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A Descriptive Study Of Upper Gastrointestinal Endoscopy Findings In Symptomatic Gallstone Disease Patients

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Abstract

Background: *Gallstone disease (GSD) is a prevalent hepatobiliary disorder characterized by the formation of cholesterol or pigment stones within the gallbladder or biliary tree. While ultrasonography (USG) is the standard diagnostic tool for cholelithiasis, many patients experience persistent symptoms such as biliary colic, dyspepsia, and upper abdominal discomfort, even after cholecystectomy. These ongoing symptoms, known as post-cholecystectomy syndrome (PCS), may be related to undiagnosed upper gastrointestinal (GI) pathologies, which can be effectively detected by preoperative upper gastrointestinal endoscopy (UGIE).*

Objectives*: To determine the frequency of upper GI abnormalities in patients with USG-confirmed gallstone disease and evaluate the diagnostic utility of preoperative UGIE in identifying associated GI conditions among symptomatic patients scheduled for elective cholecystectomy.*

Methods: *This cross-sectional study was conducted over 18 months at a tertiary care center and included 36 patients with symptomatic GSD. All participants underwent preoperative UGIE. Data were collected using structured questionnaires detailing demographics, clinical symptoms, and endoscopic findings.*

Results: *Significant upper GI abnormalities were identified in 64% of patients, while 36% had normal UGIE findings. Gastritis was the most frequent abnormality (36%), followed by duodenitis (20%), reflux esophagitis (16%), hiatus hernia (10%), and duodenal ulcers (2%). Older patients (51–70 years) were more likely to have abnormal findings. Gastritis was more prevalent in males (50%), whereas duodenitis was more common in females (23.7%). No significant gender difference was observed for hiatus hernia or reflux esophagitis.*

Conclusion: *A high prevalence of upper GI abnormalities in GSD patients suggests many symptoms may be due to coexisting gastric or duodenal disorders. Routine preoperative UGIE is recommended to improve patient management and reduce persistent PCS.*

Keywords: *Gallstones, Cholelithiasis, Endoscopy, Digestive System, Ultrasonography, Postcholecystectomy Syndrome, Gastritis, Duodenitis, Esophagitis, Hiatal Hernia, Dyspepsia, Abdominal Pain*

INTRODUCTION:

Gallstones are the most common biliary pathology, forming in the gallbladder or biliary tract due to abnormal increases in cholesterol or bilirubin in bile.[1] These stones consist of calcium salts, bile pigments, and cholesterol.[2] Factors contributing to gallstone formation include bile saturation, stasis from sphincter of Oddi dysfunction, biliary sludge, and changes in bile composition.[3] The prevalence of gallstones is estimated at 10–15% in the general population.[4] Cholesterol gallstones, which make up more than 50% cholesterol, account for about 90% of cases in Western countries[5] and 77% in China.[6]

Patients with gallstone disease (GSD) may present with typical biliary colic or atypical symptoms such as abdominal discomfort, dyspepsia, nausea, belching, heartburn, food intolerance, flatulence, vomiting, and loss of appetite.[7–9] These atypical symptoms may also reflect associated gastrointestinal (GI) pathologies.[10],[11] A subset of cholecystectomy patients experiences persistent or recurring symptoms—post-cholecystectomy syndrome (PCS)—classified as early (1–30 days post-op) or late (31–180 days).[12],[13] One cause of PCS is underlying upper GI pathology, and preoperative upper GI endoscopy (UGIE) can help identify coexisting conditions.[14–16]

Endoscopy is central in diagnosing and managing upper GI disorders, especially in GSD patients with atypical symptoms. Since the development of the first fiberoptic endoscope by Larry Curtiss and advancements by Basil

Hirschowitz in 1957,[17],[18] modern technologies like Narrow Band Imaging (NBI), confocal endoscopy, and chromoendoscopy have enhanced lesion detection and visualization.[19–21]
Beyond diagnosis, endoscopy is now integral for therapy, including management of Barrett's esophagus, minimally invasive POEM for Achalasia Cardia, and advanced procedures like EUS, endoscopic pancreatic drainage, and targeted biliary interventions.[19–21] These innovations have improved the safety and accuracy of upper GI endoscopy, making it a preferred modality for both diagnosis and treatment.[22] This study evaluates the effectiveness of preoperative UGIE in identifying additional upper GI tract abnormalities in patients scheduled for cholecystectomy.

MATERIALS AND METHODS:

This cross-sectional study was conducted over 18 months at Adichunchanagiri Hospital and Research Centre, B.G. Nagara, Mandya District. The study enrolled 36 patients diagnosed with cholelithiasis and scheduled for elective cholecystectomy, using purposive sampling. Inclusion criteria were age above 16 years, ultrasonographic confirmation of gallbladder stones, and the presence of clinical symptoms such as right upper quadrant or epigastric pain (particularly post-prandial), persistent pain with nausea or vomiting, or dyspeptic symptoms including indigestion, bloating, or belching. Written informed consent was obtained from all participants. Exclusion criteria included patients younger than 16 years, those with severe abdominal or colicky pain, clinical instability, or refusal to participate.
Data were collected using a structured questionnaire administered through face-to-face interviews, capturing demographic information and presenting complaints. This was followed by a general physical examination and upper gastrointestinal endoscopy for all patients. Prior to the procedure, participants fasted for at least six hours. No intravenous sedation or prophylactic antibiotics were administered; however, a wide-bore IV line was established, and 1% lignocaine jelly was applied to the endoscope for local anesthesia. Patients were positioned in the left lateral decubitus position. The endoscopy was performed using a 120 cm forward-viewing instrument, with a trained assistant present to ensure airway protection and proper positioning. The endoscope was advanced under direct vision from the mouth through the esophagus, stomach, and into the proximal duodenum, with systematic inspection and air insufflation for optimal mucosal visualization. All regions of the upper gastrointestinal tract were carefully examined and documented.
Collected data were entered in Microsoft Excel and analyzed using SPSS version 26.0. Quantitative variables were described as mean ± standard deviation (SD), and qualitative variables as frequency and percentage. For statistical analysis, Student's t-test was used to compare continuous variables and the chi-square test was applied for categorical data. A p-value of less than 0.05 was considered statistically significant.

RESULTS

The study included participants aged **20 to 70 years**, with a **mean age of 40.04 ± 11.44 years**. The largest proportion of subjects (48%) was in the **31-40 year** age group, followed by those aged 20-30 years (18%), with progressively fewer in older age brackets. The cohort was predominantly female (**76% female**, 24% male). Endoscopic evaluation revealed that **64% of patients had significant abnormalities**, while **36%** had normal findings. Among significant endoscopic findings, **gastritis was the most frequent** (36%), followed by duodenitis (20%), reflux esophagitis (16%), hiatus hernia (10%), and duodenal ulcer (2%).

Age-based Associations

The frequency of significant endoscopic findings increased with age, from **55.6% in the 20-30 year group** to **100% in the 61-70 year group**. However, this trend did not reach statistical significance (p = 0.423). Gastritis prevalence was higher in older age groups, most notably **100% in patients aged 61-70 years**, and 42.9% in both the 41-50 and 51-60 groups; still, this association was not statistically significant (p = 0.141). Duodenitis was more evenly distributed, with the highest rates in the 20-30 and 61-70 year groups (33.3% each), but showed no significant association with age (p = 0.467). Duodenal ulcers were rare, observed only in one participant in the 31-40 group (4.2%), with no significant age relationship (p = 0.893). Hiatus hernia was somewhat more frequent in the 31-40 (16.7%) and 51-60 (14.3%) groups, but absent in the youngest and oldest age groups (p = 0.487). Reflux esophagitis was most common in the 51-60 group (28.6%), but again, no significant association with age was found (p = 0.813).

Gender-based Associations

Significant endoscopic findings were slightly more common in males (66.7%) than females (63.2%), but this was not statistically significant (p = 0.825). **Gastritis** was observed in 50% of males compared to 31.6% of females (p = 0.342). **Duodenitis** was more frequent in females (23.7%) than males (8.3%) (p = 0.083). **Duodenal ulcers**

were rare, seen only in females (2.6%) (p = 0.246). **Hiatus hernia** occurred in 8.3% of males and 10.5% of females, showing no gender difference (p = 0.825).
Reflux esophagitis was more common in males (25%) than females (13.2%), but again, this difference was not statistically significant (p = 0.329).

DISCUSSION

Upper abdominal symptoms are commonly encountered in both gallstone disease and inflammatory disorders of the stomach and duodenum. The prevalence of gallstone disease varies globally but remains notably high in developed nations. Although gallstone disease is widespread, the majority of cases are asymptomatic[23,24]. In Asian countries, prevalence rates are estimated at 5–10%, while in Western populations, prevalence reaches about 7.9% in males and 16.6% in females[25].
Individuals with gallstone disease may present with classic biliary colic or a variety of atypical symptoms, including abdominal discomfort, indigestion, nausea, belching, heartburn, food intolerance, bloating, vomiting, and reduced appetite. These nonspecific symptoms are frequently attributed to coexisting gastrointestinal (GI) pathologies[26-28]. Upper gastrointestinal endoscopy is a valuable diagnostic tool for identifying concurrent upper GI conditions and provides important insights for patient management[29-31].
In the present study, 50 patients with symptomatic gallstone disease underwent upper GI endoscopy to determine the prevalence of associated upper GI abnormalities. The age of participants ranged from 20 to 70 years (mean 40.04 ± 11.44), with most patients (48%) between 31 and 40 years of age; females accounted for 76% of the cohort. These demographic patterns are consistent with previous studies, including Gobu and Pai[32], who reported a predominance of females (70%) and a similar mean age, as well as Narayan et al[33], who also found most patients in the 31–60 year range, predominantly female.
The frequency of significant endoscopic abnormalities in our cohort was 64%, while 36% had normal findings. Gastritis was the most prevalent abnormality (36%), followed by duodenitis (20%), reflux esophagitis (16%), hiatus hernia (10%), and duodenal ulcer (2%). Similar findings have been reported by Gobu and Pai[32], who identified gastritis in 33.3% of their patients, and by Kolla et al[34] and Karmacharya et al[35], where gastritis was also the leading abnormality.
Comparative data from larger studies, such as Sasoda et al[36] and Narayan et al[33], further support the predominance of gastritis among patients with gallstone disease. Bartosz and Gluszek[37] reported gastritis or gastric ulcer as the most frequent endoscopic finding (43.6%), and Kunnuru et al[38] found pathological endoscopy in 75.5% of their patients, with gastritis the most common.
In the current study, the occurrence of significant endoscopic abnormalities increased with age, from 55.6% in the 20–30 year group to 85.7% in those aged 51–60 and 100% in the 61–70 group. Gastritis was especially common in the oldest patients, while duodenitis was more prevalent among younger and middle-aged groups. Duodenal ulcers were rare, and reflux esophagitis and hiatus hernia were most frequently seen in middle-aged adults. These trends are consistent with Narayan et al[33], who observed that gastritis and duodenitis were common in younger adults, while ulcers were more frequent in older age groups.
Gender-based analysis showed that gastritis was more prevalent in males (50%) compared to females (31.6%), whereas duodenitis was more frequent in females (23.7% vs. 8.3% in males); neither difference was statistically significant. Duodenal ulcers were rare overall, seen only in 2.6% of females. Hiatus hernia affected both genders similarly (8.3% of males, 10.5% of females), and reflux esophagitis was more common in males (25%) than females (13.2%), mirroring trends in other studies, though none of these associations reached statistical significance.

CONCLUSION

This study highlights the high prevalence of upper gastrointestinal abnormalities among patients with symptomatic gallstone disease, with 64% showing clinically significant findings on endoscopy. Gastritis, duodenitis, and reflux esophagitis were the most frequent abnormalities, with their incidence tending to increase with advancing age. Notable gender differences were observed: men were more likely to have gastritis and reflux esophagitis, while duodenitis was more frequent in women. Although some associations did not reach statistical significance, these trends underscore the clinical value of routine endoscopic evaluation in this population. Early identification and management of coexisting GI pathologies may enhance patient outcomes and quality of life. Larger, prospective studies are warranted to confirm these findings and inform individualized management approaches.

REFERENCES

1. Everhart JE, Ruhl CE. Burden of digestive diseases in the United States Part III: liver, biliary tract, and pancreas. Gastroenterology. 2009;136(3):1134-44.
2. Tanaja J, Meer JM. Cholelithiasis [Internet]. 2017. Available from: [Include URL if applicable]
3. Behar J, Lee KY, Thompson WR, Biancani P. Gallbladder contraction in patients with pigment and cholesterol stones. Gastroenterology. 1989;97(6):1479-84.
4. Diehl AK. Epidemiology and natural history of gallstone disease. Gastroenterol Clin North Am. 1991;20(1):1-19.
5. Attili AF, Carulli N, Roda E, et al. Epidemiology of gallstone disease in Italy: prevalence data of the multicenter Italian study on cholelithiasis (M.I.COL.). Am J Epidemiol. 1995;141(2):158-65.
6. Wang Y, Jiang ZY, Fei J, et al. ATP binding cassette G8 T400K polymorphism may affect the risk of gallstone disease among Chinese males. Clin Chim Acta. 2007;384(1-2):80-5.
7. Lammert F, Gurusamy K, Ko CW, Miquel JF, Méndez-Sánchez N, Portincasa P, et al. Gallstones. Nat Rev Dis Primers. 2016;2(1):16024.
8. Lund R. Surgical indications in cholelithiasis. Ann Surg. 1960;151(2):10.
9. Festi D, Sottili S, Colecchia A, Attili A, Mazzella G, Roda E, et al. Clinical manifestations of gallstone disease: Evidence from the multicenter Italian study on cholelithiasis (MICOL). Hepatology. 1999;30(4):839-46.
10. Chandio A, Naqvi SA, Sabri S, Abbasi M, Shaikh Z, Chandio K, et al. Is it useful to perform preoperative upper GI endoscopy in symptomatic gallstones? J Gastroenterol. 2018;4(1):1012.
11. Bellad AKP, Asha MC. Role of preoperative upper gastrointestinal endoscopy in symptomatic patients undergoing elective laparoscopic cholecystectomy for gallbladder stone disease. J Evol Med Dent Sci. 2019;8(20):1598-601.
12. Schofer JM. Biliary causes of postcholecystectomy syndrome. J Emerg Med. 2010;39(4):406-10.
13. Isherwood J, Oakland K, Khanna A. A systematic review of the aetiology and management of postcholecystectomy syndrome. Surgeon. 2019;17(1):33-42.
14. Berger MY, Olde Hartman TC, Bohnen AM. Abdominal symptoms: Do they disappear after cholecystectomy? Surg Endosc. 2003;17(11):1723-8.
15. Middelfart HV, Kristensen JU. Pain and dyspepsia after elective and acute cholecystectomy. Scand J Gastroenterol. 1998;33(1):10-4.
16. Khatana PS, Kumar J, Sharma DK. Evaluation of patients undergoing cholecystectomy with special reference to postcholecystectomy syndrome. Int Surg J. 2018;5(6):2316-21.
17. Talley NJ, Stanghellini V, Heading RC, Koch KL, Malagelada JR, Tytgat GN. Functional gastroduodenal disorder. Gut. 1999 Sep;45 Suppl 2:II37-42.
18. Jones R. Endoscopy in general practice. BMJ. 1995 Apr 1;310(6983):816-7.
19. Saftoiu A, Vilmann A, Vilmann P. Endoscopic ultrasound-guided drainage of pancreatic pseudocysts. Endosc Ultrasound. 2015 Oct-Dec;4(4):319-23.
20. Friedberg SR, Lachter J. Endoscopic ultrasound: current roles and future directions. World J Gastrointest Endosc. 2017 Oct 16;9(10):499-505.
21. Hoffman A, Rey JW, Kiesslich R. Single-operator choledochoscopy and its role in daily endoscopy routine. World J Gastrointest Endosc. 2013 May 16;5(5):203-10.
22. DiSario JA, Petersen BT, Tierney WM, Adler DG, Chand B, Conway JD, et al. Enteroscopes. Gastrointest Endosc. 2007 Nov 1;66(5):872-80.
23. Narayan H, Ravishankar N, Shivabasappa S, Kotekar N. Gallstones and dyspepsia: does upper gastrointestinal endoscopy have a pivotal role? Int Surg J [Internet]. 2019 May 28 [cited 2025 Feb 2];6(6):1938–43. Available from: https://www.ijsurgery.com/index.php/isj/article/view/4377
24. Everhart J. E., Ruhl C. E. Burden of digestive diseases in the United States. Part III: liver, biliary tract and pancreas. Gastroenterology. 2009;136:1134–1144.
25. Acalovschi M., Dumitrascu D., Caluser I., Ban A. Comparative prevalence of gallstone disease at 100-year interval in a large Romanian town. Digestive Diseases and Sciences. 1987;32:354–357.
26. Huang J, Chang CH, Wang JI, Kuo HK, Zin JW, Shan WY. Nationwide epidemiological study of several gallstone disease in Taiwan. BMC Gastroenterol. 2009;9:63.
27. Lammert F, Gurusamy K, Ko CW, Miquel JF, Méndez-Sánchez N, Portincasa P, et al. Gallstones. Nat Rev Dis Primer. 2016;2(1):16024.
28. Chandio A, Naqvi SA, Sabri S, Abbasi M, Shaikh Z, Chandio K, et al. Is it useful to perform preoperative upper GI endoscopy in symptomatic gall stones? J Gastroenterol. 2018;4(1):1012.
29. Lund R. Surgical indications in cholelithiasis: Ann Surg. 1960;151(2):10.
30. Berger MY, Olde Hartman TC, Bohnen AM. Abdominal symptoms: Do they disappear after cholecystectomy? Surg Endosc. 2003;17(11):1723-28.
31. Middelfart HV, Kristensen JU. Pain and dyspepsia after elective and acute cholecystectomy. Scand J Gastroenterol. 1998;33(1):10-14.
32. Khatana PS, Kumar J, Sharma DK. Evaluation of patients undergoing cholecystectomy with special reference to post-cholecystectomy syndrome. International Surgery Journal. 2018;5(6):2316-21.
33. Pai DR. Gobu HK,. Symptomatic Gallstone Disease and Associated Upper Gastrointestinal Pathologies - A Prospective Cohort Study. J Clin Diagn Res. 2023 Jul;17(7):PC01-PC05.
34. Kolla V, Charles N, Datey S, Mahor D, Gupta A, Malhotra S. Upper gastrointestinal endoscopy prior to laparoscopic cholecystectomy: A clinical study at a tertiary care centre in central India. Int Surg J. 2016;3(2):637-42.
35. Karmacharya A, Malla BR, Joshi HN, Gurung RB, Rajbhandari M. The predictive value of pre-operative symptoms including upper gastrointestinal endoscopy before laparoscopic cholecystectomy for elective symptomatic cholecystolithiasis. Kathmandu Univ Med J. 2013;44(4):300-04.

36. Sosada K, Zurawinski W, Piecuch J, Stepien T, Makarska J. Gastroduodenoscopy: A routine examination of 2,800 patients before laparoscopic cholecystectomy. Surg Endosc. 2005;19(8):1103-08.
37. Narayan H, Ravishankar N, Shivabasappa S, Kotekar N. Gall stones and dyspepsia: does upper gastrointestinal endoscopy have a pivotal role?. Int Surg J 2019;6:1938-43.
38. Gaharwar A. Factors favouring cholelithiasis in North Indian population. IOSR J Pharmacy. 2013;3(5):01-3.
39. Mozafar M, Sobhiyeh MR, Heibatollahi M. Is esophagogastroduodenoscopy essential prior to the elective surgical therapy of symptomatic cholelithaisis? Gastroenterol Hepatol. 2010;3(2):77- 82.
40. Ure BM, Spangenberger W, Lefering R, Dietrich A, Troidl H. Routine gastroscopy before laparoscopic cholecystectomy: evaluation of the technology in 376 patients. Z Gastroenterol. 1992;30(3):529-33.
41. Bartosz K, Głuszek S. Need assessment for gastroscopy in patients with gallstones. Polski Przegląd Chirurgiczny. 2010;82(8):469-78.
42. Kunnuru SKR, Kanmaniyan B, Thiyagarajan M, Singh BK, Navrathan N. A Study on Efficacy of UGI Scopy in Cholelithiasis Patients before Laparoscopic Cholecystectomy. Minim Invasive Surg. 2021 Jan 13;2021:8849032.

Table 1. Basic demographic characteristics

Variable	Category	Frequency	Percent (%)
AGE GROUP	20-30	9	18.0
	31-40	24	48.0
	41-50	7	14.0
	51-60	7	14.0
	61-70	3	6.0
	Mean ± SD	40.04 ± 11.44	
GENDER	Male	12	24.0
	Female	38	76.0

FIGURE 1. ENDOSCOPIC FINDINGS

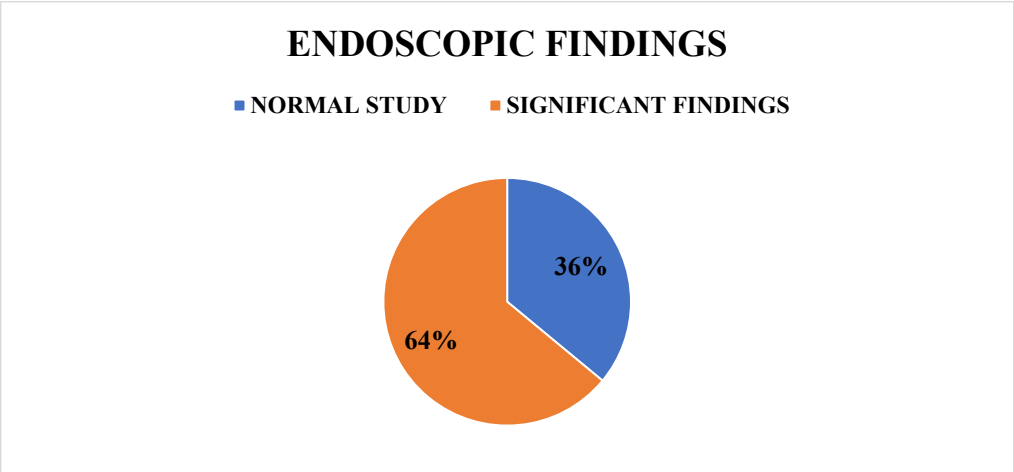

FIGURE 2. SIGNIFICANT ENDOSCOPIC FINDING

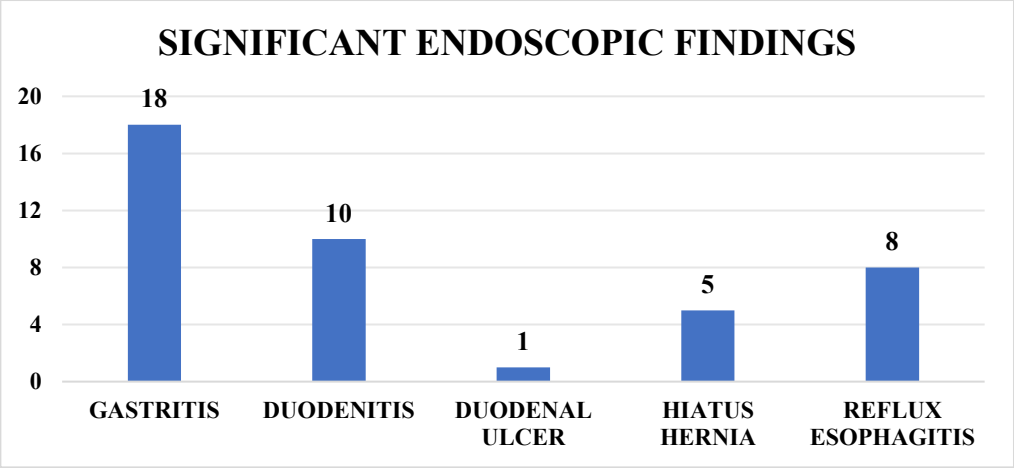

Table 2: Association of age with endoscopic findings

Finding	Age Group, n (%)					P value
	20-30	31-40	41-50	51-60	61-70	
Gastritis	3 (33.3%)	6 (25.0%)	3 (42.9%)	3 (42.9%)	3 (100.0%)	0.141
Duodenitis	3 (33.3%)	4 (16.7%)	0 (0.0%)	2 (28.6%)	1 (33.3%)	0.467
Duodenal Ulcer	0 (0.0%)	1 (4.2%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.893
Hiatus Hernia	0 (0.0%)	4 (16.7%)	0 (0.0%)	1 (14.3%)	0 (0.0%)	0.487
Reflux Esophagitis	1 (11.1%)	4 (16.7%)	1 (14.3%)	2 (28.6%)	0 (0.0%)	0.813

Table 3: Association of gender with endoscopic findings

Finding	Gender		P value
	Male	Female	
Gastritis	6 (50.0%)	12 (31.6%)	0.342
Duodenitis	1 (8.3%)	9 (23.7%)	0.083
Duodenal Ulcer	0 (0.0%)	1 (2.6%)	0.246
Hiatus Hernia	1 (8.3%)	4 (10.5%)	0.825
Reflux Esophagitis	3 (25.0%)	5 (13.2%)	0.329