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What Are the Challenges for Gastroscopy During COVID-19 Pandemic?

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Abstract

Objective: We aimed to evaluate and investigate the effects of the pandemic on gastroscopy, including indications, the procedure performed, and diagnoses made as a result of the procedure.

Methods: In our retrospective study, patients who came to Trakya University Hospital to have a gastroscopy between March 2019 and March 2021 were evaluated, retrospectively. Percentages, mean, median, and quartiles were used as descriptive statistics. Mann–Whitney *U* test was used for the variations which are contrary to the normal distribution range in the comparison of the 2 groups. The Pearson Chi-Square and Fisher's Exact test studied the relations between qualitative variations. The significant value was determined as .05 for all statistical analyses.

Results: In our study, there were 109 patients during COVID-19 period and 268 patients during the pre-COVID-19 period. The mean age was 55.5 for the pre-COVID and 56.6 for the COVID period. The rate of patients who underwent percutaneous endoscopic gastrostomy during pre-COVID was 14.17% and during COVID period, it was 19%. The rate of re-admissions to the hospital with malignant pathology of patients who had previously been operated on for malignant reasons was 5.26% during Pre-COVID and 11.81% during COVID period ($P < .001$).

Conclusions: During the COVID-19 period, we observed that patients applied late because they were afraid of coming to the hospital even if they had symptoms. More scheduled health services will provide better results for both patients and health personnel in such epidemic periods.

Keywords: COVID-19, gastroscopy, endoscopy, gastrostomy, pandemic

Introduction

As a result of the researches carried out on a group of patients who showed respiratory symptoms such as fever, cough, and shortness of breath in Wuhan, China, in late December 2019, the SARS-CoV-2 RNA virus was identified on January 13, 2020, which caused the largest pandemic in modern history.[1,2] It has placed a difficult burden on healthcare systems.[3] As a consequence of the pandemic, the priorities of healthcare facilities have changed. Due to the reasons such as infected patients requiring hospitalization, mechanical ventilation, safety precautions, and determination of COVID-19 as a priority, routine work in healthcare facilities, including endoscopy units, has changed and there have been delays in the diagnosis and treatment of diseases.[4,5]

Endoscopic examination is a safe and accurate procedure used to diagnose and treat gastrointestinal system diseases.[6,7] Gastroscopy, also known as upper endoscopy, is a specialized endoscopy that examines the esophagus, stomach, and duodenum.[8] It is a routine investigation performed in patients with diagnostic indications such as abdominal pain, dyspepsia, vitamin B12 deficiency, stomach bloating, dysphagia, gastric cancer, and therapeutic indications including polypectomy, sclerotherapy of bleeding esophageal varices can be used, management of upper gastrointestinal bleeding, dilatation of esophageal strictures.[6,9,10]

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Gastroscopy is an outpatient procedure with a low complication rate when performed in a properly equipped area and by experienced hands.[9,11] Because gastroscopy is a short and easy procedure, it may be performed in many places, including hospitals, treatment clinics, and private offices.[9] Gastroscopy, which is an easy procedure, has become problematic during the COVID-19 period because physicians must wear extra equipment such as masks, visors, protective suits, glasses, and there is difficulty in providing sterilization conditions.

In this study, we aim to evaluate the number of endoscopies performed in 1 year before and after the first COVID-19 case seen in Turkey (March 10, 2020), how many of these endoscopies were percutaneous endoscopic gastrostomy (PEG), how many were gastroscopy, for what purpose the gastroscopies were performed (symptomatic, screening; for those who are thought to have gastric pathology in their examinations, percentages), We evaluated the results of pathologic examination (benign, malignant percentages), whether patients with a history of surgery (either because of benign or malignant gastric pathology) are more likely to show malignant pathology compared to patients without a history of surgery, and the effects of age and gender variables on gastroscopy.

Methods

Ethics

The Scientific Research Ethics Committee approved this study of Trakya University School of Medicine (Date: April 18, 2022, Protocol Code:2022/177).

Patients

This retrospective study was approved by the Ethics Committee of the Trakya University, and written informed consent was

obtained from each participant in accordance with the institutional guidelines. Between March 10, 2019, and March 10, 2021, 379 consecutive patients who underwent gastroscopy or PEG were retrospectively recruited from Trakya University.

Inclusion Criteria

The predefined inclusion criteria were as follows: (1) undergoing gastroscopy or PEG and (2) being older than 18. The predefined exclusion criterion was being younger than 18.

Statistical Analysis

The normal distribution range was controlled by the Shapiro-Wilk test. The Mann–Whitney *U* test was used for the variations contrary to the normal distribution range in the comparison of the 2 groups. The relations between qualitative variations were studied by the Pearson chi-square test and Fisher's accurate test. Median and quarter values have been given for the quantitative variations and percentage and frequency rates were given for the qualitative variations as descriptive statistic evaluation. The significant value was determined as .05 for all statistical analysis. Cut-off values for the quantitative variations were also studied by ROC analysis. All statistical analyses were performed with the TURCOSA (Turcosa Analytics Ltd. Co, Turkey, www.turcosa.com.tr) statistical software program.

Results

According to the data obtained from 378 patients screened before the COVID-19 pandemic and after the first case was seen on March 3, 2020, a total of 268 patients applied to the endoscopy unit before COVID-19; this number decreased by 59.32% to 109 people after the COVID-19 Pandemic. The average age of the patients who applied before COVID-19 was 55.5; after COVID-19, the average was found to be 56.6, with an increase of approximately 1 unit, and no statistically significant difference was found ($P = .493$).

Gastroscopy was applied to 85.82% of 268 patients who applied before the COVID-19 pandemic. Percutaneous endoscopic gastrostomy was applied to 14.17% of them. After COVID-19, patients who underwent PEG increased to 19%, and 21 of 110 patients who applied after COVID-19 pandemic were treated with PEG (Table 1).

It was observed that 259 people (85.82%) out of 268 patients who applied before the pandemic applied for screening purposes, but this rate increased to 99.09% with 109 people after the COVID-19 pandemic. No statistically significant difference was found ($P = .178$), and it was observed that the percentage of patients presenting symptomatic decreased from 3.35% to 0.59% (Table 2).

Malignant (gastric cancer) pathology was obtained in 14 (5.22%) of 268 patients who applied before the COVID-19 pandemic in the pathology reports. In all of these cancers, the pathology is adenocarcinoma, 6 of them have an ulcerovegetative mass in the antrum, and 8 of them have an ulcerovegetative mass in the cardia. In comparison, the pathology result of 13 (11.81%) of 110 patients after COVID-19 was found to be malignant (gastric cancer). In 4 of these patients, an ulcerovegetative mass was detected in the antrum and in 9 in the cardia, and adenocarcinoma was detected in the pathological examination of all of them. Although there was a 6.59% increase in malignant results of pathologic examination reports after COVID-19, this difference was not statistically significant ($P = .075$) (Figure 1).

In 91.50% of patients who underwent endoscopy with the indication of screening before COVID-19, no lesion was found. Benign (non-cancerous) results were obtained in 3.47% and malignant results in 5.01% of patients in the pathologic examination with screening indications. In patients with symptoms affecting the quality of life, no lesion was found in 88.88%, and a malignant result was obtained with pathologic examination in 11.11%. Benign results were not obtained with pathologic examination in any of the symptomatic patients.

Table 1. Change in Procedures Applied During the COVID-19 Pandemic and Before

	Before COVID Pandemic	After COVID Pandemic	Total
Procedure			
Gastroscopy	230 (85.82%)	89 (80.9%)	319 (84.39%)
PEG	38 (14.17%)	21 (19.09%)	59 (15.6%)
Total	268 (100%)	110 (100%)	378 (100%)

Within each dependent measure, means with different subscripts differ significantly ($P = .178$).
PEG, percutaneous endoscopic gastrostomy.

Table 2. Change in Endoscopy Indication, Before and After COVID-19 Pandemic

	Before Covid Pandemic	After Covid Pandemic	Total
Indications			
Screening	259 (96.64%)	109 (99.09%)	368 (97.35%)
Symptomatic Patients	9 (3.35%)	1 (0.9%)	10 (2.64%)
Total	268 (100%)	110 (100%)	378 (100%)

Within each dependent measure, means with different subscripts differ significantly. ($P = .178$).

After the COVID-19 Pandemic, 109 patients did not have any complaints and were applied to the endoscopy unit for screening those who are thought to have gastric pathology in their laboratory or physical examinations. No lesion was found in 84.54% of these patients. Benign lesions with pathologic examination were found in 3.66% and malignant lesions in 11.92%. Only one patient presented symptomatically, and no abnormality with pathologic examination of biopsy was found.

In the statistical studies performed on 246 patients who did not have a history of surgery in the preoperative period, no pathology was found in 91.86% of them. Benign lesions were obtained from 3.25% and malignancy result was obtained from 4.87% with the pathologic examination. Nineteen patients had previously been operated on for malignancy. In the biopsy results obtained by endoscopy of these patients, no pathology was found in 89.47%, benign lesion was found in 5.26%, and malignant lesion was found in 5.26% by the pathologic examination (Table 3).

After COVID-19, there were 94 patients without a history of surgery. No pathology was found in 91.48%. However, benign lesion was found in 4.25% of the patients and malignant lesion in 4.25% by the pathologic examination. While no pathology was found in 84.54% of the patients who underwent surgery for malignancy, 13 individuals, that is, 11.81%, were diagnosed with malignancy again in the control biopsy. This difference in patients with a

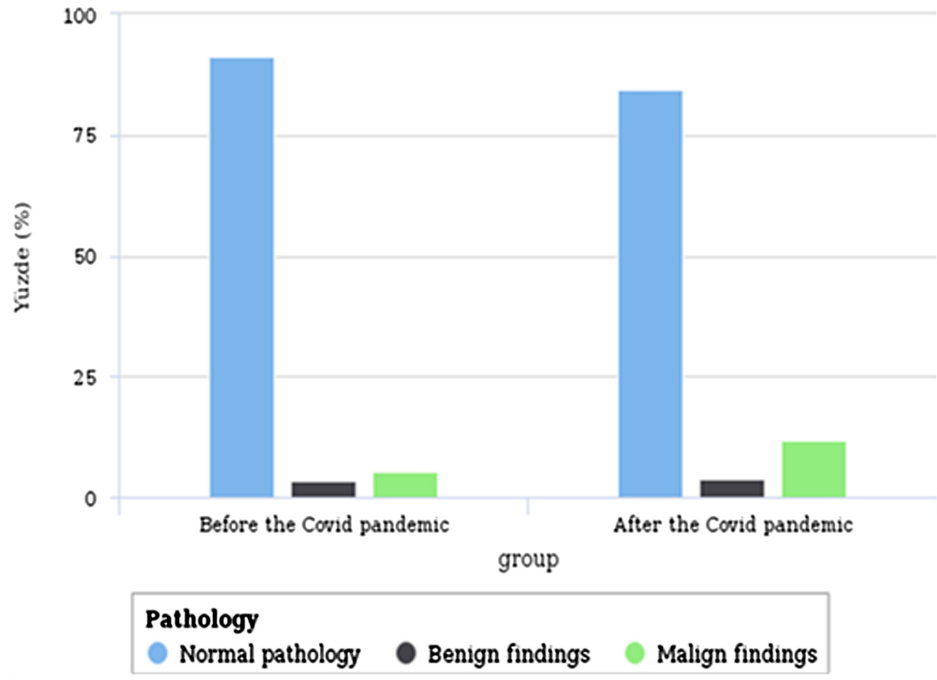

Figure 1. Change of pathology results before and after COVID-19 pandemic.

history of malignancy in the post-COVID period was found to be statistically significant ($P < .001$) (Table 3).

Discussion

The number of patients who underwent gastrointestinal endoscopy at Trakya University Hospital decreased by 59.32% in the year preceding and following the first case of COVID-19 in Turkey on March 11, 2020. It was expected to experience a decrease due to the fear of people coming to the hospital during the COVID-19 period. When we look at similar studies, it was seen that this rate increased to 91.2% in a much shorter period in France.[12] However, we can attribute this high rate to the fact that people were fearful when they encountered this disease for the first time, which they did not know what it was in the first months of the COVID-19 pandemic, and that the most significant declines took place in the first months.

We know that the risk of developing cancer increases with age. The average age of our patients who were diagnosed as having malignancy is 59.38, while the average age of our benign or healthy patients is 55.75, indicating that our data are consistent with this information.

According to the data from World Health Organization, male patients are more prone to stomach and esophagus cancer. Because 66.6% of our patients who were diagnosed as having malignancy are males, our results are compatible with these data.

When we compare the rate of patients with PEG placed before and after the pandemic, we see that it increased from 14% to 19% during the COVID-19 pandemic. The increased number and overcrowded states of intensive care units due to the people severely affected by this disease during the COVID-19 pandemic have increased the number of people placed in PEG.[13]

Table 3. The Effect of History of Surgery on Pathology Before and After COVID-19

	Pathology							
	Before COVID Pandemic				After COVID Pandemic			
History of Surgery	Normal Findings	Benign Pathology	Malign Pathology	Total	Normal Findings	Benign Pathology	Malign Pathology	Total
No history of surgery	226 (91.86%)	8 (3.25%)	12 (4.87%)	246 (100%)	86 (91.4%)	4 (4.25%)	4 (4.25%)	94 (100%)
Gastric surgery (benign disease)	2 (66.66%)	0	1 (33.33%)	3 (100%)	1 (100%)	0	0	1 (100%)
Gastric surgery (malignant disease)	17 (89.47%)	1 (5.26%)	1 (5.26%)	19 (100%)	6 (40%)	0	9 (60%)	15 (100%)
Total	245 (91.41%)	9 (3.35%)	14 (5.22%)	268 (100%)	93 (84.54%)	4 (3.63%)	13 (11.8%)	110 (100%)

Within each dependent measure, means with different subscripts differ significantly ($P = .275$) ($P < .001$, after the COVID-19 pandemic).

Stress reduces stomach acid, which is an important defense mechanism of the body, and as a result, *Helicobacter pylori* settles in the stomach and turns into a disease-causing factor.[14,15] Stress-increasing factors such as the fear of people for themselves and their relatives, the lack of socialization, and the uncertainty of the process may also have caused this during the COVID-19 period.[16-18] As a result, as seen in the study, the COVID period may be a cause for the increasing rate of HP+ (pre-COVID-19 ratio: 22.55%, post-COVID-19 ratio: 23.63%)

Díez Redondo et al.[19] in their study, say that the majority of inappropriate gastroscopy requests are followed by lesions that do not require follow-up, and 4% of these unnecessary follow-ups are followed up after gastric cancer resections. Our study observed that the gastroscopies requested increased by 2.45% due to post-COVID screening. The entire health system has been affected during the COVID-19 period, and more attention is paid to avoiding unnecessary examination requests. Despite all this, the increase in the rate of patients admitted with screening shows that the patient profile of Trakya University Hospital has shifted to the axis of follow-up patients rather than new applications.

Langtinga et al in their study, when comparing 2019 and 2020, observed that the number of patients who underwent gastroscopy with suspicion of cancer in 2020 decreased, but the rate of detected cancer increased. Our study also observed that the malignancy rate detected after COVID-19 increased by 6.5% in parallel. However, the *P* value was calculated as .075, which is statistically insignificant.[20]

In summary, when we compared and analyzed the number of people who had gastroscopy and PEG placed in the year before and after the first COVID-19 case was detected in Turkey with data from similar studies, we discovered that there was a decrease in the number of patients who had a gastroscopy and an increase in the number of people who had PEG placed. Similarly, an increase was observed in the rate of patients who applied for screening those who are thought to have gastric pathology in their physical and laboratory examinations, the rate of HP+ patients, the average age of patients diagnosed with malignancy, and the rate of re-diagnosis of gastric malignancy in patients who were operated for gastric malignancy. There was no statistically significant difference in the rate of patients diagnosed with malignancy.

During the COVID-19 period, we observed that patients applied late because they were afraid to come to the hospital even if they had symptoms. COVID-19 affects the duration of the patient's meeting with the physician and the duration of the endoscopy procedure. We observed a decrease in the number of patients admitted to the hospital due to the COVID-19 Pandemic. It can also be considered that the stress on people due to COVID may be a reason for *H. pylori* positivity. Although the number of patients who were diagnosed as having malignancy after COVID-19 increased, the difference was not significant. We found that the rate of patients who underwent PEG procedure after COVID-19 increased.

As in all clinics in the hospital, although the number of procedures has decreased due to both the cancellation of elective procedures and the reluctance of patients to come to the hospital during COVID, it has been observed that the pathologies have not disappeared. Ensuring the continuation of routine procedures under appropriate conditions and with the right indications during the pandemic is important for public health.

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