

Breast Cancer Multidisciplinary Management during COVID-19 Pandemic: Experiences and Strategies Used by a Singapore Breast Surgical Unit

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Abstract

The overwhelming COVID-19 pandemic has forced healthcare institutions around the world to direct resources to manage the pandemic. This has resulted in a sudden acute limitation of resources to care for non-COVID patients with critical conditions. In Singapore, the escalating situation has necessitated swift reaction in the Division of Breast Surgery in Changi General Hospital to develop strategies to support the battle against COVID-19 and yet deliver care to our breast cancer patients. This paper described the challenges faced and measures adopted by the division during this pandemic in our multidisciplinary management of non-COVID breast cancer patients. It is our fervent hope that this article will serve as a guide for physicians in similar settings who are managing breast cancer patients amidst this pandemic.

Keywords

COVID 19, pandemic, multidisciplinary, breast cancer management, Singapore.

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Introduction

In December 2019, China reported the first case of the novel coronavirus (2019-nCoV) in Wuhan [1]. Thereafter, its rapid spread to the rest of Asia, Europe and America led the World Health Organization (WHO) to name it the Coronavirus Disease 2019 (COVID-19) [2] and declared it a pandemic on 11 March 2020.

The first case of COVID-19 in Singapore was reported on 23 January 2020. Singapore had the highest number of reported cases outside China by the end of January 2020 [3]. Consequently, the Singapore Ministry of Health (MOH), on 7 February 2020, raised the level of the Disease Outbreak Response System Condition (DORSCON) [3] from yellow to orange signifying that the disease was severe, spread easily but was still contained [3]. Containment measures included travel restrictions, temperature screenings and quarantines [3].

Unfortunately, the number of COVID-19 positive cases rose alarmingly, leading to the implementation of the circuit breaker measures by the Singapore Government from 7 April to 1 June 2020. This meant the closure of all schools, institutes of higher learning and non-essential services.

Home-based learning and working from home was mandated except for essential industries. All were required to remain at home, except when attending to essential needs (e.g. purchase of food). Masks were to be worn when going out and safe distancing of 1 m was required. The aim was to flatten the curve and reduce community spread.

Restrictions also applied to hospitals to limit contact between healthcare staff from different institutions, staff from different disciplines as well as interaction with patients. Channelling resources to address COVID-related issues required the reduction of non-essential patient activities. This included non-critical outpatient appointments and surgeries. Changi General Hospital (CGH) is one of the 13 public hospitals in Singapore that manages COVID-suspected and positive patients.

Management of breast cancer patients requires a delicate balance between achieving the best oncological outcomes while not increasing the risk of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection in this vulnerable group. Liang et al. [4] reported a nationwide analysis of cancer patients with SARS-CoV-2 infection in China and concluded that

patients with cancer might have a higher risk of COVID-19 and had poorer outcomes.

This paper describes the challenges faced and measures adopted by the Division of Breast Surgery, CGH, in Singapore during this pandemic in our multidisciplinary management of non-COVID breast cancer patients.

Background

Breast cancer is the most common cancer amongst women in Singapore [5]. The Division of Breast Surgery, CGH, is a full-fledged tertiary referral centre that delivers one-stop comprehensive care to residents living in the east of Singapore [6]. There are four full-time specialist breast surgeons and two full-time non-specialist doctors. In addition, six external doctors from different institutions come to the centre on a regular basis to provide outpatient consultations and contribute to the multidisciplinary meetings. The Division is also an accredited assessment centre for BreastScreen Singapore (BSS), the nationwide breast cancer screening programme managed by the Health Promotion Board in Singapore [6]. Furthermore, the doctors are teaching faculty for the three medical schools in Singapore and clinical faculty for the surgical residency programme. From 2015–2019, our total outpatient visits over the past 5 years number approximately 30,000 and operative volume of about 2500 breast surgeries, including oncoplastic and reconstructive surgeries.

Adaptation of clinical practice

Outpatient clinic visits

DORSCON orange (February 2020)

When MOH declared DORSCON orange, it meant a lockdown of healthcare staff to their own institutions. Cross-institutional activities (except for urgent patient care) were halted. As a result, the six external doctors could not come to CGH to provide outpatient consults. In-house doctors had to take over the care of their patients, which led to a sudden increase in outpatient load for us. To cope with this surge, we reviewed the clinical records of these patients to determine the need for their clinic review. Those who were coming for routine follow-ups of benign conditions were postponed to a later date. Patients with abnormal investigation results or were on follow-up for breast cancer continued to be seen. Any such patients who did not attend their scheduled appointments were contacted by our nurses and their appointments re-scheduled. Should they decline to come, due to fear of contracting COVID-19, their particulars would be recorded in a secure database, in order to contact them once the situation improves. The nurses would also check if they had adequate medication.

In order to cope with this sudden influx of patients, who were previously not under our care, we reviewed the patients' electronic health records prior to their appointments

to summarise their issues. This facilitated the seamless transfer of care from the external doctors to us. In addition, should any of our doctors were to become unfit to work (e.g. quarantined due to exposure), another colleague can fill-in with little compromise to patient care.

To handle the increase in outpatient load, the clinic resources of both the external doctors and ours were suspended. This meant that existing appointments were maintained, but no additional appointment slots could be added. However, as a referral centre, appointment slots for urgent new referrals were not suspended. These include breast abscess, suspicious mammogram or ultrasound findings of breast imaging-reporting and data system (BIRADS) 4 or 5 categories, suspicious signs and symptoms suggestive of breast cancer and/or newly diagnosed breast cancer.

The adjustments to the clinic resources were initially implemented from February to May 2020. Hence non-critical patients' appointments were postponed to June 2020. However, these clinic suspensions were extended to December 2020 when COVID-19 was declared a pandemic. This allowed us to cope with the postponed cases, and also to prepare for the possibility of deployment of our staff to COVID-19 areas.

Circuit breaker (April 2020)

When the circuit breaker measures were announced, MOH issued a set of definition of essential face-to-face medical services [7]. This included cancer services, which when delayed would increase the chances of relapse or deterioration, including high-risk biopsies. Our outpatient load consists of patients with cancer and non-cancer conditions. Cancer patients consist of newly diagnosed breast cancer patients, and breast cancer patients on routine follow-up. Non-cancer patients were mainly those with high-risk lesions, strong family history or breast imaging abnormalities.

With the commencement of the circuit breaker measures, MOH mandated that all non-essential patient visits to hospitals to be postponed. To do this, we collated a list of all the patients coming for consultations from April to June 2020. These patients' records and any recent investigation results were reviewed. The following are patients whose outpatient appointments were not to be postponed:

- Newly diagnosed breast cancer patients.
- Breast cancer patients on routine follow-up, who were treated within the last 2 years, as the recurrence risk of breast cancer within the first 2 years of treatment is higher [8].
- Non-cancer patients, with recent investigations revealing abnormalities, as these abnormalities could be malignant.
- Patients with recent onset of new symptoms, so as not to delay diagnosis and treatment.

Our nurses would contact patients whose review could be safely postponed to ensure that they were asymptomatic and had sufficient medication (for cancer patients on endocrine therapy). Any patient who was symptomatic would be advised to come for their original appointment. Within

3 days, we sieved through 446 patient records in April 2020, and reduced the number of outpatient consultations to 24% of the original consults. This was similarly done for May and June 2020.

Screening/imaging

Screening was deemed a non-essential medical service and was thus suspended when circuit breaker was implemented. However, women who were recalled for abnormalities detected on screening mammogram under BSS continued to be reviewed by our breast radiologists and us. We felt that the evaluation of these women should not be delayed as they have a higher risk of malignancy. The attendance rates at the BSS clinic were well maintained, with only about 10% of women calling in to postpone their appointments. These were quickly filled by others who requested for earlier appointments. The ability to maintain healthy attendance rates amidst limited resources required great team effort between the radiologists and surgeons.

Surgery

The Division of Breast Surgery is part of the Department of Surgery, which has other sub-specialities like upper gastrointestinal surgery, colorectal surgery, head and neck surgery, hepatobiliary surgery, vascular surgery and plastic and reconstructive surgery. While vascular and plastic and reconstructive surgery have their own operating theatre (OT) lists, the rest share three OT lists on a daily basis.

Before COVID-19, the Division of Breast Surgery was allocated two OT lists a week. Our surgeries are mostly performed on a Day Surgery or 23-hour ward (1 overnight stay) basis. This applied to therapeutic breast cancer surgeries, including oncoplastic and reconstructive surgeries. Only patients with transverse rectus abdominis myocutaneous (TRAM) or deep inferior epigastric perforator (DIEP) flap reconstructions required a longer inpatient stay. The Day Surgery and 23-hour wards are located in a separate facility from the inpatient wards. This practice limits the exposure of our patients and clinicians to the general hospital cohort.

DORSCON orange (February 2020)

During the COVID-19 period, resources and healthcare staff were channelled towards caring for COVID-19 positive and/or suspected patients. This led to a reduction in nursing staff and anaesthetists running the OTs. Hence, CGH implemented a cohort-based OT booking system for elective surgeries. This meant that the entire Department of Surgery (including vascular and plastics and reconstructive team) shared one OT on 3 days and two OTs on 2 days per week. This resulted in a reduction of OT allocations for the Division of Breast Surgery to one OT per week.

All benign, non-urgent diagnostic breast surgeries were postponed indefinitely but their details were recorded in a

secure database, in order to contact them when the situation permits. Priority was thus given to oncological cases or cases that were indeterminate and required diagnostic surgery. Immediate reconstruction options (autologous or implants) and oncoplastic surgery were still offered. Unfortunately, by March 2020, the wait-time for breast cancer surgery was beyond 6 weeks. This was unacceptable and our appeal for more theatre space was successful, leading to an increase in theatre list to two per week. With more theatre lists, the wait-time reduced to about 3 weeks.

Circuit breaker (April 2020)

One week into the circuit breaker, the number of COVID-19 positive cases increased exponentially, requiring the deployment of staff to COVID-related areas, which included the anaesthetists and nurses. This led to a further reduction in resources and manpower to safely conduct operations and our OT list was again reduced to one per week. Due to the reduction in clinic attendance, there was a concurrent reduction in newly diagnosed breast cancer. Therefore, despite having an OT list once a week, the wait-time was 3–4 weeks.

A case series reported by Lei et al. [9] on outcomes of patients undergoing surgery during the incubation period of COVID-19 showed that elderly patients with co-morbidities undergoing surgery with long general anaesthetic time had higher mortality rates. Moreover, such patients also required longer inpatient stay and the need for intensive care unit (ICU) and high-dependency care. Similarly, the guideline issued by the College of Surgeons, Singapore, in April 2020, state that whenever possible, surgery should be performed by experienced surgical staff, to minimize operative time and potential complications [10]. Likewise, the CGH Department of Surgery guidelines for surgery during COVID-19 recommends to keep the number of personnel in the OT to the bare minimum and to have specialist-led surgery with minimum assistants.

Hence, the Division of Breast Surgery segregated our staff into two surgical teams. Each breast team consisted of three doctors: a senior specialist surgeon, a junior specialist surgeon and a non-specialist doctor. We confined ourselves to our teams when performing surgery. This was because, during surgery, it is not possible to maintain a distance of 1 m between the staff and the patient. In addition, aerosolisation of SARS-CoV-2 has been reported when energy devices like diathermy pens are used [11]. Hence, should the patient subsequently be diagnosed to be COVID-19 positive post-surgery, only the surgical team who were involved in the operation needs to be quarantined. The other team would still be able to run the service and thus not compromise on patient care. Likewise, inpatient ward rounds and outpatient clinics were conducted in a similar manner.

We also reviewed the nature of operations we conducted. Therapeutic surgery for breast cancer and diagnostic surgery for suspicious lesions continued, albeit performed by the most experienced breast surgeon in each team. Newly diagnosed breast cancer patients, who opted for immediate

breast reconstruction post-mastectomy with TRAM or DIEP flap, were advised to have an expander implant inserted instead, with subsequent definitive reconstruction. This was to shorten operative time, length of inpatient stay and reduce complication risks. As per hospital guidelines, surgery for suspected or confirmed COVID-19 patients are performed under full personal protective equipment (PPE) and powered air-purifying respirator (PAPR) respectively.

Systemic treatment and radiation

Breast cancer patients requiring systemic therapy and/or radiation continued to have their treatment. The recommendations for such treatment are made at the multidisciplinary clinical meetings (MDM). These meetings continued, so as to not compromise patient care, albeit with only the essential staff needed to make crucial management decisions. When the circuit breaker measures were implemented, the MDMs were conducted with staff from different disciplines attending via teleconferencing. These measures were taken as part of a multidisciplinary effort to ensure timely delivery of care for breast cancer patients while adhering to safe distancing measures advocated by the government. For patients who required systemic and/or radiation therapy, we were mindful to ensure safe distancing, minimizing immunosuppression and reducing unnecessary visits.

Suspension of other activities

Education – continued medical education (CME) for staff, undergraduate and postgraduate training

When DORSCON orange was implemented, all non-essential academic meetings were cancelled to minimise contact between staff. Journal readings were conducted online with sharing of interesting journal articles. Formal lectures and bedside tutorials for post-graduate surgical trainees were suspended. For undergraduate students, all elective attachments were halted. In addition, medical and nursing schools affiliated to our institution concurrently suspended clinical attachments for their students, replacing them with home-based online learning, to minimise exposure to potential COVID patients.

Clinical research

All clinical trials that involved patient contact were suspended to minimise unnecessary exposure of patients to healthcare staff.

Patient support activities

Support group events for our breast cancer patients such as survivor support groups and volunteer training programmes

were also put on hold. Patients continued to have standard counselling by doctors and breast care nurses (BCNs) that were conducted on a one-to-one basis.

Impact on patients

The magnitude of the long-term implications due to reduction in clinical activities is unknown. Patients who had either deferred or failed to attend their hospital appointments have increased over the last few months, due to fear of contracting the disease in hospital. However, this postponement may lead to a delay in diagnosis and treatment. For undetected malignancy, delay in diagnosis and treatment inevitably lead to unfavourable long-term outcome.

As the number of COVID-19 cases increases, more resources are channelled towards the areas in need. OT spaces are reserved for emergency cases. Fortunately, we were able to keep our wait-time to therapeutic surgery to about 4 weeks. However, patients who opted for TRAM or DIEP flap immediate reconstruction would instead have to undergo staged surgery with an initial implant expander before the definitive reconstruction at a later date. This will incur a higher total treatment cost as well as having to undergo another general anaesthesia along with its inherent risks. The cosmetic outcomes may also not be as ideal as immediate reconstruction [12].

The suspension of patient support activities may have a psychological impact on breast cancer patients and their families that may not be immediately apparent. Without these services and activities, patients and their families lose an avenue to share their concerns and worries. They may also feel alone in their cancer treatment journey and be deprived of coping techniques to deal with the stress. Similarly, caregiver stress that is not addressed may lead to adverse psychological outcomes.

Learning points

The SARS-CoV-2 virus is highly contagious, leading to rapid community spread. Moreover, infected individuals may be asymptomatic or pre-symptomatic, which makes early detection and isolation a challenge. The elderly, especially those with comorbidities, have higher mortality rates. Hence personal hygiene and safe distancing are key to the containment of spread of SARS-CoV-2 [9]. In the healthcare setting, the challenge is to ensure safe distancing and minimise unnecessary exposure, but without compromising patient care. To achieve this, the ability to promptly identify appropriate patients and institute swift measures is paramount. Multidisciplinary efforts from important stakeholders in breast cancer care, including but not limited to surgeons, radiologists, medical oncologists, radiation oncologists, pathologists and BCNs cannot be emphasized more and this requires a concerted effort from all to ensure timely delivery of standard of care in the new normal. All the measures and prioritization principles (Table 1) adopted by the authors would not have been

Table 1 Prioritization Principles in Different Aspects of Care

Outpatient Visits	Minimize outpatient visits as much as possible. Replace with telemedicine or tele-consult if appropriate.
Screening/Imaging	Priority given to conditions that when delayed would increase the chances of relapse or deterioration. Minimise hospital visits as much as possible. Defer all screening imaging for 6–12 months.
Surgery	Priority given to conditions that when delayed would increase the chances of relapse or deterioration. Surgery for urgent/life-threatening situations. Oncologic resection achieved with shortest anaesthesia, least morbidity, shortest hospital stay and fastest recovery.
Systemic Treatment	To consider alternatives to surgery in selected and suitable cases. Systemic treatment with least risks of immunosuppression. Delay treatment as per current evidence if resources limited.
Radiation Therapy (RT)	Shorter treatment duration (dose-dense), reduce visits as much as possible. Postpone RT up to 3–6 months, if resources limited. Shorter fractions or accelerated partial RT in selected cases.

possible without the cooperation and teamwork from all specialties involved.

Electronic health records (EHR)

The EHR is assessable only by healthcare staff involved in the care of the patients and is password protected. All patients diagnosed with cancer are “tagged” in the EHR, allowing for their quick identification. The summary in each of our patients’ EHR enabled the swift review of their condition, to determine the need for their clinic review. Transfer of care from one doctor to another could be safely done without compromise.

Minimising risk to patients

Reducing non-essential clinic visits

The need for safe distancing and to minimize exposure of patient to staff and vice versa forced us to scrutinize the need for clinic reviews for some of our patients. We realised that selected groups of patients who underwent open and/or percutaneous diagnostic biopsies were capable of assessing their post-operative wounds and did not need to come for an outpatient review. Moreover, the benign results of a biopsy need not be conveyed in person.

Reducing non-essential surgery

Both our surgeons and radiologists are capable of performing ultrasound-guided biopsies (core needle biopsy and vacuum-assisted biopsy) under local anaesthesia. Performing these procedures in the outpatient setting reduces the need for OT utilization.

Reducing inpatient stay

Prior to COVID-19, it was our routine practice for most of our post-operative patients, including therapeutic oncological

surgery with oncoplastic procedure and reconstruction, to be discharged home the following day. This practice allowed us to continue to perform these surgeries with minimal exposure risk to the patients.

Post circuit breaker and moving on to the new normal

As we cautiously ease into the post circuit breaker period in June 2020, there are valid concerns of resurgence of community cases. Hence, the Singapore government has outlined a three-phase approach [13]. For healthcare services, cancer screening, outpatient services and surgery for semi-urgent conditions will be permitted. There is a total of 833 patients whose appointments were postponed during the circuit breaker period who will require clinic review at the Breast Centre. This would be over and above the existing clinic load. As safe distancing is still mandated, the challenge would be the ability to review them in a timely manner and still maintain safe distancing. We thus prioritized our breast cancer patients to be reviewed first, followed by those with image-detected abnormal lesions, patients for high-risk screening and finally patients with benign conditions.

Conclusion

Healthcare facilities around the world were largely caught off-guard by the COVID-19 pandemic. This erratic and continually evolving disease has stretched healthcare manpower and resources to the limit. Despite the COVID-19 pandemic, patients with essential non-COVID conditions still require attention.

Hence managing breast cancer patients during the COVID-19 pandemic requires swift and adaptable strategies to cope with the constantly changing demands. Prompt patient stratifications, quick adaptation to restricted resources whilst balancing the risks of exposure to patients and healthcare personnel are all crucial in providing optimal patient care.

The importance of multidisciplinary team effort is pivotal in ensuring optimal delivery of care to breast cancer patients.

We hope that our experience in adapting to this crisis may assist others in similar circumstances, to prioritize and adapt to the evolving situation, so as to continue to manage essential non-COVID patients.

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