RESEARCH ARTICLE

# Efficacy of Upper Gastrointestinal Endoscopy In Cholelithiasis Before Laparoscopic Cholecystectomy

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## ABSTRACT

**Background:** The most prevalent condition affecting the gallbladder and biliary tree is cholelithiasis. Presence of gall stones is discovered commonly during imaging tests for other pathologies. Laparoscopic cholecystectomy is a preferred modality for the treatment of gallstone disease.

**Objective:** The primary aim of the study is to determine the efficacy of upper gastrointestinal endoscopy as a routine investigative modality in symptomatic presentation of cholelithiasis prior to laparoscopic cholecystectomy.

**Methods:** A total 50 participants having single or multiple stones in the gall bladder found on ultrasound were included in the study. Enrolled patients underwent routine investigations. The baseline demographic details like patient name, age, gender, clinical presentation, and upper endoscopy findings were documented. The intensity of the pain was measured by visual analogue scale.

**Results:** A total of 36% patients were in the age-group of <30 years. The highest incidence of cholelithiasis was observed in female gender. Abdominal pain was the most common symptom. The most common upper gastrointestinal endoscopy findings were gastritis followed by gastritis erosion. A significant reduction of pain was noted in group I as compared to group II at first- and fourth-week time durations.

**Conclusion:** Cholelithiasis has common clinical presentations in similarity to other upper gastrointestinal diseases. Upper gastrointestinal endoscopy can be recommended for patients with atypical presentation to prevent post-surgical adverse outcomes.

**Keywords:** Cholelithiasis, abdominal pain, gastrointestinal laparoscopy, Gall bladder.

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## INTRODUCTION

The most prevalent condition affecting the gallbladder and biliary tree is cholelithiasis. The gallstone formation is a complex process. Cholesterol secretion increases due to various reasons including obesity, high-calorie diets, and medications like oral contraceptives. These factors enhance the lithogenicity of bile by supersaturating the bile. Additionally, abnormal emptying of the gall bladder and resection of the ileum may also aid in formation of the gallbladder stones. Removing gallstones without removing the gallbladder increases the recurrence of gallstones.[1]

Presence of the gallstones, does not have any specific symptoms and are commonly diagnosed during radio-imaging of any other pathology. Symptomatic cholelithiasis usually presents as epigastric pain or colicky-type right upper quadrant pain. Other symptoms which may present include dyspepsia, food intolerance, flatulence, and some alteration in bowel habits. The pain is usually felt postprandially or after a fat meal. 80% of the patients who experience the symptoms may have the chance of developing complications in the future. [2]

The complications of cholelithiasis involve acute cholecystitis or migration of the gallstone into the common bile duct which may lead to cholangitis or pancreatitis. It occurs as a result of obstruction in the gallbladder outlet. [3] Laproscopic cholecystectomy is considered as the gold standard surgical approach for the management of this disease. Cholecystectomy is curative only to the symptoms which is due to gallstone and not any upper gastrointestinal pathology. Otherwise, it may pose an unnecessary burden of cost and surgical risk to the patients. [4]

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A cholecystectomy is a frequent abdominal surgery used to treat conditions such as choledocholithiasis, calcified gall bladder, acute cholecystitis, cholelithiasis, and biliary dyskinesia. It is well acknowledged that the most effective therapy for symptomatic gallstones is gall bladder ectomy. [5] Performing oesophagogastric duodenoscopy as a routine investigation prior to the procedure helps in decreasing the symptoms. It is also helpful in the detection of other gastroduodenal abnormalities in its early phase. Most of the patients with upper gastrointestinal problems along with gallstones usually have peptic ulcer disease, hiatus hernia, gastritis, and esophagitis. It is attributed to the post-cholecystectomy syndrome.[6,7]

Evaluating the patients with gallstones and other morbidities of the upper gastrointestinal tract can be benefitted in ruling out of the cause of the symptoms. In some patients, abdominal abnormalities can even be noted after the laproscopic cholecystectomy, which can be attributed to the lack or inadequate preoperative evaluation of other conditions which cause similar symptomatology. This study aims to find the efficacy of upper gastrointestinal endoscopy as a routine investigation modality before laproscopic cholecystectomy in clinically expressed cholelithiasis patients.

## METHODOLOGY

This cross-sectional study was conducted between March 2022- February 2023, in the Department of General Surgery, Sree Balaji Medical College and Hospital, Tamil Nadu, India. A total 50 participants were enrolled under two groups based on symptomatic presentation of cholelithiasis and findings of endoscopy of upper gastrointestinal tract. All the patients included in the study had symptomatic cholelithiasis. Group I consisted of a normal upper gastrointestinal endoscopy and Group II had patients with abnormal findings of upper gastrointestinal endoscopy. The study included all patients ≥18 years with one or more gall bladder stones confirmed by ultrasound imaging, and experiencing one or more symptoms such as upper abdominal pain or discomfort, nausea or vomiting, early satiety, bloating sensation, or fullness of abdomen. Patients having acute abdomen or biliary colicky pain were excluded from the study. The study was initiated after approval from the Institutional Ethical Committee. The 50 research participants who were recruited throughout the study period underwent preanesthetic fitness testing after undergoing standard examinations. Details including age, gender, clinical presentation, and the results of the upper endoscopy were among the baseline demographic information recorded. A Visual Analogue Scale (VAS) score was used to measure the intensity of the pain with a range of 0 to 10, where higher scores were indicative of higher intensity pain. The statistical data analysis was carried out by SPSS software version 27.0. The data was presented in the form of numbers and percentages. The chi-square test was utilized for the comparison of two or more groups and a p-value <0.05 was counted as statistically significant.

## RESULTS

A total of 50 patients having symptomatic cholelithiasis with confirmed presence of one or more gall stones were enrolled for this study. Both the groups had majority of the study patrticipants with <30 years of biological age with a preponderance of females. A detailed profile describing the demographic and pre-operative presentations of the study participants has been mentioned in Table 1.

Abdominal pain was the most common symptom observed in both the groups and was observed in 11 (44%) and 18 (72%) patients respectively. Chest pain was the least observed symptom with 0 (0%) and 1 (4%) patient in each group I and group II respectively. All the symptoms observed in both the groups were statistically insignificant. A detailed profile describing the pre-operative clinical presentations of the study participants has been mentioned in Table 2.

Upper gastrointestinal endoscopy findings in participants of group II indicate gastritis in 7 (28%) patients, gastritis erosion in 6 (24%) patients, h. pylori positive in 5 (20%) patients, esophagitis in 4 (16%) patients, laxle in 2 (8%) patients, and gastric and duodenal ulcer in 1 (4%) patient (Figure 1).

Pain score was lower in group I as compared to group II at 0 weeks without statistical significance. At a 1-week follow-up, the pain score was observed to be significantly reduced in Group I. 4$^{th}$ week of follow-up showed a similar pain score in both the groups. 6$^{th}$ week follow-up showed a significant reduction in the pain scores in group I as compared to Group II (Table 3).

## DISCUSSION

One of the main reasons for elective abdominal surgery is gallstone disease. Most gallstones, however, are quiescent and are only found by incidentally during radiological investigations

**Table 1:** Demographic profile of the study group

| *Variable* | *Domain* | *Group I* | *Group II* | *p-value* |
|---|---|---|---|---|
| Age group | <30 years | 9 (36%) | 9 (36%) | 0.380 |
| | 30-40 years | 7 (28%) | 8 (32%) | |
| | 41-50 years | 5 (20%) | 4 (16%) | |
| | 51-60 years | 3 (12%) | 3 (12%) | |
| | 61-70 years | 1 (4%) | 1 (4%) | |
| Gender | Male | 8 (32%) | 7(28%) | 0.370 |
| | Female | 17 (68%) | 18(72%) | |

**Table 2:** Preoperative symptomatic profile of the study group

| *Parameter* | *Group I (N/ %) (N=25)* | *Group II (N/ %) (N=25)* | *P-value* |
|---|---|---|---|
| Abdominal pain | 11 (40.0) | 18 (72.0) | 0.486 |
| Heartburn | 3 (12.0) | 10 (40.0) | 0.320 |
| Dyspepsia | 4 (16.0) | 8 (32.0) | 0.555 |
| Nausea and vomiting | 1 (4.0) | 3 (12.0) | 0.617 |
| Dysphagia | 1 (4.0) | 1 (4.0) | 1.000 |
| Chest Pain | 0 (0) | 1 (4.0) | 0.619 |

**Table 3:** Comparison of preoperative and postoperative pain scores in two groups

| *VAS Score* | *0 Week* | | *1 Week* | | *4 Week* | | *6 Week* | |
|---|---|---|---|---|---|---|---|---|
| | *Group I* | *Group II* | *Group I* | *Group II* | *Group I* | *Group II* | *Group I* | *Group II* |
| 0 | 2 (8%) | 1 (4%) | 18 (72%) | 4 (16%) | 21 (84%) | 21 (84%) | 24 (96%) | 20 (80%) |
| 1 | 3 (12%) | 11 (44%) | 7 (28%) | 14 (56%) | 4 (16%) | 4 (16%) | 1 (4%) | 5 (20%) |
| 2 | 12 (80%) | 9 (36%) | 0 | 6 (24%) | 0 | 0 | 0 | 0 |
| 3 | 8 (32%) | 2 (8%) | 0 | 1 (4%) | 0 | 0 | 0 | 0 |
| 4 | 0 (0%) | 2 (8%) | 0 | 0 | 0 | 0 | 0 | 0 |
| *p-value* | 0.070 | | 0.003* | | 0.050 | | 0.040* | |

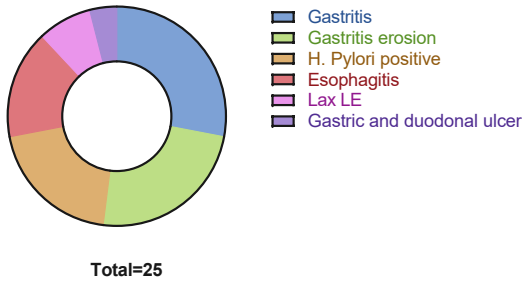


**Figure 1:** Upper gastrointestinal endoscopy findings in participants of Group II

(especially ultrasonography), other procedures, abdominal surgery, or autopsy. Symptomatic gall stone disease can have life-threatening side effects, including acute pancreatitis, acute cholecystitis, acute cholangitis, and cholangiocarcinoma. [8,9] Most gallstones are cholesterol stones linked to a diet and lifestyle typical to the West. The frequency of gallstones is rising in India due to the fast westernization. [10,11]

Gallstones may present with symptoms that are similar to those of other upper gastrointestinal or foregut pathologies. As a result, many patients may receive cholecystectomy, which is the preferred course of treatment for symptomatic gallstone disease, even while an alternative upper gastrointestinal pathology is the root of their symptoms. [8,9] Following a successful and uneventful cholecystectomy, many patients may continue to experience upper gastrointestinal discomfort, a condition known as post-cholecystectomy syndrome. The majority of concurrent upper gastrointestinal pathologies can be easily identified by upper gastrointestinal endoscopy and treated correctly prior to elective cholecystectomy, even though there are other potential causes of postcholecystectomy syndrome. In fact, in certain circumstances, cholecystectomy may be postponed. [12]

In the present study, most of the patients were <30 years of age and only 1.3% of patients were between 61-70 years of age-group. In the previous study by Morrison and Mokoena, the mean age was 44.0 years which supports the findings of our study by highlighting a higher incidence of disease in the 3rd and 4th decade of life. [12] Kunnuru et al., reported a mean age of 45.3 ± 22.29 years in the study participants. Maximum number of patients in group B was in 51–60 years of age group (26.4%).[6] In the study by Kim et al., the mean age of presentation was 47.3 ± 10.9 years. [13]

The highest incidence of cholelithiasis was observed in female gender in the patients included in this study in similarity to the research published by Morrison and Mokoena which reported a female preponderance (88.7%).[12] In the study by Kunnuru et al., there were 276 (69%) female patients and 124 (31%) male patients. [6] In the study by Kim et al., the female-to-male ratio was 1.4:1. [13] Due to the hormonal impact of estrogen, a second investigation on the gender ratio of cholelithiasis in Novacek revealed that female incidence was two to three times greater. [14]

The dominant symptoms in the present study were abdominal pain followed by heartburn, dyspepsia, nausea and vomiting, dysphagia, and chest pain. Similar findings were made in the study by Morrison and Mokoena, in which predominant symptoms were right upper quadrant (87%) or epigastric (59.7%) pain and epigastric tenderness (52.4%).[12] In the study by Kunnuru *et al*., abdominal pain was the commonest symptom (99%) followed by heartburn (25.5%) and dyspepsia (23%).[6] Fitzgerald *et al*. stated that nausea, vomiting, dyspepsia, and upper abdominal pain were typical signs of gallstone disease. [15]

In the present study, upper gastrointestinal endoscopy findings in participants of group II indicate gastritis in 7 (28%) patients, gastritis erosion in 6 (24%) patients, *H. pylori* positive in 5 (20%) patients, esophagitis in 4 (16%) patients, laxle in 2 (8%) patients, and gastric and duodenal ulcer in 1 (4%) patient. Similar findings were made in the study by Morrison and Mokoena, in which acute gastritis was the most common and peptic ulcer the most serious.[12] Another research reported gastritis (22%), and gastric erosion (19%) as common findings in symptomatic cholelithiasis patients with abnormal endoscopy findings (12).[6] In the study by Ayuo *et al*., common findings in upper gastrointestinal endoscopy were gastric and duodenal ulcers, gastritis, duodenitis, and reflux esophagitis. [16]

This research observed a statistical significant lower pain scores in group I patients at follow up durations of 1- and 4-weeks. A similar observation was made by Kunnuru *et al*., which reported a significant lower pain scores at pre-operative and follow up duration of 1 week, whereas no difference was noted at 4th and 6th week duration follow-up.[6] A comparable trial conducted by Khedkar *et al*., revealed the resolution of

all discomfort complaints after three months with an overall response rate of 95%.[16]

Findings of the current research are supportive of upper gastrointestinal endoscopy utility for the treatment of concomitant upper gastrointestinal pathology prior to elective cholecystectomy in patients in Southern India. Post-cholecystectomy syndrome is likely to be less common if co-existing upper gastrointestinal pathology is identified early and treated. This would need to be verified, nevertheless, by a prospective randomized trial in which a subset of patients would not get therapy for upper gastrointestinal-related pathology and upper gastrointestinal endoscopy prior to elective cholecystectomy for cholecystolithiasis.

## CONCLUSION

Cholelithiasis can have non-specific clinical symptoms, which can be presented as a diagnostic challenge, as the symptomatic presentations can be non specific. Upper gastrointestinal endoscopy prior to cholecystectomy can be helpful in diagnosis different upper gastrointestinal pathologies. Unusual presentations could be treated with upper gastrointestinal endoscopy to avoid unusual postoperative symptoms. The discovery of active upper gastrointestinal endoscopy pathology that required treatment in a sizable fraction of patients with putative symptomatic gallstones in a South Indian environment has validated the practice of regular upper gastrointestinal endoscopy prior to elective cholecystectomy. Though, upper gastrointestinal endoscopy is not advised for every cholelithiasis patient, it can help prevent unusual post-operative symptoms in some cholelithiasis patients with an atypical presentation.

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