Brief Report

The impact of COVID-19 on breast surgery during the height of the New York City pandemic

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Abstract: The COVID-19 pandemic has caused significant changes in cancer care delivery. This report describes the Breast Surgical Oncology Division's experience at a quaternary care hospital within the geographic epicenter of the COVID-19 outbreak in the United States. This is a cohort study of patients scheduled for breast surgery at a single academic institution in New York City (NYC) between March 23 –April 21, 2020. Patients who were scheduled for surgery were prospectively tracked in a surgical database. The primary outcome was the proportion of cases actually performed. Secondary outcomes were the clinical characteristics of the patients who received surgery and the perioperative methods used in this group. Of the 43 cases scheduled, 0% were emergent, 39.5% urgent, and 60.5% elective, and 15 (34.9%) actually had surgery during the study period. Thirty-two patients (74.4%) experienced a surgical delay. The mean delay of an urgent case was 3 days. Two of the patients had a change in surgical plan from bilateral mastectomy with reconstruction and sentinel lymph node biopsy (SLNB) to lumpectomy with SLNB. Only two patients were admitted postoperatively. Of the 17 patients who had localization, the planned localization method differed from the actual method in 7 (42%) patients. Of the 28 patients who did not have surgery during the study period, 8 (28.6%) initiated neoadjuvant endocrine therapy as a bridge to their eventual surgery. We conclude that the surgical management of patients with breast cancer has been significantly impacted at the height of the COVID-19 pandemic in NYC.

Keywords: Breast surgery; COVID-19 pandemic; breast surgery during COVID-19; coronavirus

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Introduction

In March of 2020, New York State Governor Cuomo signed executive order 202.10 instructing hospitals to suspend elective surgery to preserve resources for the COVID-19 pandemic (1). Over the ensuing days, the Department of Surgery at Columbia University Irving Medical Center-New York Presbyterian (CUIMC-NYP) decreased the number of surgeries to preserve personal protective equipment and increase bed capacity by converting operating rooms (ORs) into intensive care units (ICUs). All surgical divisions rationed the use of remaining ORs for urgent cases; each division submitted urgent cases to a central team for final approval. Simultaneously, multiple surgical societies published guidelines for the prioritization of surgeries based on clinical features, prognosis, and alternative treatment options (2,3).

This report describes the CUIMC-NYP Breast Surgical Oncology Division's experience in New York City (NYC) during the COVID-19 outbreak to inform physicians facing similar circumstances in the future. We present the following article in accordance with the STROBE checklist (4) (available at https://abs.amegroups.com/article/view/10.21037/abs-20-55/rc).

Methods

This is a cohort study of patients scheduled for breast

surgery between March 23–April 21, 2020 at CUIMC-NYP. Patients were included if they were scheduled for lumpectomy or mastectomy during the study period or if their surgery was requested during the study period.

Eligible patients were identified from a prospective database maintained by the breast surgical service and used to prioritize patients. Patients were categorized as emergent (within 48 hours), urgent (within 2 weeks), or elective (could be considered at later date); and patients were stratified based on published guidelines, hospital policy, and patient/surgeon availability (2,3). Demographic, tumor and treatment characteristics, and procedure dates were determined by chart review.

The primary endpoint was the proportion of patients who had breast surgery within the study period. We also evaluated factors associated with receipt of surgery during the study period such as planned surgical and localization procedures, axillary surgery, clinical stage, receipt of neoadjuvant endocrine therapy or chemotherapy, and COVID-19 status obtained through chart review. No comparative analysis was performed for the cohort or any subgroups and any missing data was excluded.

The study was conducted in accordance with the Declaration of Helsinki (as revised in 2013). The study was approved by the NewYork Presbyterian Hospital-Columbia Irving Medical Center Internal Review Board (IRB# AAT0116) and informed consent was obtained from all patients.

Results

In the study period, 43 cases (0% emergent, 39.5% urgent, and 60.5% elective) were scheduled or submitted for centralized approval. Fifteen operations (34.8%) were performed, all of which were considered urgent. Participant demographics, tumor characteristics, and clinical staging are displayed in *Table 1*. Of the 43 cases submitted, 32 (74.4%) experienced a surgical delay.

Of the 15 operations performed, 9 (60.0%) were lumpectomies and 6 (40.0%) were mastectomies; 13 (86.7%) had a sentinel lymph node biopsy (SLNB), 1 (6.7%) had an axillary lymph node dissection (ALND), and 1 (6.7%) had no axillary surgery. Two (13.3%) were admitted to CUIMC-NYP for one night and 13 (86.7%) were performed in the ambulatory setting including four mastectomies with reconstruction. Two patients (13.3%) had a change in surgical plan from a bilateral mastectomy with reconstruction (prophylactic on the contralateral side) and SLNB to a lumpectomy and SLNB and were performed as ambulatory surgeries. Four (26.7%) had triple negative breast cancer and 8 (53.3%) had clinical stage II–III disease. Notably, one pregnant patient with stage IA (T1bN0M0) hormone receptor (HR) positive disease had surgery due to limited alternative therapeutic options.

Of the 28 patients who did not have surgery during the study period, 6 (21.4%) initiated presurgical endocrine therapy as a bridge to their eventual surgery.

In total, 25 patients had a localization procedure planned either for the primary breast lesion or a regional lymph node, and 17 patients underwent localization. The planned localization method differed from the actual localization method in 7 (42%) patients, for example, 16 of 25 patients were originally scheduled for a wire localization, but only 2 received wire localization and 7 were switched to radar device localization.

There were no reported COVID-19 cases in either the pre-operative or post-operative period in this cohort.

Discussion

In this single institution cohort study at an academic center in NYC during the COVID-19 pandemic, we found that only a third of scheduled surgeries were actually performed; and about 70% of patients experienced a surgical delay. This is likely an underestimation as patients may have rescheduled their surgical date prior to the study period in response to COVID-19 pandemic in other regions. Reassuringly, no patient developed COVID-19 after breast surgery at our site.

Multiple societies have offered recommendations based on expert opinion regarding cancer care during COVID-19, but data related to surgical outcomes in breast cancer patients is limited (2,3). A single study from Turkey reported that 29 out of 80 (36.3%) eligible patients had breast surgery during the COVID-19 pandemic, which is similar to our findings (5).

Unsurprisingly, the proportion of patients who had clinical stage II–III, human epidermal growth factor receptor 2^+ ($HER2^+$), triple negative, or received neoadjuvant chemotherapy was higher in the cohort who received surgery compared to those who did not have surgery, as these factors have prognostic implications that could influence the urgency of the surgery (2,3,6).

During this time, we modified our normal practices to optimize resource use. For example, almost 90% of patients expected to have needle localization were modified

Table 1 Characteristics of patients with breast surgeries planned and performed from March 23–April 21, 2020 at an academic center in New York during the COVID-19 pandemic

Characteristics	Patients requested for surgery (n=43)	Patients who did not have surgery (n=28)	Patients who had surgery (n=15)
Age, median [range]	56 [36–77]	60 [39–77]	52 [36–76]
Race, n (%)			
Caucasian	20 (46.5)	11 (39.3)	8 (53.3)
African American	8 (18.6)	5 (17.9)	3 (20.0)
Asian	2 (4.7)	1 (3.6)	1 (6.7)
Hawaiian or Pacific Islander	1 (2.3)	1 (3.6)	0 (0.0)
Other	7 (16.3)	4 (14.3)	2 (13.3)
Preferred not to answer	5 (11.6)	5 (17.9)	0 (0.0)
Ethnicity, n (%)			
Non-Hispanic	31 (70.5)	18 (64.3)	13 (87.5)
Hispanic	12 (29.5)	10 (35.7)	2 (12.5)
Clinical stage, n (%)			
Benign/premalignant/unknown	5 (11.6)	5 (17.9)	0 (0.0)
0	8 (18.6)	7 (25.0)	1 (6.7)
IA	16 (37.2)	11 (39.3)	7 (46.7)
IB	0 (0.0)	0 (0.0)	0 (0.0)
IIA	9 (20.9)	4 (14.3)	5 (33.3)
IIB	4 (9.3)	2 (7.1)	2 (13.3)
IIIA	1 (2.3)	0 (0.0)	1 (6.7)
IIIB	1 (2.3)	1 (3.6)	0 (0.0)
IV	0 (0.0)	0 (0.0)	0 (0.0)
Receptor status, n (%)			
$HR^+/HER2^-$	20 (66.6)	13 (81.25)	7 (50.0)
$HR^-/HER2^-$	3 (10.0)	0 (0.0)	3 (21.4)
$HR^+/HER2^+$	5 (16.7)	1 (6.25)	4 (28.6)
$HR^-/HER2^+$	2 (6.7)	2 (12.5)	0 (0.0)
Histology, n (%)			
Invasive ductal	27 (62.8)	15 (53.6)	12 (80.0)
Invasive lobular	3 (6.8)	1 (3.6)	2 (13.3)
Ductal carcinoma in situ	8 (18.6)	7 (25.0)	1 (6.7)
Other	5 (11.6)	5 (17.9)	0 (0.0)

Table 1 (*continued*)

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Characteristics	Patients requested for surgery (n=43)	Patients who did not have surgery (n=28)	Patients who had surgery (n=15)
Breast surgery, n (%)			
Lumpectomy w/o SLNB	6 (14.0)	5 (17.6)	1 (6.3)
Lumpectomy w/SLNB	15 (34.9)	7 (25.0)	8 (53.3)
Mastectomy w/SLNB w/o reconstruction	4 (9.3)	4 (14.3)	0 (0.0)
Mastectomy w/SLNB w/reconstruction	17 (39.5)	12 (42.9)	5 (33.3)
Mastectomy w/ALND w/reconstruction	1 (2.3)	0 (0.0)	1 (6.7)
Prior treatment, n (%)			
Neoadjuvant chemotherapy/targeted therapy	10 (23.3)	4(14.3)	6 (40.0)
Neoadjuvant endocrine therapy	1 (2.3)	1(3.6)	0 (0.0)
Planned localization method [actual localization method]	25 [17]	14 [6]	11 [11]
Wire	16 [2]	11 [0]	5 [2]
Radar probe	7 [14]	2 [6]	5 [8]
Ultrasound	0 [0]	0 [0]	0 [0]
Palpation	2 [1]	1 [0]	1 [1]
Treatment impact, n (%)			
Surgery delay	32 (74.4)	25 (89.3)	7 (43.8)
Reasons for delay, n (%)			
COVID-19+ or exposure	1 (2.3)	1 (3.6)	0 (0.0)
Practice reduction policies	42 (97.7)	26 (92.9)	15 (100.0)
Patient availability	1 (2.3)	1 (3.6)	0 (0.0)
Change in surgical plan	2 (4.6)	0 (0.0)	2 (13.3)
Unplanned neoadjuvant endocrine therapy	8 (18.6)	6 (21.4)	2 (13.3)

HR, hormone receptor; HER2, human epidermal growth factor receptor 2; SLNB, sentinel lymph node biopsy; ALND, axillary lymph node dissection.

to radar probe localization which alleviated the need to coordinate surgical and radiology schedules on short notice without compromising efficacy of localization procedures (7,8). Another example is the limitation of post-operative admissions. Four patients had mastectomies with reconstruction and were discharged the day of surgery and two patients received lumpectomies with SNLB instead of bilateral mastectomies with SNLB to decrease hospital resource use and limit COVID-19 exposure. Reassuringly, no patient required re-admission. Shared decision making with patients was essential to minimize risk and maximize individual benefits during this time period.

Our study is inherently limited by its small sample size and lack of a comparison group.

Conclusions

This report details the experience of a Breast Surgical Oncology Division practice at a major academic hospital during a pandemic. As the trajectory of the COVID-19 outbreak is still unclear, the authors believe it is important to convey our experience, as our methods for resource preservation may be helpful strategies for others during these unprecedented times.

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Footnote

Reporting Checklist: The authors have completed the STROBE reporting checklist. Available at https://abs.amegroups.com/article/view/10.21037/abs-20-55/rc

Data Sharing Statement: Available at https://abs.amegroups.com/article/view/10.21037/abs-20-55/dss

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Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at https://abs.amegroups.com/article/view/10.21037/abs-20-55/coif). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. The study was conducted in accordance with the Declaration of Helsinki (as revised in 2013). The study was approved by the NewYork Presbyterian Hospital-Columbia Irving Medical Center Internal Review Board (IRB# AAT0116) and informed consent was obtained from all patients.

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