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# Management of surgical oncology patients during the COVID-19 pandemic: Short-term results

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## Abstract

**Aim:** In our study, the effect of the pandemic on the treatment of surgical oncology patients and its short-term results were investigated. The Coronavirus Disease 2019 pandemic has put a heavy burden on healthcare institutions. During this period, treatment of many diseases, including cancer patients, have been disrupted.
**Methods:** Our study was designed as a retrospective, observational study. It was investigated to what extent the treatment of patients receiving cancer treatment was affected and what changes were made in the management of patients diagnosed with cancer during the pandemic period.
**Results:** The 148 cancer cases were discussed at Multidisciplinary Meetings (MDM) held in our clinic between December 2019 and May 2020. Of the patients, 76 (51.4%) had gastrointestinal system malignancies, 39 (26.3%) had breast malignancies, and the rest had other malignancies. There was no statistically significant difference between the mean number of cancer cases discussed in MDMs held in pre-pandemic and pandemic periods. However, it was observed that there was a statistically significant decrease in the number of operations performed during the pandemic period ($p < 0.001$). The treatment protocol of 14 malignancy patients was changed due to the pandemic. Of these patients, 10 were diagnosed with colorectal, 2 with gastric, 1 with breast cancer and 1 with gastrointestinal stromal tumor.
**Conclusion:** According to the short-term results in our study, delaying surgical treatment for a while in some oncological patients and administration of systemic chemotherapy during this period when considered necessary did not have a significant negative effect on the course of the disease.



## Introduction

The disease, which emerged in China in December 2019 and entered the literature as "Coronavirus Disease 2019 (COVID-19)", was declared as a pandemic by the World Health Organization on March 11, 2020 (1). Due to the rapid spread of the disease all over the world, it was observed that the health system infrastructure in many countries was insufficient in the face of the pandemic. During this period, most of the bed and intensive care unit capacity of hospitals was reserved for COVID-19 patients, and almost all elective surgeries were postponed. During the pandemic process, undesirable problems occurred especially in the surgical treatment of oncological patients. In order for oncological patients to overcome this process without harm or with minimal harm, many guidelines have been created from different countries regarding the treatment approaches and surgical treatment methods. These guidelines are generally based on the observations and experiences of health professionals and may differ from country to country. However, in oncological patients, it is recommended to make a surgical decision with a multidisciplinary approach, taking into account the patient's condition, hospital conditions and benefit-harm balance (2-6).

Some changes in the follow-up and treatment protocols of oncological patients have become necessary due to the pandemic. During pandemic period, our institution served as a pandemic hospital and elective surgeries due to benign diseases were postponed, and some mandatory restrictions were imposed on operations performed due to malignant diseases. As a result of the decrease in the number of COVID-19 patients, elective surgeries have started gradually as of June 2020.

In our faculty, a Multidisciplinary Meeting (MDM) is held once a week. The diagnosis, treatment and follow-up stages of oncological patients are discussed in these meetings in the light of current literature, and joint decisions are made. During the pandemic process, these meetings continued to be held by taking the necessary precautions, and decisions were taken by considering the recommended guidelines, the facilities of our hospital and the situation of each patient individually discussed.

In our study, it was planned to investigate the extent to which

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**Table 1.** Distribution of diagnoses of patients discussed in MDMs in pre-pandemic and pandemic periods

| | | Group1 | Group2 | Total |
|---|---|---|---|---|
| Diagnoses of patients discussed in MDMs | Colorectal cancer | 34 | 13 | 47 |
| | Gastric cancer | 17 | 12 | 29 |
| | Breast cancer | 29 | 10 | 39 |
| | Thyroid malignancy | 12 | 4 | 16 |
| | Pancreatic cancer | 3 | 5 | 8 |
| | Other | 5 | 3 | 8 |
| | Total | 100 | 48 | 148 |

the treatment protocols planned for oncological patients in the pre-pandemic period could be applied in the pandemic period in our clinic, what strategy was followed in the management of oncological patients during the pandemic process, and the effects of changes in the treatment protocols of patients in the short term.

## Methods

The study was designed as a retrospective, observational study. For the study, 20-KAEK-234 numbered ethics committee approval from was obtained.

Our Surgical Oncology clinic has been operating in a tertiary university hospital. MDM is held on Tuesdays with the participation of faculty members from General Surgery, Surgical Oncology, Medical Oncology, Radiation Oncology, Nuclear Medicine, Pathology and Endocrinology departments. At the MDMs, patients with suspected cancer, diagnosed with cancer or operated due to cancer and had pathology results are discussed in the light of current literature, and joint decisions are made regarding the diagnosis, treatment or follow-up protocols of the patients. Consensus decisions made at the council are recorded and reported to patients after the council. If the patients accept the recommendations, management of the patients are arranged in line with these decisions. During the COVID-19 pandemic process, MDMs continued to be organized in a large hall with good ventilation, paying attention to social distance rules and all participants wearing surgical masks. After the electronic infrastructure of the hospital system was completed, the meetings were held remotely online.

In the study, the decisions made for each patient in MDMs between December 1, 2019 and May 31, 2020 was obtained from the meeting book. The demographic information of the patients, their diagnoses, and the decisions made as a result of the council, and the information regarding the subsequent diagnosis, treatment and follow-up processes were searched from the hospital database between 01.12.2019 and 31.08.2020.

The extent to which the treatment decisions (such as surgery after neoadjuvant chemo-radiotherapy) could be applied in the next period and the problems that occurred were investigated at the meetings between December 1, 2019 and March 20, 2020, which is the period before our hospital was declared as a pandemic hospital. It was investigated what changes were made in the decisions taken in the MDMs between March 21, 2020 and May 31, 2020, when our hospital served as a pandemic hospital, and whether these changes caused disruption in the diagnosis, treatment and follow-up processes of oncological patients.

During the pandemic period, the operations of oncological patients requiring emergency surgery such as obstruction and bleeding due to malignancy were performed without delay, by taking necessary precautions. Those whose conditions were suitable for conservative follow-up were followed up under conservative treatment in the surgical oncology service.

Routine COVID-19 diagnostic test was not applied to patients before surgery. During the surgery, the operation team used double-layer surgical masks and occasionally visors. The planned surgery technique (laparoscopic-open) was not changed due to the pandemic. Care was taken for all patients and their attendants to wear a surgical mask in the surgical oncology service. During the peak period of the pandemic (April 2020), approximately 40% of the hospital bed capacity had COVID-19 positive patients. All intensive care beds were reserved for pandemic patients, except for emergencies.

Descriptive analyses were performed to provide information on general characteristics of the study population. Quantitative data were expressed as median and interquartile range. Independent samples t test was used to compare the normally distributed variables between the groups. A p-value $< 0.05$ was considered significant. Statistical analyses were performed using SPSS 19 (IBM SPSS Statistics 19, SPSS Inc.).

## Results

Between December 2019 and May 2020, there were 148 malignancy cases discussed in MDMs. Of the patients, 79 (53.4%) were female, and their mean age was 61.7 ± 13.1 years. Of the patients discussed in the council, 76 (51.4%) had gastrointestinal system malignancies, 39 (26.3%) had breast malignancies, and the rest had other malignancies (Table 1).

A total of 100 cases were discussed in 16 multidisciplinary council meetings held between December 1, 2019 and March 20, 2020 (Pre-pandemic period: Group 1). A total of 48 cases were discussed in 9 meetings held between March 21 and May 31, 2020 (pandemic period: Group 2). There was no statistically significant difference in the number of patients discussed per meeting ($p = 0.36$).

During the pre-pandemic period, 113 patients were operated on 47 operating tables, while 26 patients were operated on 28 operating tables during the pandemic period. During the pandemic period, a statistically significant decrease was observed in the number of patients operated compared to the number of the operating table (Table 2).

Emergency surgery due to perforation or obstruction was performed in 8 (7.1%) of 113 patients who were operated before the pandemic. On the other hand, during the pandemic period, 5 (19.2%) of the 26 patients who were operated were first applied surgical treatment for obstruction.

In patients who received neoadjuvant chemo-radiotherapy (CRT) and were operated for rectal cancer in the pre-pandemic period, the time until surgery after neoadjuvant CRT was 83 ± 23.3 days, while this period was found to be 129 ± 24.8 days during the pandemic period ($p < 0.05$). No statistically significant difference was found in any of the patients who were operated due to gastric, colon, breast and thyroid malignancies, when the time from diagnosis or termination of neoadjuvant therapy to surgery was compared between the groups (Table 3).

The treatment protocol of 10 (21.3%) of 47 patients discussed at the council with the diagnosis of colorectal malignancy was

**Table 2.** The number of operations performed pre-pandemic and pandemic periods

| Group | Number of operating tables | Number of patients operated on | Average number of operations per operating table | Standard deviation | p value |
|---|---|---|---|---|---|
| 1 | 47 | 113 | 2.4 | 1.03 | <0.001 |
| 2 | 28 | 26 | 0.9 | 0.54 | <0.001 |

**Table 3.** Interval until surgery in pre-pandemic and pandemic periods

| Diagnoses | Group | Number of | Average interval to surgery (days) | Standard deviation | p value |
|---|---|---|---|---|---|
| Rectal cancer (after neoadjuvant radiotherapy) | Group 1 | 3 | 83 | 23.3 | 0.03 |
| | Group 2 | 6 | 129.3 | 24.8 | |
| Colon cancer | Group 1 | 13 | 23.5 | 16 | 0.54 |
| | Group 2 | 6 | 36.7 | 48.8 | |
| Breast cancer (after neoadjuvant chemotherapy) | Group 1 | 6 | 29.5 | 8.1 | 0.2 |
| | Group 2 | 7 | 36.7 | 10.6 | |
| Breast cancer | Group 1 | 12 | 14.8 | 12.8 | 0.56 |
| | Group 2 | 4 | 19 | 13.3 | |
| Gastric cancer (after neoadjuvant chemotherapy) | Group 1 | 2 | 39 | 35.4 | 0.78 |
| | Group 2 | 6 | 34.2 | 15.0 | |
| Gastric cancer | Group 1 | 6 | 14.8 | 6.8 | 0.66 |
| | Group 2 | 3 | 18.3 | 17.2 | |
| Thyroid malignancy | Group 1 | 9 | 41.6 | 21.5 | 0.34 |
| | Group 2 | 3 | 59 | 39.9 | |

changed due to the pandemic. The total number of cancer patients whose treatment process was affected by the pandemic was 14 (9.5%) (Table 4).

Patients with a diagnosis of rectal cancer who received neoadjuvant CRT and from whom a clinically complete response was obtained were informed about the wait-and-see protocol. Four patients wanted to be followed-up by this protocol. One of these patients was in the pre-pandemic period, and three were in the pandemic period. No recurrent mass was observed in any of the patients in the colonoscopy and biopsy performed approximately 3 months later. No metastasis was observed in the radiological examinations of these patients.

There were no cases of COVID-19 infection in doctors participating in MDMs, doctors, nurses and other assistant staff in our Surgical Oncology clinic and operating room until May 31, 2020. In addition, there were no patients who were positive for COVID-19 in the study group between the observed dates.

## Discussion

In regions where the pandemic is intense and hospital capacity is limited, it is recommended to avoid major surgical procedures for cancer as much as possible, and to manage complications such as obstruction and bleeding by endoscopic methods (5). Considering the situation of our hospital, it is not possible to choose endoscopic procedures instead of surgery due to the lack of trained personnel and materials for advanced endoscopic procedures. The referral of patients to other cities for endoscopic procedures was not considered appropriate due to the fact that the pandemic was more intense in big cities, the occupancy rates of the hospitals there were higher, and the patients did not want to travel because of the risk of contamination. Especially during periods of intense pandemic, the need to manage oncological patients in local hospital conditions has arisen.

During the pandemic period, there is intensity and commotion in hospitals. In this period, it is important to prevent cancer patients from disappearing in the commotion and to continue their treatment by minimizing the effect of the pandemic. In this period, applications of routine treatment protocols has become harder. Multidisciplinary meetings should continue in order to protect cancer patients from the commotion and to determine the best treatment option within the bounds of possibility for them. It should be preferred to hold meetings remotely online.

It has been reported that the rates of diagnosis in many types of cancer have decreased significantly during the pandemic period (7). In our study, it was observed that there was no statistically significant difference in the number of patients evaluated at the multidisciplinary council meetings during the pandemic period compared to the previous period. Based on this, we can conclude that there is no decrease in cancer diagnosis rates in our hospital. We think that this is due to the fact that the intensity of the pandemic in our city and hospital is not excessive. The pandemic has spread more rapidly in cities with a high population density, placing a huge burden on the health system. This has led to the use of ventilators even in the operating room for COVID-19 patients in many healthcare institutions, thus delaying all elective operations and oncological operations. Oncology centers in regions with low population density and less affected by the pandemic may be more effective in the treatment management of cancer patients during this period.

In our clinic, the number of operations performed during the pandemic period had decreased considerably. This may cause

**Table 4.** Patients whose treatment protocol has affected due to the pandemic

| P. No | Age | Sex | Diagnosis | MDM decision | Impact of the pandemic | Postoperative histopathology | Tumor regression grade | Recent situation |
|---|---|---|---|---|---|---|---|---|
| 1 | 60 | M | Gastric cancer (after neoadjuvant chemotherapy) | Surgery | 45 days delay in surgery | Tis N3b | RYAN:Grade 3 | Adjuvant chemotherapy continues |
| 2 | 72 | F | Recurrence of GIST | Surgery | Surgery postponed | | | Imatinib treatment continues |
| 3 | 67 | F | Breast cancer | Surgery | Surgery postponed | | | Neoadjuvant chemotherapy continues |
| 4 | 61 | M | Gastric cancer (after neoadjuvant chemotherapy) | Additional chemotherapy | 3 additional cycles of chemotherapy were given until surgery | T4a, N3b | RYAN: Grade 2 | Adjuvant chemotherapy continues |
| 5 | 59 | M | Rectal cancer (after neoadjuvant radiotherapy) | Surgery | 45 days delay in surgery | Peritonitis carcinomatosis | No response to treatment | Exitus due to pneumonia 40 days after the operation |
| 6 | 64 | F | Operated colon cancer, liver and peritoneal recurrence | Cytoreductive surgery and HIPEC | No suitable center was found for the procedure | | | chemotherapy continues |
| 7 | 56 | M | Colon cancer | Surgery | The patient did not want surgery during the pandemic period. Surgery was delayed for 4 months. | T3N0 | | surveillance |
| 8 | 56 | F | Rectal cancer (after neoadjuvant radiotherapy) | Surgery | Surgery was delayed for 4 months, 4 cycles of additional chemotherapy was given. | T2N0 | RYAN: Grade 1 | Adjuvant chemotherapy continues |
| 9 | 67 | M | Rectal cancer (after neoadjuvant radiotherapy) | Surgery | Surgery was postponed and 3 additional cycles chemotherapy was given. | | Radiological complete response | The patient does not want to undergo surgery. Surveillance continues |
| 10 | 87 | M | Rectal cancer and Liver metastasis | Short course radiotherapy | Surgery was postponed, additional chemotherapy was given | | Radiological partial response | The patient does not want to undergo surgery. Chemotherapy continues |
| 11 | 55 | M | Operated Rectum Cancer | Closure of the colostomy | Surgery Postponed | | | Chemotherapy continues |
| 12 | 72 | M | Rectal cancer (after neoadjuvant radiotherapy) | Surgery | Surgery was postponed, additional chemotherapy was given for 12 weeks | T3N0 | | Adjuvant chemotherapy continues |
| 13 | 69 | M | Rectal cancer (after neoadjuvant radiotherapy) | Surgery | Surgery delayed about 2 months | T0N0 | Pathological complete response | Chemotherapy continues due to suspected lung metastasis. |
| 14 | 75 | F | Rectal cancer (after neoadjuvant radiotherapy) | Surgery | Surgery delayed about 2 months | T3N0 | RYAN: Grade 1 | Preventive chemotherapy continues. |

concerns about disruption in the treatment of cancer patients, especially those requiring surgery. According to the short-term results in our study, delaying surgical treatment for a while in some oncological patients and administration of systemic chemotherapy during this period when considered necessary did not have a significant negative effect on the course of the disease. One patient with a diagnosis of rectal cancer who was operated 45 days after the planned surgery time had peritoneal carcinomatosis which was not seen in preoperative radiological imaging detected during surgery. Although it is not possible to prove that peritoneal spread did not occur during the 45-day delay period in this patient, we think that peritoneal spread, which could not be detected by radiological methods, might exist before in this patient with a diagnosis of locally advanced rectal cancer and showed a minimal response to neoadjuvant therapy. COVID-19 infection has high mortality rates in oncological patients due to advanced age, high rate of concomitant diseases, immunosuppression due to cancer and surgery(5). In treatment planning in oncological patients, the delicate balance between the risk of transmission and the risk of disease progression should be considered, and the treatment approach should be determined with a multidisciplinary approach, considering the hospital facilities.

Cancer diagnosis and treatment process can cause serious psychological problems such as anxiety and depression in patients. The COVID-19 pandemic process has increased the rates of depression and anxiety in people on a global scale(8). The psychological burden of the patients who are already under a heavy psychological burden due to cancer has increased due to the fear of being infected and/or the fear of disrupting their treatment during the pandemic period. We think that this situation may have an effect on the decisions made by patients during their treatment process. Patients should be informed about treatment options, and detailed information about the risks that may occur due to the pandemic and treatment should be given. In our clinic, rectal cancer patients with complete clinical response after neoadjuvant therapy are informed about the wait-and-see strategy. It has been shown that the wait-and-see strategy reduces mortality and morbidity in the short term in patients with rectal cancer who completely and clinically respond to neoadjuvant therapy (9). The wait-and-see strategy may be an appropriate approach in rectal cancer patients with clinical complete response, particularly during the pandemic period, until the time when hospital conditions are appropriate.

The short-term results of our study, the low number of cases and the evaluation of oncological cases in different protocols together constituted the limitations of our study. An effective treatment for COVID-19 has not yet been found. It is not clear how effective the few vaccines that have recently been introduced will be. There are still concerns that the disease will continue due to the mutation of the virus. In our study, it was observed that making some changes in the treatment protocols of cancer patients due to the pandemic did not have a significant effect on the course of the disease in the short term. Until an effective treatment or vaccine is found, it is obvious that health systems will continue to have difficulties in the face of pandemic due to the intensity and high risk of transmission. This situation may cause longer and longer disruptions that may lead to bad results such as losing the chance of curative treatment in the diagnosis and treatment processes of cancer patients. We think that it will be beneficial to establish appropriate centers in order for the diagnosis, treatment and follow-up processes of oncological patients to continue effectively during the pandemic period, which is expected to continue for a while. If possible, it would be beneficial to purify these centers from COVID-19 patients and to provide cancer patients with a good psychological support as well as medical treatment.

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