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Research Article

Retrospective Evaluation of Gastroscopic Findings in Colon Cancer Patients and Colonoscopic Findings in Gastric Cancer Patients

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Abstract

Objectives: The aim study is to detect gastroscopic lesions in colon cancer patients and colonoscopic lesions in gastric cancer patients.

Methods: This study is a single-center retrospective study. 101 colon cancer and 53 gastric cancer patients were included in the study. In colon cancer control group, 115 patients were selected who applied colonoscopy with no malignancy result. And in gastric cancer control group, 112 patients were selected who applied gastroscopy with no malignancy result.

Results: We observed colon cancer in 2 (%3,8) patients and totally 22 colon polyps in 13 (%24,5) patients from 53 gastric cancer patients. There was no colon cancer diagnosis and totally 36 colon polyps found in 27(%24,1) in control group (n=1l 2) patients. There was no statistically significance in both groups about the number and adenomatous polyps ratio (p>0.05). In colon cancer group (n=10l), 1 (%1) patient had severe dysplasia and 10(%9,9) patients had gastric polyp; but in control group (n=115), there was 1 (%0,8) mild dysplasia and 11(%9,6) gastric polyp. There was no statistically significance in both groups about the number and adenomatous of polyps.

Conclusion: We found no statistically significant difference between the groups. Prospective studies are needed for second primary cancer investigations.

Keywords: Gastric cancer, colon cancer, polyp, gastroscopy, colonoscopy

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Colorectal cancers are the third most common cancer worldwide, accounting for 10% of all cancer cases.[1,2] Gastric cancer is the sixth most common and the fourth leading cause of death. The presence of any primary malignancy predisposes a patient to an increased risk of developing secondary cancers in other regions. This clinical observation remains valid for both gastric and colon cancers. In regions with a high prevalence of gastric cancer, numerous studies have been conducted to facilitate both the early detection of this malignancy and the identification of potential second primary cancers. Efforts to find common etiological factors and establish cancer screening programs have been the focus of many studies to date.

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First described by Billroth in 1889, the definition of multiple primary cancers is used for cases where there are two or more primary cancers of origin with variations, without recurrence, metastasis or extension. Currently, the diagnostic criteria established by Warren and Gates are employed for the identification of second primary cancers. Accordingly, it is based on the histological determination of both tumors as the same tumor.[3] Numerous retrospective studies have reported a coexistence of colorectal and gastric cancers. Recognizing this association underscores the necessity of considering additional malignancies in patients undergoing cancer treatment. In a study conducted in South Korea, Oh et al.[4] investigated the presence of colon cancer in 105 patients with gastric carcinoma, identifying adenomatous polyps in 22.9% and colorectal adenocarcinoma in 9.5% of the cohort. Similarly, another study by Park et al.[5] examined the prevalence of colorectal cancer development in patients with gastric carcinoma; colorectal cancer was detected in 9% (3.5%) of 543 patients, while colonic adenomas were reported in 215 of these patients (39.6%).

Studies have been conducted not only with patients with gastric cancer but also with patients with colon cancer, and the frequency of gastric cancer in colon cancer patients has been investigated. In a study conducted by Lim et al.[6] in Korea in 2008, 1542 colorectal cancer patients were included in the study, and synchronous gastric carcinoma was detected in 31 (2.0%) of them. Of these detected gastric carcinoma patients, 26 (83.9%) were reported as having early stage and 5 as having advanced gastric carcinoma.

In addition to investigations into carcinomas within the gastrointestinal system, the presence of precancerous lesions has been the subject of numerous studies to date.[7-10] Patients with gastric mucosal non-malignant polyps have a significantly higher incidence of colon polyps compared to the primary control group, which supports the idea that gastric polyps are a risk factor for colon polyps.[11]

Although there is no implemented health policy in our country regarding the possibility of other gastrointestinal malignancies in colon and stomach cancer patients and the need for screening, there is a need for research on this subject, which is being investigated worldwide, and for studies to be conducted in our country to establish endoscopic screening programs.

Methods

The records of patients who applied to the endoscopy unit of the Gastroenterology Department at Ondokuz Mayıs University Faculty of Medicine between January 2006 and December 2011 were examined.

Patients diagnosed with colon cancer who underwent gastroscopy and those diagnosed with gastric cancer who underwent colonoscopy were identified. Patients whose phone numbers could be reached were included in the study. 53 gastric cancer patients who underwent colonoscopy and 101 colon cancer patients who underwent gastroscopy were included in the study. Patients' gender, age at diagnosis, comorbid diabetes, history of cholecystectomy, smoking and alcohol habits were all investigated. The study included patients whose histopathology revealed gastric and colon adenocarcinoma. Patients with colon and gastric cancer whose pathology revealed lymphoma, gastrointestinal stromal tumor, or neuroendocrine tumor, as well as patients with FAP, Peutz-Jeghers syndrome, ulcerative colitis, and Crohn's disease, were excluded. For both groups, non-cancer patients aged 18-83 years were selected to match the patient's age. 115 colon cancer patients served as the control group, and 112 gastric cancer patients served as the control group.

This study is a retrospective study conducted after written consent was obtained from the Ondokuz Mayıs University Faculty of Medicine Clinical Research Ethics Committee. Ethics committee approval number is B.30.2.ODM.0.20.08/965. The study was conducted in accordance with the Declaration of Helsinki.

Statistical Analysis

The data obtained from the research were transferred to the computer and analyzed using SPSS version 15 (SPSS, Chicago, IL, USA). Descriptive characteristics of the data were expressed as mean, standard deviation, number, and percentage. Normality tests were performed for all measurement variables in the statistical analyses. Paired t-test was applied to the measurement variables that had a normal distribution, and Mann-Whitney U test was applied to those that did not conform to a normal distribution. Risk factors were evaluated with chi-square analysis, and the statistical significance level was accepted as $p<0.05$. Risk factors were evaluated using chi-square analysis, and the statistical significance level was accepted as $p<0.05$.

Results

Of the 53 patients with gastric cancer, 15 (28.3%) were female and 38 (71.7%) were male (Table 1). Twenty (37.7%) of the 53 patients were in the 60-70 age range, and 79.2% were over 50 years of age (Table 2). The mean age was 56.4±12.9 years for the 15 female patients and 59.3±12.3 years for the 38 male patients in the gastric cancer group, with no significant difference observed between them. Regarding habits, 54.7% of the patients with gastric cancer were smokers and 15.1% consumed alcohol. In the control group, the smoking rate was 29.5% ($p<0.05$). Additionally,

Table 1. Demographic characteristics of gastric cancer patients and control groups

Gastric cancer	Patient group n (%)	Control group n (%)	p
Gender			
Female	15 (28.3)	63 (56.3)	>0.05
Male	38 (71.7)	49 (43.8)	
Age			
Mean ± SD	58.5±12.5	55.2±16.0	>0.05
Diabetes	6 (11.3)	16 (14.3)	>0.05
Smoking	29 (54.7)	32 (29.5)	0.02
Alcohol	8 (15.1)	12 (10.7)	>0.05
Cholecystectomy	2 (3.8)	8 (7.1)	>0.05

6% of the patients had diabetes, and only 3.8% had undergone gallbladder surgery prior to the diagnosis of gastric cancer (Table 1). Aside from smoking, there were no significant differences between patient and control groups in terms of diabetes, cholecystectomy, and alcohol consumption. Of the 53 patients, 79.2% were stages III and IV, with gastric cancer most frequently detected in stage IV in both sexes. Furthermore, stage IV gastric cancer was most common in those over 50 years of age (59.5%) (Table 3). No significant association was found between diabetes, smoking, alcohol, cholecystectomy, and gastric cancer stages (p>0.05). Although stage IV gastric cancer was more common in those over 50, no statistically significant difference was found when compared to those under 50. In patients with stage III and stage IV gastric cancer, both nonneoplastic lesions and colon cancer were more common than in patients with stage I and stage II gastric cancer, but the difference was not statistically significant (Table 4). When the relationship between the histological type of gastric cancer and colon lesions was examined, nonneoplastic lesions and colon adenomas were more frequently observed in intestinal type gastric cancer, and the second primary colon cancer was more frequently observed in diffuse type gastric cancer (7.7%) (p>0.05) (Table 5).

Gastric cancer was most frequently observed in the distal stomach at a rate of 43.4%, with the frequency decreasing towards the proximal part of the stomach. Intestinal type gastric cancer was observed in 33 (62.3%) of the patients, and an increase in the frequency of intestinal type gastric cancer was detected towards the distal part (Table 6).

In both sexes, gastric cancer predominantly involved the distal part of the stomach. Intestinal type was the most

Table 2. Distribution of colon and gastric cancer by decade

Decade	Gastric cancer n (%)	Gastric cancer control n (%)	Colon cancer n (%)	Colon cancer control n (%)
<40	4 (7.6)	23 (20.6)	9 (8.8)	26 (22.6)
40–49	7 (13.2)	21 (18.8)	12 (11.9)	32 (27.8)
50–59	15 (28.3)	20 (17.8)	24 (23.8)	23 (20.0)
60–69	20 (37.7)	22 (19.6)	26 (25.7)	19 (16.5)
70–79	5 (9.4)	20 (17.8)	25 (24.8)	11 (9.6)
>80	2 (3.8)	6 (5.4)	5 (5.0)	4 (3.5)

Table 3. Demographic characteristics according to gastric cancer stages

	Stage I n (%)	Stage II n (%)	Stage III n (%)	Stage IV n (%)	p
Gender					
Female	2 (33.3)	1 (20.0)	3 (21.4)	9 (32.1)	>0.05
Male	4 (66.7)	4 (80.0)	11 (78.6)	19 (67.9)	
Age					
<50	2 (33.3)	2 (40.0)	4 (28.6)	3 (10.7)	>0.05
>50	4 (66.7)	3 (60.0)	10 (71.4)	25 (89.3)	
Diabetes	1 (16.7)	0 (0)	2 (14.3)	3 (10.7)	>0.05
Smoking	4 (66.7)	3 (60.0)	7 (50.0)	15 (53.6)	>0.05
Alcohol	2 (33.3)	1 (20.0)	1 (7.1)	4 (14.3)	>0.05
Cholecystectomy	0 (0)	0 (0)	2 (14.3)	0 (0)	>0.05

Table 4. Colonoscopy findings according to stages in the gastric cancer patient group

	Non-neoplastic n (%)	Adenoma n (%)	Cancer n (%)	Other n (%)	Normal n (%)	p
Stage I	1 (7.7)	1 (9.1)	0 (0)	0 (0)	4 (11.8)	>0.05
Stage II	2 (15.4)	0 (0)	0 (0)	1 (33.3)	2 (5.9)	>0.05
Stage III	2 (15.4)	3 (27.3)	1 (50.0)	1 (33.3)	9 (26.5)	>0.05
Stage IV	8 (61.5)	7 (63.6)	1 (50.0)	1 (33.3)	19 (55.8)	>0.05

Table 5. Histopathology of lesions detected during colonoscopy according to gastric cancer type

	Non-neoplastic n (%)	Adenoma n (%)	Cancer n (%)	Other n (%)	Normal n (%)	p
Diffuse type	2 (15.4)	0 (0)	1 (7.7)	1 (7.7)	9 (69.2)	>0.05
Intestinal	9 (24.4)	5 (13.5)	1 (2.7)	0 (0)	22 (59.4)	>0.05
Other	2 (15.4)	6 (46.1)	0 (0)	2 (15.4)	3 (23.1)	>0.05

Table 6. Relationship between gastric cancer localization and cancer histology

	Diffuse infiltrative type n (%)	Intestinal type n (%)	Other n (%)	Total n (%)	p
Proximal stomach	4 (30.8)	9 (69.2)	0 (0)	13 (100)	>0.05
Gastric corpus	5 (29.4)	8 (47.1)	4 (23.5)	17 (100)	>0.05
Distal stomach	4 (17.4)	16 (69.6)	3 (13.0)	23 (100)	>0.05

common histological type in both sexes, more frequent in male patients. While no significant relationship was found between histological type and gender, the occurrence of intestinal type gastric cancer in those over 50 years of age was significant (p=0.01) (Table 7). In 62.3% of colonoscopies performed on gastric cancer patients, the cecum was reached, while in the entire control group, the cecum was reached. Colonoscopies were performed on patients as early as 1 month and as late as 180 months after diagnosis, with an average of 12.3 months after the diagnosis of gastric cancer. Thirteen adenomas were detected in 11 of 53 patients, all of whom were over 50 years old. Benign lesions and adenomas were more frequently found in male patients. Of the 5 patients in whom malignant lesions were detected during colonoscopy, 3 were female and under 50 years of age (Table 8).

Colon cancer was detected in 2 out of 53 patients (3.8%), and in both cases the tumor was localized to the rectum. The patient who was diagnosed with colon cancer during a colonoscopy performed within 1 month of a gastric cancer diagnosis was a 68-year-old male with stage IV gastric cancer. In another patient, colon cancer was detected during a colonoscopy performed 48 months after a diagnosis of stomach cancer; this was a 40-year-old woman with stage III stomach cancer. The other three patients with malignancy in the colon had rectal metastases of stomach cancer. Compared to the control group, 61.3% of the gastric cancer patient group and 75.0% of the control group had no pathology on colonoscopy (p>0.05) (Table 9). In the gastric cancer patient group, one patient had both neoplastic and nonneoplastic colon polyps. When both groups were compared in terms of neoplastic and nonneoplastic polyps, no statistically significant difference was found between them. Although colon cancer and ulcerative colitis were more common in the gastric cancer patient group, there was no significant difference between them (p>0.05) (Table 9).

Regarding the distribution of colonic lesions, the number of adenomas was higher in the control group. However, compared to the patient group, adenomas in the right colon were detected more frequently in the control group than in the gastric cancer group (p=0.03). In the gastric cancer patient group, non-neoplastic lesions in the right colon were more prevalent than in the control group, and this difference was statistically significant (p<0.009). Colon cancer was detected only in patients with gastric cancer and was not observed in the control group. Furthermore, both the metastasis and the second primary colon cancer were found to be located in the left colon (Table 10). Colonic polyps were detected in 13 (24.5%) of the 53 patients with gastric cancer, and a total of 22 polypectomies were performed in these 13 patients. In the control group, polypectomies were performed on a total of 36 polyps in 27 patients. When compared in terms of the number of colonic polyps, a maximum of 3 polyps were detected in both

Table 7. Demographic characteristics according to gastric cancer type

	Diffuse type n (%)	Intestinal type n (%)	Other n (%)	p
Gender				
Female	5 (41.7)	6 (18.8)	4 (44.4)	>0.05
Male	7 (58.3)	26 (81.2)	5 (55.6)	
Age				
<50	6 (50.0)	**3 (9.4)**	2 (22.2)	**=0.01**
>50	6 (50.0)	**29 (90.6)**	7 (77.8)	
Diabetes mellitus	4 (33.3)	2 (6.3)	0 (0)	>0.05
Smoking	5 (41.7)	20 (62.5)	4 (44.4)	>0.05
Alcohol	2 (16.7)	5 (15.6)	1 (11.1)	>0.05
Cholecystectomy	2 (16.7)	0 (0)	0 (0)	>0.05

Table 8. Colonoscopy findings in gastric cancer patients

	Normal n (%)	Benign lesion n (%)	Adenoma n (%)	Malignant lesion n (%)
Total	33 (62.3)	8 (15.1)	7 (13.2)	5 (9.4)
Age				
<50	6 (18.2)	1 (12.5)	0 (0)	4 (80.0)
>50	27 (81.8)	7 (87.5)	7 (100)	1 (20.0)
Gender				
Female	10 (30.3)	0 (0)	2 (28.6)	3 (60.0)
Male	23 (69.7)	8 (100.0)	5 (71.4)	2 (40.0)
Smoking	19 (57.6)	7 (87.5)	4 (57.1)	0 (0)
Alcohol	6 (18.1)	2 (25.0)	0 (0)	0 (0)
Diabetes mellitus	5 (15.1)	1 (12.5)	0 (0)	0 (0)
Cholecystectomy	1 (3.0)	0 (0)	0 (0)	1 (20.0)

Table 9. Colonoscopy findings of gastric cancer patients and control group

Gastric cancer	Patient group n (%)	Control group n (%)	p
Polyp			
Non-neoplastic	7 (13.2) *	10 (8.9)	>0.05
Neoplastic	7 (13.2) *	15 (13.4)	>0.05
Cancer	2 (3.8)	0 (0)	>0.05
Ulcerative colitis	2 (3.8)	1 (0.9)	>0.05
Other	4 (7.5)	2 (1.8)	>0.05
No pathology detected	33 (62.3)	84 (75.0)	>0.05

*n: Number of patients: 1 patient has both nonneoplastic and neoplastic polyps.

groups; 1 polyp was identified in 11.3% of the gastric cancer patients and 17.8% of the control group (Table 11). However, there was no statistically significant difference. Regarding polyp size, all colonic polyps in both the gastric cancer and control groups were under 1 cm, and no significant difference was observed in terms of polyp size (Table 11). Ulcerative colitis limited to the rectum was identified in 2 (3.8%) of the 53 patients. Additionally, colonic metastasis of gastric cancer was detected in 3 (5.7%) of the 53 patients, all three of which had metastasized to the rectum. Of the 101 colon cancer patients, 40 (39.6%) were women and 61 (60.4%) were men (Table 12). Thirty (29.8%) of the 101 patients were over 70 years old, and 21 (20.7%) were under 50 years old (Table 2). Colon cancer was most common in the sixth decade, but occurred with almost equal frequency in decades after age 50. Sixty-fourth (64.4%) of the 101 patients were in stages 3 and 4, occurring in equal proportions. Forty-one (40.6%) of the patients were smokers and 15 (14.9%) were alcohol users. 14.9% of the patients were diabetic and only 8.9% had undergone gallbladder surgery before being diagnosed with colon cancer (Table 12). There were no significant differences between the colon cancer

Table 10. Location of pathological findings detected by colonoscopy in gastric cancer patients and control groups (n: number of lesions in the colon)

	Gastric cancer patient group n (%)*	Control group n (%)*	p
Left colon			
Benign	3 (10.3%)	9 (24.3%)	>0.05
Adenoma	7 (24.1%)	13 (35.1%)	>0.05
Cancer	2 (6.8%)	0 (0%)	>0.05
Other	6 (20.7%)	3 (8.2%)	>0.05
Right colon			
Benign	7 (24.1%)	1 (2.7%)	=0.009
Adenoma	4 (14.0%)	10 (27.0%)	=0.03
Cancer	0 (0%)	0 (0.0%)	>0.05
Other	0 (0%)	1 (2.7%)	>0.05

Table 11. Number and size of polyps detected during colonoscopy in gastric cancer patients and control groups

	Gastric cancer patient group	Gastric cancer control group	p
No polyps	40 (75.5%)	85 (75.9%)	p>0.05
1 polyp	6 (11.3%)	20 (17.8%)	p>0.05
2 polyps	5 (9.4%)	5 (4.5%)	p>0.05
3 polyps	2 (3.8%)	2 (1.8%)	p>0.05
Polyp size (cm) Mean ± SD	0.25±0.32	0.15±0.35	p>0.05

SD: Standard deviation.

Table 12. Demographic characteristics of colon cancer patients and control groups

	Colorectal cancer patient group n (%)	Control group n (%)	p
Gender			
Female	40 (39.6%)	65 (56.5%)	p>0.05
Male	61 (60.4%)	50 (43.5%)	
Age			
Mean ± SD	60.4±14.1	50.7±15.52	p=**0.001**
Diabetes mellitus	15 (14.9%)	10 (8.7%)	p>0.05
Smoking	41 (40.6%)	35 (30.4%)	p>0.05
Alcohol	15 (14.9%)	12 (10.4%)	p>0.05
Cholecystectomy	9 (8.9%)	4 (3.5%)	p>0.05

SD: Standard deviation.

and control groups in terms of smoking, alcohol, diabetes and cholecystectomy (p>0.05).

Colon cancer was most frequently detected in the left colon (56.4%), and within the left colon, it was most commonly found in the rectum (25.7%). Left colon involvement was more common in both patients under and over 50 years of age, but this difference was not statistically significant. Left colon involvement was more common in male patients, but there was no significant difference compared to the right colon. Furthermore, no significant association was found between smoking, alcohol, diabetes, and a history of cholecystectomy and the localization of colon cancer (Table 13). Gastroscopy was performed on colon cancer patients an average of 14 months later (1-120 months). In the colon cancer patient group, no gastroscopic pathology was detected in 64.4% of patients, while in the control group, gastroscopy was reported as normal in 74.8% of patients. Regarding gastric polyps and polyp pathology, no significant difference was found between the control and patient groups (Table 14).

Gastroscopic biopsies of colon cancer patients showed no significant difference in intestinal metaplasia and H. pylori positivity compared to the control group (p>0.05). In the colon cancer group, 1% of patients had severe dysplasia on gastroscopic biopsy. The patient was a 33-year-old woman who had been diagnosed with stomach cancer six months after her colon cancer diagnosis. She had stage III sigmoid colon cancer. When compared in terms of gastric polyps, 9.9% of the colon cancer group had gastric polyps, while 9.6% were detected in the control group (p>0.05). Regarding polyp localization, 60% of gastric polyps in the colon cancer group were located in the distal stomach, while 72% were located proximally, and particularly in the fundus, in the control group. There was no difference between the patient and control groups in terms of H. pylori and intestinal metaplasia (Table 15). Histopathological findings revealed the pres-

Table 13. Demographic characteristics of colon cancer patients according to cancer location

	Right colon n (%)	Left colon n (%)	p
Number (%)	44 (43.6)	57 (56.4%)	
Age			
<50	6 (13.6)	15 (26.3)	>0.05
>50	38 (66.4)	42 (73.7)	
Gender			
Female	19 (43.2)	21 (36.8)	>0.05
Male	25 (56.8)	36 (63.2)	
Smoking	17 (38.6)	24 (42.1)	>0.05
Alcohol	4 (9.1)	11 (20.0)	>0.05
Cholecystectomy	4 (9.1)	5 (9.8)	>0.05
Diabetes mellitus	4 (9.1)	1 (20.0)	>0.05

Table 14. Gastroscopy findings of the colorectal cancer patient group and the control group

Gastroscopy findings	Colorectal cancer patient group n (%)	Control group n (%)	p
Normal	65 (64.4%)	86 (74.8%)	>0.5
Peptic ulcer	11 (10.9%)	7 (6.1%)	>0.5
Cancer	1 (1.0%)	1 (0.9%)	>0.5
Esophagitis	14 (13.9%)	10 (8.7%)	>0.5
Gastric polyp			
Neoplastic	1 (1.0%)	1 (0.9%)	
Non-neoplastic	5 (5.0%)	10 (5.7%)	>0.5
Other	4 (4.0%)	0 (0%)	
Polyp size (cm)			
Mean ± SD	0.47±0.16	0.82±0.36	>0.5

SD: Standard deviation.

Table 15. Comparison of gastroscopic biopsies from colon cancer and control groups

Gastric pathology	Colorectal cancer patient group n (%)	Control group n (%)	p
Gastrointestinal metaplasia	24 (46.2%)	24 (39.3%)	>0.05
Dysplasia	1 (1.9%)	1 (1.6%)	>0.05
H. pylori gastritis	27 (51.9%)	36 (59.1%)	>0.05

ence of tubular adenomas and hyperplastic polyps in both groups, with no significant difference in distribution (Table 16). The control group had a 0.5 cm polyp located at the cardioesophageal junction with mild to severe dysplasia.

Discussion

The incidence of gastric and colorectal cancer varies significantly across different countries and regions.[12] Gastric cancer, which increases with age, is most commonly observed between the ages of 50 and 70.[13] In our study, 50.9% of gastric cancer patients were over 60 years old, while 7.6% were under the age of 40. Furthermore, consistent with other studies in the literature, gastric cancer was more frequent in the male gender.[5,7,14-16] Intestinal-type gastric cancer is not only more common but also tends to involve the distal stomach, with a higher prevalence in male patients. [13] Similarly, in our study, intestinal-type gastric cancer was identified in 62.3% of the patients and was found to be more frequent in males (90.6%). While some publications report that diffuse-type gastric cancer is more prevalent especially among females, it was observed at nearly equal rates in both genders in our study.[15] Over the last 30 years, the incidence of gastric cardia adenocarcinoma has increased 5- to 6-fold in developed countries. While distal gastric cancer is more common in developing countries, proximal gastric cancer exhibits higher rates in developed countries.[13] The eradication of H.pylori is cited as the primary reason for the decrease in distal gastric cancer incidence.[17] Additionally, the rise in obesity and reflux has been implicated as a factor in the increasing incidence of proximal gastric cancer.[18,19] In a retrospective study conducted by Vardar et al.[20] in Türkiye, the change in the localization of gastric adenocarcinomas in the Aegean Region was investigated, and no significant change was reported in the distal/proximal gastric cancer ratio. In our study, however, distal gastric cancer was found to be more prevalent than proximal gastric cancer.

Male gender and advanced age are two well-known risk factors for colorectal cancer.[21] In our study, 60.4% of colon

Table 16. Gastroscopic lesions detected in colon cancer patients and control groups, and their relationship with the demographic characteristics of the patients

	Colon cancer patient group				Control group				p
	No polyp	Benign polyp	Adenoma	Cancer	No polyp	Benign polyp	Adenoma	Cancer	
Age									
<50	18 (90.0%)	1 (5.0%)	0 (0%)	1 (5.0%)	57 (98.3%)	1 (1.7%)	0 (0%)	0 (0%)	>0.05
>50	72 (93.5%)	4 (5.2%)	1 (1.3%)	0 (0%)	46 (80.7%)	10 (17.5%)	0 (0%)	1 (1.8%)	
Gender									
Female	36 (90.0%)	3 (7.5%)	0 (0%)	1 (2.5%)	58 (89.2%)	7 (10.8%)	0 (0%)	0 (0%)	>0.05
Male	54 (94.7%)	2 (3.5%)	1 (1.8%)	0 (0%)	45 (90.0%)	4 (8.0%)	0 (0%)	1 (2.0%)	
Smoking	37 (41.1%)	4 (80.0%)	0 (0%)	0 (0%)	31 (30.1%)	2 (18.2%)	0 (0%)	0 (0%)	>0.05
Alcohol	11 (12.2%)	4 (80.0%)	0 (0%)	0 (0%)	12 (11.7%)	0 (0%)	0 (0%)	0 (0%)	>0.05
Cholecystectomy	7 (7.8%)	1 (20.0%)	1 (11.1%)	0 (0%)	4 (3.9%)	0 (0%)	0 (0%)	0 (0%)	>0.05
Diabetes mellitus	14 (15.6%)	1 (20.0%)	1 (6.3%)	0 (0%)	0 (0%)	1 (9.1%)	0 (0%)	0 (0%)	>0.05

cancer patients were male and 79.2% of all patients were over 50 years old.

In autopsy studies, colon cancer is most frequently seen in the left colon, and especially in the rectum.[22] In recent years, studies have been conducted that contradict this situation. In a prospective study by Thomas et al.[23], the rate of right colon cancer was found to be higher than left colon cancer. However, in our study, colon cancer was more common in the left colon (56.4%) than in the right. In addition, 25.7% of all colon cancers were in the rectum, making it the most frequent localization area. Insulin and IGF-1 levels play a role in carcinogenesis by affecting cell proliferation and apoptosis. While most studies consider diabetes to be a disease that increases the risk of colorectal cancer, some studies have claimed the opposite. This difference in the literature was examined by Larsson et al.[24] in a meta-analysis of 15 studies. In this meta-analysis, it was reported that diabetes increased the risk of colorectal cancer by 1.2-1.4 times, without distinction of gender and localization. Although diabetes was more prevalent in the colon cancer patient group compared to the control group in our study, it was not statistically significant. Studies on the effects of diabetes on gastric cancer have shown that gastric cancer mortality is higher in diabetic patients. However, there is no data to suggest that it increases the risk of gastric cancer.[25] In our study, there was no significant difference in diabetes mellitus between the control group and gastric cancer patients.

H. pylori infection, which is held responsible for the etiology of gastric cancer, has also been the subject of research concerning the etiology of colon cancer and colonic adenoma.[26] While some studies identify H. Pylori infection as a causative factor in the development of colonic neoplasia, others argue that there is no significant association between them.[27,28] In our study, the prevalence of H.pylori positivity in colorectal cancer patients did not differ significantly from the control group.Smoking, perhaps the most significant of all risk factors, is considered responsible for the etiology of both gastric and colorectal cancer. Compared to non-smokers, a higher frequency of p53 gene mutations has been detected in smokers.[29,30] In our study, the smoking rate was found to be significantly higher only in patients with gastric cancer.Another controversial topic in the etiology of gastric cancer is alcohol consumption. A meta-analysis evaluating 52 studies revealed that, based on current data, the relationship between gastric cancer and alcohol consumption remains clearly undefined.[31] The same situation applies to colorectal cancer. Franceschi et al.[32] evaluated 27 studies and stated that alcohol consumption, in parallel with low folate intake, increases the risk of colorectal cancer by 1–1.7 times. This finding has been supported by other meta-analyses.[31,33] In our study, no significant difference was found regarding alcohol consumption when gastric cancer and colorectal cancer groups were compared with the control groups.Cholecystectomy alters the bile acid content of the feces.[34] While some studies have shown an increased risk of proximal colon cancer specifically in women, other studies have additionally argued that the risk of rectal cancer also increases. Conversely, there are studies suggesting that cholecystectomy does not increase the risk of colorectal cancer.[35]

Early detection of gastric cancer makes curative surgery possible. In gastric cancer detected in the early stages, the 5-year survival rate is around 96%, and the 10-year survival rate is around 92%.[36] In our study, 79.2% of gastric cancer patients and 64.4% of colon cancer patients were detected in stages 3 and 4. In regions where gastric cancer is endemic, such as Korea and Japan, early detection of gastric cancer is common because screening programs have been established.[37] However, a screening program for gastric cancer has not yet been established in our country.

The first study on a second primary cancer was conducted in Japan in 1985 by Ikeda et al. [38] The study found an incidence of 2%. Subsequent studies have reported rates between 1.1% and 4.7%.[39] In another study by Ueno et al.[40], cancer patients were followed for a long period and the development of a second cancer was investigated. In this study, the development of a second malignancy was reported in 2/3 of the patients within the first 3 years after the development of the primary cancer. In East Asia, gastric cancer has a higher incidence among multiple primary cancers compared to other cancers, and it is reported to occur with colon cancer in most cases.[41] Studies in South Korea have also reported that multiple primary cancers are most frequently in the stomach.[42] In our study, gastric cancer was detected in 1 of the colon cancer patients, and this was detected during gastroscopy 6 months later. In patients with gastric cancer, colon cancer was detected in 2 patients; this was discovered during colonoscopies performed at 1 month and 48 months, respectively, and both tumors were localized to the rectum.

Studies conducted in the East have identified an increased frequency of gastric cancer among patients with colorectal cancer.[39-42] Some publications report that the prevalence of gastric cancer in colorectal cancer patients ranges between 0.2% and 2.9% [6,41–43]. In a study by Oh et al.[4], the risk of colorectal cancer in 105 patients with gastric cancer was found to be 9.5%, while colorectal cancer was detected at a rate of 0.7% in a control group of 269 patients without gastric cancer. In another prospective study by Oh et al.[4], colorectal cancer was detected in 2.4% of 723 gastric cancer patients; this value was reported to be 2.5

times higher than that of the healthy population, which was identified as 0.97%.However, some studies conducted in the West have demonstrated the exact opposite, reporting no increase in the development of gastric cancer among colorectal cancer patients compared to the general population.[44,45] In our study, while colorectal cancer was identified in 3.8% of gastric cancer patients, gastric cancer was detected in 1% of colorectal cancer patients. Although both cancers appeared more frequent in terms of percentage compared to the control group, this was not statistically significant. A likely reason for this is the limited number of patients. Furthermore, the rate of reaching the cecum via colonoscopy in the gastric cancer group was 62.3%, which suggests that the actual prevalence of colonic malignancy in these patients might be higher.It is well known that the presence of an adenoma in one part of the gastrointestinal tract is associated with the synchronous presence of an adenoma in another region.[10,11,46] Gastric polyps are generally asymptomatic and are often detected incidentally during endoscopic or radiological examinations at a rate of 1–5%. Gastric polyps can be divided into two groups: non-neoplastic (hamartomatous, inflammatory, and hyperplastic polyps) and neoplastic (adenomas and fundic gland polyps). Gastric polyps are found in 1–2% of the general population, and 7–10% of these are adenomatous polyps, which are premalignant lesions.[47,48] In a retrospective study by Cappell et al.[11] involving 41 patients with gastric polyps, a significantly higher rate of colonic polyps was detected compared to the control group. Similarly, in another retrospective study, colorectal adenomas were detected in 33% of the control group, whereas adenomas were found in 56% of patients with duodenal adenomas during colonoscopy. Additionally, when the rates of advanced colorectal adenoma and neoplasia were compared between the two groups, they were found to be 19% in the control group and 38% in the patient group.[46] Gastric polyps may also be associated with various polyposis coli syndromes.[49,50] It has been shown that the risk of colorectal cancer increases even in patients who only have duodenal adenomas or gastric fundic gland polyps.[51]

Patients with nonmalignant gastric mucosal polyps have a significantly higher incidence of colon polyps compared to the primary control group, supporting the idea that gastric polyps are a risk factor for colon polyps.[11,52] 53.
Watanabe et al.[53] reported that the presence of gastric polyps increased the risk of colon polyps fourfold, and the presence of colon polyps increased the risk of gastric polyps twentyfold. In a study conducted in Korea, Oh et al.[4] investigated colon cancer in 105 patients with gastric carcinoma. Colon adenomatous polyps were detected in 22.9% and colorectal adenocarcinoma in 9.5%. In another study conducted by Park and colleagues, the prevalence of colorectal cancer development in patients with gastric carcinoma in Korea was investigated. It was reported that colorectal cancer was detected in 19 (3.5%) of 543 gastric carcinoma patients, and adenoma in 215 (39.6%).[5] In our study, the rate of polyps in the colon was 39.6% in gastric cancer patients, while this rate was 29.5% in the control group. No significant difference was found between them in terms of polyp number and pathology. However, the fact that total colonoscopy was not performed in the gastric cancer group may have caused the data to be insufficient.

With the increasing elderly population, advances in diagnostic techniques for cancer mutations, and increased exposure to carcinogens, there has been an increase in the prevalence of multiple primary cancers. The gold standard technique for diagnosing colon cancer is colonoscopy, which also helps us detect precancerous lesions. However, many patients with gastric cancer are too debilitated to tolerate a total colonoscopy, and the technical difficulties of the procedure following prior surgery act as further deterrents. In our study, the low rate of cecal intubation may have hindered the detection of advanced adenomas or foci of cancer.

Screening programs exist in regions such as Japan, where gastric cancer is observed with high incidence. Through intensive screening, gastric cancer is detected at an early stage in asymptomatic populations, thereby reducing mortality rates. In studies conducted with asymptomatic individuals over the age of 50 in South Korea, where gastric cancer is common, colorectal cancer was detected at a rate of 1–4.1%.[46,54] In patients who have undergone surgery for colorectal cancer, primary cancer may recur, or second primary cancers and adenomatous polyps may develop. In this patient group, the average time for detecting metachronous adenomas after surgical resection is 19–32 months, whereas most recurrent adenocarcinomas (85%) are diagnosed within 3 years.[55] While colorectal carcinomas tend to localize in the sigmoid colon and rectum, data obtained in recent years indicate a relative increase in right-sided colon involvement, suggesting a shift in distribution. The detection of precancerous lesions in cancer development is crucial. Indirect evidence supporting the adenoma-carcinoma sequence exists; one such piece of evidence is the similarity in the prevalence and distribution patterns of colorectal cancer and colonic polyps in the general population.[4,5] Another is the frequent coexistence of benign adenomatous tissue with invasive cancer tissue in early-stage malignancies. Furthermore, the decrease in colorectal cancer incidence following endoscopic polypectomy supports the fact that polyps are indeed precancerous lesions.[56] A study by Bond et al.[57] in South Korea reported that the prevalence of colorectal adenoma increased with age, reaching 10% in the 30s, 22% in the 40s,

and 33% in the 50s. Adenomatous polyps carry a risk of malignant transformation.

The limitations of our study include its single-center design, the small sample size in both the gastric and colorectal cancer groups, the inability to perform colonoscopy sufficiently to reach the cecum in all patients, and the lack of control groups with similar age and gender characteristics.

Conclusion

In conclusion, the diagnosis of multiple primary cancers has become more common due to advances in diagnostic tests and the increasing elderly patient population. Considering the increase in life expectancy and the growing elderly population not only in our country but also worldwide, it is inevitable that cancer rates will increase day by day. Therefore, the importance of early detection of cancerous and precancerous lesions through complete cancer screenings and advanced evaluations of existing pathologies is highlighted. However, prospective studies with a larger number of patients are needed to create new cancer screening programs.

Disclosures

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