Exclusion Criteria

- Patients < 18 Years of Age
- Acute abdomen
- Choledocholithiasis
- Surgical Obstructive Jaundice
- Gall Bladder stone pancreatitis

- Gall Bladder neoplasm
- Previous Gall Bladder or Pancreatic surgery
- All congenital anomalies of biliary duct system recorded incidentally or accidentally even if gall bladder stones are present.

Criteria for Deferring Laparoscopic Cholecystectomy in Patients with Concurrent Upper GI Pathologies

1. Active Peptic Ulcer Disease (PUD)

- Recent upper GI bleeding (within the past 4 weeks).
- Presence of ulcer-related perforation or gastric outlet obstruction.

2. Gastroesophageal Reflux Disease (GERD)

- Los Angeles (LA) Grade C or D esophagitis.
- Presence of Barrett's esophagus with high-grade dysplasia.

3. Large Hiatal Hernia (>5 cm) or Paraesophageal Hernia

- Symptomatic paraesophageal hernia requiring repair.
- Severe reflux or regurgitation with significant dysphagia.

4. Acute Upper GI Bleeding

- Hemodynamic instability.
- Recent transfusion requirement for ongoing bleeding.

5. Unexplained Gastric Mass

- Suspicious gastric mass detected on endoscopy, awaiting biopsy results.

Method of Data Collection

This prospective study included approximately 80 patients diagnosed with symptomatic gallbladder stones, either clinically or radiologically, in the Department of General Surgery at A J Institute of Medical Sciences and Research Centre. Verbal and written informed consent was obtained from all participants. Patient data included demographic details, presenting symptoms (typical or atypical biliary colic), ultrasonography findings, upper GI endoscopy (UGE) results, and biopsy reports when applicable. After clinical evaluation, all patients underwent UGE a few days before surgery. If necessary, biopsies were taken for histopathological examination.

Endoscopic findings were categorized as normal, infective, inflammatory, erosive, ulcerative, or malignant. Patients with ulcers underwent biopsy and H. pylori testing via the rapid urease test (RAT). H. pylori-positive cases were treated with a triple eradication regimen, while other ulcers were managed with proton pump inhibitors (PPIs) for four weeks. Patients with gastric or duodenal inflammation were started on PPI therapy before undergoing laparoscopic

cholecystectomy. Patients with malignant findings on endoscopy did not proceed with cholecystectomy but were further evaluated and managed based on tumor staging.

Statistical Analysis

Descriptive statistics were used to analyze the distribution of pathological UGE findings, including gastritis, hiatus hernia, peptic ulcer disease, polyps, and malignancy, and were expressed as percentages. Categorical variables were compared using the Chi-square test or Fisher's exact test, as appropriate. Continuous variables were analyzed using the independent t-test or Mann-Whitney U test, depending on the normality of distribution assessed by the Shapiro-Wilk test. All data were recorded in Microsoft Excel and analyzed using IBM SPSS Statistics version 27. A p-value <0.05 was considered statistically significant.

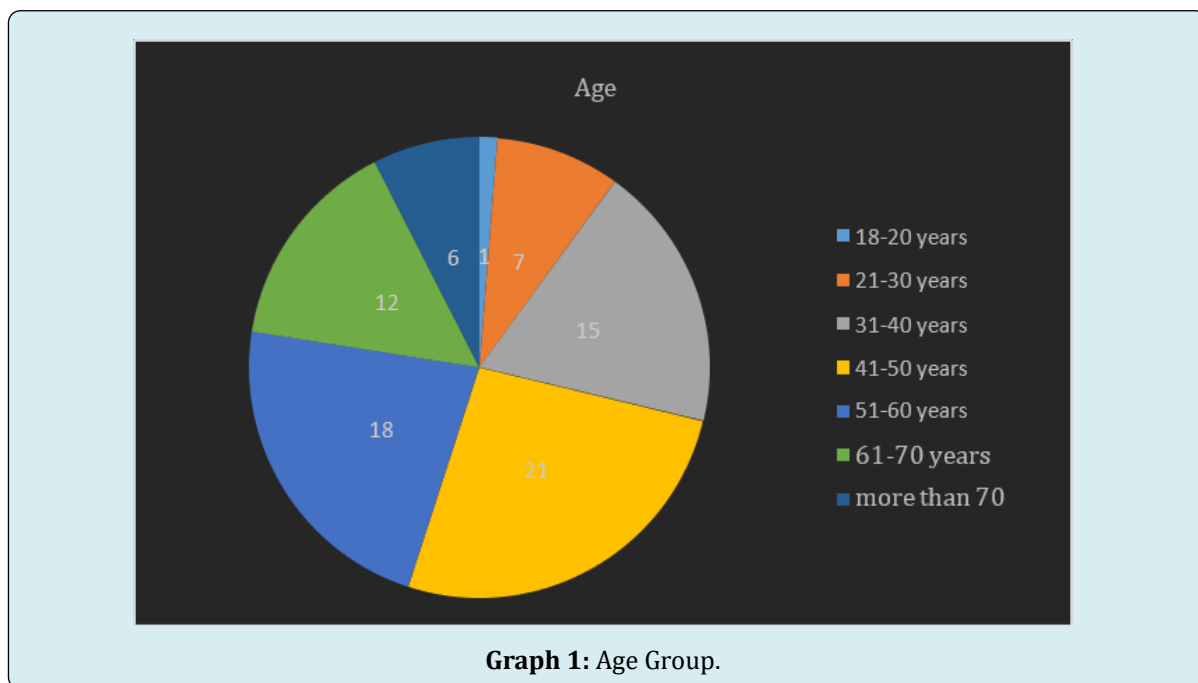
Results and Observations

The present study was done at a teaching hospital on 80 cases that met predefined criteria and gave an informed consent for the study demographic data. The findings of the study are discussed below.

Demographic Data

Age	Case No	Percent
18-20 years	1	1.25%
21-30 years	7	8.75%
31-40 years	15	18.75%
41-50 years	21	26.25%
51-60 years	18	22.50%
61-70 years	12	15.00%
more than 70 years	6	7.50%

Table 1: Age Group.



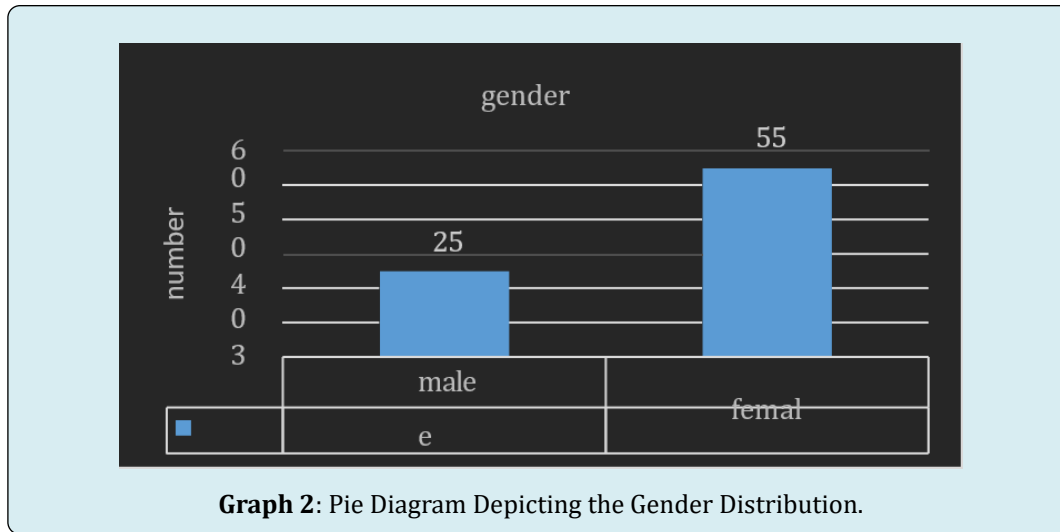
1 case (1.25%) belonged to the age group between 18 years and 20 years, 7 case (8.75%) belonged to the age group between 21 years and 30 years, 15 cases (18.75%) belonged

to the age group between 31 years and 40 years, 21 cases (26.25%) belonged to the age group between 41 years and 50 years, 18 cases (22.50%) belonged to the age group between 51 years and 60 years, 12 cases (15%) belonged to the age group between 61 years and 70 years and 6 cases (7.5%) belonged to the age group more than 70 years the mean age was 50.76 years SD + 15.27 years.

Gender Distribution

Gender	Frequency	Percentage
male	25	31.25%
female	55	68.75%
Total	80	100.00%

Table 2: Table Depicting the Gender Distribution.



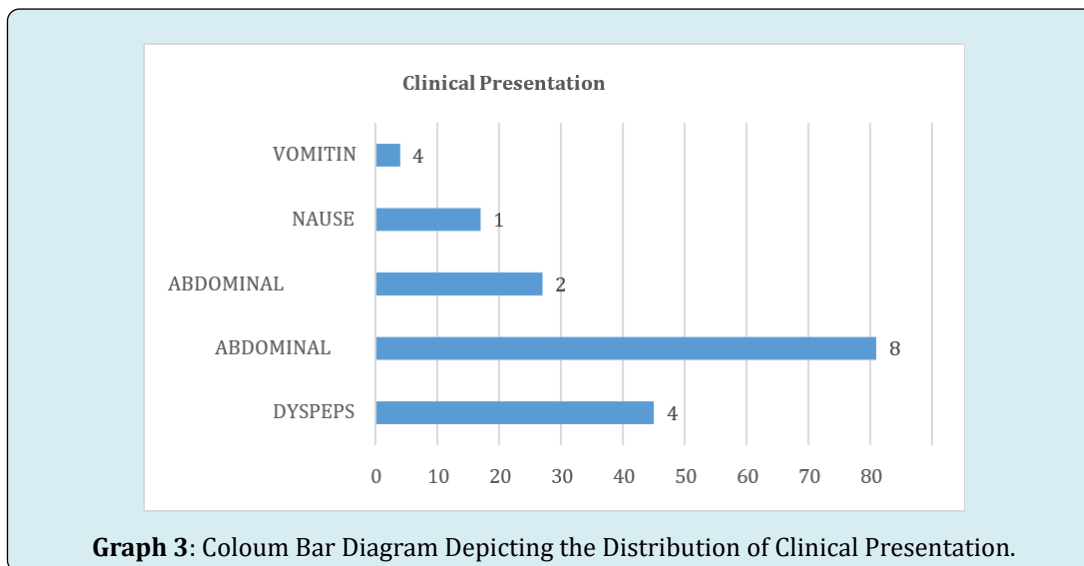
68.75% were females and 31.75% were males, the male to female ratio was 0.45 to 1. The difference in gender was

statistically significant with the P value 0.032.

Clinical Details

Clinical Presentation	Frequency	Percent
Dyspepsia	45	56.25%
Abdominal Pain	81	100.00%
Abdominal Bloating	27	33.75%
Nausea	17	21.25%
Vomiting	4	5.00%

Table 3: Table Depicting the Distribution of Clinical Presentation.



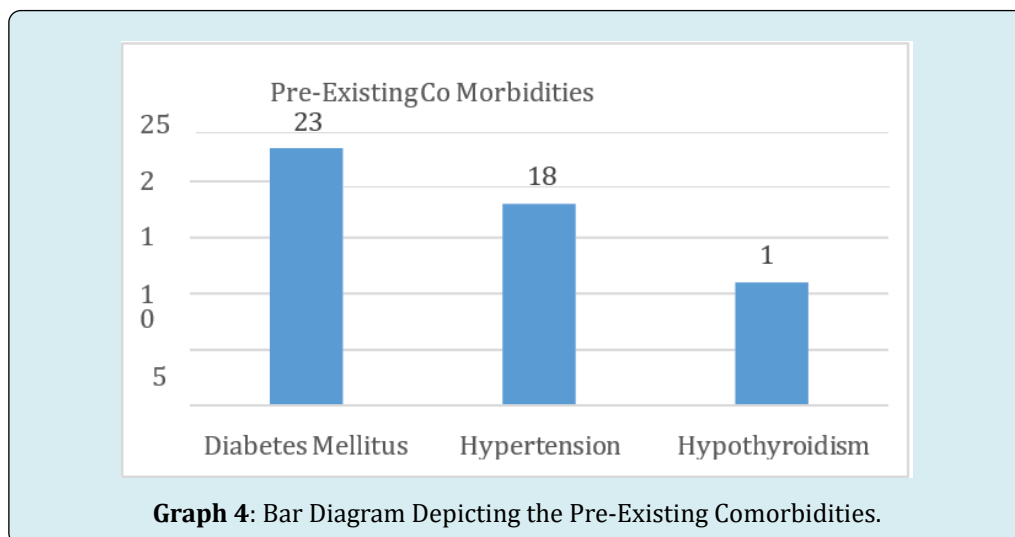
In the order of frequency of symptoms abdominal pain was seen in 80 cases (100.00%) , dyspepsia was seen 45 cases (56.25%) , abdominal bloating was seen 27 cases

(33.75%), nausea was seen 17 cases (21.25%) , vomiting was seen 4 cases (25%).

Pre-Existing Co-Morbidities

Pre-Existing Co Morbidities	Frequency	Percentage
Diabetes Mellitus	23	28.40%
Hypertension	18	22.22%
Hypothyroidism	11	13.58%

Table 4: Table Depicting the Pre-Existing Co Morbidities.



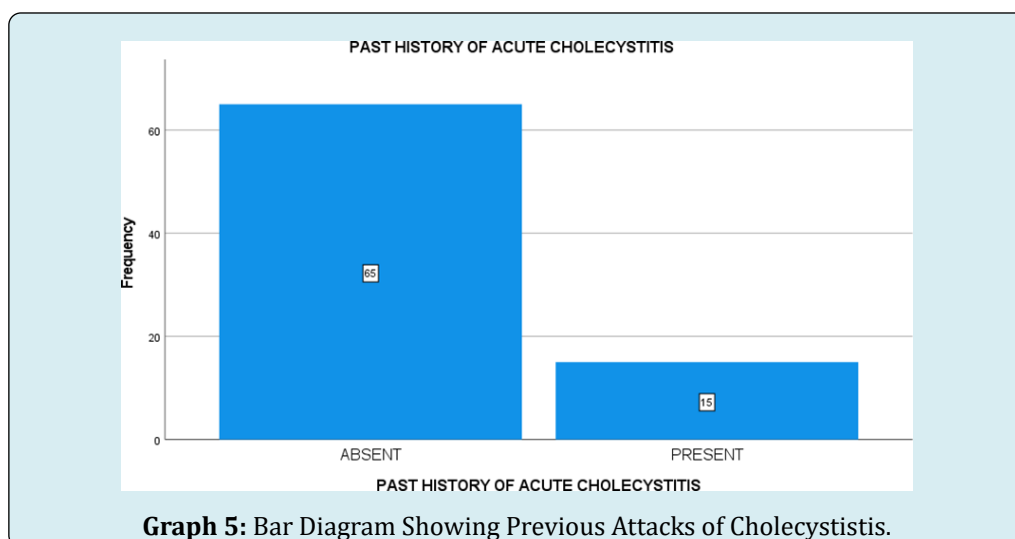
The pre-existing co morbidities were as follows diabetes mellitus was present in 23 cases (28.40%) , hypertension

was present in 18 cases (22.22%) hypothyroidism was present in 11 cases (13.58%) .

Previous Attacks of Cholecystitis

Previous Attacks Of Cholecystitis	Frequency	Percent
Absent	65	81.30%
Present	15	18.70%

Table 5: Previous Attacks of Cholecystitis.

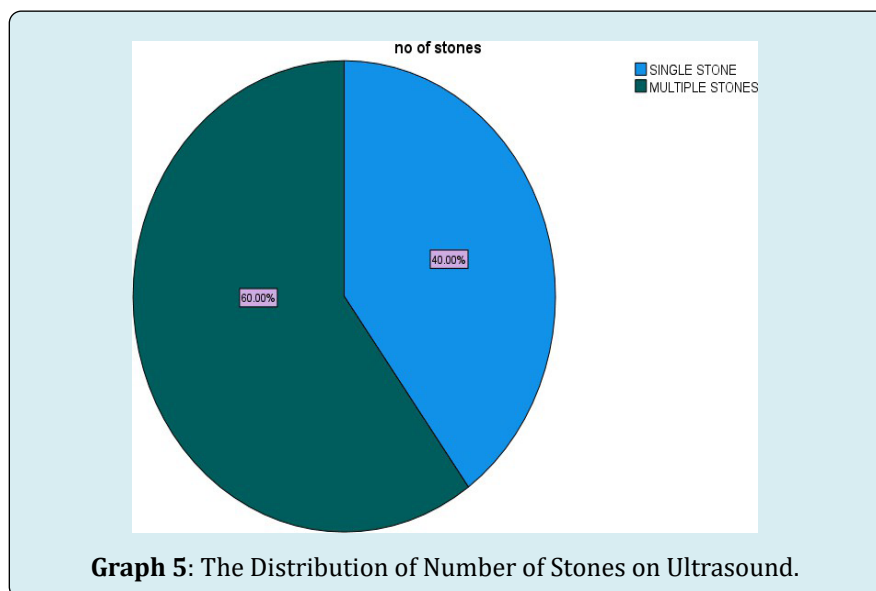


81.3% had previous attacks of cholecystitis in the present study.

The Distribution of Number of Stones on Ultrasound Abdomen

Ultrasound Findings - Number Of Stones	Frequency	%
Multiple Stones	48	60%
Single Stone	12	40%

Table 6: The Distribution of Number of Stones on Ultrasound.



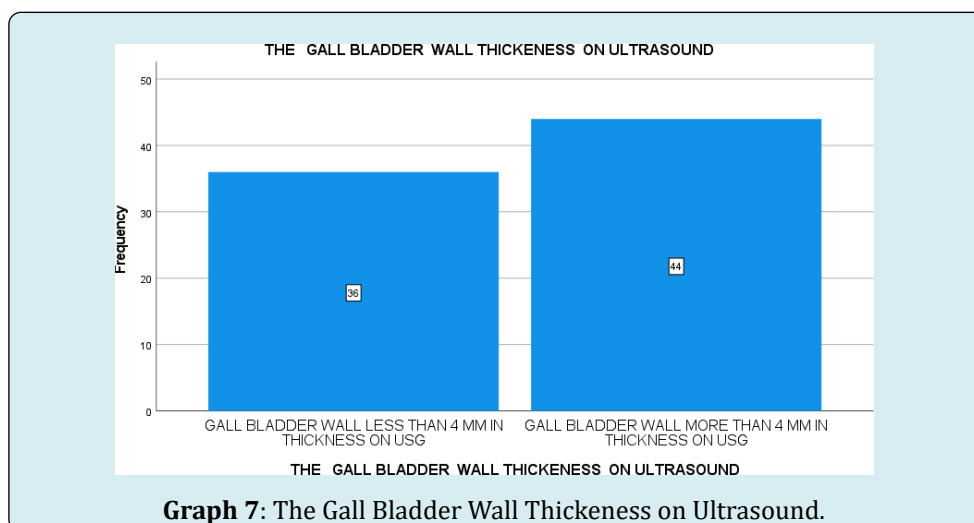
Graph 5: The Distribution of Number of Stones on Ultrasound.

In the present study, 60 % had multiple stones and 40% had single stones.

The Gall Bladder Wall Thickness on Ultrasound Abdomen

The Gall Bladder Wall Thickness On Ultrasound	Frequency	Percentage
Gall Bladder Wall >4mm	44	55%
Gall Bladder Wall Thickening <4mm	36	45%

Table 7: The Gall Bladder Wall Thickness on Ultrasound.



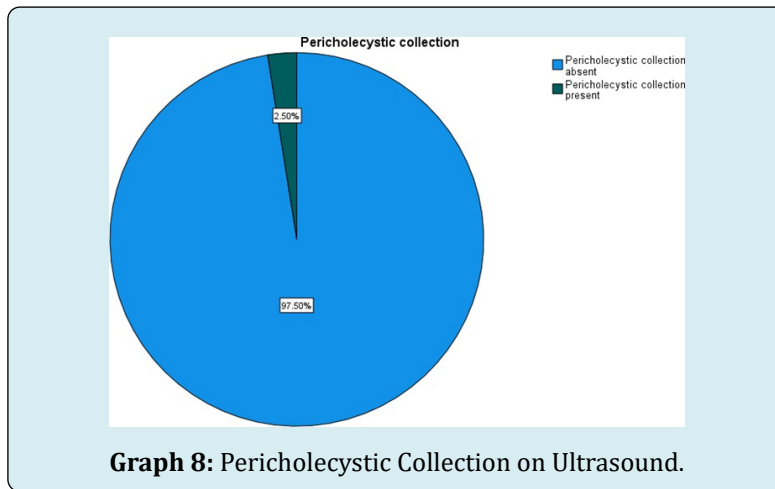
Graph 7: The Gall Bladder Wall Thickness on Ultrasound.

55% had a gall bladder wall thickness more than 4 mm on ultrasound.

Pericholecystic Collection on Ultrasound Abdomen

Pericholecystic Collection On Ultrasound	Frequency	Percent
Pericholecystic collection present	2	2.50%
No Pericholecystic collection	78	97.50%

Table 8: Pericholecystic Collection on Ultrasound.

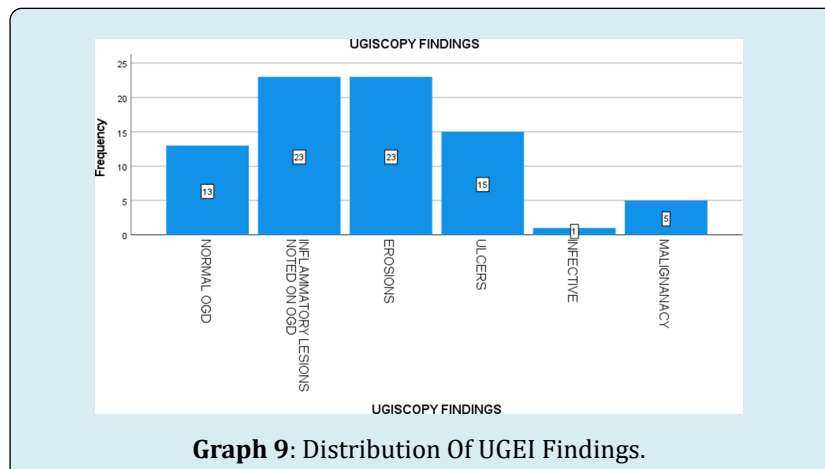


2.5% had pericholecystic collection on ultrasound.

The Distribution Of Ugie Findings

Ugie Findings	Frequency	Percent
Normal Ugie	13	16.25%
Inflammatory Lesions Noted On Ugie	23	28.75%
Erosions	23	28.75%
Ulcers	15	18.75%
Infective	1	1.25%
Malignancy	5	6.25%

Table 9: Distrubtion of Ugie Findings.



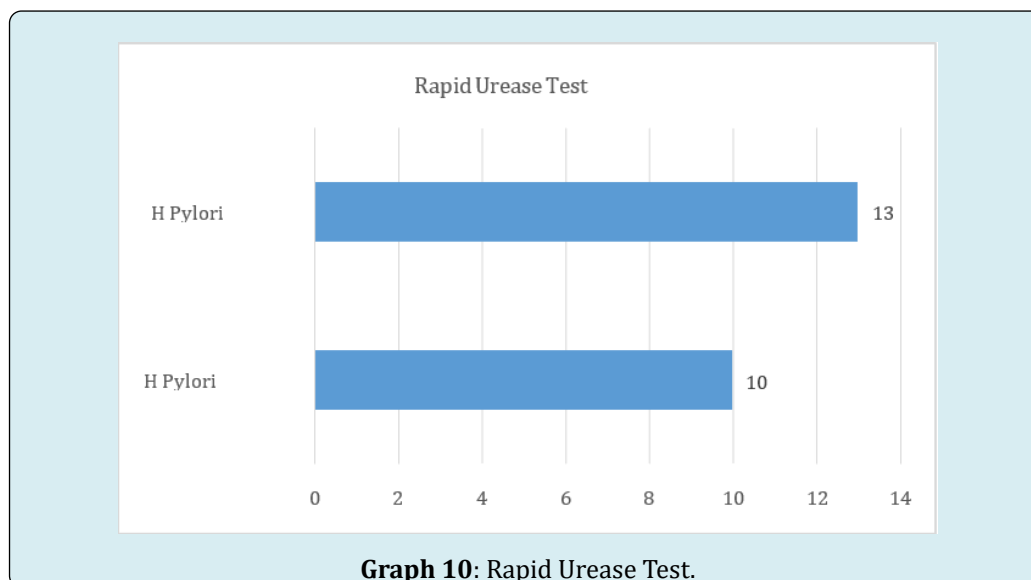
In our study, upper GI endoscopy (UGIE) findings were abnormal in 83.75% of patients, while 16.25% had normal findings. The most common pathology was inflammatory lesions (28.75%), followed by erosions (28.75%), ulcers (18.75%), malignancy (6.25%), and infective pathology (1.25%). These results align with previous studies, which have reported a significant prevalence of upper GI pathologies in patients with symptomatic gallstone disease. Our study highlights the importance of identifying and managing coexisting upper GI conditions before proceeding with cholecystectomy. Additionally, *Helicobacter pylori* infection was detected in 43.48% of inflammatory lesion cases via the rapid urease test (RUT), further reinforcing the role of *H. pylori* in upper GI inflammation and symptom persistence. Treatment with an eradication regimen led to symptom improvement in these patients. Compared to

prior research, our findings demonstrate that gastritis and erosions (56.5%) are the most frequent UGIE abnormalities in symptomatic cholelithiasis patients, followed by peptic ulcers and malignancies (25%). This emphasizes the need for preoperative UGIE in gallstone patients presenting with upper abdominal symptoms to ensure optimal management and avoid unnecessary surgeries.

Rapid Urease Test

Rapid Urease Test (RUT)	Frequency	Percent
H Pylori Present	10	43.48%
H Pylori Absent	13	56.52%

Table 10: Rapid Urease Test.



Graph 10: Rapid Urease Test.

In the present study we had 23 inflammatory lesion in which rapid urease test was done of which 10 cases (43.48%) were positive for *H. Pylori* infection.

Out of 80 patients evaluated with upper GI endoscopy prior to laparoscopic cholecystectomy, 61 patients proceeded with surgery. Among the remaining 19 patients, the following findings were noted:

- 13 patients tested positive for Rapid Urease Test (RUT) for *Helicobacter pylori*.
- 5 patients were diagnosed with malignancy (esophageal or gastric cancer).
- 1 patient had severe GERD with LA - D esophagitis and a recent history of upper GI bleeding.

These findings highlight the importance of preoperative upper GI evaluation in optimizing patient selection for laparoscopic cholecystectomy.

Discussion

Age	Supreeth Kumar Reddy Kunnuru, et al. (17)	Present study
18-30 years	96 (24%)	10% (8)
31-40 years	80 (20%)	18.75%(15)
41-50 years	60 (15%)	26.25%(21)
51-60 years	100 (25%)	22.50%(18)
61-70 years	40 (10%)	15.00%(12)
more than 70 years	24 (6%)	7.50%(6)

Table 11: Gall Stones were Common After 40 Years of Age Similar to the Presents Today.

Supreeth Kumar Reddy Kunnuru, et al. [17] noted that gall stones were common after 40 years of age similar to

the presents today. In the present 61% were above the age of 40 years which is similar to the study by Supreeth Kumar Reddy Kunnuru et al 17 56% were above the age of 40 years . As compared, the commonest age group in the study had 21 cases (26.25%) belonged to the age group between 41 years and 50 years., As compared to the study by Supreeth Kumar Reddy Kunnuru et al 17 51-60 years the commonest age group.

Gender Comparison with Other Studies

Supreeth Kumar Reddy Kunnuru et al 17 noted that 69% were females and 31% were male patients. which is similar to the present study. we also had females more than males. In Kim et al.'s study, the female to male ratio was 1.4 : 19 . A Novacek also noted that gallstones are common in females by 2-3 than males. 45% were females and 55% were males , the male to female ratio was 0.85 to 1 .The difference in gender was statistically significant with the P value 0.032.

The Distribution of Clinical Presentation

In the order of frequency of symptoms abdominal pain was seen in 80 cases (100.00%) , dyspepsia was seen 45 cases (56.25%) , abdominal bloating was seen 27 cases

(33.75%), nausea was seen 17 cases (21.25%) , vomiting was seen 4 cases (25%).

According to Fitzgerald et al., upper abdominal pain, dyspepsia, and nausea and vomiting are the common symptoms of gallstone disease¹¹. In our study, pain abdomen was the commonest symptomatology (99% of patients) followed by heart burn (25.5%) and dyspepsia (23%). We got upper GI endoscopy positive findings in 75.5% of our total patients. Only 24.5% of patients presented with normal UGIE. It means 3/4th of cholelithiasis patients were associated with other gastroduodenal problems. In Ayuo et al.'s study¹²; common findings in upper GI endoscopy were gastric ulcer (3.1%), duodenal ulcer (11%), gastritis (8.4%), duodenitis (5%), and reflux esophagitis (7.9%).

In our study, gastritis (22%), gastric erosion (19%), reflux esophagitis (12%), lax lower end of esophagus (10%), and gastric and duodenal ulcer (7%) were comparable to the above study. 13(16.25%) cases had a normal UGIE , 23(28.75%) cases had inflammatory lesions noted on UGIE 23(28.75%) cases had erosions, 15(18.75%) cases had ulcers , 1(1.25%) cases had a infective etiology , and 5(6.25%) cases had malignancy.

Gastritis	Gastric erosion	H.pylori positive	Gastric and duodenal ulcer	Esophagitis	Lax LE
90	76	54	30	49	40
22%	19%	13%	7%	12%	10%

Table 12: In the Present Study we Had 23 Inflammatory Lesion in which Rapid Urease Test was Done of which 10 Cases (43.48%) were Positive for H.Pylori Infection.

Summary

This prospective study was conducted at a tertiary care medical college hospital in Mangalore, Karnataka, India. A total of 80 patients diagnosed with gallbladder stones via ultrasound underwent upper GI endoscopy to assess the correlation between upper GI pathology and gallstone disease.

The study found a higher prevalence of gallstones in females compared to males, with a female-to-male ratio of 1:0.45. Gallstones were more common in patients over 40 years of age, with the majority of affected females being around 60 years old. A subset of patients with inflammatory pathology on upper GI endoscopy tested positive for *Helicobacter pylori* using the rapid urease test. These patients showed symptomatic improvement after receiving an *H. pylori* eradication regimen.

Additionally, upper GI endoscopic abnormalities were more frequently observed in patients with single gallstones compared to those with multiple gallbladder calculi. Patients

with normal upper GI endoscopic findings also had normal gallbladder wall thickness. Several studies have reported a strong association between gallbladder disease and upper GI pathology. A study by Dietrich et al. found that nearly 40% of patients with gallstones had concurrent upper GI conditions, including gastritis, reflux esophagitis, and peptic ulcer disease, which often contributed to persistent symptoms post-cholecystectomy. Similarly, Csendes et al. reported that *H. pylori* infection was prevalent in gallstone patients and that eradication therapy significantly improved their symptoms, reinforcing the role of upper GI pathology in symptom persistence.

Other studies have also highlighted that patients with single gallstones are more likely to exhibit upper GI abnormalities compared to those with multiple calculi. Moreover, research has indicated that patients with normal upper GI endoscopic findings tend to have normal gallbladder wall thickness, suggesting that inflammation in the upper GI tract might influence gallbladder pathology. Given these findings, preoperative upper GI evaluation in gallstone

patients is crucial, as addressing underlying gastrointestinal conditions may reduce unnecessary cholecystectomies and improve patient outcomes.

Conclusion

The findings of this study underscore the critical role of gastrointestinal evaluation, particularly upper gastrointestinal endoscopy (UGE), in the management of patients with gallstone disease.

- A significant proportion of patients experiencing pain have underlying gastrointestinal inflammatory pathology rather than gallstones as the primary cause. Hence, it is advisable to first diagnose and treat any existing gastrointestinal disease and subsequently reassess symptoms.
- Laparoscopic cholecystectomy should be deferred until gastrointestinal inflammatory conditions are appropriately managed. If symptoms resolve following treatment, patients may be placed under observation rather than undergoing surgery.

Supporting Evidence

- Gallstones frequently remain asymptomatic, and their detection has increased due to the widespread use of advanced imaging modalities.
- Upper gastrointestinal symptoms are often mistakenly attributed to gallstones when, in reality, they may result from other pathologies such as gastritis, peptic ulcer disease, or *Helicobacter pylori* infection, which share similar clinical presentations.
- A thorough gastrointestinal evaluation should be conducted before diagnosing gallstones as the definitive cause of symptoms and proceeding with surgical intervention.

Given the potential for misattribution of symptoms, this study reinforces the need for a comprehensive, evidence-based approach to gallstone disease management, ensuring that unnecessary cholecystectomies are avoided, and patient outcomes are optimized.

Recommendations

Our study observed that a subset of patients with inflammatory pathology on upper gastrointestinal endoscopy (UGE) tested positive for *Helicobacter pylori* (*H. pylori*) using the rapid urease test. Previous research has also suggested a potential association between gallstones and *H. pylori* infection. Therefore, further studies are warranted to explore whether *H. pylori* colonization in the gallbladder mucosa plays a role in the pathogenesis of gallstone disease.

Based on our findings and existing literature, we propose the following recommendations:

Routine Upper GI Endoscopy Prior to Cholecystectomy:

Given that many patients with gallstones have concurrent upper gastrointestinal pathology, a preoperative UGE should be considered, particularly in those presenting with dyspeptic symptoms.

Identifying and treating conditions such as gastritis, peptic ulcer disease, or *H. pylori* infection may help alleviate symptoms without the need for surgery.

Targeted *H. pylori* Screening and Eradication: Studies have suggested a correlation between *H. pylori* and gallstone disease. Screening for *H. pylori*, particularly in patients with persistent dyspeptic symptoms, may be beneficial. If detected, eradication therapy could be considered as part of the treatment plan.

Deferring Cholecystectomy in Patients with Upper GI Inflammatory Conditions: In patients diagnosed with both gallstones and upper gastrointestinal pathology, medical management should be prioritized. Laparoscopic cholecystectomy should only be performed if symptoms persist following adequate treatment of the gastrointestinal condition.

Long-Term Follow-Up for Non-Operative Management: Patients with asymptomatic gallstones or those who improve after medical therapy should be placed under long-term surveillance. Regular follow-ups with clinical assessment and imaging can help monitor disease progression and guide further management.

Further Research on the Role of *H. pylori* in Gallstone Formation: More extensive studies, including histopathological and microbiological analyses of gallbladder mucosa, are needed to establish whether *H. pylori* plays a direct role in gallstone formation and symptomatology. Investigating the impact of *H. pylori* eradication on gallstone disease progression could provide valuable insights into future management strategies.

Improved Diagnostic Criteria for Symptomatic Gallstones:

Current diagnostic protocols should incorporate a more comprehensive approach, distinguishing between pain due to gallstones and symptoms arising from gastrointestinal pathology. Developing clear guidelines for differentiating true biliary colic from other dyspeptic conditions could help reduce unnecessary surgeries.

These recommendations aim to refine the clinical approach to gallstone disease, minimizing unnecessary

surgical interventions while ensuring optimal patient outcomes.

A prospective multicenter observational cohort study should be designed to validate these findings by enrolling a large, diverse group of symptomatic cholelithiasis patients scheduled for cholecystectomy across various tertiary care centers. A standardized UGIE protocol would be implemented to uniformly categorize findings (normal, inflammatory, erosions, ulcers, infective, malignancy), with detailed preoperative assessments and postoperative follow-ups at defined intervals (e.g., 1, 3, and 6 months) to monitor symptom resolution. A robust sample size (e.g., >500 patients) and multivariate statistical analyses (e.g., logistic regression, Kaplan-Meier curves) would ensure sufficient power to correlate UGIE findings with persistent symptoms and evaluate the impact of targeted treatments such as *H. pylori* eradication. Inter-center calibration and centralized data monitoring would further ensure data consistency, with the collaborative results ultimately guiding clinical guidelines for the routine preoperative evaluation of gallstone disease. Data consistency would be further guaranteed by inter-center calibration and centralized data monitoring, and the joint findings would eventually inform clinical recommendations for the standard preoperative assessment of gallstone disease.

Author Contributions

Collection and/or Assembly of Data

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Manuscript Writing and Approval

Anand Bhandary Panambur, Anand Peter Ignatius.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

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