

## Original Research Article

# The usage of prior upper gastrointestinal endoscopy among symptomatic patients undergoing cholecystectomy

Ayesha Jule Khan\*, Samridhi Gupta, Manu Kohli, Gopal S. Bhargava

Department of Surgery, Sri Guru Ram Das Institute of Medical Sciences and Research, Vallah, Sri Amritsar, Punjab, India

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**\*Correspondence:**

Dr. Ayesha Jule Khan,

E-mail: drayeshakhan2025@gmail.com

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### ABSTRACT

**Background:** Cholelithiasis is one of the most common problems encountered in surgery. It is an immense challenge to discriminate between signs and symptoms due to gastrointestinal lesions and gallstones diseases. The objective of this study was to evaluate the usage of pre-operative upper gastrointestinal endoscopy (UGE) as a routine in treating symptomatic gallstone patients.

**Methods:** This prospective hospital based observational study was conducted in the Department of General Surgery at Sri Guru Ram Das Institute of Medical Sciences and Research, Sri Amritsar from January 2018 to June 2019. 60 symptomatic gallstone patients were selected for cholecystectomy and preoperative upper gastrointestinal (GI) endoscopy evaluation was done for any associated upper gastrointestinal problems.

**Results:** Out of the total patients, females constituted 85% of overall study patients and majority of the patients presented with atypical biliary colic symptoms (55%, group 2) whereas 45% presented with typical biliary colic symptoms (group 1) (p value=0.009). Relief rate was highest in group 1 with abnormal UGE than with group 2.

**Conclusions:** The routine use of upper GI endoscopy in patients with symptomatic cholelithiasis prior to cholecystectomy will help reduce post-operative persistence of symptoms and thus, it is a useful investigation in the overall treatment of gallstone diseases.

**Keywords:** UGE, Typical biliary colic, Atypical biliary colic

### INTRODUCTION

Gallstone disease (cholelithiasis) continues to be a national and international health problem and it remains one of the most common medical problems leading to surgical intervention.<sup>1</sup>

The prevalence of gallstone disease is 5-10% of population in Asian countries especially among older individuals and females while in western countries it occurs in up to 7.9% of men and 16.6% of women.<sup>2</sup> While its prevalence in India is 4%.<sup>3,4</sup>

The third National Health and Nutritional Examination Survey estimated that 14.2 million women and 6.3 million men aged between 20 and 74 in the United States have gallstone disease.<sup>5</sup>

There are multiple risk factors identified for gallstone disease including age, gender, obesity, lithogenicity, rapid weight loss, diabetes mellitus, number of pregnancies, post-operative periods, family history, oestrogen replacement therapy, serum lipids, drugs and decreased physical activity.<sup>6</sup>

Patients with gallstones can be divided into three groups based on their presentation.

The first and the most common form of these is patients with gallstones on imaging studies but without symptoms (asymptomatic) which constitute 80% of patients with cholelithiasis.<sup>1,6,7</sup>

Majority of these asymptomatic patients will remain asymptomatic for many years or have less than 20% chance of ever developing clinical symptoms.

The term 'symptomatic gallstone' is widely used to describe symptoms arising secondary to the presence of gallstone.<sup>8</sup>

Asymptomatic gallstones can be managed expectantly but once gallstones become symptomatic, it becomes an indication for cholecystectomy.

The second group defined as having typical biliary symptoms with gallstones on imaging studies. Biliary colic is the pain that occurs due to obstructing stone that causes sudden expansion of gallbladder.<sup>9</sup>

These typical symptoms are defined as a sudden onset rapidly increasing pain that commonly fires after a fatty meal (about one to two hours later) and usually does not occur during fasting and can be associated with nausea and vomiting. The pain is usually severe and may last for minutes or even several hours. Frequently the pain starts during the night and wakens the patient. The frequency of recurrent attacks may vary from hours to years.<sup>10</sup>

As the supply is splanchnic nerve, the pain that was situated in the right upper quadrant or mid epigastrium may radiate to back, right scapula or shoulder tip.<sup>11,12</sup> This group should undergo elective cholecystectomy.

The third category consists of the patients that have mixture of atypical upper gastrointestinal (UGI) symptoms and incidentally discovered to have gallstones on imaging studies. Atypical symptoms are those that do not fit typical pain criteria and include any dyspepsia, abdominal discomfort, nausea, vomiting, belching, food intolerance, heart burn, loss of appetite and flatulence.<sup>7</sup>

This group are likely to be associated with poor symptomatic outcome.<sup>13</sup>

The best treatment for symptomatic gallstone disease is the removal of the gallbladder that is cholecystectomy. As symptoms are not entirely due to cholelithiasis, after elective cholecystectomy some patients do not get symptomatic relief or get only partial relief.

So, it is an immense challenge to assess patients with upper GI symptoms who are found to have gallstones whether the source of symptoms are stones that is gallstone disease or the stones are an incidental finding.

As both gallstones and upper GI symptoms are common in the general population, distinguishing between these two situations is very crucial.

Many upper GI pathologies are associated with cholecystitis such as gastritis, peptic ulcer and hiatus hernia and can cause persistence of upper abdominal discomfort and dyspepsia in post cholecystectomy patients.<sup>14</sup>

The relationship between such persistent pain and cholelithiasis is often unclear. Coexistence of concurrent upper gastrointestinal problems with gallstones may have attributed to the post cholecystectomy syndrome.

Post-cholecystectomy syndrome or persistent post cholecystectomy pain consists of a group of abdominal symptoms that recur and/or persist after cholecystectomy.<sup>15</sup>

It can be early if occurring in the immediate post-operative period and late if it manifests after months or years.

Post-cholecystectomy syndrome varies in frequency between 6% and 47%.<sup>16,17</sup>

Symptomatology of upper GI diseases can be overlapping so upper gastrointestinal endoscopy is important to identify the diseases of upper gastrointestinal tract as it evaluates the esophagus, stomach and duodenum along with direct visualization of the ampulla of Vater.

The persistence of abdominal symptoms in post cholecystectomy patients can be due to inadequate preoperative evaluation of other conditions that causes the same symptomatology.

Thus, this study was conducted to contribute UGI endoscopy as routine preoperative investigation and the importance of UGI endoscopy to evaluate the association between gastrointestinal symptoms with gallstones and reduce the prevalence of post cholecystectomy pain.

## METHODS

This prospective observational study was conducted in department of surgery at Sri Guru Ram Das Institute of Medical Sciences and Research, Sri Amritsar from January 2018 to June 2019. The patients of both sexes and of ages above 18 years with symptomatic gallstone disease were taken up for surgery.

The data collected from the patients included personal information, presenting signs and symptoms, investigations including ultrasound abdomen, upper gastrointestinal endoscopy (UGE) finding, biopsy reports if present, medications, surgery details, any post-operative complications and findings.

A total of 60 patients were included in this study who were divided into two groups based on symptomatology, first group (group 1) in which patients present with typical symptoms of gallstones (n=27) and second group (group 2) in which patients present with atypical symptoms (n=33).

Typical symptoms include biliary colic which is defined as recurrent sudden onset rapidly increasing pain, situated in right upper quadrant or epigastric and may radiate to scapula that commonly increases after a meal.

Atypical symptoms are dyspepsia, abdominal discomfort, nausea, belching, heartburn, food intolerance, flatulence and loss of appetite.

**Inclusion criteria**

Symptomatic patients with ultrasonologically documented gallstones was included.

**Exclusion criteria**

Patients below age of 18 years, with acute cholecystitis whose general condition is not stable, not willing to participate in study or lost to follow up, with acalculus cholecystitis, choledocholithiasis, cholangitis, jaundice, gall stone pancreatitis, gallbladder neoplasm, past history of previous biliary or pancreatic surgery and patients with asymptomatic gallstones were excluded.

All symptomatic patients with gallstones whether experienced typical or atypical symptoms were subjected to UGI endoscopic examination 1 to 4 days prior to operation.

The endoscopic findings were divided as normal, inflammatory, erosions, ulcers, hiatus hernia and others including carcinomas.

The cases involving ulcer and inflammatory changes of gastric and duodenum mucous membrane were subjected to histopathological examination. Similar categorizations were applied for histopathological findings as well.

Symptomatic gallstone patients with normal upper gastrointestinal findings on endoscopy were operated for cholecystectomy.

Similarly, cholelithiasis patients associated with upper GI symptoms with preoperative upper gastrointestinal lesions on endoscopy were subjected to cholecystectomy along with institution of medical treatment for GI lesions found on preoperative endoscopy. Scheduled cholecystectomy was postponed when there was gastric ulcer or duodenal ulcer or erosions until histopathological results were obtained and ulcers healed.

All enrolled patients were followed up post operatively on days 7, 14 and 30 for the relief in preoperative

symptoms (typical or atypical) and time taken for that relief along with relief rate was calculated.

Relief rate is defined as number of patients who don't have symptoms postoperatively or number of patients with given symptoms preoperatively.

**Statistical analysis**

Chi square test was used to see the association between type of symptoms, time taken for the relief in symptoms with or without medication for GI lesions and endoscopic findings.

A p value of 0.05 was considered statistically significant. The data was entered in MS Excel spreadsheet and analysis was done using statistical package for Social Sciences (SPSS) version 21.0.

The data so obtained was carefully recorded and collected. Appropriate statistical tests were utilised to analyze the data.

**RESULTS**

A total of 60 patients were recruited in the study, at Sri Guru Ram Das Institute of Medical Sciences and Research at Department of General Surgery, except those under exclusion criteria.

The patients in both the groups were randomly selected. Their distribution in the two groups was also random. Majority of the study patients presented atypical abdominal symptoms (n=33, 55%) whereas 45.0% (n=27) of them presented typical biliary colic symptoms (Table 1).

All patients selected for the study underwent clean and elective cholecystectomies except those patients who were diagnosed with gastric ulcers, gastric erosion on UGI endoscopy.

The patients' aged ranged 20 to 75 years were recruited in the study with majority of patients being aged between 51 to 60 years (30%). In age group of 20 to 30 and 31 to 40 years, typical pain was more common whereas in age group 41 to 60 years, atypical pain symptoms were common.

**Table 1: Number of cases.**

Group	Number of patients
Group 1- (typical pain group)	27
Group 2- (atypical pain group)	33

Typical symptoms were more common in age group of 20-30 upto 33.33% whereas atypical symptoms were more common in age group of 51-60 upto 5.45%. The

mean age of patients in group 1 was 40.85±14.10 years and group 2 was 48.88±11.90 years. The table drawn

below depicts the age distribution among the typical pain and atypical pain group.

**Table 2: Age distribution.**

Age group (years)	Group 1		Group 2		Total	
	N	%	N	%	No.	%
20-30	9	33.33	3	9.09	12	20.00
31-40	8	29.63	7	21.21	15	25.00
41-50	4	14.81	5	15.15	9	15.00
51-60	3	11.11	15	45.45	18	30.00
61-70	3	11.11	3	9.09	6	10.00
<b>Total</b>	27	100.00	33	100.00	60	100.00
<b>Mean age</b>	40.85±14.10		48.88±11.90		45.27±13.45	

Statistical inference: p value: 0.020, Significant.

**Table 3: Distribution of UGE and histopathological findings.**

UGE finding	No. of cases	%	Histopathological findings
Normal	31	51.67	Not done
Duodenitis	18	30	Duodenitis
Gastritis	7	11.67	Gastritis
Erosion	3	5.0	Erosion
Ulcer	1	1.67	Ulcer
Others	0	0.00	-

**Table 4: Comparison of preoperative and postoperative relief of symptoms.**

Time interval	Group 1		Group 2	
	Normal UGE	Abnormal UGE	Normal UGE	Abnormal UGE
<b>No. of patients</b>	19	8	12	21
<b>7 days</b>	19	0	12	0
<b>14 days</b>	0	3	0	3
<b>30 days</b>	0	4	0	15
<b>Relief rate (%)</b>	100	87.5	100	85.70

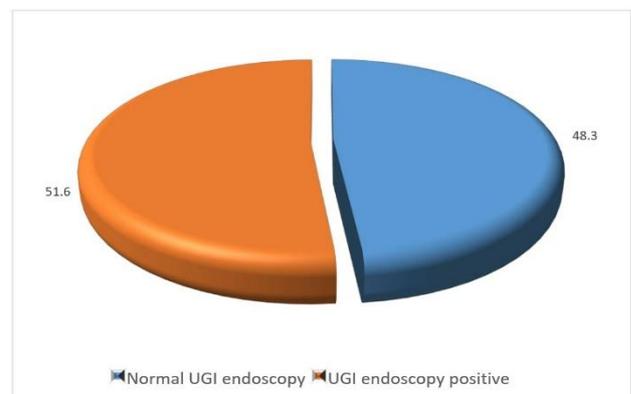
The female to male ratio was 24:3 in group 1 and 27:6 in group 2. A female predominance was observed in both study groups.

Out of 60 patients, only 1 was ever smoker, 4 were alcoholic, 13 were diabetics and 14 had history of dislipidemia. History of dyslipidaemia was more common in group 1 than in group 2.

The UGE of symptomatic patients with gallstones showed that 51.6% (n=31) of the patients had normal endoscopy findings when compared to 48.3% (n=29) of patients with positive endoscopy findings (Figure 1).

Significantly higher proportion of patients with positive UGE findings presented with atypical pain (72.4%, n=21) when compared to typical biliary colic patients with positive findings (27.58%, n=8; p<0.05). Out of 27 patients with typical pain (group 1), 8 patients (29.63%) had abnormal UGE finding whereas 19 patients (70.37%) had normal UGE findings. In atypical pain (group 2), 21

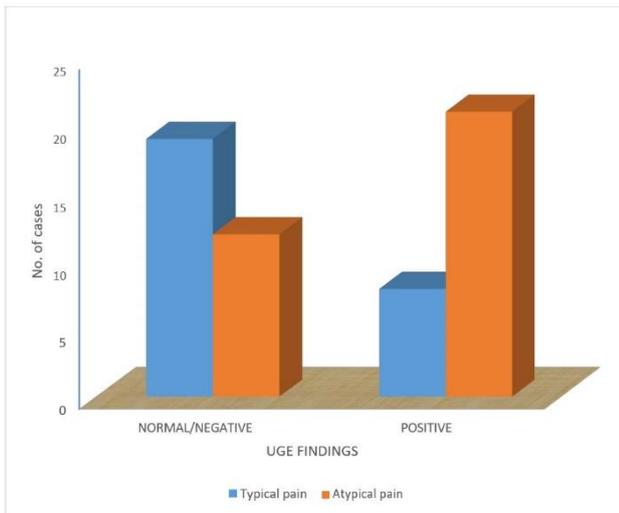
patients (63.64%) had positive UGE findings while 12 patients (36.36%) had normal UGE findings.



**Figure 1: Distribution of UGE findings.**

Among 29 patients who were positive for upper GI lesions, 21 (63.6%) of them had atypical pain and 8 (29.6%) had typical biliary colic symptoms. In

comparison. Among 31 normal UGE findings patients. 19 (70.3%) patients had typical biliary colic and 12 (36.3%) patients had atypical symptoms. This difference was statistically significant ( $p=0.009$ ) (Figure 2).



**Figure 2: Distribution of UGE among the groups**

Out of 60 patients, 31 (51.67%) patients showed normal findings and 29 (48.3%) showed abnormal findings which were subjected to biopsy. Most common UGE findings being duodenitis (30.00%), gastritis (11.67%), gastric erosions (5.0%) and gastric ulcer (1.67%) as shown in Table 3.

Histopathological examination was done for 29 patients. The most common finding was *Helicobacter pylori* infestation in the biopsies obtained from those with gastric ulcer (5.2%), gastric erosions (5.2%) and chronic inflammation in stomach and duodenum (89.4%).

Table 4 shows that a 100% relief of preoperative symptoms was observed within 1 month of follow up in case of patients who showed no findings on UGE.

87.5% of relief was achieved in patients of typical pain with abnormal UGE. Patients with atypical pain with abnormal UGE showed 85.7% of relief rate at the end of 1 month of follow up.

**Table 5: Relation of UGE findings and management plan.**

OGD findings	Management plan	
	Not changed	Changed
	N (%)	N (%)
Normal (n=31)	31 (100)	0 (0)
Abnormal (n=29)	25 (86.2)	4 (13.7)
Total (n=60)	56 (93.3)	4 (6.67)

P value: 0.032.

The treatment planned after UGE findings having gastric erosions in 3 patients and ulcer in 1 patient were changed

as there is possible upper GI bleed due to the perioperative stress. Cholecystectomy were performed in 56 patients (93.3%) and all the patients who have abnormal UGE findings were advised for a full course of proton pump inhibitors and HP kit along with cholecystectomy (Table 5). It is statistically significant.

**DISCUSSION**

Majority of patients with complaints of colicky or chronic upper abdominal pain undergo ultrasound examination which is a non-invasive, readily available and inexpensive investigation. After ultrasound detection of gallstones, gallstones remain the main focus of treatment for surgeons and almost all patients with proven gall stones are referred to undergo elective cholecystectomy, a common and a safe procedure.

In these situations, further investigations to rule out other pathologies causing similar symptoms are seldom to be considered. However, owing to the fact that high proportion of non-specific abdominal symptoms in patients with known gallstones may lead to unjustifiable cholecystectomies. Ruling out other causes of pain prior to cholecystectomy using prior UGI endoscopy will not only decrease persistence of symptoms but can also be helpful in detecting gastroduodenal pathologies at an early stage.<sup>1,18</sup>

In our study conducted in the Department of Surgery, Sri Guru Ram Das Institute of Medical Sciences and Research, Sri Amritsar, we have made a sincere attempt to evaluate the usage of prior upper GI endoscopy among the symptomatic patients undergoing cholecystectomy.

Findings from the current study has also re-emphasized and preferred the usage of upper gastrointestinal endoscopy as a routine in treating symptomatic patients with gallstones prior to cholecystectomy.

Majority of the patients in our study presented with atypical upper abdominal symptoms 55% (n=33) whereas 45.0% (n=27) of them presented typical biliary colic symptoms which is consistent with previous studies like Srikantaiah et al, Chandio et al and Kolla et al.<sup>24-26</sup>

This is in contrast to the study by Mozafar et al and Karmacharya et al where more patients presented with typical pain then atypical pain group.

A total of 60 patients were included in this study with a mean age of 45.27±13.45 years.<sup>22,23</sup> This is comparable to the studies by Chandio et al and Srikantaiah et al in which they reported the mean age to be 46.10 years and 43.6 years respectively.<sup>25,26</sup>

In our study, incidence of typical biliary colic was higher among younger age group (75%) compared to atypical symptoms which was common in older age group (83.3%). This is consistent with the study carried out by

Srikantaiah et al who reported 63.2% of younger patients common in typical biliary colic group whereas 66.7% of older patients was common in atypical pain group. A significant association was seen between age and symptoms of biliary colic.<sup>26</sup>

In our study, out of the 60 patients, 15% were males and 85% were females. Thus, result verifies the more prevalence of gallstone diseases in females.

Mozafar et al conducted retrospective study of 360 patients out of which 45 were smokers, 135 had dyslipidemia, 44 were chronic alcoholic and 32 ones had diabetes mellitus. In this study, the history of dyslipidemia, smoking, drinking and diabetes mellitus were more common among the patients with atypical pattern of pain. Of 43 patients who drank alcohol and had atypical abdominal pain, 42 (97.7%) had also abnormal EGD findings: 19 inflammations, 18 peptic ulcers and 5 others. Among 45 smoker patients 44 (97.8%) had abnormal endoscopic findings: 23 inflammations, 19 peptic ulcers and 2 others.<sup>22</sup>

In our study among 60 patients, only one (1.67%) was smoker, 4 patients (6.66%) were alcoholic, 13 patients (21.67%) had diabetes mellitus and 14 (23.33%) patients had dyslipidaemia. Similar to Mozafar et al, in our study history of drinking and diabetes mellitus was more common in atypical pain group whereas history of dyslipidaemia was more common in typical pain group. The association observed were statistically not significant ( $p > 0.05$ ).<sup>22</sup>

The UGE of patients with symptomatic gallstones showed that 51.6% (n=31) of the patients had normal endoscopy findings when compared to 48.3% (n=29) of patients with positive endoscopy findings.

Significantly higher proportion of patients with positive UGE findings presented atypical upper abdominal pain (72.4%, n=21) when compared to typical biliary colic patients with positive findings (27.58%, n=8;  $p < 0.05$ ) similar to other studies.

In our study, among 29 patients who were positive for upper GI lesions, 21 (63.6%) had atypical and 8 (29.6%) had typical biliary colic symptoms. In comparison, among 31 normal UGE findings patients, 19 (70.3%) had typical biliary colic and 12 (36.3%) had atypical symptoms. This difference was statistically significant ( $p = 0.009$ ). This result is similar to the other studies.

These observations may hint at possibilities of UGE being abnormal in patients having gallstones with atypical symptoms. In addition, normal UGI findings were seen in patients with typical pain reinforcing the fact that patients with typical abdominal pain are less likely to present with coexisting upper gastrointestinal lesion.

The study conducted by Kolla et al shows that out of 118 patients, 34 (28.8%) patients showed normal UGI endoscopy findings and 84 (71.2%) patients showed abnormal findings in group 2 patients subjected to biopsy in case of ulcer or any abnormal pathology; most common finding being gastritis (40.67%). Other findings were hiatus hernia (30.51%), duodenitis (15.28%), reflux oesophagitis (9.32%), gastric ulcer (2.54%), duodenal ulcer (1.69%) and others including candidial oesophagitis and celiac disease (3.39%) with histopathological finding suggestive of *H. pylori* related ulcers in stomach and duodenum and celiac disease.<sup>24</sup>

While in our study, out of 60 patients, 31 (51.67%) showed normal findings and 29 (48.3%) showed abnormal findings which were subjected to biopsy. Most common findings were duodenitis (30.00%), gastritis (11.67%), gastric erosions (5.0%) and gastric ulcer (1.67%).

Thybusch et al conducted a study in which endoscopy of the upper digestive tract was performed in 338 consecutive patients undergoing cholecystectomy. About 50% of patients had pathological findings on OGD examination. These findings were gastritis (25.7%), peptic ulcers (6.8%), hiatal hernias (4.7%), polyps (3.2%), oesophagitis (3%), gastric erosions (1.8%) and gastric cancer (0.6%). The management plan had to be changed in 8.3% of patients based on these oesophagogastroduodenoscopy findings. 26 patients received medical treatment prior to undergoing cholecystectomy and two patients with gastric cancer underwent gastrectomy. Thus, this study evaluated the role and therapeutic implications of routine OGD before cholecystectomy.<sup>21</sup>

Of the 60 patients in our study, 56 were symptom free at the end of 4 weeks.

This included 56 patients who underwent elective cholecystectomy.

19 patients with typical pain, 12 patients with atypical pain with normal UGE finding and achieved 100% relief rate upto 1 month follow up.

7 patients with typical pain and 18 patients of atypical pain with abnormal UGE finding achieved 87.5% and 85.70% of relief rate respectively

All the patients with abnormal endoscopic findings were prescribed proton pump inhibitors. Dietary and life style changes and *H. pylori* therapy (HP Kit) following positive *H. pylori* in biopsies.

While the remaining 4 (1 with typical pain and 3 with atypical pain) (6.67%) were the patients in whom planned cholecystectomy was postponed and received medical line of management in view of the UGE findings and advised more than 1 month follow up.

Therefore, our study shows a 100% relief of symptoms in case of patients who showed no findings on UGE after the cholecystectomy and gradual relief of symptoms in case of patients whose UGE has positive findings at the end of 1-month follow-up.

In patients who had gastric erosions and ulcers, there was no relief of symptoms even after appropriate procedure and dietary regulations at 1 month follow up. Patients with typical pain and negative UGE showed complete relief of symptoms within one week post-operatively. However, patients with atypical pain had persistence of symptoms which were relieved on specific treatment and life style changes.

It was seen that majority of the study patients presented with atypical upper GI symptoms (55%) with 29 patients (48.3%) having positive upper GI lesions. Comparatively normal UGE was seen in 70.3% of patients with typical biliary colic and 36.3% being atypically symptomatic patients and was statistically significant ( $p=0.013$ ).

Peptic ulcer disease may have not been recognized if routine EGD had not been performed. Patients with peptic ulcer disease who undergo cholecystectomy run the risk of such serious complications as bleeding and perforation of the ulcer attributable to perioperative stress. This is why patients with diagnosed ulcer should not undergo surgery but should rather have anti-ulcer treatment. It is advisable to perform a control EGD after 3 to 6 weeks. Patients in whom ulcer has healed can be qualified for planned cholecystectomy.

Role of preoperative endoscopy of upper GI tract in patients undergoing cholecystectomy has been recommended by prior studies. Similar to our findings, Diettrich et al found abnormal upper GI lesions in 31 patients which changed their subsequent plan of treatment and recommended that preoperative endoscopy of upper gastrointestinal tract should be used in patients undergoing cholecystectomy to rule out other gastrointestinal disorders.<sup>20</sup>

Apart from the established diagnostic value of pre-elective UGE for cholelithiasis, studies have also aimed at understanding other pathologic changes which may have been overlooked. In the current study, UGE results showed that majority of the patients were normal (~51.6%) whilst the rest being positive for UGE detected lesions. Among them, majority of them had duodenitis (~31.67%), followed by gastritis (11.67%), erosions (3.33%) and benign gastric ulcer (1.67%).

These findings may plausibly explain the reason for persistent pain despite successful surgery in few patients. Patients received surgical therapy for symptomatic cholelithiasis even while significant inflammation of the gastric or duodenal mucous membrane was seen in current and other studies.<sup>19,21</sup>

This suggests that UGE need not necessarily correlate with clinical symptoms and that a UGE findings can surely influence treatment management, posing a strong argument for routinely performed UGE before planned cholecystectomy.

## CONCLUSION

In conclusion, the routine use of UGE before cholecystectomy in the presence of proven gallstones may result in change of the management plan due to detection of other pathologies such as gastritis, duodenitis and peptic ulcer disease, thereby reducing postoperative persistence of symptoms. Pre elective UGE also assists in planning treatment modality for patients with recognised cholelithiasis accordingly.

In our study, routine use of UGE specifically in patients presenting with atypical upper abdominal pain resulted in detection of other coexisting pathologies in about 51.6% of patients. This study hereby highlights the diagnostic value of UGE as a routine investigation before elective cholecystectomy specifically in patients with atypical upper abdominal pain which will thus avoid persistence of symptoms post cholecystectomy.

Therefore, in patients of proven gallstones with atypical upper abdominal pain, UGE must be recommended. This study recruited a small sample size. A larger sample size and a longer follow up would provide more accurate results. Such an elective planning would also be clinically and economically beneficial.

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