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Study of Upper GI Endoscopy Findings and Plan of Treatment in Patients with Cholelithiasis

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Abstract: ***Background: Upper gastrointestinal (GI) endoscopy has become an essential diagnostic tool for evaluating the upper GI tract, facilitating the direct visualization of the esophagus, stomach, and proximal duodenum. This study aims to assess the impact of preoperative upper GI endoscopy on the treatment plans for patients with cholelithiasis. Materials and Methods: This observational descriptive longitudinal study was conducted over one year at Pravara Rural Hospital, Loni. A total of 140 patients with ultrasound-confirmed gallstones and upper abdominal symptoms were included. All patients underwent upper GI endoscopy before laparoscopic cholecystectomy. Data on endoscopic findings and treatment modifications were collected and analyzed using descriptive statistics and Fisher's exact test. Results: The mean age of participants was 47 years, with a range from 16 to 86 years. Among the patients, 55.7% were female and 44.3% were male. Upper GI endoscopy revealed abnormalities in 124 patients (88.6%), with common findings including gastritis (50.7%), esophagitis (17%), and gastroesophageal reflux disease (GERD) (15.7%). Treatment plans were modified for 70% of the patients based on endoscopic findings, while 30% proceeded with the initial plan. A statistically significant p-value of < .00001 indicated that endoscopy significantly impacted the treatment plan. Conclusion: Preoperative upper GI endoscopy provides a critical advantage in identifying and differentiating concurrent upper GI pathologies in patients with cholelithiasis. This diagnostic approach allows for tailored treatment plans, enhancing overall management and potentially improving patient outcomes.***

Keywords: Upper gastrointestinal endoscopy, cholelithiasis, gastritis, esophagitis, GERD, treatment modification

1. Introduction

Upper gastrointestinal (GI) endoscopy is a key diagnostic tool for evaluating upper GI disorders, offering direct visualization of the esophagus, stomach, and duodenum. [1, 2]

Gallstones are often detected incidentally during investigations for other upper abdominal symptoms, such as chronic pain or colic, with many patients undergoing laparoscopic cholecystectomy. [3] However, in some cases, symptoms persist post-surgery, leading to post-cholecystectomy syndrome. This highlights the need to consider other potential upper GI conditions, such as esophageal or gastric disorders, that may contribute to symptoms. [4]

In light of these considerations, this study aims to assess the role of upper GI endoscopy in patients with cholelithiasis. Specifically, it will evaluate how preoperative upper GI endoscopy findings may impact the treatment plan for these patients, with the goal of enhancing diagnostic accuracy and tailoring management strategies to address any concurrent esophageal or gastric pathologies.

2. Materials and Methods

This research is an observational descriptive longitudinal study conducted over a one-year period. The study involved 140 patients with ultrasound-confirmed gallstones who presented with upper abdominal symptoms and were either seen in the outpatient department or admitted under the Department of General Surgery at Pravara Rural Hospital, Loni.

Case details were meticulously documented using a pretested proforma, which included information on patient history, clinical examination, and investigative findings. Each patient underwent an upper gastrointestinal (GI) endoscopy prior to laparoscopic cholecystectomy.

Inclusion Criteria

- Patients with ultrasound-verified gallstones
- Patients referred for upper GI endoscopy
- Patients presenting with upper abdominal symptoms such as dyspepsia, regurgitation, heartburn, or bloating
- Patients who provided written informed consent

Exclusion Criteria

- Patients who declined to undergo upper GI endoscopy

Data analysis involved descriptive statistical methods, including proportions, means, medians, and standard deviations. Graphical representations were used as appropriate to illustrate the findings. To compare mean values, Fisher's exact test was employed, with a p-value of less than 0.05 deemed statistically significant. Data analysis was performed using IBM SPSS Statistics software, version 21.0 (IBM Corp., Armonk, NY).

3. Theory

Upper gastrointestinal (GI) endoscopy has emerged as a vital tool in the evaluation and management of the upper GI tract, offering direct visualization of the esophagus, stomach, and proximal duodenum. This technique has revolutionized the diagnosis of various digestive disorders, especially those presenting with unexplained upper GI symptoms such as persistent heartburn, upper GI bleeding, and dysphagia. [1] By allowing direct inspection and enabling therapeutic

interventions, upper GI endoscopy not only aids in the diagnosis of conditions like growths, celiac disease, and chronic gastritis but also facilitates procedures such as endoscopic variceal ligation, polypectomy, and stricture dilation. [2]

The procedure of upper gastrointestinal endoscopy entails using an endoscope, a small, flexible camera with a light, to examine the upper GI tract. The surgeon guides the endoscope through the esophagus into the stomach and duodenum, transmitting a video image to a monitor for a detailed examination of the gastric epithelium. [2]

Upper abdominal symptoms are prevalent in both gallstone disease and inflammatory gastroduodenal disorders. [3]

Although many individuals with gallstones remain asymptomatic, the detection of gallstones is frequently incidental during investigations for other upper GI symptoms. With the widespread availability of abdominal ultrasound, which is both affordable and effective, gallstones are often identified in patients undergoing evaluation for chronic or colicky upper abdominal pain. Consequently, these patients are frequently referred for laparoscopic cholecystectomy. However, this approach may lead to overemphasis on gallstones as the sole cause of symptoms, particularly in cases where symptoms persist despite the removal of the gallbladder. This scenario can result in post-cholecystectomy syndrome, characterized by ongoing pain and discomfort, which occurs in a significant proportion of patients. [4]

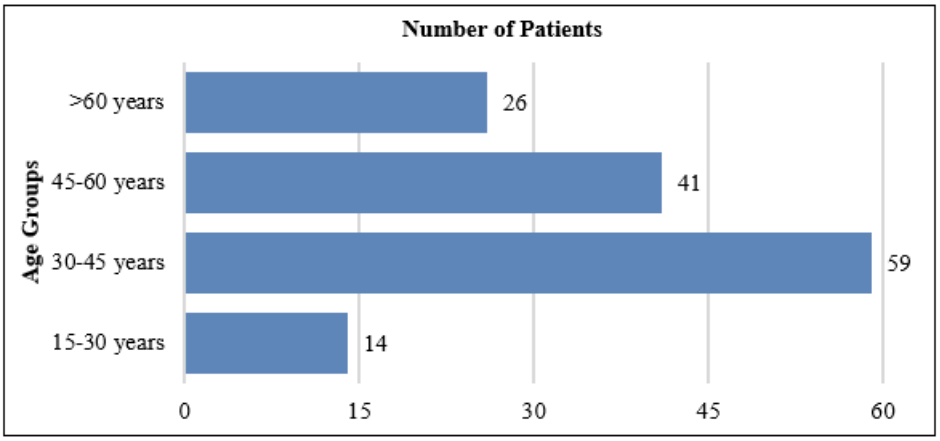
Given that some patients exhibit a combination of atypical upper GI symptoms alongside gallstones, there is a growing need to thoroughly evaluate potential alternative or concurrent GI pathologies. Before proceeding with gallbladder removal, it is essential to consider a comprehensive diagnostic approach, including upper GI endoscopy, to identify any underlying esophageal or gastric conditions that could be contributing to the patient's symptoms. This preoperative assessment can potentially alter the management plan, reducing the likelihood of persistent symptoms and improving overall patient outcomes. [4]

This study aims to assess the role of preoperative upper GI endoscopy in patients with cholelithiasis, focusing on how it may influence treatment decisions by identifying concurrent upper GI pathologies and improving diagnostic accuracy.

4. Results

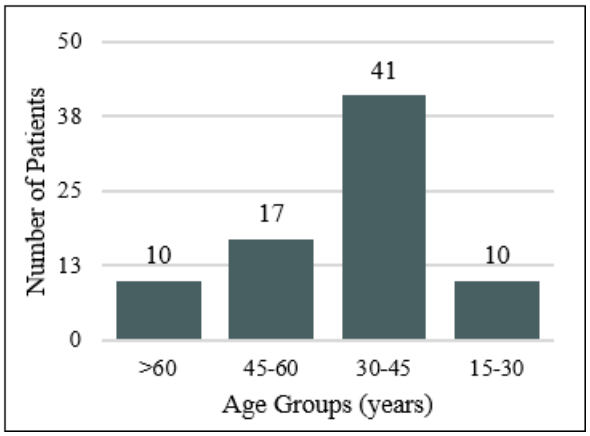
In this study, 140 patients with ultrasound-confirmed gallstones and upper abdominal symptoms were analyzed. Each individual underwent an upper gastrointestinal endoscopy before laparoscopic cholecystectomy. The mean age of participants was 47 years, with ages ranging from 16 to 86 years. Among the 140 patients, 78 were female (55.7%) and 62 were male (44.3%).

The patients were categorized into four age groups: 15-30 years, 30-45 years, 45-60 years, and above 60 years. The distribution of patients across these groups was as follows: 14 patients (10%) were aged 15-30 years, 59 patients (42.1%) were aged 30-45 years, 41 patients (29.3%) were aged 45-60 years, and 26 patients (18.6%) were above 60 years. **(Graph 1)**

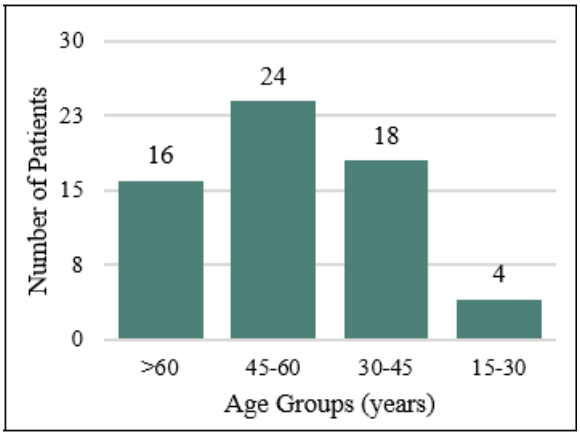


Graph 1: Age Distribution

The majority of female patients were in the 30-45 years age group (41 patients, 52.6%), while the majority of male patients were in the 45-60 years age group (24 patients, 38.7%). **(Graph 2 and 3 respectively.)**



Graph 2: Age Distribution amongst Females



Graph 3: Age Distribution amongst Males

The upper gastrointestinal endoscopy revealed a range of abnormalities among the 140 patients. Gastritis was the most common finding, affecting 71 patients (50.7%), followed by esophagitis in 24 patients (17%) and gastroesophageal reflux disease (GERD) in 22 patients (15.7%). Hiatus hernia was observed in 14 patients (10%), while duodenitis was present in 10 patients (7.1%). Gastric ulcers were found in 4 patients (2.8%), and esophageal varices and duodenal worms were each detected in 2 patients (1.4%). Additionally, 1 patient (0.7%) had a lesion suspicious for malignancy. **(Table 1)**

Table 1: Findings on Upper GI Endoscopy

Gastritis	71
Esophagitis	24
GERD	22
Hiatus Hernia	14
Duodenitis	10
Gastric Ulcer	4
Esophageal Varices	2
Duodenal Worms	2
Mid-Esophagus Obstructive Circumferential Stricture	1
Mallory-Weiss Tear	1
Mid-Esophagus Band with Non-Obstructive Stricture	1
GAVE Syndrome	1
Ulceroproliferative Growth at Pyloro-Antric Channel (? Carcinoma Stomach)	1
Solitary Polyp at D2	1
Normal	**16**

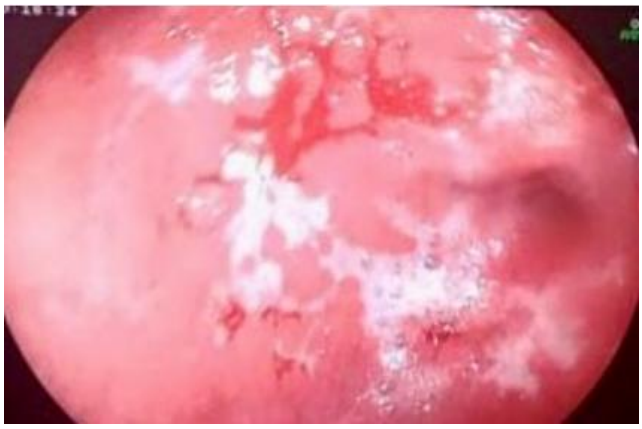


Photo 1: Gastritis

Photo 2: Hiatus Hernia

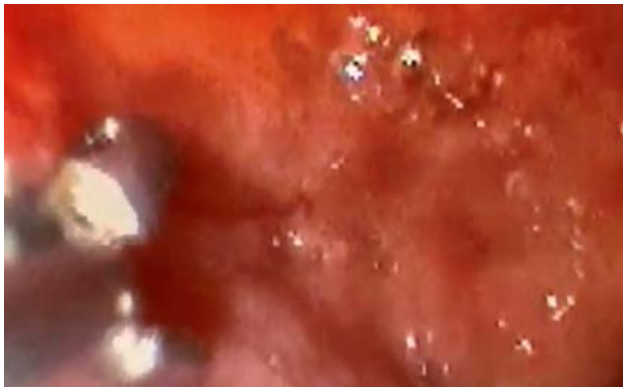


Photo 3: Duodenal Worm

Following the upper GI endoscopy, treatment plans were adjusted for 98 patients (70%), who required additional management for gastro-duodenal conditions prior to laparoscopic cholecystectomy. Only 42 patients (30%) proceeded with laparoscopic cholecystectomy as initially planned. Notably, 1 patient with a lesion suspected to be malignant did not undergo cholecystectomy as planned. **(Table 2)**

The statistical analysis revealed a p-value of < .00001 using Fisher's exact test, indicating that the effect of upper GI endoscopy on modifying treatment plans was statistically significant at $p < .05$. This result underscores the importance of incorporating upper GI endoscopy in the preoperative evaluation of patients with gallstones, as it often leads to adjustments in management strategies.

Table 2: Impact of Endoscopic Findings on Treatment Plans in Patients with Cholelithiasis

Endoscopic Findings	Total Patients	Same Treatment Plan	Modified Treatment Plan
Normal	16	16 Patients	0
Abnormal Findings	124	26 Patients	98 Patients
Total	140	42 Patients	98 Patients

Among patients who received both additional treatment for gastro-duodenal conditions and subsequent surgical intervention, the resolution of pain was comparable to that observed in patients with normal endoscopic findings.

5. Discussion

The study investigated 140 patients presenting with upper abdominal symptoms and sonographically verified cholelithiasis, with a mean age of 47 years and an age range from 16 to 86 years. The majority of patients were in the 30-45 year age group, which aligns with findings from the study by Bhagavan *et al.* (2021), reinforcing that middle-aged individuals are commonly affected by gallstone disease. [5]

Our study found a female-to-male ratio of 1:0.8, with 55.7% female and 44.3% male patients. This gender disparity corroborates findings from various studies indicating a higher prevalence of cholelithiasis in females. [6, 7] Pregnancy and sex hormones are believed to increase the susceptibility of women to cholelithiasis, a hypothesis supported by various epidemiological studies. Estrogen, in particular, is known to promote the release of biliary cholesterol, resulting in the cholesterol saturation of bile and the formation of gallstones. [8]

Endoscopic findings revealed that 124 patients (88.6%) had abnormalities, while 16 patients (11.4%) had normal upper gastrointestinal endoscopy results. The high prevalence of concurrent gastroduodenal conditions underscores the importance of comprehensive pre-operative evaluation. Addressing these additional findings is crucial, as patients with unresolved gastroduodenal issues may continue to experience pain post-cholecystectomy. Although 11.4% patients had normal endoscopy findings, indicating that routine endoscopy for all symptomatic cholelithiasis patients may not be universally warranted.

Our study identified gastritis as the most common abnormal finding, affecting 50.7% of patients, followed by esophagitis (17%), GERD (15.7%), hiatus hernia (10%), duodenitis (7.1%), and gastric ulcers (2.8%). These findings are consistent with Kunnuru *et al.* (2021), who reported gastritis (22%), gastric erosion (19%), reflux esophagitis (12%), lax lower esophagus (10%), and gastric and duodenal ulcers (7%) as common endoscopic findings. [9]

Supporting the value of preoperative endoscopy, Rassek *et al.* (1988) demonstrated that 11.3% of their patients had their treatment plans altered due to endoscopy findings. [10] Similarly, our study showed that 70% of patients had their treatment plans modified to include management of additional upper gastrointestinal issues. Notably, 1 patient with a suspicious gastric lesion did not undergo laparoscopic cholecystectomy, emphasizing the role of endoscopy in identifying potentially serious conditions like malignancy.

The study by Rashid *et al.* (2010) further illustrates the benefits of preoperative UGI endoscopy, showing that patients who underwent endoscopy and subsequent treatment had a significantly lower incidence of persistent symptoms compared to those who did not receive endoscopic evaluation. The results revealed that 32.7% of patients who were not scoped experienced persistent symptoms, whereas only 3.3% of patients who underwent endoscopy and subsequent treatment reported persistence of pain. [11] Our results align with this finding, as patients who received both additional treatment for gastro-duodenal conditions and subsequent surgical intervention experienced comparable pain resolution to those with normal endoscopic findings.

Additional studies conducted by Schwenk *et al.* (1992), Thybusch *et al.* (1996), and Sosada *et al.* (2005) also emphasize the importance of routine pre-operative upper GI endoscopy prior to cholecystectomy. These studies reported varying percentages of pathological findings, which resulted in modifications to treatment plans, emphasizing the crucial role of evaluating the upper digestive tract before cholecystectomy. [12, 13, 14]

This study, while illuminating the benefits of routine UGI endoscopy in managing patients with cholelithiasis, is not without its limitations. Key challenges include the procedural cost, which can be substantial and may affect the feasibility of routine endoscopy for all patients. Additionally, waiting lists for endoscopic procedures can lead to delays in diagnosis and treatment. The procedure itself can cause discomfort for patients. Furthermore, like all medical procedures, UGI endoscopy carries inherent risks and potential complications, such as bleeding or perforation, which must also be considered. [9]

Despite these challenges, the primary advantage of this study is its demonstration of the value of routine UGI endoscopy. By identifying and managing concurrent upper GI conditions, including malignancies, the study underscores the potential for endoscopy to refine treatment plans and improve patient care.

6. Conclusion

Cholelithiasis often presents with symptoms that overlap with other upper GI conditions, making it difficult to distinguish between symptoms caused by gallstones and those from other underlying diseases. Pre-operative upper GI endoscopy provides a crucial advantage by enabling the identification and differentiation of concurrent upper GI pathologies. This diagnostic approach allows for the modification of treatment plans based on individual patient needs, ensuring more comprehensive management and potentially improving overall patient outcomes. By integrating upper GI endoscopy into the preoperative evaluation process, clinicians can address additional GI issues, tailor treatment strategies more precisely, and enhance the effectiveness of surgical interventions for cholelithiasis.

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