

Confusing effect of concurrent endoscopy and colonoscopy on histopathologic findings in dyspeptic patients: a nested case-control study

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Abstract. – OBJECTIVE: Esophagogastro-duodenoscopy (EGD) is recommended for patients over 60 years old with dyspeptic complaints, treatment-resistant dyspepsia, and alarming symptoms such as vomiting, weight loss, and dysphagia. However, colonoscopy is recommended for patients with abnormal colonic loops in their imaging, lower gastrointestinal bleeding-iron deficiency anemia, or patients with symptoms related to the lower gastrointestinal tract. This study aimed to analyze the possibility of performing concurrent colonoscopy when it is indicated and whether this may affect endoscopic and histological findings.

PATIENTS AND METHODS: One hundred and two patients who underwent EGD and colonoscopy (Group CC) at the same time due to dyspeptic symptoms and 146 patients who underwent EGD alone (Group EA) at SBU Kartal City Hospital between December 2020 and December 2021 were included in the study. All gastric biopsies were taken by the Sydney system. The specimens were assessed in terms of *Helicobacter pylori* positivity, inflammation, neutrophilic activity, intestinal metaplasia, and lymphoid aggregate.

RESULTS: *Helicobacter pylori* positivity was 46.5% and 50.7% ($p=0.521$), inflammation was 93.1% and 98.6% ($p=0.023$), neutrophilic activity was 50.0% and 65.8% ($p=0.013$), intestinal metaplasia was 20.6% and 24.0% ($p=0.531$), and the presence of lymphoid aggregate was 46.1% and 58.9% ($p=0.046$) in Group CC and Group EA, respectively.

CONCLUSIONS: The present study comparatively evaluated the histopathological findings of patients who underwent EGD due to dyspeptic symptoms and those who underwent bidirectional endoscopy. Notably, no false positive results were observed that would necessitate a change in the treatment applied to the patients.

Key Words:

Endoscopy, Colonoscopy, Gastroscopy, *Helicobacter pylori*.

Introduction

The prevalence of dyspepsia in the general population is approximately 20%¹. There is no finding to explain the symptoms of esophagogastro-duodenoscopy (EGD) in 80% of individuals with these symptoms¹. EGD is recommended for patients over 60 years old with dyspeptic complaints, treatment-resistant dyspepsia, and alarming symptoms such as vomiting, weight loss, and dysphagia². However, colonoscopy is recommended for patients with abnormal colonic loops in their imaging, lower gastrointestinal bleeding-iron deficiency anemia, or patients with symptoms related to the lower gastrointestinal tract. In fact, similar to the American College of Gastroenterology recommendations (available at: <https://acgcasereports.gi.org/tag/acg-guidelines/>), in our country it is recommended to perform routine screening colonoscopy within the scope of the colorectal cancer screening program in patients over 50 years of age³. This raises the following questions: can concurrent colonoscopy be performed in patients with EGD planned due to upper gastrointestinal system complaints if it is also indicated? Does simultaneous colonoscopy affect our endoscopic and histological findings?

Patients and Methods

In total, 9,842 endoscopic procedures performed in the Surgical Endoscopy Unit of

Kartal Lutfu Kırdar City Hospital in 2021 were reviewed retrospectively. One hundred two cases with dyspeptic symptoms who underwent EGD and colonoscopy simultaneously and 146 cases who underwent EGD alone due to dyspeptic symptoms, for a total of 248 cases, were included in the study. All cases underwent EGD followed by colonoscopy accompanied by sedo-anesthesia. All gastric biopsies were taken by the Sydney system⁴, two from the antrum by the large and small curvature, two from the corpus, and one from the incisura angularis, as a total of five pieces. Antrum biopsies were taken at a distance of 2-3 cm from the pylorus, and corpus biopsies at 8 cm from the cardia. Endoscopic forceps were used for biopsies, and the two-bite (obtaining two mucosal biopsy specimens with a single passage of the forceps) technique was taken from the large and small curvature.

The specimens were assessed in terms of *helicobacter pylori* positivity, inflammation, neutrophilic activity, intestinal metaplasia, and lymphoid aggregate in the pathology laboratory. The direct examination was performed with the hematoxylin-eosin and Giemsa staining method to determine *Helicobacter pylori* positivity. Inflammation in the case of existing plasma cells in the examined tissue, neutrophilic activity in polymorphic core leukocytes in the gland epithelium or lumen, and lymphoid aggregate in the case of nodular lymphoid clustering were reported as positive. Intestinal metaplasia was determined using PAS-Alcian blue stain under direct examination or in case of instability.

In cases who underwent colonoscopy, intestinal cleansing was performed with two oral laxatives taken the day before the procedure, and two rectal enemas were applied in the morning.

Cases who underwent EGD for any reason other than dyspeptic symptoms, cases diagnosed with malignancy, cases whose data could not be reached, cases with inadequate colon cleansing in colonoscopy, cases who had previously undergone *helicobacter pylori* eradication therapy and who did not undergo biopsy by the Sydney System were excluded from the study.

Statistical Analysis

All statistical analyses were performed by SPSS (Statistical Package for Social Sciences) for Windows 15.0 (SPSS Inc., Chicago, IL, USA) software. Data were summarized as mean±standard deviation, numbers (n), and percent (%). Categorical variables were compared using the Chi-square test. Normality was tested using the Kolmogorov-Smirnov test and graphical methods. For normally distributed data, we used mean and standard deviation for the expression of study data. For non-normally variables, we expressed the data using the median and minimum-maximum values. When we compared one categorical variable with a numeric value, we used the Independent Sample *t*-test for normally distributed data. All statistical comparisons were two-sided, and statistical significance was determined at the confidence interval of 95% ($p < 0.05$).

Results

One hundred and twenty-four of the patients were female. The mean age of all patients was 54.46±13.37 years. Age and gender ratios of the patients according to the groups are summarized in Table I. *Helicobacter pylori* positivity was 46.5% and 50.7% ($p=0.521$), inflammation was

Table I. Demographic and histopathological findings

	Concurrent colonoscopy n = 102	Endoscopy Alone n = 146	p
Demographics			
Gender (female/male), n/n	36/66	88/58	0.001 ^b
Age (years), mean ± sd	57.67 ± 11.41	52.21 ± 14.20	0.014 ^b
Positive in Biopsy, n (%)			
<i>H. pylori</i>	47 (46.5) ^a	74 (50.7)	0.521
Inflammation	95 (93.1)	144 (98.6)	0.023 ^b
Neutrophilic Activity	51 (50.0)	96 (65.8)	0.013 ^b
Metaplasia	21 (20.6)	35 (24.0)	0.531
Lymphoid aggregate	47 (46.1)	86 (58.9)	0.046 ^b

^aOne missing case, n = 101. ^bStatistically significant difference at the confidence level of 0.95.

93.1% and 98.6% ($p=0.023$), neutrophilic activity was 50.0% and 65.8% ($p=0.013$), intestinal metaplasia was 20.6% and 24.0% ($p=0.531$), and the presence of lymphoid aggregate was 46.1% and 58.9% ($p=0.046$) in Group CC and Group EA, respectively (Table I). Histopathological results of gastric biopsies are summarized in Table I comparatively.

Discussion

The most common indications for bidirectional endoscopy (BDE) are iron deficiency anemia, stool latent blood positivity, and abdominal pain⁵. While designing our study, we estimated that concurrent EGD and colonoscopy would be more effective in revealing the pathological condition (e.g., malignancy) that would cause these conditions. Under this assumption, our hypothesis aims to show whether mechanical bowel cleansing affects the histopathological results of biopsies by increasing gastrointestinal peristalsis, especially in cases of dyspeptic symptoms. In patients who underwent EGD for dyspepsia, the histopathological result of the biopsy is *helicobacter pylori* positivity, inflammation, neutrophilic activity, intestinal metaplasia, and lymphoid aggregate status.

In light of this planning, in our study, no significant difference was found in terms of *helicobacter pylori* positivity and intestinal metaplasia when the patients who underwent BDE were compared with those who had only EGD. Neutrophilic activity and lymphoid aggregates are more prominent in cases with BDE. However, according to our study, inflammation was found to be lower in the BDE group. This suggests that mechanical bowel cleansing does not increase plasma cell migration in the stomach, but rather reduces it. However, the presence of these conditions does not cause any change in the treatment procedure⁶. If colonoscopy is added to the procedure during a control EGD in a patient treated for dyspepsia, the histopathology result of the second EGD may change depending on mechanical bowel cleansing. In this case, it should be kept in mind that mechanical bowel cleansing may reduce histopathological inflammation.

The current guidelines recommend BDE for diagnosis if no evidence of active GI bleeding or iron deficiency anemia was found at the initial examination⁷. However, in a patient who needs EGD due to dyspeptic symptoms, a concurrent

colonoscopy may be required for any reason (screening, abdominal pain, etc.).

After the examination of the last treatment algorithm for dyspepsia, it has been observed that after *helicobacter pylori* eradication, a proton pump inhibitor (PPI) is initiated in *helicobacter pylori*-positive patients. According to this treatment, if the symptoms still continue, prokinetic agents are used, or the patient is directed to psychotherapy⁶. If intestinal metaplasia is detected in the patient or the patient has a *helicobacter pylori* infection, it is recommended to perform *helicobacter pylori* eradication and frequent endoscopic follow-up^{8,9}. As seen, there is no treatment or follow-up recommendation regarding the presence of neutrophil activity, inflammation, and lymphoid aggregates, which are among the histopathological findings⁶.

Apart from the variability of histopathological findings, upper and lower endoscopic procedures performed on different days are associated with an increased risk of complications¹⁰. Different-day procedures expose patients to the discomfort of second intravenous access and increased risk of complications due to anesthesia. While the infection rate was 2.6 times higher in patients who underwent another endoscopic procedure within 30 days before EGD, this rate was found 1.5 times higher in patients who underwent another endoscopic procedure within 30 days before the colonoscopy¹¹. These data support that EGD and colonoscopy should be performed in the same session if there is an indication.

BDE is probably more cost-effective than upper and lower gastrointestinal system endoscopies performed at different times. We consider that it would be more costly to perform two separate procedures if the factors such as the examination clothes worn by the patient before the endoscopy and the medical materials used (injector, vascular access, etc.) are taken into account. In addition, it will cause a waste of time and effort for the endoscopist, anesthesiologist, and pathologist.

Limitations

The study's limitations include the fact that it is a retrospective study, that we had no precise information on whether PPIs were used before the procedure or not, and that atrophic gastritis was not evaluated.

Our study is the first in the literature to question the effect of mechanical bowel cleansing in the histopathological evaluation of EGD biopsies.

Conclusions

As was shown, when the histopathological findings of the patients who underwent EGD due to dyspeptic symptoms and the histopathological findings of the patients who underwent BDE are evaluated comparatively, there are no false positive results that can cause a change in the treatment to be applied to the patient. Apart from this, considering other studies' findings, it is an appropriate approach to additionally perform a colonoscopy in patients with dyspeptic symptoms, if indicated. These data should be supported by randomized controlled trials with larger sample sizes.

Conflict of Interest

The Authors declare that they have no conflict of interests.

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Ethics Approval

The Ethics Committee of Health Science University Istanbul Kartal Lutfu Kirdar City Hospital approved the protocol of this study (approval number: 2022-514-219-6).

Informed Consent

All participants provided written informed consent.

Authors' Contribution

F.M., M.K., and G.O.: conceptualization, methodology, software. F.M. and M.K.: data curation, original draft preparation. F.M. and M.K.: visualization, investigation. G.O.: supervision. F.M., M.K.: software, validation. G.O. and F.M.: writing, reviewing, editing.

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