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Uncovering Hidden Pathologies: Upper Gastrointestinal Endoscopy in Patients with Symptomatic Gallstone Disease

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Abstract

Background:

Gallstone disease (cholelithiasis) remains one of the most frequently encountered conditions in surgical practice, especially in females over 40 years of age. While laparoscopic cholecystectomy is widely accepted as the standard management for symptomatic gallstones, a significant proportion of patients continue to experience persistent gastrointestinal symptoms even after surgery. This has raised concerns regarding the potential coexistence of upper gastrointestinal (GI) pathologies that may be misattributed to gallstones. Upper gastrointestinal endoscopy (UGIE) is underutilized in this context despite growing evidence of its diagnostic and therapeutic relevance in symptomatic patients.

Aim:

To evaluate the spectrum of upper gastrointestinal endoscopic findings in patients diagnosed with symptomatic gallstone disease and to determine the role of preoperative UGIE in improving diagnostic accuracy and patient outcomes.

Methods:

This was a prospective observational study conducted in the Department of General Surgery at tertiary care teaching hospitals in South India . Eighty-one adult patients (>18 years) with radiologically confirmed cholelithiasis and presenting with either typical or atypical upper abdominal symptoms were

included. Exclusion criteria comprised acute abdomen, CBD stones, obstructive jaundice, pancreatitis, gallbladder neoplasms, and previous hepatobiliary surgery. All patients underwent detailed clinical assessment, abdominal ultrasonography, and preoperative upper GI endoscopy. Endoscopic findings were documented and categorized as normal, inflammatory, ulcerative, or malignant. Where indicated, biopsy and rapid urease tests were performed. Appropriate medical therapy was initiated based on findings, including H. pylori eradication or proton pump inhibitor therapy. Patients with malignant lesions were excluded from cholecystectomy and referred for oncological management. Data were analyzed using SPSS v28; associations between clinical symptoms and endoscopic findings were assessed using the Chi-square test.

Results:
The study population comprised 81 patients, with a female predominance (68.75%, male-to-female ratio: 0.45:1). The mean age was concentrated between 31 and 60 years, with the highest incidence (26.25%) in the 41–50 age group. Abdominal pain was the most universal symptom (100%), followed by dyspepsia (56.25%), bloating (33.75%), nausea (21.25%), and vomiting (4.93%). Comorbidities included diabetes mellitus (28.4%), hypertension (22.2%), and hypothyroidism (13.58%).
Ultrasound findings revealed multiple gallstones in 59.3% of cases and solitary stones in 15%. Gallbladder wall thickening >4 mm was seen in 55% of patients.
UGIE revealed abnormal findings in 32 patients (39.5%). The most common was H. pylori-positive gastritis (23.46%), followed by gastritis without H. pylori (4.94%), peptic ulcer disease (2.47%), duodenitis (1.23%), and dyskinesia of the esophagus (1.23%). One patient tested positive for H. pylori on rapid urease test. Patients diagnosed with gastritis or ulcerative lesions received medical treatment prior to surgery. In two patients with malignancies, surgical intervention was withheld, and oncological referral was made. Conclusion:
Routine preoperative upper GI endoscopy should be considered in all patients presenting with gallstone disease and atypical or dyspeptic symptoms. It aids in identifying coexisting inflammatory or ulcerative GI conditions that may mimic biliary colic. Timely medical management of these conditions can result in significant symptom relief and may avert unnecessary surgical intervention. Incorporating UGIE into the preoperative workup promotes a more rational, stepwise, and patient-centric approach, ultimately improving outcomes and reducing morbidity associated with unwarranted cholecystectomy.
Keywords: Cholelithiasis; Gallstone Disease; Upper Gastrointestinal Endoscopy; Helicobacter pylori; Dyspepsia; Upper GI Pathology; Abdominal Pain;

INTRODUCTION

One of the most common problems that are encountered in surgical practice are gall stones also referred to as cholelithiasis .[1,2] It is estimated that approximately 5 to 10 percent of the Asian population is affected by gallstones .In the Asian subcontinent cholelithiasis is more common in

females and individuals for about the age of 40. .[3,4]

It is estimated that in Western countries gallbladder disease affects approximately 15-16.6% of females and 5-7.9% of males . [5-8] Over the past few years there has been increased in the diagnosis of gallstones because of the change in dietary habits , extensive use of imaging technology for abdominal evaluations and because of the increased awareness among people regarding various diseases .[2,8]

The most common mode of management for symptomatic gallstones is cholecystectomy.[9]In approximately 85%-90 % of all cholelithiasis that are symptomatic , they have good relief following the removal of the gall bladder .But , a small number of cases show no significant relief following cholecystectomy. When research was done It showed that it is underlying upper GI pathology that's responsible for persistence of symptoms it was also noted that in those patients during polycystic me when no stones were found the incidence of persistence of symptoms was as high as 40% following cholecystectomy. .[10-12]

Though cholecystectomy is routinely done laparoscopic procedure it is not without risk. For the procedure it required that general anaesthesia be given which itself has its own risks and complications .Also, the pneumoperitoneum that is created causes a burden on the cardio-respiratory reserve . [11-14] The cholecystectomy itself has its own complications.[15]

If it is possible to identify those percentage of individuals who have upper GI pathologies with gallstones and treating them can relieve the symptoms it can reduce the unnecessary surgery that has been done on the patient .this is also very important because most of the upper GI pathologies symptoms mimic the symptoms of the biliary tree.[16,17]

Coexistence of concurrent upper gastrointestinal problems in gallstones disease patients may have attributed to the post-cholecystectomy syndrome. .[12-14] Although, gallstone disease is asymptomatic in the vast majority of individuals, it is frequently accepted that removal of the gallbladder is the best treatment for symptomatic gallstone disease. Evaluation of gall stone disease is an immense challenge as to ascertain whether gallstones are responsible for symptoms or incidental findings..[15]

There are various studies that have shown that in patients for who have undergone cholecystectomy for gallbladder disease and have persisting symptoms , they will have some finding on upper GI endoscopy which when treated will cause a reduction of the dyspeptic symptoms or pain following cholecystectomy . [16-17]

The upper GI pathologies are the cause of pain or symptoms that most often are wrongly attributed to gall bladder disease . . [16-17]

Patients, post cholecystectomy present with persisting dyspeptic symptoms and the need to evaluate the cause of these symptoms gave rise to this study. Most patients have coincidental upper gastrointestinal findings and can hence be given better relief of symptoms once managed in accordance.

MATERIALS AND METHODS

This observational study was conducted in the Department of General Surgery at tertiary care teaching hospitals in South India over a five-year period, from November 2018 to December 2022. The study employed purposive sampling and included approximately 80 subjects who met the defined inclusion and exclusion criteria.

Eligible participants were adults above 18 years of age with a radiologically confirmed diagnosis of cholelithiasis. Both patients presenting with typical symptoms—such as right upper quadrant pain, nausea, or fatty food intolerance—and those with atypical presentations were considered for inclusion. Exclusion criteria included individuals under 18 years of age, patients presenting with acute abdomen, those with common bile duct (CBD) stones, surgical obstructive jaundice, gallbladder stone-induced pancreatitis, gallbladder neoplasms, or a history of previous gallbladder or pancreatic surgery. Additionally, patients with congenital anomalies of the biliary duct system, even if gallstones were present, were excluded if these anomalies were detected incidentally or accidentally.

All participants provided both verbal and written informed consent prior to inclusion. Data collection included demographic details, clinical history, and presenting symptoms, which were categorized as either typical or atypical biliary colic. Diagnostic investigations such as abdominal ultrasonography and upper gastrointestinal endoscopy (UGE) were performed. Biopsy samples were taken during endoscopy when indicated, and histopathological reports were reviewed.

Upper GI endoscopy was carried out in a dedicated endoscopy suite a few days prior to surgical intervention. The findings during endoscopy were classified into categories such as normal, infective, inflammatory, erosive, ulcerative, or other findings, including malignancies. Corresponding histopathological findings were similarly categorized. In patients where endoscopy revealed ulcerative lesions, biopsies were obtained, and rapid urease tests for Helicobacter pylori (H. pylori) were conducted. If H. pylori was detected, patients were treated with a standard triple therapy regimen. For ulcers unrelated to H. pylori, a proton pump inhibitor (PPI) therapy was initiated and continued for four weeks.

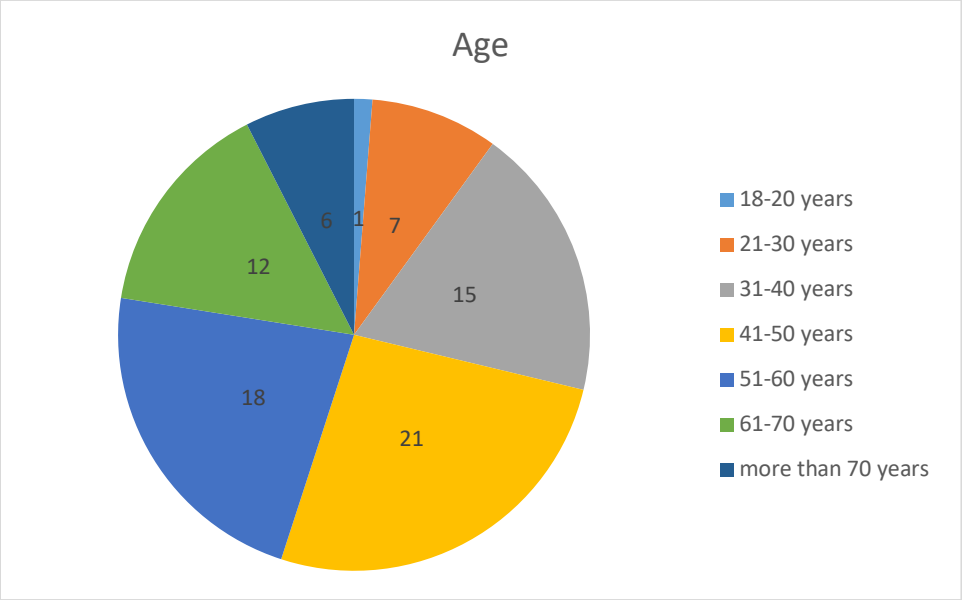
In cases where endoscopy revealed inflammation of the gastric or duodenal mucosa, patients were commenced on PPI therapy before undergoing laparoscopic cholecystectomy. However, patients in whom endoscopy revealed malignancy were not considered for cholecystectomy. Instead, they underwent further evaluation and were referred for oncological management based on the staging of the tumor.

Statistical analysis:

Descriptive statistics of the pathological UGE findings (gastritis, hiatus hernia, peptic ulcer disease,

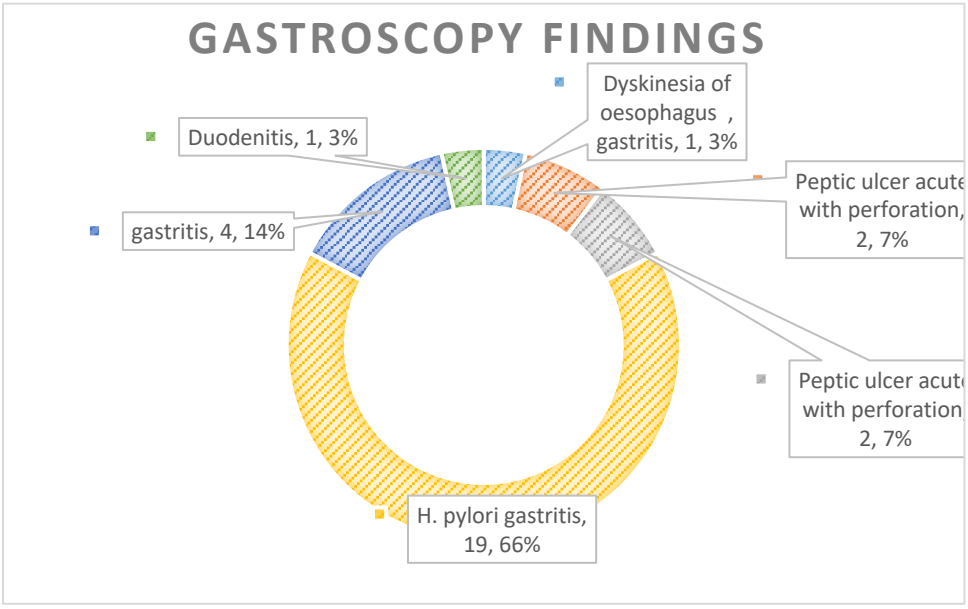
polyps, malignancy etc.,) was analyzed in terms of percentage. All the data will be entered in MS EXCEL and Chi square test will be used to find the association between pain type and endoscopic findings and analyzed using 28 SPSS package.

RESULTS AND OBSERVATIONS



GRAPH 1: THE 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 . 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.



GRAPH 2: THE DIAGRAM DEPICTING THE DISTRIBUTION OF GASTROSCOPY FINDINGS

In the present study, abdominal pain was the most common presenting symptom, observed in all 81 patients (100%). This was followed by dyspepsia in 45 patients (56.25%), abdominal bloating in 27 patients (33.75%), nausea in 17 patients (21.25%), and vomiting in 4 patients (4.93%). These findings suggest that while pain is a universal symptom in gallstone disease, a significant proportion of patients also exhibit gastrointestinal symptoms that may overlap with other conditions.

Regarding pre-existing comorbidities, diabetes mellitus was the most frequently observed, present in 23 patients (28.40%), followed by hypertension in 18 patients (22.22%) and hypothyroidism in 11 patients (13.58%). These comorbidities may have implications for disease progression and postoperative outcomes.

Ultrasonography findings revealed that the majority of patients had multiple gallstones, observed in 48 cases (35.00%), while 12 patients (15.00%) had a solitary stone. Gallbladder wall thickening greater than 4 mm was observed in 44 patients (55%), whereas 36 patients (45%) had wall thickness less than 4 mm. Only 2 patients (2.5%) showed evidence of pericholecystic fluid collection, while 78 patients (97.5%) had no such findings, suggesting that acute inflammation or complicated cholecystitis was relatively rare in this cohort.

Upper gastrointestinal endoscopy was performed in all patients prior to surgical intervention. The most common finding was *Helicobacter pylori* gastritis, diagnosed in 19 patients (23.46%). Gastritis without *H. pylori* was seen in 4 patients (4.94%), and acute peptic ulcer disease with perforation was observed in 2 patients (2.47%). Other findings included dyskinesia of the esophagus and duodenitis, each found in 1 patient (1.23%). Rapid urease testing for *H. pylori* was

performed in those with ulcerative lesions, and 1 patient (1.23%) tested positive, indicating the need for targeted triple therapy in such cases.

Follow-up data indicated that a small proportion of patients continued to experience symptoms even after undergoing laparoscopic cholecystectomy, highlighting the possibility that their initial symptoms may have been due to coexisting upper gastrointestinal pathology rather than gallstones alone.

Discussion

The present study highlights the significant role of gastrointestinal tract evaluation—particularly upper gastrointestinal endoscopy—in guiding the appropriate management of patients with gallstone disease. It was observed that in many patients presenting with upper abdominal pain, the underlying etiology was more often related to gastrointestinal inflammatory pathology rather than cholelithiasis itself.

In the present study, abdominal pain was the most common presenting symptom, reported by 100% of patients with radiologically proven cholelithiasis. Other frequently observed symptoms included dyspepsia (56.25%), bloating (33.75%), and nausea (21.25%). These findings are consistent with several previous studies that underline the predominance of dyspeptic and gastrointestinal symptoms in patients diagnosed with gallstone disease.

A similar pattern was noted by **K. Aravind et al**,[9] who evaluated 63 patients with gallstones and dyspeptic symptoms. Abdominal pain was the most common complaint (77.77%), followed by postprandial fullness (63.49%), nausea (53.96%), and vomiting (14.28%). Interestingly, after treating patients conservatively based on endoscopic findings, 97.92% of them became symptom-free without undergoing cholecystectomy. This highlights the diagnostic and therapeutic importance of preoperative endoscopic evaluation.

Our findings are also supported by the study conducted by **Mohamed Toum Musa Ibrahim et al**,[10] where cholecystectomy led to symptom resolution in 85% of patients. However, in 56% of cases, upper gastrointestinal endoscopy revealed coexisting pathologies. This emphasizes that a considerable proportion of patients with gallstones may have concurrent gastrointestinal abnormalities contributing to their symptoms.

In line with our findings, **Inpharasun et al** [11] at Tagore Medical College reported abnormal endoscopic findings in 49% of their cholelithiasis patients. Gastritis was the most common pathology (14.7%), and they strongly recommended routine preoperative upper GI endoscopy to identify and manage associated conditions. This strategy was found to improve overall outcomes and helped guide the decision regarding elective cholecystectomy.

The study by **Harsha Narayanet al** [12] also highlighted the high prevalence of gastritis (25%) and duodenitis (13%) in gallstone patients, and further noted that management plans changed in over 13% of patients based on endoscopic findings. This reflects our clinical approach wherein patients with inflammatory GI findings were treated medically before reassessing the need for surgery.

Furthermore, **Pramod Pati et al** [13] emphasized that 70% of patients with gallstone disease had

abnormal upper GI findings, most commonly gastritis (27%). They concluded that dyspeptic symptoms can often mimic those of gallstone disease, necessitating diagnostic clarification through endoscopy.

A significant insight came from the prospective study by **A. Karmacharya et al**, [14] which demonstrated a statistically significant difference in endoscopic findings between patients with typical and atypical pain. Notably, those with atypical symptoms had a higher rate of pathological findings, including malignancy and active ulcer disease. In our study as well, such findings led to medical treatment instead of cholecystectomy in a few cases, reinforcing the value of individualized assessment based on endoscopic evaluation.

In the study by **Indira Khedka et al**, [15] gastritis was observed in 72.5% of patients undergoing preoperative endoscopy, followed by oesophagitis (55%) and hiatus hernia (16.5%). A significant reduction in pain was noted by the end of the first postoperative week. Although we did not quantify postoperative symptom relief in detail, some of our patients did report persistent symptoms even after surgery, especially those with preexisting GI pathology.

The study by **Azeem Nasaruddin et al** offers a critical comparison by analyzing postoperative pain in patients with and without abnormal UGIE findings. Patients with abnormal findings had significantly higher rates of pain at both 14 and 30 days post-surgery, suggesting that failure to address concurrent GI pathology could result in persistent symptoms despite cholecystectomy. [16]

At Sri Guru Ram Das Institute, **Ayesha Jule Khan et al** found that a majority of patients (55%) presented with atypical symptoms and emphasized the diagnostic value of preoperative endoscopy, particularly when clinical features are not clearly attributable to gallstones.[17]

Bhaskar V. Musande et al found that 75% of their patients had abnormal endoscopic findings, with gastritis, reflux esophagitis, and hiatus hernia being the most common. Their study highlighted that endoscopic findings altered the management plan in 11 cases, further demonstrating the clinical value of routine UGIE.[18]

Taken together, our study aligns well with the aforementioned literature in affirming that gallstones may often coexist with or be incidental to other upper gastrointestinal pathologies. Routine preoperative endoscopy in symptomatic patients can help avoid unnecessary surgeries and guide targeted medical management. Patients with atypical symptoms and abnormal UGIE findings especially benefit from initial conservative management before proceeding to surgery. Therefore, we recommend a selective but judicious use of upper GI endoscopy in all patients with gallstones and dyspeptic symptoms to enhance diagnostic clarity and optimize patient outcomes.

Conclusion

Based on our findings, it is advisable to first evaluate and treat any coexisting gastrointestinal inflammatory conditions. Following appropriate medical therapy, patients should be reassessed for symptom resolution. If symptoms improve or resolve, the need for surgical intervention may be reconsidered, and the patient can be kept under observation with regular follow-up.

This approach is supported by the observation that gallstones are frequently asymptomatic and increasingly diagnosed due to the widespread use of imaging modalities. Moreover, not all upper gastrointestinal symptoms are attributable to gallstones, as several other gastrointestinal pathologies may mimic similar clinical presentations.

Therefore, it is prudent to thoroughly investigate and exclude alternative causes of symptoms before attributing them solely to gallstones and proceeding with laparoscopic cholecystectomy. A more conservative and stepwise approach may help avoid unnecessary surgical procedures and improve patient outcomes.

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