

Effects of COVID-19 pandemic in a breast unit: is it possible to avoid delays in surgical treatment?

Running Title: Pandemic effects in a non-infected hospital

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ABSTRACT

Background: COVID-19 pandemic has caused fear all around the world. With people avoiding hospitals, there has been a significant decrease in outpatient clinics. In this study, we aimed to compare and explore the first-peak of the pandemic period by studying its effects on patient applications, new diagnoses, and treatment approaches in a non-infected hospital.

Methods: We collected data from the first peak of the pandemic period in Turkey, from the pandemic's declaration (March 11, 2020) to social normalization (June 1, 2020), and compared it with data from a pre-pandemic period with a similar length of time. We analyzed the data of breast cancer patients from application to surgery.

Results: The data of 34,577 patients were analyzed for this study. The number of patients who applied to outpatient clinics decreased significantly during the pandemic period. After excluding control patients and benign disorders, a figure was reached for the number of patients who had a new diagnosis of breast cancer (146 vs 250), were referred to neoadjuvant treatment (18 vs 34), and were treated with surgery (121 vs 229). All numbers decreased during the pandemic period, except for surgeries after neoadjuvant treatment (29 vs 27). Surgical treatment approaches also changed. However, the rate of newly diagnosed breast cancer patients treated with surgery was similar in both periods. None of these patients were diagnosed with COVID-19 or died during the pandemic.

Conclusion: This study shows that non-infected hospitals can be useful in avoiding delays in the surgical treatment of cancer patients.

KEYWORDS: COVID-19, pandemic, breast cancer, non-infected hospital

WHAT IS ALREADY KNOWN ABOUT THIS TOPIC?

The COVID-19 pandemic has caused fear worldwide. Curfews, social distancing, and hospital avoidance have reduced routine controls and screening programs. Throughout the pandemic, some new algorithms were published for breast cancer treatment, which were suggested postponing surgical treatment for low-risk patients because of the increased infection risk in hospitals. However, we have seen postponing can not be a solution.

WHAT DOES THIS ARTICLE ADD?

The effects of the Sars-CoV-2 pandemic and its spread continue to be seen. Another way has to be found for the treatment of cancer patients but postponing surgical treatment or risking their lives in hospitals. Non-infected hospitals may be the answer to this issue.

1 | INTRODUCTION

The COVID-19 pandemic has caused fear all around the world. Curfews, social distancing, and hospital avoidance have led to a reduction in routine controls and screening programs. Over the course of the pandemic, some new algorithms were published for breast cancer treatment¹⁻⁴. Most of the algorithms suggested postponing surgical treatment for low-risk patients because of the increased infection risk in hospitals. Also, it was suggested that screening and routine diagnostic imaging be deferred to a later date.

Surgery is an important part of the treatment for breast cancer patients. Postponing surgical treatment may cause a progression in the cancer stage, or a patient may lose her chance to have breast-conserving surgery.

In this study, we aimed to compare and explore the pandemic period by studying its effect on patient applications, new diagnoses, and treatment approaches for breast cancer patients in our hospital.

2 | METHODS

2.1. | Study design: This single-center, retrospective, observational cohort study includes patients who were admitted and treated in the breast unit of the University of Health Sciences Ankara Oncology Hospital between December 21, 2019 and June 1, 2020. Data were collected from the hospital database.

2.2. | Ethical consideration: The data were collected retrospectively and approved by our institutional ethics committee. Also, we obtained permission for this study from the Turkish Ministry of Health Scientific Research Commission (Approval Code: 2020-07.10T00_25_31) and Institutional Review Board (Approval Code: 2020-08-04-99).

2.3. | Patient selection & method:

The WHO declared COVID-19 pandemic on March 11, 2020 ⁵. According to the Turkish Ministry of Health statistics, a rapid increase of infected patients was seen in the first month of the pandemic; however, the situation stabilized in June 2020 ⁶. Between March 11 and June 1, 2020, most of the population was advised to stay at home. Since June 1, our country has seen the onset of social normalization.

In Turkey, hospitals were classified into three groups: pandemic hospitals, non-infected hospitals that do not admit any patients with proven COVID-19, and combined hospitals that admit both COVID-19 patients and others. Our hospital was in the second group. We continued both emergency surgeries and malignancy procedures but did not admit patients with either suspected or proven COVID-19.

In this study, patients were explored in two groups. The first group was from the pandemic period, i.e. March 11, 2020, to June 1, 2020. The second group was from a similar period (82 days) before the pandemic.

For these two groups, patients who applied to our outpatient clinics were analyzed. After excluding other medical conditions, 11,479 patients were analyzed to explore diagnoses and treatment approaches for patients with breast disorders. Control patients and benign breast disorders were excluded to analyze breast cancer patients particularly.

2.4. | Working in a non-infected hospital during the pandemic:

An outpatient clinic for patients who were suspected to be infected with Sars-CoV-2 was established in the garden of the hospital. In this way, neither suspected nor infected patients entered the hospital. The emergency room entrance was also separate.

At all of the hospital's entrances, patients were given a temperature check, and those with fever were referred to the separate outpatient clinic mentioned above.

There was a separate inpatient clinic and intensive care unit for isolating suspected patients who already had surgery.

All patients were given a PCR test for Sars-CoV-2 before both hospitalization and surgery. We tried to make diagnoses and perform staging, preoperative preparations, and treatment decisions permanently in outpatient clinics. We did not hospitalize patients before their operations without necessary situations.

We also tried to shorten hospitalization time and discharged patients immediately after surgery unless any complications occurred.

Before discharging patients, we educated them about postoperative wound care, possible risks or complications, and protection from Sars-CoV-2 infection.

We did not operate on patients who had benign diagnoses without suspected malignancy or non-emergency cases during the pandemic period.

The number of surgeries was limited for each operating room in order to reduce personnel exposure and limit the risk of spreading infection.

2.5. | Statistical analysis: Patient characteristics were given as numbers and percentages, and continuous data were given as the median value (minimum-maximum). The numbers for admissions, breast cancer diagnoses, operation types, and pathological results of each group were compared.

Means, ranges, and percentiles were calculated for continuous variables. All analyses were performed with SPSS software (version 21.0; SPSS Inc., Chicago, IL).

3 | RESULTS

We explored a total of 34,577 patients who applied to outpatient clinics in our hospital. With the declaration of the pandemic, the number of applications to our outpatient clinics noticeably decreased (Figure 1). After excluding other medical conditions, there were 11,479 patients with breast disorders. There were 2,420 patient who had breast cancer in our outpatient clinics (Table 1).

There were 250 patients who had a breast cancer diagnosis before the pandemic (Group 2) and 146 during the pandemic period (Group 1). New breast cancer diagnoses comprised 5.2% of all applications to the breast unit in the first group and 2.8% in the second group. There were more patients in the second group with benign disorders and follow-ups.

Three hundred and fifty surgically treated patients were analyzed in particular. The median age was 51 (range: 20-82).

Before the pandemic, 143 of 250 patients (57.2%) underwent breast cancer surgery, and 34 (13.6%) of newly diagnosed breast cancer patients were referred to neoadjuvant treatment.

During the pandemic period, 89 of 146 patients (60.9%) had surgery for breast cancer, and 18 (12.3%) patients were referred for neoadjuvant treatment.

The mastectomy rate slightly increased during the pandemic, with 61 patients (68.5%) in the first group and 92 (64.3%) in the second group. The positivity rate of sentinel lymph node biopsies also saw an increase in the pandemic period. There were 19 patients (30.1%) who had metastatic sentinel lymph nodes in group 1 and 25 patients (23.1%) in group 2 (Table 2). Patients had bigger tumors and more lymph node metastases in the pandemic period (Table 3). Further, there were more DCIS patients but no significant changes in the pathological type of tumors.

There were 12 benign operations during the pandemic period. Indications for these operations were biopsies to diagnose granulomatous mastitis, abscess, phyllodes tumors, and growing masses suspected of malignancy.

We had no COVID-19 positive patients during this period.

4 | DISCUSSION

Our hospital is a reference center for cancer patients. During the pandemic period, travel restrictions made it difficult to reach the hospital for some patients. Also, the fear of infection while visiting the hospitals caused patients to be wary of hospitals, leading to a noticeable decrease in applications to outpatient clinics.

Breast cancer screening programs could not work effectively during the pandemic. Screening programs and routine diagnostic imaging were deferred. However, symptomatic patients were diagnosed.

More patients who already had a symptomatic disease and needed treatment came to our hospital during the pandemic, but there were fewer follow-up patients and patients with benign disorders. There were fewer wire-guided biopsies in the pandemic period due to the deferrals of the routine screening programs. The rate of patients diagnosed with breast cancer increased during the pandemic as a result of the decrease of patients with benign disorders.

Most of the guidelines suggested postponing surgical treatment for low-risk patients ¹⁻⁴. In an international survey of the European Breast Cancer Research Association of Surgical Trialists (EUBREAST), the results show that considerably modified management for breast cancer treatment during the COVID-19 pandemic ⁷.

The European Society for Medical Oncology (ESMO) recommended priority-setting of health interventions in oncology during COVID-19 ⁸. They categorized the new diagnosis of breast cancer as a high priority as well as symptomatic patients or those with BI-RADS 5 mammograms. Non-invasive breast cancers and BI-RADS 4 mammograms in asymptomatic patients were categorized as medium priority. However, they also suggested postponing primary surgery up to 12 weeks for low-risk early breast cancer patients.

We limited surgical operations with high and medium priority patients in our hospital. On the other hand, as we worked in a non-infected hospital, most of our surgeons did not postpone surgical operations for early breast cancer patients.

The rate of surgically treated patients in newly diagnosed breast cancer patients were similar. The rate of malignant procedures was higher in the pandemic period due to the reduced number of benign procedures performed. We did not perform benign procedures except for emergencies and suspected malignancies.

Fear may have affected patients' decision-making process and caused them to be more anxious about the spread of COVID-19 ⁹. Both patients and surgeons might have preferred more non-complicated processes in order to decrease the amount of time spent in hospitals. Besides, our results show that patients seen during the pandemic period had larger tumors with more axillary metastases (Table 3). This may be related to people waited longer to be seen during the pandemic because of their fear of going to a hospital. Or more severe cases applied to hospitals than patients with asymptomatic tumors. Furthermore, the rate of

surgeries after neoadjuvant treatment was higher in the second group. As a result, there was a slightly increased mastectomy rate and a significant increase in SLNB positivity rates.

The number of breast cancer operations after neoadjuvant treatment did not change because their treatments had already been planned. Also, the rate of patients referred to neoadjuvant therapy was similar in both groups.

4.1. | Study limitations: There are limitations to our study. We need more data covering a longer period of time to consider the pandemic's effect on the stages of cancer. Also, more data is needed to analyze the second peak of the pandemic, which may cause a severe overloading in hospitals.

5 | CONCLUSION

The hospital in which we were working was a non-infected hospital, so we were able to continue with malignant surgeries under new rules mentioned before. Working in a non-infected hospital allowed us to continue surgical oncology procedures more securely without compromising scientific suggestions in guidelines for cancer patients. There were no significant differences in our treatment approach for breast cancer patients in our hospital and no extra delays for surgery.

The effects of the Sars-CoV-2 pandemic and its spread continue to be seen. Another way has to be found for the treatment of cancer patients but postponing surgical treatment. Non-infected hospitals may be the answer to this issue.

DISCLOSURE: The authors declare that they have no conflict of interest.

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DATA AVAILABILITY STATEMENT: The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

REFERENCES

1. Curigliano G, Cardoso MJ, Poortmans P, et al. Recommendations for triage, prioritization and treatment of breast cancer patients during the COVID-19 pandemic. *Breast*. 2020;52:8-16. doi:10.1016/j.breast.2020.04.006
2. Soran A, Gimbel M, Diego E. Breast Cancer Diagnosis, Treatment and Follow-Up During COVID-19 Pandemic [published correction appears in *Eur J Breast Health*. 2020 July 1st;16(3):228]. *Eur J Breast Health*. 2020;16(2):86-88. Published 2020 March 25th. doi:10.5152/ejbh.2020.240320
3. Tzeng CD, Teshome M, Katz MHG, et al. Cancer Surgery Scheduling During and After the COVID-19 First Wave: The MD Anderson Cancer Center Experience. *Ann Surg*. 2020 Aug;272(2):e106-e111. doi: 10.1097/SLA.0000000000004092. PMID: 32675511; PMCID: PMC7373457.
4. Ng CWQ, Tseng M, Lim JSJ, Chan CW. Maintaining breast cancer care in the face of COVID-19. *Br J Surg*. 2020 Sep;107(10):1245-1249. doi: 10.1002/bjs.11835. PMID: 32880908; PMCID: PMC7461076.
5. World Health Organization (2020). Timeline of WHO's response to COVID-19 [online]. Website <https://www.who.int/news-room/detail/29-06-2020-covidtimeline>; 2020 [accessed 6 December 2020].
6. COVID-19 situation report Turkey [online]. Website <https://covid19.saglik.gov.tr/EN-69532/general-coronavirus-table.html>; 2020 [accessed 06 December 2020].
7. Gasparri ML, Gentilini OD, Lueftner D, Kuehn T, Kaidar-Person O, Poortmans P. Changes in breast cancer management during the Corona Virus Disease 19 pandemic: An international survey of the European Breast Cancer Research Association of

Surgical Trialists (EUBREAST). *Breast*. 2020;52:110-115.

doi:10.1016/j.breast.2020.05.006

8. de Azambuja E, Trapani D, Loibl S, et al. ESMO Management and treatment adapted recommendations in the COVID-19 era: Breast Cancer. *ESMO Open*.2020;5(Suppl

3):e000793. doi:10.1136/esmoopen-2020-000793

9. Vanni G, Materazzo M, Pellicciaro M, et al. Breast Cancer and COVID-19: The Effect of Fear on Patients' Decision-making Process. *In Vivo*. 2020;34(3 Suppl):1651-1659.

doi:10.21873/invivo.11957

	Group 1 During pandemics (March 11, 2020 – June 1,2020)	Group 2 Before pandemics (December 21, 2019 – March 10,2020)
Application to outpatient clinics	5872	28705
Number of patients with breast disorders	2793	8686
Number of breast cancer patients	760 (27.3%)	1660 (19.1%)
Breast cancer diagnosis	146 (5.2%)	250(2.8%)

TABLE 1: Differences between the number of patients who applied to outpatient clinics

	Group 1	Group 2
Neoadjuvant treatment	34 (13.6%)	18 (12.3%)
Surgery	121 (86.4%)	229 (87.7%)
Benign procedures	12 (9.9%)	25 (10.9%)
Wire guided biopsies	20 (16.5%)	61 (26.6%)
Malignant procedures	89 (73.6%)	143 (62.4%)
Breast conserving surgery	28 (31.5%)	51 (35.7%)
Mastectomy	61 (68.5%)	92 (64.3%)
Sentinel lymph node biopsy (slnb)	63 (70.8%)	108 (75.5%)
Slnb positive	19 (30.1%)	25 (23.1%)
Slnb negative	44 (69.9%)	83 (76.9%)
Axillary dissection	45 (50.6%)	66 (46.2%)

TABLE 2: Treatment types and operations applied to patients who treated with surgery

	GROUP 1 (PANDEMIC PERIOD)	GROUP 2 (BEFORE PANDEMIC)
Tumor size		
In-situ	7 (7.9%)	7 (4.9%)
T1	14 (15.7%)	48 (33.6%)
T2	58 (65.2%)	75 (52.4%)
T3	9 (10.1%)	12 (8.4%)
T4	1 (1.1%)	1 (0.7%)
Lymph node status		
N0	40 (44.9%)	76 (53.1%)
N1	35 (39.3%)	47 (32.9%)
N2	5 (5.6%)	10 (7.0%)
Pathological diagnosis		
Dcis	7 (7.9%)	7 (4.9%)
Invasive	80 (89.8%)	135 (94.4%)
Others	2 (2.2%)	1 (0.7%)
Dcis	7 (7.9%)	7 (4.9%)

TABLE 3: Pathological tumor sizes and lymph node status of patients who treated surgically

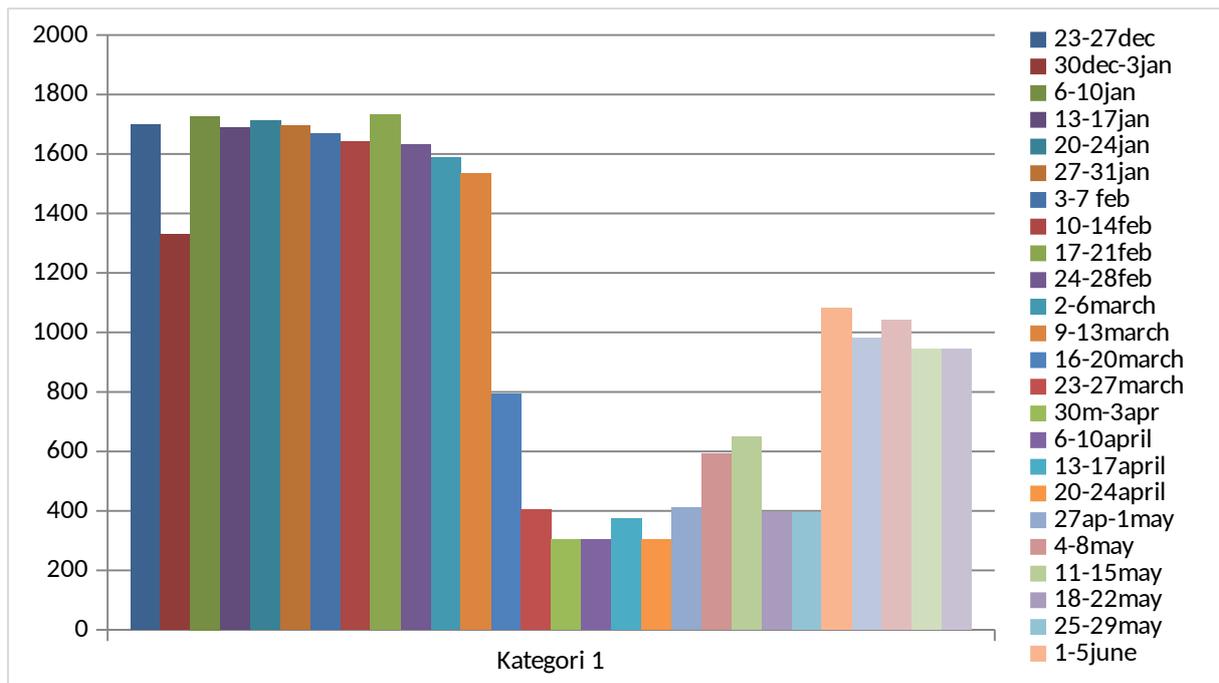


FIGURE 1: Outpatient clinics approval by weeks