

COVID-19 pandemic and our endoscopy experiences

✉ Celil Uğurlu, ✉ Murat Yıldırım, ✉ Bülent Koca, ✉ Mustafa Sami Bostan,
✉ Salih Yılmaz, ✉ Namık Özkan

Department of General Surgery, Tokat Gaziosmanpaşa University Faculty of Medicine, Tokat, Turkey

ABSTRACT

Introduction: It is known that endoscopic procedures are reduced all over the world in the coronavirus disease 2019 (COVID-19) pandemic. The results of clinics operating without interrupting elective endoscopic procedures during the pandemic process are unknown. We aimed to explain the endoscopy procedures, precautions, experiences, and how safe endoscopy service is provided by our clinic, which continues its endoscopy service during the pandemic without patient selection and number restrictions.

Materials and Methods: This is a retrospective, cross-sectional and descriptive study. Between March 2020 and March 2021, the patients who underwent endoscopic procedures have included in the study. Medical files of 5986 patients were accessed from the hospital database and evaluated. COVID-19 transmission status of healthcare professionals working in endoscopy was analyzed.

Results: About 3722 of patients were men (62.2%), 2264 of patients were women (37.8%). The mean age of the patients was 53±12 (17–85). Gastroscopy was performed in 3824 (63.8%) patients, and colonoscopy was performed in 1606 (30%) patients. Rectoscopy and sigmoidoscopy 205 (2.68%), colonoscopic polypectomy 190 (3.17%), gastroscopic polypectomy 77 (1.28%), foreign body removal by emergency gastroscopy 31 (0.51%), endoscopic percutaneous gastrostomy 29 (0.48%), emergency gastroscopy for upper gastrointestinal bleeding 19 (0.31%) and 5 (0.08%) emergency colonoscopy for volvulus detorsion was performed. Only 2 (8.3%) of healthcare workers had Covid 19 transmission during the pandemic process.

Conclusion: Endoscopic procedures can be performed safely under pandemic conditions, with arrangements in the endoscopy unit, complete procurement of Personal protective equipment, training of healthcare professionals, and pre-procedure polymerase chain reaction.

Keywords: Coronavirus disease 2019; endoscopy; pandemic.

Introduction

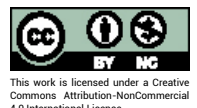
The Coronavirus epidemic started in Wuhan, China's Hubei province, in December 2019, and it has spread rapidly in the world and has become a global health problem that threatens all countries.^[1] Around 13 million people were infected worldwide in July.^[2] The first case of coronavirus disease 2019 (COVID-19) was reported on March 11, 2020,

in Turkey.^[3] Despite the tightened preventive measures implemented by individuals and governments worldwide, the number of people infected with COVID-19 is increasing. Despite all measures taken in our country, like other countries in the world, the number of cases is increasing. In March 2021, Turkey became one of the world's first four countries in the number of daily cases.^[4]



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Correspondence: Celil Uğurlu, M.D., Department of General Surgery, Tokat Gaziosmanpaşa University Faculty of Medicine, Tokat, Turkey
e-mail: basri_celil@hotmail.com



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The virus is highly contagious and staff working in the endoscopy unit are at high risk. In the presymptomatic phase of the disease, it is thought that the highest viral loads will be reached and the risk of aerosol transmission of viral particles from the nasopharynx during the upper gastrointestinal symptom (GIS) endoscopy procedures of the patients.^[5] It has been shown that the healthcare personnel on duty in the procedures in which aerosol-generating procedures are applied carry a 4.66 times (95% confidence interval, 3.13–6.94) risk of contamination compared to other healthcare professionals.^[6] The virus was detected in the fecal tissue samples of 23% of virus-infected patients. Therefore, there is a risk of fecal-oral transmission for staff performing colonoscopy.^[7] For this reason, many international endoscopy associations have made recommendations for endoscopic interventions. They recommended not performing endoscopy other than an emergency, the necessity of personal protective equipment (PPE), negative pressure rooms, and viral tests based on a polymerase chain reaction (PCR) to each patient as much as possible.^[8–11] Because of these recommendations, a significant decrease in the number of endoscopic procedures has been observed worldwide.^[12]

Our hospital serves as a tertiary care hospital in Turkey's province of Tokat. Our city is in a high-risk group expressed in red for COVID-19 in Turkey. As of April 2020, the endoscopy service has been stopped due to the assignment of doctors and other personnel in other fields due to the pandemic in State hospitals that provide endoscopy services in our province, and this service is provided only by our hospital throughout the province. We wanted to explain the endoscopy procedures, precautions, experiences, and how safe endoscopy service is provided by our clinic, which continues its endoscopy service during the pandemic without patient selection and number restrictions.

Materials and Methods

Our study was designed as a retrospective, cross-sectional and descriptive study. The first 1-year period of the pandemic process in Turkey, which is between March 2020 and March 2021 the patients who underwent endoscopic procedures have been included in the study. Medical files of 5986 patients were accessed from the hospital database and evaluated.

Many expert opinions, association recommendations, and guidelines have been published to safely perform

endoscopic procedures in the pandemic. During the pandemic process, we made some operational changes in our endoscopy unit to provide health services and avoid patient victimization. A triage point was established to question the patients in terms of their general health status and suspicious contact with the questionnaire and to evaluate them at the endoscopy entrance. Ventilation of waiting areas and resting areas was provided. Healthcare professionals, patients, and companions were made to comply with the social distance rule. The number of attendants of the patients was limited to one person. PPE was stocked in the endoscopy unit for personnel and patient safety and was fully presented to the personnel in each procedure. We have not implemented the method for delaying non-urgent endoscopy to reduce the patient burden, which is widely accepted worldwide, to reduce the virus exposure of healthcare workers, and to balance the workforce of healthcare professionals for pandemic services. As the only active endoscopy center in the province with a population of approximately 600,000, including its districts, we took care to work without selecting patients and without interrupting service.

Endoscopy personnel was trained on personal hygiene, frequent hand washing, methods for putting on and taking off PPE, and their sequences. Non-clinical front desk personnel were also trained on hygiene, mask, and social distance rules. N95 masks, waterproof apron, bonnet, face shields, and glasses were provided to the healthcare workers before the procedure. In line with the recommendations of many experts, local anesthetic sprays were not used due to the concern that they would produce an aerosol. The desire to gag was minimized by providing adequate sedation. Since the endoscopes were reused after each procedure was disinfected by the protocols. As few personnel as possible were assigned while treating patients who were treated for COVID-19 infection and needed urgent endoscopy in the hospital. Since the virus can survive for a long time on some surfaces after these processes, extensive disinfection was performed after the procedure. The symptoms of the healthcare professionals performing the procedures were closely followed.

After the detection of infected individuals with mutations in our country and the increase in the number of positive cases per day, PCR test before endoscopy was started to be applied in our endoscopy unit. We have been doing this application for the past 3 months. Gender, age, and type of procedure were recorded for each patient. During the

pandemic process, those infected with COVID-19 among the healthcare personnel working in the Endoscopy Unit were registered. The patients were recorded as those who were known to have COVID-19 infection, those with and without PCR test before the procedure.

This study has been approved by the Republic of Turkey Ministry of Health for Scientific Research Platform (2021-03-28T18_57_14).

Statistical Analysis

SPSS 16.0 software was used for statistical analysis. Mean±SD, number, and percentage values were given for descriptive data.

Results

The data of the gender, age, and endoscopic procedures of 5986 patients included in the study are presented in Table 1. Of all the patients who underwent endoscopy during the pandemic process, 3722 were men (62.2%) and 2264

Table 1. Gender and age distribution of patients who underwent endoscopy and types of endoscopic procedures

	n	%
Age range		
<30	616	10.29
≥30–60	3543	59.18
≥60	1827	30.52
Median age	53	–
Gender		
Male	3722	62.17
Female	2264	37.83
Types of endoscopic procedures		
Gastroscopy	3824	63.8
Foreign body removal with emergency gastroscopy	31	0.51
Gastroscopic polypectomy	77	1.28
Emergency gastroscopy in upper GI bleeding	19	0.31
Endoscopic percutaneous gastrostomy	29	0.48
Colonoscopy total	1606	30
Rectoscopy and sigmoidoscopy	205	2.68
Colonoscopic polypectomy	190	3.17
Emergency colonoscopy	5	0.08
Volvulus detorsion		

Table 2. GEndoscopy procedures performed on COVID 19 (+) patients, PCR test distributions, COVID 19 infection distribution of healthcare professionals

	n	%
COVID-19 (+) patients	13	100
COVID-19 (+) percutaneous endoscopic gastrostomy	4	30.76
COVID-19 (+) Emergency gastroscopy in upper GI bleeding	9	69.24
Patients who underwent PCR before the procedure	1094	18.28
Patients without PCR before the procedure	4892	81.73
Personnel in charge of endoscopy	24	100
Personnel in charge of endoscopy and infected with COVID-19	3	12.5

were women (37.8%). The mean age of the patients was 53±12 (17–85). Gastroscopy was performed in 3824 (63.8%) patients, and colonoscopy was performed in 1606 (30%) patients. Rectoscopy and sigmoidoscopy 205 (2.68%), colonoscopic polypectomy 190 (3.17%), gastroscopic polypectomy 77 (1.28%), foreign body removal by emergency gastroscopy 31 (0.51%), endoscopic percutaneous gastrostomy 29 (0.48%), emergency gastroscopy for upper gastrointestinal bleeding 19 (0.31%) and 5 (0.08%) emergency colonoscopy for volvulus detorsion was performed.

The endoscopic intervention was performed in 13 patients who were known to be infected with COVID-19 and were hospitalized. Of these procedures, 4 (30.76%) were percutaneous endoscopic gastrostomy, 9 (69.24%) were urgent endoscopy for upper gastrointestinal bleeding.

In our clinic, routine PCR testing before the endoscopic procedure was initiated after mutant virus forms were seen in our country. Before this application, 4892 patients (81.73%) underwent endoscopic procedures regardless of the PCR result. After starting this application, 1094 (18.28%) patients gave a PCR test before endoscopy. The total number of healthcare workers on endoscopy was 24, and only 2 (8.3%) of them had COVID-19 transmission during the pandemic process (Table 2).

Discussion

In the article, we shared the endoscopy experiences in our hospital during the pandemic process. Except for the patients who had PCR (+) before the procedure, we did not

make any restrictions on elective endoscopy procedures. We analyzed the endoscopic procedures performed during this period and the number of our personnel infected with COVID-19. During the pandemic process, we performed high-capacity endoscopic procedures. Besides, after these procedures, COVID-19 transmission was observed in only 2 of our employees. We isolated our infected friends and included them again at the end of their treatment. It has been reported to us by the filiation teams that these infections do not originate from the endoscopy unit and are of social origin.

Despite the strict measures taken since March 2020, when the first case was seen in Turkey,^[13] the number of cases has gradually increased. The ministry of health has declared mobilization by taking intense measures to combat the COVID-19 epidemic. In this process, our Provincial Health Directorate declared all state hospitals in the provinces and districts as pandemic hospitals to combat COVID-19. During the pandemic, one of the leading services stopped in state hospitals was endoscopy services. Doctors and staff in charge of endoscopy were assigned in other fields in combating the pandemic. Our university hospital was the only center in our city where endoscopy was performed. For this reason, our University Hospital has decided to continue Endoscopy services without interruption. Many centers in Germany and Northern Italy have gone slowing down their endoscopy services. Many centers in Germany have reduced it to 40–60%.^[14] There was a severe pandemic process in Italy and many endoscopy centers worked with a capacity of 1–25%.^[15] In a national observation about endoscopy in England, it was reported that Gastroscopy, colonoscopy, and sigmoidoscopy decreased by 86%, 90%, and 91%, respectively, during the pandemic process.^[16]

The reduction of endoscopy procedures during the pandemic will have economic implications as well as health-related implications. In the United States, 17.7 million endoscopic procedures are performed annually. Simultaneously, around 136 billion dollars are spent annually on GIS diseases.^[17] In Australia, 3.56% of the population undergo endoscopic procedures per year.^[18] The reduction of these transactions during the pandemic process will initially cause a great decrease in economic expenditures for many countries. Alternatively, considering that diseases that have malignancy potential and can be prevented by endoscopic intervention become late and malignant and the stages of cancer patients progress,

economic expenses may increase more. In this respect, there are estimates about the health consequences of its reduction, apart from the economic dimension. It is estimated that there will be a delay in the diagnosis of more than 2800 colorectal cancers and over 22,000 polyps with malignant potential because of the cessation of 6-month endoscopy services in the USA alone.^[17] Also, it can be said that this will increase the 6-month mortality rate of patients with colorectal cancer by 6.5% in the future.^[19] It has been reported that there is a serious decrease in cancer diagnosis in the Netherlands.^[20] All these show that endoscopy services cannot be suspended for a long time and all endoscopy units will inevitably start elective endoscopy procedures as soon as possible.

We believe that it is necessary to use PPE in the endoscopy unit to perform the endoscopy safely. Data published in China reported that the virus transmission is caused by asymptomatic patients at a rate of 44%.^[21] For this reason, we argue that PPE should be used in all endoscopic procedures. In a recent study conducted in China, no virus transmission was observed in any healthcare workers working in the high-risk department for COVID-19 transmission, who pay attention to hand hygiene and use N95 masks.^[22] A medical or surgical mask prevents the transmission of large particles and does not provide safe sealing for COVID-19. However, COVID-19 aerosols are small particles and can be safely sealed with N95/FFP2/FFP3 masks were recommended by the European Society of Gastrointestinal Endoscopy/European Society of Gastroenterology and Endoscopy Nurses and Associates to wear N95 or an equivalent mask, bonnet, goggles, face shield, waterproof gown and double-layer gloves for endoscopy healthcare professionals.^[11] The employees of our clinic have been trained to use PPE and put on and take off in the correct order, and a harmonious relationship with the hospital management has been established in providing complete PPE in all procedures.

When performing endoscopy on patients known to be infected with COVID-19, endoscopists and auxiliary personnel are recommended to use cap, goggles, face shield, N95 mask, waterproof disposable gowns, and PPE up to shoe covers.^[23] Again, the anesthesiologist/technician responsible for this procedure must use PPE fully. The endoscopist should ensure hand disinfection by removing the PPE in another area before entering the section where he will enter the notes in the system.^[23] In our clinic, complete PPE, use of as few personnel as possible, removal

of PPE under appropriate conditions after the procedure, disinfection of the unit, and ventilation conditions for at least 6 h were provided in the procedures of COVID-19 infected patients with endoscopy. After the endoscopy was performed on patients infected with COVID-19, there was no COVID-19 infection in any healthcare workers.

The PCR test was not applied to patients who underwent endoscopy for about 8 months during the pandemic. The PCR test was applied to all patients 24–48 h before the procedure due to the severe increase in the number of daily cases and the increase in the number of mutated viruses in the last 4 months. Performing the PCR test before endoscopy is an effective strategy to restart endoscopy.^[24] In cases with negative PCR test results, elective endoscopy was performed and the procedure of positive cases was postponed until after treatment and quarantine. We did not find it meaningful to compare the period we worked without a PCR test and the period we worked by taking a PCR test, as there were significant differences in the number of daily cases in our country in both periods.

There are some limitations due to the retrospective nature of the study. First of all, longer-term results may be needed as the COVID-19 pandemic is still increasing. Another limitation is that the PCR test could only be performed on personnel when symptomatic due to health policies, and it should not be ruled out that there may be asymptomatic infected personnel. Another limitation is the sharing of our experiences as a single center. Using it together with data from different centers can give more reliable results.

Conclusion

The postponement of elective endoscopic procedures will cause late diagnosis of malignant diseases or precancerous lesions that have the risk of transformation into malignancy. As a result, survival rates in cancer patients will decrease and precancerous lesions will be deprived of potentially curative treatment before they turn into cancer. We suggest that endoscopic procedures can be performed safely under pandemic conditions, with arrangements in the endoscopy unit, complete procurement of PPE, training of healthcare professionals, and pre-procedure PCR.

Disclosures

Ethics Committee Approval: This study has been approved by the Republic of Turkey Ministry of Health for Scientific Research Platform (2021-03-28T18_57_14).

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