Journal of Chemical Health Risks

www.jchr.org

JCHR (2026) 16(2), 574-580 | ISSN:2251-6727

The Significance and Indications for Routine Pre-Operative Upper Gi Endoscopy in patients with Cholelithiasis Undergoing Laparoscopic Cholecystectomy

Dr Shilpa Samuel Dhinakaran, Dr Dinesh Kumar Reddy C, Dr Raja Senthil

(Received: 05 January 2026 Revised: 15 February 2026 Accepted: 05 March 2026)

KEYWORDS

Cholelithiasis, Endoscopy, Gall stones, Heart burn, Dyspepsia, Nausea, Cholecystectomy

ABSTRACT:

Objective

Cholelithiasis is one of the most common surgical conditions encountered in clinical practice. While typical biliary colic results from transient obstruction of the cystic duct leading to gallbladder distension, many patients present with atypical gastrointestinal symptoms such as dyspepsia, nausea, belching, heartburn, flatulence, vomiting, and loss of appetite. This study aimed to evaluate the role of upper gastrointestinal endoscopy (UGE) in identifying associated UGI lesions and correlating gastrointestinal symptoms with gallstone disease.

Methods

This is a prospective and retrospective observational study. Patients with symptomatic cholelithiasis diagnosed on imaging were included. Both patients with typical and atypical symptoms were enrolled after obtaining consent. Clinical data, imaging, UGE results, biopsy reports, treatment details and postoperative outcomes were recorded and analysed.

Results

A total of 111 patients with atypical biliary symptoms demonstrated a significantly higher incidence of abnormal UGI endoscopic findings compared to those with typical symptoms. Persistence of postoperative symptoms showed a strong association with atypical preoperative presentation. Most patients with typical biliary symptoms were symptom-free by the end of four weeks postoperatively, whereas a substantial proportion of patients with atypical symptoms continued to have persistent complaints. This association was statistically significant.

Conclusion

Upper gastrointestinal endoscopy plays an important role in the preoperative evaluation of symptomatic patients. Selective use of UGE, particularly in patients with atypical symptoms, helps identify coexisting gastrointestinal lesions and may reduce postoperative symptoms and help in a faster recovery.

Introduction

Some patients continue to experience symptoms even after undergoing cholecystectomy, suggesting that their symptoms may not solely be attributable to cholelithiasis.[1] With the widespread availability of ultrasound examinations, the diagnosis of cholelithiasis has become more common. However, the presence of gallstones on ultrasound may be incidental, with the actual cause of pain being peptic ulcer disease, gastroesophageal reflux, hiatus hernia, or other upper gastrointestinal conditions.[2]

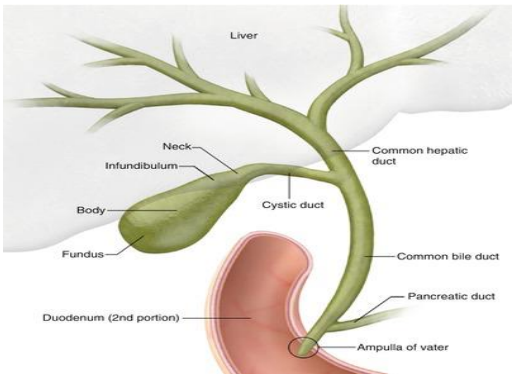

Figure 1 - Gall bladder and its parts

Journal of Chemical Health Risks

www.jchr.org

JCHR (2026) 16(2), 574-580 | ISSN:2251-6727

Upper abdominal pain may arise from either cholelithiasis or gastroduodenal issues due to overlapping symptomatology.[3] While gallstones are the most prevalent biliary pathology, most cases are asymptomatic. Despite being asymptomatic initially, a small percentage of patients develop symptomatic gallstone disease annually, leading to cholecystectomy becoming a common surgical procedure.[4]

Laparoscopic cholecystectomy is typically the preferred treatment for cholelithiasis, offering quicker recovery, less pain, and a faster return to normal activities. The operative mortality rate for cholecystectomy is low, at less than 1 per cent.[5] Despite the benefits of surgery, some patients do not experience symptom relief post-cholecystectomy. Post-cholecystectomy pain, characterized by pain persisting or recurring after surgery, may be caused by conditions such as reflux esophagitis, bile gastritis, gastric erosions, and duodenal ulcers.[6] Therefore, accurate documentation of atypical abdominal pain is crucial, and patients should be managed comprehensively, addressing both cholelithiasis and associated upper gastrointestinal issues. Evaluating gallstone disease is challenging, given the need to discern whether symptoms are directly attributable to gallstones or merely incidental findings. This is a critical distinction due to the prevalence of both conditions in the general population.[7]

This study aims to assess the utility of upper gastrointestinal endoscopy (UGE) in identifying associated disorders of the upper gastrointestinal tract in patients with confirmed gallstones via ultrasonography presenting with chronic dyspepsia. The objective is to evaluate the effectiveness of UGE as a pre-operative investigative tool in gallstone patients experiencing chronic dyspepsia. The study aims to find the significance and indications for routine pre-operative upper gastrointestinal endoscopy in patients with symptomatic cholelithiasis undergoing laparoscopic cholecystectomy.

Materials and Methods

This prospective observational study was conducted in the Department of General Surgery at Sri Ramachandra Institute of Higher Education and Research (SRIHER), a tertiary care teaching hospital, over a period spanning from December 2022 to May 2024. A total of 111 adult patients of both sexes were included in the study. Patients presenting to the General Surgery outpatient department, admitted as inpatients, or referred from other departments with symptomatic cholelithiasis were screened for eligibility. Symptomatic gallstone disease was defined as gallstones identified on imaging, either single or multiple, associated with typical or atypical biliary symptoms. Only patients aged more than 18 years and with no prior history of biliary surgery were included. Patients presenting with acute abdomen, complicated gallstone disease such as choledocholithiasis, obstructive jaundice, acute cholangitis, gallstone pancreatitis, gallbladder neoplasm, or cholecysto-enteric fistula were excluded. Patients who developed postoperative biliary complications such as common bile duct injury or bilioma were also excluded from the analysis.

The study protocol was reviewed and approved by the Institutional Ethics Committee of SRIHER prior to initiation of the study. All procedures were carried out in accordance with institutional ethical standards and the principles of the Declaration of Helsinki. Written informed consent was obtained from all participants. Following enrolment, all patients underwent a detailed clinical evaluation. Demographic data, presenting symptoms, duration of symptoms, relevant medical history, and medication history were recorded using a structured questionnaire. This was followed by a thorough physical examination. As part of the preoperative assessment, all patients underwent upper gastrointestinal endoscopy prior to cholecystectomy.

Upper gastrointestinal endoscopy was performed using a standard forward-viewing flexible endoscope. The instrument consisted of a flexible insertion tube with a high-resolution video chip at its distal tip, allowing real-time visualisation of internal structures. Illumination was provided by dual fibre-optic light bundles. The endoscope was equipped with a working channel that enabled suction, irrigation, and passage of accessories such as biopsy forceps, cytology brushes, snares, and bipolar probes when required. A dedicated water channel facilitated lens irrigation to maintain optimal visual clarity. The proximal control section housed the control knobs for tip deflection, air–water insufflation, suction controls, and connection to the light source and video processor.

Patients were instructed to fast for a minimum of six hours prior to the endoscopic procedure. Prophylactic antibiotics were not administered. Prior to the procedure, intravenous access was secured using a wide-bore cannula. Intravenous sedation was not used during the study. To minimise discomfort and suppress the gag reflex, 1% lignocaine jelly was applied topically to the endoscope before insertion. Patients were positioned in

Journal of Chemical Health Risks
www.jchr.org
JCHR (2026) 16(2), 574-580 | ISSN:2251-6727

the left lateral decubitus position with slight head elevation using a pillow to facilitate ease of endoscope insertion and airway protection.

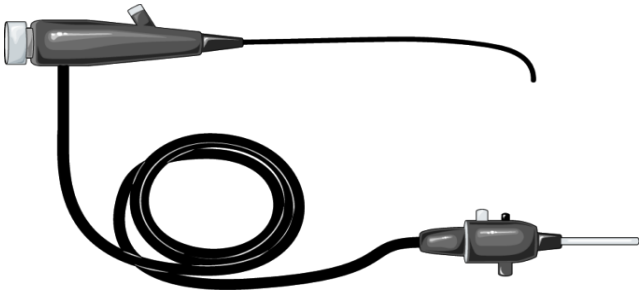

Figure 2 - Endoscope

The endoscopic procedure was performed by an experienced surgeon using a single-handed technique, with an assistant positioned near the patient's head to assist with suction, stabilisation of the endoscope, and airway protection. Under direct vision, the endoscope was advanced over the tongue, past the uvula and epiglottis, and posterior to the cricoarytenoid cartilages to reach the upper oesophageal sphincter. Gentle advancement was carried out as the sphincter relaxed. The oesophagus was carefully examined during insertion, taking care to avoid mucosal injury.

The esophagogastric junction was identified as the transition point between squamous oesophageal epithelium and columnar gastric epithelium and assessed in relation to the diaphragmatic hiatus. Entry into the stomach was achieved under direct vision, followed by aspiration of gastric contents. Systematic examination of the gastric cardia, fundus, body, and antrum was performed using controlled tip deflection and shaft rotation. The pylorus was visualised in an end-on view, and the endoscope was advanced through it into the duodenum. Entry into the duodenum was confirmed by identifying its characteristic pale, granular mucosa. The scope was further advanced into the second part of the duodenum by negotiating the superior duodenal angle using combined tip deflection and rightward shaft rotation. Careful inspection of all examined regions was performed during slow withdrawal of the endoscope, which allowed better visualisation with adequate luminal distension. Retroflexion was performed in the antrum when required to assess the fundus and cardia. At all times, advancement of the endoscope was performed only under direct visual guidance, and the instrument was withdrawn whenever orientation was uncertain.

The collected data were entered in Microsoft Excel 2016 and analysed with IBM SPSS Statistics for Windows, Version 29.0. (Armonk, NY: IBM Corp). To describe the data descriptive statistics frequency analysis, and percentage analysis were used for categorical variables and the mean & SD were used for continuous variables. To find the significance in qualitative categorical data Chi-Square test was used similarly if the expected cell frequency is less than 5 in 2×2 tables then the Fisher's Exact was used. In all the above statistical tools the probability value less than 0.05 is considered a significant level.

Results

The study population predominantly comprised middle-aged adults, with the highest proportion of patients belonging to the 31–40-year age group (30.6%), followed by those aged 51–60 years (22.5%) and 41–50 years (17.1%). Very few patients were younger than 20 years (0.9%) or older than 70 years (5.4%), indicating that symptomatic gallstone disease was most prevalent in the economically productive age group. Females accounted for nearly two-thirds of the study population (64.9%), consistent with the known higher prevalence of gallstone disease among women. With regard to gallstone characteristics, multiple gallstones were significantly more common than solitary stones, being present in 84.7% of patients, whereas only 14.4% had a single stone. Around Fifty-eight point six percent of patients described typical biliary symptoms, while a remarkable number of 41.4% presented with atypical ones, underlining the heterogeneous clinical manifestation of gallstone disease (Table 1).

Upper abdominal pain was the most common presenting symptom and it was observed in 74.8% of all patients significantly confirming that cholelithiasis presents classically as UGIB. As compared to other reports, many patients also experienced non-specific gastrointestinal dysfunctions such as epigastric pain (37.8%), nausea/vomiting (35.1%) and/or dyspepsia (18.9%) and or abdominal discomfort 11.7%. Oral endoscopy showed mucosal lesions in more than half of the patients (53.2%), while 46.8% had no significant endoscopic changes. The most frequent endoscopic finding was gastritis (31.5%) and gastric erythema (27.9%). Gastroesophageal reflux disease was found in 9.9% of patients; erosions (5.4%), duodenitis (3.6%), esophageal candidiasis (3.6%), hiatus hernia (3.6%) and ulcers (1.8%) were less frequent causes for endoscopic findings. These results highlight the routine occurrence

Journal of Chemical Health Risks
www.jchr.org
JCHR (2026) 16(2), 574-580 | ISSN:2251-6727

of additional upper gastrointestinal disease in patients presenting with symptomatic cholelithiasis.

Table 1: Demographic profile, clinical characteristics, and upper gastrointestinal endoscopic findings of the study population (N = 111)

Variable	Category	Number of subjects (n)	Percentage (%)
Age (years)	≤20	1	0.9
	21–30	11	9.9
	31–40	34	30.6
	41–50	19	17.1
	51–60	25	22.5
	61–70	15	13.5
	71–80	6	5.4
Gender	Male	39	35.1
	Female	72	64.9
Gallstone characteristics	Single stone	16	14.4
	Multiple stones	94	84.7
Symptom pattern	Typical	65	58.6
	Atypical	46	41.4
Presenting symptoms	RUQ pain / biliary colic	83	74.8
	Epigastric pain	42	37.8
	Dyspepsia	21	18.9
	Flatulence	8	7.2
	Abdominal discomfort	13	11.7
	Belching	7	6.3
	Nausea / vomiting	39	35.1
Overall endoscopic findings	Significant lesions	59	53.2
	No significant findings	52	46.8
Specific endoscopic lesions	Gastritis	35	31.5
	Duodenitis	4	3.6
	Esophagitis	2	1.8
	GERD	11	9.9
	Gastric erythema	31	27.9
	Esophageal candidiasis	4	3.6
	Erosion	6	5.4
	Ulcer	2	1.8
	Hiatus hernia	4	3.6
	Others	3	2.7

Table 2: Distribution of upper gastrointestinal endoscopic findings according to pain pattern (N=111)

Endoscopic finding	Typical pain (n = 65)	Atypical pain (n = 46)
Gastritis	11 (16.9)	24 (52.2)
Duodenitis	0	4 (8.7)
Esophagitis	1 (1.5)	1 (2.2)
GERD	5 (7.7)	6 (13)
Gastric erythema	13 (20)	18 (39.1)
Esophageal candidiasis	3 (4.6)	1 (2.2)
Erosion	0	5 (10.9)
Ulcer	1 (1.5)	2 (4.3)
Hiatus hernia	1 (1.5)	3 (6.5)
Others	0	3 (6.5)

Table 3: Association between pain pattern and upper gastrointestinal endoscopic findings (N = 111)

Endoscopic findings	Typical pain (n = 65)	Atypical pain (n = 46)	Total (N = 111)	χ^2 value	*p*-value
Present	21 (32.3%)	38 (82.6%)	59 (53.2%)	27.371	0.0005
Absent	44 (67.7%)	8 (17.4%)	52 (46.8%)		

The comparison of endoscopic findings and the type of pain by Pearson's Chi-Square test were $\chi 2=27.371$, $p=0.0005$ which shows high statistical significance. The majority of subjects with atypical pain had positive endoscopic findings whereas subjects presenting with typical pain had normal study (Table 3).

Table 4: Association between pain pattern and postoperative symptoms at Week 1 (N = 111)

Postoperative symptoms (Week 1)	Typical pain (n = 65)	Atypical pain (n = 46)	Total (N = 111)	χ^2 value	*p*-value
No symptoms	58 (89.2%)	8 (17.4%)	66 (59.5%)	57.672	0.0005
Symptoms present	7 (10.8%)	38 (82.6%)	45 (40.5%)		
Total	65 (100%)	46 (100%)	111 (100%)		

Journal of Chemical Health Risks
www.jchr.org
JCHR (2026) 16(2), 574-580 | ISSN:2251-6727

A week later post-operatively 89.2% of the subjects with typical presentation showed no symptoms whereas 82.6% showed the presence of symptoms in the atypical group. Comparison was drawn using Pearson's Chi-Square test which was $\chi 2=57.672$, $p=0.0005$ (<0.01) which shows a highly statistically significant association between postoperative symptoms in Week one (Table 4).

Table 5: Association between pain pattern and postoperative symptoms at Week 4 (N = 111)

Postoperative symptoms (Week 4)	Typical pain (n = 65)	Atypical pain (n = 46)	Total (N = 111)	χ^2 value	*p*-value
No symptoms	65 (100.0%)	34 (73.9 %)	99 (89.2%)	19.012	0.0005
Symptoms present	0 (0.0 %)	12 (26.1 %)	12 (10.8%)		
Total	65 (100 %)	46 (100%)	111 (100%)		

Four weeks later post-operatively 100% of the subjects with typical presentation showed no symptoms whereas 26.1% showed the presence of symptoms in the atypical group. The comparison was drawn using Fischer's exact test which was $\chi 2=19.012$, $p=0.0005$ (<0.01) which shows a highly statistically significant association between post-operative symptoms in Week four (Table 5).

Discussion

The patients with ultrasound-proven cholelithiasis and who are symptomatic (typical or atypical biliary pain) had their age, sex, endoscopic findings, and post-operative symptoms recorded in the proforma. The prevalence of significant lesions in endoscopy was noted down and their correlation with other factors was charted down. All the data tables and interpretations are shown in the results and observation chapter.

In this study, the mean age of the population was 46.7 years with males 46.9 years and females 46.72 +/- 14.4 years. In a similar study done by Sheik et al.;[8] the average age was 46.10 +/- 6.31 years. The youngest patient was 19 years and the oldest was 77 years old. In a study done by Ibrahim et al.;[9] the youngest patient was 24 years and the oldest was 84 years. Among the 111 subjects in the study there was an increased female ratio with Male to female ratio being 1.08:2 and a similar study done by Anandaravi BN et al. [10] shows 1:2.5.

Ultrasound findings revealed single stones in 16(14.4 %) patients and multiple stones in 94(84.7%) patients which are in accordance with findings seen by Sheik et al.;[8] (21.72% with single stones and 78.28% with multiple stones). In a study done by Karmacharya et al.[11] 60% of the patients had multiple stones. Typical biliary colic was seen in 58.6% and atypical biliary colic in 41.4%. In a study done by Srikantaiah HC et al., [12] 45.3 % presented with biliary colic symptoms whereas the majority (54.7%) presented with atypical biliary colic symptoms and in a similar study done by Karmacharya et al.[11] 55.2% of patients presented with typical pain and 44.8% with atypical pain.

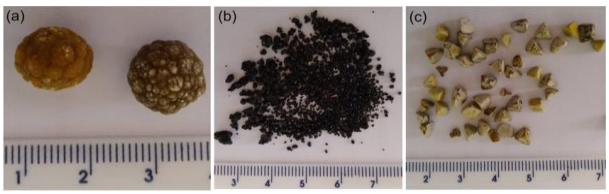

Figure 3 - Types of Gallstones (a-cholesterol stones, b-pigment stones, c-mixed stones)

Out of 111 symptomatic cholelithiasis patients' normal study of the upper gastrointestinal tract was found in 46.8% (which constitutes 52 subjects) whereas 53.2 % (59 subjects) had significant pathological findings in endoscopy. In a similar study by Ibrahim et al.; pathological findings were seen in 47.3% and 56% in a study by Anandaravi BN et al. [11] This result does not correlate with the study done by Ure et al. [13] which has positive findings in only 16% of the patients with symptomatic cholelithiasis. This difference can be explained by the fact that: 1. The patients subjected to the study come from different racial backgrounds. 2. The sample size is relatively small compared to other studies. 3. Being a tertiary centre specializing in surgical care, our hospital tends to receive referrals with more significant findings, as these patients typically have already undergone and not responded to some form of conservative treatment provided by general practitioners in the local community.

The upper gastrointestinal endoscopy (UGI) of patients exhibiting biliary colic symptoms revealed that 67.7% (n=44) of the patients had normal endoscopic findings, whereas 32.3% (n=21) demonstrated positive

Journal of Chemical Health Risks
www.jchr.org
JCHR (2026) 16(2), 574-580 | ISSN:2251-6727

endoscopic findings. A significantly higher proportion of patients with positive UGI findings presented with atypical biliary symptoms (82.6%, n=38) in comparison to those with typical biliary colic symptoms and positive findings (17.4%, n=8; $p<0.05$). This is following a similar study done by Srikantaiah HC et al. [12] Among 59 patients who were positive for upper GI lesions 21(35.5%) of them had typical biliary colic symptoms and 38(64.4%) had atypical symptoms. In comparison in patients with normal Upper gastrointestinal symptoms 8(15%) patients had atypical symptoms and 43(82.6%) had typical symptoms.

Among endoscopically positive patients 31.5% of the patients presented with Gastritis followed by 27.9% with gastric erythema, 9.9% with GERD, 5.4% with gastric erosion, 3.6% with duodenitis, 3.6% with hiatus hernia, 3.6% with esophageal candidiasis, 1.8% with Gastroduodenal ulcer and 1.8% with esophagitis. Both gastritis and gastric erythema were seen in 28.8% of positive patients. This data is similar to a study done by Ibrahim et al. [9] where gastritis was seen in 35.5% of the patients, duodenitis in 6.5%, and Esophagitis in 3%. In another study by Anandaravi BN et al. [11] GERD is seen in 31%, Gastritis/duodenitis in 11%, hiatus hernia in 5%, gastroduodenal ulcer in 19% and esophagitis in 2%.

In our study, all 111 patients were assessed for the presence of pain and symptoms at week 1 and week 2 post-operatively. In patients with typical biliary colic, 89.25 had no symptoms by the end of the first week and almost all of them had no symptoms by the end of the fourth week. In comparison, 82.6% of the patients with atypical biliary colic had persistent symptoms by the end of the first week and by the end of the fourth week 27% had persistent symptoms. A similar study by Karmacharya et al.[11] showed that in all patients with typical pain, a 100% relief rate was observed by the end of 4 weeks and patients with atypical pain had persistent symptoms.

The findings suggest that most patients exhibit significant lesions on endoscopy. Whether these lesions are incidental or causative of the patient's symptoms remains debated. However, the small sample size limits the generalizability of the study's results. As the study is conducted in a tertiary centre, many patients included may have been referred after unsuccessful medical treatment, potentially accounting for the higher incidence of significant lesions. Additionally, inter-observer variations could affect the consistency of endoscopic findings.

Conclusion

Upper gastrointestinal endoscopy before cholecystectomy can significantly influence management in patients with symptomatic cholelithiasis, particularly those with atypical or dyspeptic symptoms. A high prevalence of significant upper gastrointestinal lesions is observed in such patients compared to normal findings. Preoperative endoscopy helps identify treatable conditions such as gastritis, peptic ulcer disease, and hiatus hernia, which may not resolve with cholecystectomy alone. Selective use of upper gastrointestinal endoscopy can reduce postoperative symptom persistence and improve overall treatment outcomes.

References

1. Soitkar S., Saxena D., Wasnik N., Akhtar M., 2018. Study of persistent post laparoscopic cholecystectomy symptoms: a 6 month long follow up of 62 patients. Int Surg J. 5, 3368-71.
2. Froutan Y., Alizadeh A., Mansour-Ghanaei F., Joukar F., Froutan H., Bagheri F.B., Naghipour M.R., Chavoshi S.A., 2015. Gallstone disease founded by ultrasonography in functional dyspepsia: prevalence and associated factors. Int J Clin Exp Med. 8(7), 11283-8.
3. Johnson C.D., 2001. ABC of the upper gastrointestinal tract. Upper abdominal pain: Gall bladder. BMJ. 323(7322), 1170-3.
4. Lee B.J.H., Yap Q.V., Low J.K., Chan Y.H., Shelat V.G., 2022. Cholecystectomy for asymptomatic gallstones: Markov decision tree analysis. World J Clin Cases. 10(29),10399-10412.
5. Sandblom G., Videhult P., Crona Guterstam Y., Svenner A., Sadr-Azodi O., 2015. Mortality after a cholecystectomy: a population-based study. HPB (Oxford). 17(3), 239-43.
6. Muhammad M.I., Alhassan A.H., Alkhars A.Y., Alzahrani R. A., Al Mansour M. H., Alghamdi F.H., 2021. Clinical patterns and causes of post-cholecystectomy syndrome. Int J Community Med Public Health. 8, 4139-43.
7. Sasmal P.K., Singh P.K., Sahoo A., Dutta T., 2025. Asymptomatic gallstone disease: Re-evaluating the threshold for surgical options in the era of precision medicine. World J Gastrointest Surg. 17(11), 110501.

Journal of Chemical Health Risks

www.jchr.org

JCHR (2026) 16(2), 574-580 | ISSN:2251-6727

8. Chandio A., Naqvi S.A., Sabri S., Abbasi M., Shaikh Z., Chandio K., 2018. Is it useful to perform preoperative upper GI endoscopy in symptomatic gall stones? J Gastroenterol. 4(1), 1012.
9. Ibrahim M.T.M.M., Khair R.Z.A.M., Mohamed E.H.Y., Massaad A.M.M., 2012. Upper gastrointestinal endoscopic findings in patients with gallstone disease. Khartoum Medical Journal. 5(2), 749–752.
10. Anandaravi B.N., Abdul Jabbar F., 2019. Upper gastro-intestinal endoscopy prior to cholecystectomy, a necessity? an observational study in a tertiary care hospital in South India. International Surgery Journal. 6(3), 686–690.
11. Karmacharya A., Malla B.R., Joshi H.N., Gurung R.B., Rajbhandari M., 2013. The predictive value of pre-operative symptoms including upper gastrointestinal endoscopy before laparoscopic cholecystectomy for elective symptomatic cholecystolithiasis. Kathmandu University Medical Journal (KUMJ). 11(44), 300–304.
12. Srikantaiah H.C., Manjappa V.B., 2019. Diagnostic value of pre-operative upper GI endoscopy in gall bladder stone patients undergoing elective laparoscopic cholecystectomy. International Surgery Journal. 6(8), 2949–2954.
13. Ure B.M., Spangenberger W., Lefering R., Dietrich A., Troidl H. 1992. Routine gastroscopy before laparoscopic cholecystectomy: evaluation of the technology in 376 patients. Zeitschrift für Gastroenterologie. 30(8), 529–533