



Global Forum of Cancer Surgeons: Cancer Surgery During the COVID-19 Pandemic: Impact and Lessons Learned

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ABSTRACT

Background. The purpose of this article is to summarize the opinions of the surgical oncology leaders from the Global Forum of Cancer Surgeons (GFCS) about the global impact of COVID-19 pandemic on cancer surgery.

Methods. A panel session (virtual) was held at the annual *Society of Surgical Oncology 2021 International Conference on Surgical Cancer Care* to address the impact of COVID-19 on cancer surgery globally. Following the virtual meeting, a questionnaire was sent to all the leaders to gather additional opinions. The input obtained from all the leaders was collated and analyzed to understand how cancer surgeons from across the world adapted in real-time to the impact of COVID-19 pandemic.

Results. The surgical oncology leaders noted that the COVID-19 pandemic led to severe disruptions in surgical cancer care across all domains of clinical care, education, and research. Several new changes/protocols associated with increased costs were implemented to deliver safe care. Leaders also noted that preexisting disparities in care were exacerbated, and the pandemic had a detrimental effect on well-being and financial status.

Conclusions. The COVID-19 pandemic has led to severe disruptions in surgical cancer care globally. Leaders of the GFCS opined that new strategies need to be implemented to prepare for any future catastrophic events based on the lessons learned from the current events. The GFCS will embark on developing such a roadmap to ensure that surgical cancer care is preserved in the future regardless of any catastrophic global events.

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Since its emergence in late 2019, the SARS-CoV-2-related, COVID-19 pandemic has infected more than 245 million people.¹ To date, it is estimated that approximately 5 million deaths are related to the COVID-19 pandemic.¹ Some believe that the actual death toll may be higher, attributable to insufficient or incorrect reporting of COVID-19 cases in many parts of the world.² The genetic

lineage of SARS-CoV-2 virus has led to the emergence of multiple variants, some of which have been more lethal than the original virus.³ It is likely that SARS-CoV-2 virus and its evolutionary variants will continue to add to the incrementally accumulating burden of this disease.

The COVID-19 pandemic has had a grave impact on every facet of life with catastrophic consequences for the entire world.¹ The brunt of this impact has been felt the most in the field of health care with interruptions in care delivery and adverse consequences to both patients and caregivers.⁴⁻⁶ The World Health Organization (WHO) conducted a rapid assessment survey of service delivery for noncommunicable diseases during the first wave of the pandemic in 2020.⁴ The survey was conducted between May 1–25, 2020 and involved 194 Ministries of Health across the world. Nearly 122 countries reported that they noted disruptions in services for many noncommunicable diseases. Disruptions (partial or complete) in cancer delivery services were reported by approximately 42% of the responding countries. Approximately 5% of the countries noted complete interruptions.

Riera et al. conducted a systematic review of studies to specifically identify, categorize, and estimate the frequency of delays and disruptions in global cancer health care due to the COVID-19 pandemic.⁵ Despite lacking high methodological quality, the included 62 studies identified multiple and severe disruptions along the entire chain of cancer care delivery. Treatment delays (26–62.4%), treatment interruption (77.5%), change in treatment plan (1.6–82%), and reduction in cancer treatment (42%) were noted by the authors. Specific to surgical care, treatment delay (3.34–76%), treatment interruption (30–80%), and reduction of the number of surgeries (14.28–85.8%) were documented across the world.

The impact of COVID-19 on cancer with a specific focus on surgical care was analyzed by the COVIDSurg Collaborative.⁶ This international, prospective, cohort study was conducted in 2020 by obtaining data from 466 hospitals in 61 countries across the world. The authors sought to analyze the impact of COVID-19 on disruptions in surgical cancer care for 15 solid organ cancer types and included 20,006 patients. Of all the eligible patients, nearly 10% of the patients did not receive surgery after a median follow-up of 23 weeks. The level of interruptions in cancer surgical care varied based on several factors, such as the stringency of lockdowns (low, medium, and high) and income status (based on World Bank Index: high-income countries, upper middle-income countries, and low-to-middle-income countries) of the respective countries.

The Global Forum of Cancer Surgeons (GFCS) was formed in 2017 to advance the goals of cancer surgery on the global stage.^{7,8} The mission of the GFCS is to provide a voice for cancer surgeons to improve surgical care for

cancer patients through multidisciplinary clinical care, education, research, outreach advocacy, and leadership on the global stage.⁹ The GFCS consists of surgical oncology leaders from 15 reputable surgical oncology societies across the world. These societies with their respective leaders represent more than 75% of the global cancer burden by incidence and mortality.

The GFCS, in its nascent stages, has strived to advocate for cancer surgery on the global stage through several initiatives. Some of the initiatives include addressing the barriers to cancer surgery¹⁰ and promoting the benefits¹¹ of safe and timely cancer surgery. The GFCS also has been involved in addressing specific issues relating to cancer surgery in specific countries. One such initiative included collaboration with the Brazilian Society of Surgical Oncology (BSSO) and other bodies to successfully lobby the Brazilian government to include cytoreductive surgery/hyperthermic intraperitoneal chemotherapy in the Brazilian Public Health System (Sistema Único de Saúde, or SUS).¹²

As expected, the emergence of SARS-CoV-2 virus prompted the leaders of the GFCS to discuss the adverse ramifications of the COVID-19 pandemic on cancer surgery globally. The purpose of this article is to summarize the opinions of the surgical oncology leaders of the GFCS about the impact of the COVID-19 pandemic on cancer surgery on the global stage.

METHODS

A panel session (virtual) was held at the annual *Society of Surgical Oncology 2021 International Conference on Surgical Cancer Care* to address the impact of COVID-19 on the global stage. This session (*Cancer Surgery During a Pandemic: A Global Perspective*) sought to obtain the opinions of global cancer surgery leaders about the impact of COVID-19 on the various domains of cancer surgical care. Following the virtual meeting, a questionnaire was sent to all the leaders to gather additional opinions regarding the impact of the COVID-19 pandemic on cancer surgery. Opinions were sought on the various domains of cancer surgical care ranging from: clinical care, education, research, well-being, effect of inequities, impact on financial situation, etc. The input obtained from all the leaders was collated and analyzed to understand how cancer surgeons from across the world adapted to the impact of the COVID-19 pandemic.

TABLE 1 Interruptions in cancer surgery and cancers most affected

Country/region	Canceled elective cancer surgery: yes/no	Cancer sites most affected
Brazil	Yes (March/April 2020)	Breast/colorectal/cervix/prostate
Canada	Yes (Variable time periods based on successive waves: from April 2020 to September 2021)	Breast/GI/colorectal/lung/GU/ovarian
Chile	Yes (April to July 2020)	Skin/breast/thyroid
China	Yes (February to April 2020)	Lung/thyroid
Egypt	Yes (March to May 2020)	Breast/Colorectal/Bladder
Europe	Yes (March to May 2020)	Breast/colon
India	Yes (approximately 6 weeks during first lockdown)	Pancreas/head & neck/breast/colorectal/thoracic
Israel	No	Delays in screening for breast/colorectal
Italy	No	Colorectal/pancreas/sarcoma
Japan	Yes (only during first wave: April to May 2020—approximately 10% cancellation)	Colorectal/gastric/lung
Republic of Korea	No	Gastrointestinal/lung/hepatobiliary/pancreas
Mexico	Yes (2 weeks)	Gastrointestinal/lung
Pakistan	Yes (delayed for 11 months from February to December 2020)	Breast/colorectal/gastroesophageal junction
United States of America	Yes, for varying periods during 2020 and 2021	Breast/colon/prostate/pancreas/endocrine

RESULTS

Findings about interruptions in cancer surgery (canceled elective cancer surgery) and cancers most affected are documented in Table 1. The majority of the leaders (76%) noted that elective cancer surgical cases were canceled as a result of the pandemic. The most common time period for cancellation of elective cancer surgical cases was during the first half of 2020. Leaders from Israel, Italy, and Republic of Korea did not document cancellation of elective cancer surgical cases. Although nearly all cancer sites were affected, the most common cancers affected by the pandemic were related to breast, colorectal, thyroid, and gastrointestinal cancers. Despite not cancelling elective cancer surgical cases, leaders from Israel, Italy, and Republic of Korea noted an adverse impact on cancer care related to breast, colorectal, gastrointestinal, and other malignancies.

Changes/new protocols implemented in the perioperative setting to accommodate for the COVID-19 pandemic are documented in Table 2. The common adaptive themes that emerged from the preoperative setting included: enhanced screening for COVID-19 with near universal use of RT-PCR testing and other investigations, reducing surgical procedures (particularly complex procedures) or shifting to an ambulatory setting where feasible, minimizing procedures that may need stay in the Intensive Care Unit (ICU), triaging patients for procedures, categorizing risk status for potential COVID-19 infection, and restrictive visitor policies.

In the intraoperative setting, the most common changes consisted of: use of Personal Protective Equipment (PPE) and following universal precautions, avoiding or modifying laparoscopic procedures to minimize aerosolization, avoiding or minimizing other aerosol-generating procedures, special precautions during intubation and extubation, minimizing the number of personnel in the operating room (OR), dedicating particular ORs for patients with COVID-19, and modifications to other OR equipment (electrocautery, suction, etc.).

In the postoperative setting, the changes and new policies focused on: early discharge, implementation of Early Recovery After Surgery (ERAS) protocols, restrictive visitor policies, continued vigilance with retesting for COVID-19 patients as needed, and modifying nursing care patterns to minimize visitors.

Availability of PPE

The majority of the respondents noted that they faced shortages of PPE to varying degrees (mild to severe, requiring adaptation in some cases by using raincoats under surgical gowns, etc.) during the early stages of the pandemic. Over the course of 2020 and later, nearly all reached sufficiency with PPE from a combination of enhanced local production or importing from other countries.

Impact on Long-Term Oncological Outcomes

The majority of leaders noted that the disruptions to surgical cancer care due to the pandemic will affect the long-term prognosis at the individual and population level.

TABLE 2 Changes/new protocols implemented in the peri-operative setting to accommodate for the COVID-19 pandemic

Country/ region	Preoperative	Intraoperative	Postoperative
Brazil	<ol style="list-style-type: none"> 1. Screening for cases with contact or symptoms of COVID-19 2. Rational use of RT-PCR testing (due to shortage) 3. Pre-operative self-isolation 	<ol style="list-style-type: none"> 1. Universal use of PPE for all 2. Avoid AGP procedures including some laparoscopic procedures 3. Special filters to deflate pneumoperitoneum 4. Dedicated COVID-19 operating rooms 	<ol style="list-style-type: none"> 1. Early discharge 2. ERAS protocols
Canada	<ol style="list-style-type: none"> 1. Protocols to triage patients for surgery 2. Screening protocols to assess risk of COVID-19 (green= low risk/orange=high risk/red= confirmed case of COVID-19) 3. COVID-19 testing if symptoms 	<ol style="list-style-type: none"> 1. Early on: PPE and universal precautions for all and mandatory time between cases to allow for air exchange 2. Later: PPE and universal precautions based on risk from Screening protocols 	<ol style="list-style-type: none"> 1. Restricted visitor policy 2. Recovery after extubation in the OR due to PACU nurse shortage
Chile	<ol style="list-style-type: none"> 1. Eliminate complex surgical procedures 2. Shift to ambulatory surgery when feasible 	<ol style="list-style-type: none"> 1. Focus on low-complexity surgical procedures 	<ol style="list-style-type: none"> 1. Early discharge
China	<ol style="list-style-type: none"> 1. Infection screening with COVID-10 tests 	–	–
Egypt	<ol style="list-style-type: none"> 1. Consider possible alternative treatment: neoadjuvant therapy 2. ERAS protocols 3. Admission only on day of surgery 4. For those that need pre-operative admission, application of stringent criteria 5. Specific pre-operative clearance clinics 6. Virtual clinics to update treatment plans 7. RT-PCR test 	<ol style="list-style-type: none"> 1. Minimize laparoscopic procedures 2. Minimize number of operating surgeons 3. Emergent cancer cases with COVID-19: avoid multiple stops and all care (intubation/extubation, etc.) provided in the operating room 	<ol style="list-style-type: none"> 1. Early discharge planning 2. Daily virtual visit after discharge
Europe	<ol style="list-style-type: none"> 1. Triage patients for systemic treatment where feasible 	<ol style="list-style-type: none"> 1. FFP2 masks 2. Double gloves 3. Restricted the number of Anesthesiology staff in the OR 	–
India	<ol style="list-style-type: none"> 1. RT-PCR test 2. Restrictive visitor policy 3. Spacing of beds 	<ol style="list-style-type: none"> 1. Minimum staff in the OR 2. Plastic barriers during intubation 3. Smoke evacuators 4. Low pressure pneumoperitoneum 5. Use of Sodium hypochlorite solutions in suction bottles 6. Surgeons to leave room before extubation 7. PPE usage 8. Fiberoptic intubations 	<ol style="list-style-type: none"> 1. Restricted visitor policy 2. Social distancing 3. Spacing between beds 4. Re-testing for COVID-19 as needed or for patients after 12 days 5. Reduce in-hospital stay 6. ERAS protocols 7. Modified chemotherapy regimens
Israel	<ol style="list-style-type: none"> 1. Mandatory RT-PCR test 	<ol style="list-style-type: none"> 1. N95 and face shields for all staff during intubation 	–
Italy	–	<ol style="list-style-type: none"> 1. FFP 2 masks 	<ol style="list-style-type: none"> 1. COVID-19 testing for patients with fevers
Japan	<ol style="list-style-type: none"> 1. Screening test for SARS-CoV-2 2. Screening chest CT 3. Restricted visitor policy 	<ol style="list-style-type: none"> 1. Full universal precautions if patient confirmed with COVID-19 diagnosis 	<ol style="list-style-type: none"> 1. Mask usage after surgery for patients

Table 2 (continued)

Country/ region	Preoperative	Intraoperative	Postoperative
Republic of Korea	<ol style="list-style-type: none"> 1. RT-PCR test 2. Infrastructure modifications to accommodate for COVID-19 patients 	<ol style="list-style-type: none"> 1. If confirmed or suspected of COVID-19—PPE usage with facemask/goggles and other universal precautions 2. OR with negative pressure 3. Powered air-purifying respirator (PAPR) 	<ol style="list-style-type: none"> 1. Restrictive visitor policy 2. New Nursing system to take care of patients and reduce family members
Mexico	<ol style="list-style-type: none"> 1. RT-PCR test 2. CT chest 3. Evaluation for COVID-19 symptoms 	<ol style="list-style-type: none"> 1. More outpatient surgical procedures 2. More procedures under regional anesthesia 3. Specific intubation protocols 4. Specific OR's for COVID-19 positive patients 	–
Pakistan	<ol style="list-style-type: none"> 1. Chest X ray 2. RT-PCR test 3. Clinical screening for COVID-19 	<ol style="list-style-type: none"> 1. OR with negative pressure 2. Lowest setting for electrocautery 3. Dedicated OR for COVID-19 patients 4. PPE for all during procedures with general anesthesia 5. Minimize personnel in OR, particularly during intubation/extubation 6. OR doors closed at all times 7. Smoke evacuators for electrocautery 8. Extra precautions for laparoscopic procedures 	<ol style="list-style-type: none"> 1. Enhanced monitoring for COVID-19 with repeat RT-PCR test as needed 2. Separate rooms for patients with suspected COVID-19 3. If COVID-19 confirmed—involved healthcare workers isolated for 14 days and patient moved to special units 4. Restricted visitor policy
United States of America	<ol style="list-style-type: none"> 1. COVID-19 testing pre op 2. Consider non-operative approaches with increase in neo-adjuvant therapy 3. Minimize cases that would need ICU stay or overnight stay 	<ol style="list-style-type: none"> 1. Dedicated OR for COVID-19 patients 2. PPE usage 	<ol style="list-style-type: none"> 1. Restricted visitor policy 2. Promote out-patient surgery 3. Promote telehealth follow up

ERAS enhanced recovery after surgery, PACU Post Anesthesia Care Unit, PPE personal protective equipment, AGP aerosol-generating procedures, OR operating room, ICU intensive care unit

This is due to multiple factors ranging from: reducing screening for cancer, such as breast/colorectal, etc., lack of screening leading to presentation of cancers at more advanced stages of disease, delayed or cancelled surgical procedures, and inability to offer other treatment options when surgery is cancelled. Many respondents noted that they are already witnessing an increase in the numbers of patients with advanced stages of disease. Leaders from places where surgical care was resumed quickly felt that the impact on long-term prognosis may be minimal.

Impact on Research and Education

The majority of respondents noted a significant negative impact on surgical research due to various factors: preferential allocation of all resources to address the COVID-19 pandemic and inability to or slowdown of recruitment of patients into trials due to lack of or reduced patient contact (Table 3). Some noted that established trials were allowed to continue with or without modifications, albeit at a slower

pace with a pause on initiation of new trials. Paradoxically, some responded that they found more time to conduct research not requiring direct clinical input. Although there was a reduction in the overall level of research activity, the majority noted that they initiated new research protocols or trials related to the impact of COVID-19 on cancer care.

Similarly, the majority of respondents expressed a concern of the significant impact on surgical education. For many of the countries/regions, education was transitioned to virtual formats. Education in the OR was significantly disrupted due to the precautionary reduction in the number of personnel permitted, which by hierarchical default affected trainees the most. Some countries felt the need to arrange dedicated workshops to make up for the loss of months of surgical skill training. Although the impact on education was felt to be significant, many noted that they were able to return to pre-pandemic educational routines within a few months.

The impact on ancillary domains of cancer care during the COVID-19 pandemic is documented in Table 4. Not

TABLE 3 Impact on research and education

Country/ region	Impact on research in general	Initiated new COVID-19 related research protocols- yes/no	Impact on surgical education
Brazil	1. Significant effect due to all efforts being diverted to address COVID-19/lack of interactions with patients	Yes	1. Significant impact for 6 months with transition to virtual classes 2. Minimized impact on surgical oncology education due to efforts of BSSO
Canada	1. Open trials: allowed to continue trial for already enrolled patients 2. Stopped enrollment of new patients 3. Stopped activation of new trials 4. Some protocols changed to accommodate virtual visits 5. Priority given to COVID-19 related research 6. Trials with minimal resource requirements were able to be continued	Yes	1. Reduction of number of learners in the OR 2. Fewer learners in clinics and these were transitioned to virtual format 3. All didactics transitions to virtual 4. Stopped away elective rotations 5. Royal College examinations for first year trainees transitioned to multiple choice questions only with elimination of oral examination
Chile	1. Research related to clinical contact was stopped but noted more time to conduct research that did not require patient encounters	Yes	1. No interruption of teaching in the intra-operative setting
China	–	No	1. Significant impact on medical students/postgraduate students/fellows
Egypt	1. Started trials with new management protocols such as: short course radiation therapy/TNT	Yes	1. Transition to virtual format
Europe	1. Most clinical trials were stopped	Yes	1. No students or observers were permitted for the entirety of 2020
India	1. Significant impact 2. Some protocols were modified	Yes	1. Transition to virtual format
Israel	1. Minimal impact early in the pandemic but subsequent impact due to diversion of research resources to COVID-19 related research	Yes	1. Reduction of number of learners in the OR earlier in the pandemic with return to normal by summer of 2020
Italy	1. Delay in projects due to lack of clinical material	Yes	1. Significant impact on education as many surgical departments were shut down
Japan	1. Temporary disruption of patient enrolment in trials	No	1. Medical students prohibited from entering teaching hospital or University
Republic of Korea	1. Decrease or stopped enrollment of patients in trials	No	1. Significant impact early on in the pandemic with return to normal patterns
Mexico	1. Significant impact 2. Reduction in translational research as laboratories closed 3. Reduction in clinical trials 4. Decreased activity in the Institutional Review Committee	Yes	1. Minimal impact
Pakistan	1. Some delays or slowing of patient enrolment 2. Paradoxical increase in cancer research in some parts 3. Increase in COVID-19 related research in cancer patients.	Yes	1. Significant impact as surgical trainees were redirected to COVID-19 care resulting in loss of nearly 1 year of surgical training and confidence 2. Arranged dedicated workshops for junior surgical residents to improve surgical skills
United States of America	1. Challenges with clinical trials 2. Restrictions in research personnel access to campus/more research personnel working from home 3. Difficulties placing orders for animal research	Yes	1. For surgical trainees: decreased operative cases/didactic conferences/and clinical rotations 2. Difficulty with job searches for surgical trainees 3. Cancelled clinical rotations for medical students for several months

TNT total neoadjuvant therapy, BSSO Brazilian Society of Surgical Oncology, OR operating room

TABLE 4 Impact on ancillary domains of cancer care during the COVID-19 pandemic

Country/ region	Effect of social inequities	Financial impact on healthcare systems	Impact on well-being of surgical community
Brazil	1. Delayed screening/increased wait times for surgery for patients accessing SUS	1. Public investment in cancer care remained the same due to partnership between the BSSO and Health Ministry	1. Well-being was maintained by the multiple efforts of BSSO (increased activities/campaigns/online events/enhance social media activities)
Canada	1. Yet to be determined but anecdotally worse outcomes for LSES patients	1. Significant but the full impact is yet to be determined	1. Personal and professional stress and burnout related to fear, uncertainty, unpredictable work patterns and reduced remuneration
Chile	1. LSES patients fared worse due to lack of access to care and information regarding COVID-19	1. Reduction in income for private surgeons by almost 50%. 2. It is likely that the government will increase funding for healthcare in the future	1. Some stress due to uncertainty but also a paradoxical increase in the sense of duty and fulfilment
China	–	1. Decreased income	–
Egypt	1. Not applicable as all patients have access to NHS and Insurance 2. Satellite centers in rural and remote areas helped to alleviate the situations	1. Additional COVID-19 related measures increased the cost of cancer care which was partially offset by budget readjustments and extra financial aid from the government and donations	–
Europe	1. The presence of NHS did not aggravate any of the pre-existing disparities	1. Significant but the full impact is yet to be determined	1. Stress of patient care is now manifesting in many surgeons/nurses leaving jobs
India	1. Compromised care for LSES due to multiple issues such as: financial constraints/transportation issues/rural locations of many patients	1. Significant loss of revenue which was worsened by the increased costs related to additional COVID-19 related precautions/measures	1. Significant impact early on due to fear of uncertainty and COVID-19 infection in some surgical personnel. 2. Morale recovered within a short period of time 3. Regular counselling in small groups/motivating messages through WhatsApp and group emails 4. Increase in sense of pride and determination helped as well
Israel	1. Lower vaccination rates for areas with lower economic status	1. Initial loss of revenue was subsequently and near completely addressed through the enhanced efforts and funding from the Ministry of Health (increasing staff positions/ICU beds/sustaining cancer care despite the pandemic)	1. Inability to travel and interact with peers/friends may have affected level and standard of care 2. No specific measures were undertaken
Italy	1. No effect	1. Present but difficult to calculate	1. No specific measures were undertaken
Japan	1. No effect	1. Support from the government negated any adverse financial impact	1. No impact on well-being and no specific measures were undertaken
Republic of Korea	1. Due to the presence of public insurance for all, social inequities did not affect care 2. Initial drop in screenings for LSES patients was returned to normal by enhanced governmental efforts	1. Significant impact but equally significant compensation from the government may have contributed to net equal situation with no major financial losses	1. Decrease in morale and well-being due to social distancing and meeting bans 2. Being addressed by conducting academic meetings online and holding small gatherings
Mexico	1. No effect	1. Greater impact on governmental institutions	1. Significant impact due to anxiety, burnout, posttraumatic stress and depression 2. Addressed by providing counseling services online and in-person
Pakistan	1. The pandemic aggravated the pre-existing disparities in cancer care	1. Increased costs of care to address patients presenting in more advanced stages of disease	1. Fear of contracting disease affected the moral of trainees.

Table 4 (continued)

Country/ region	Effect of social inequities	Financial impact on healthcare systems	Impact on well-being of surgical community
	<ol style="list-style-type: none"> 2. LSES patients that seek care in public health care systems were affected the most 3. Privately insured patients were able to access care albeit at a higher price 4. Funding from federal government/ NGO's and private philanthropists was instrumental in blunting the impact 	<ol style="list-style-type: none"> 2. Costs increased in both public and private health care systems 	<ol style="list-style-type: none"> 2. Leading from the front, maintaining the team dynamics and training opportunities, providing adequate time off were helpful in improving morale
United States of America	<ol style="list-style-type: none"> 1. Awareness and increased responsiveness to the underserved 2. Yet to be assessed impact due to social inequities 	<ol style="list-style-type: none"> 1. Employee separation and pay cuts in 2020 but rebounded strongly in 2021 2. Loss of income due to reduced procedures which was counterbalanced by government funding 	<ol style="list-style-type: none"> 1. Morale strong in some places due to teamwork although some burnout was evident 2. Many willing to work at front lines beyond their primary scope of work or training 3. Lack of face-to-face interactions and prolonged impact of the pandemic has been depressing

SUS Brazilian Public Health System (Sistema Único de Saúde, or SUS), BSSO Brazilian Society of Surgical Oncology, LSES lower socio-economic strata, NHS National Health System/Service, ICU intensive care unit

surprisingly, patients from the lower socio-economic strata (LSES) in some countries were affected the most due to delays in screening and care. LSES patients traditionally access the public health systems which were hit harder in these aforesaid countries. As of result of the heightened impact on the public health care systems, some noted a worsening of the preexisting disparities in cancer care for LSES patients. Some countries did not notice any detrimental effect, which was particularly noted in countries that had any type of preexisting robust National Health Service/System (NHS) in place for health care delivery.

Many countries/regions noted a significant financial impact related to loss of revenue combined with an increase in costs to deliver care in the COVID-19 environment. In some countries, governmental aid was instrumental in compensating for the financial losses resulting in a net neutral situation. Some other countries acknowledged the significant financial effects but the full impact is yet to be determined.

The COVID-19 pandemic had a significant impact on the morale and well-being of the surgical community due to many reasons, such as: fear of the unknown, unpredictable work patterns, reduced remuneration, inability to travel and interact with peers, and social isolation. Several respondents noted that they proactively implemented measures to improve well-being and morale, such as: increasing support through professional societies, increasing online interactions and social media activities,

providing counseling (online and in-person) services, maintaining normalcy as much as possible, and providing adequate time off.

Lessons Learned and Strategies for the Future are Documented in Table 5

Some of the respondents noted that cancellation of cancer surgical procedures must be avoided at any cost. This would obviously depend on the presence of prior care platforms that help to plan, anticipate, and implement alternative treatment pathways when forced to cancel planned elective cancer operations. The role and importance of multidisciplinary teams in determining alternative treatment strategies also was highlighted as was the collaborative spirit between surgical, medical, and radiation oncologists. Several respondents felt that they found new appreciation for the resilience displayed by cancer professionals even under the duress of a pandemic. Some respondents emphasized other lessons, such as: improving efficiency in screening, developing triage algorithms, exploiting the value of ambulatory care platforms, promoting virtual platforms for patient care and education, obtaining real-time data on COVID-19 burden, and the value of assisted funding from government to help cope with the pandemic.

Several strategies were suggested to help prepare for any future catastrophic events. Creating dedicated units/

TABLE 5 Lessons learned and strategies for the future

Country/ region	Lessons learned	Strategies for the future
Brazil	<ol style="list-style-type: none"> 1. Detrimental effects of halting cancer surgical procedures 2. Hitherto underappreciated resilience of cancer surgeons came to light and they need to be supported by their respective Societies 3. Vigilance to address the consequences of the pandemic 	<ol style="list-style-type: none"> 1. Create dedicated units/hospitals to cater exclusively for cancer care and thereby avoid interruptions in care 2. Cross-pollination of best and worst practices between various surgical oncology societies across the world 3. Vigilance regarding false information
Canada	<ol style="list-style-type: none"> 1. Vital to have prioritization strategies a priori 2. Ability to make decisions for treatment alterations under resource constraints 3. Collaborative spirit of medical and radiation oncologists 4. Virtual care platforms need to be developed for postoperative care and for remotely located patients 	<ol style="list-style-type: none"> 1. Advocate and support our patients, particularly those vulnerable to societal/economic inequities 2. Support for other healthcare professionals 3. Support (education and psychological) for surgical oncologists as well through webinars, etc.
Chile	<ol style="list-style-type: none"> 1. Need universal health care 2. Demonstrated that we can a lot even with minimal resources 3. Remarkable resilience of healthcare workers was evident 	<ol style="list-style-type: none"> 1. Universal access to health care 2. Strengthen healthcare systems
China	<ol style="list-style-type: none"> 1. Importance of personal protection 2. Witnessed the efficiency of public health care system 	–
Egypt	<ol style="list-style-type: none"> 1. To have strategies in place for alternative treatment plan when surgery cannot be performed 2. Financial/logistical back up plans need to be in place 3. Explore the role of virtual and telemedicine for patient care and education 	<ol style="list-style-type: none"> 1. Vigilance regarding any future catastrophic events 2. Rapid implementation of back up plans at the earliest sign of any future catastrophic events 3. Restructuring and better utilization of available services/resources through training
Europe	<ol style="list-style-type: none"> 1. Robust, multidisciplinary platforms to divert patients to alternative treatment pathways when planned surgical procedure are cancelled or postponed 2. Enhance the role of ambulatory cancer surgery programs 3. Enhance the role of simulation-based training for surgical trainees 	<ol style="list-style-type: none"> 1. Translate/transfer lessons learned from this pandemic in to practice
India	<ol style="list-style-type: none"> 1. Stringent and rapid screening and safety protocols 2. Guideline-based alteration in surgical treatment plans 3. Enhance the role of ERAS protocols 	<ol style="list-style-type: none"> 1. Continue some of current practices, such as masks, social distancing, etc. 2. Enhance safety protocols in pre-, intra-, and post-op settings 3. Promote vaccination for patients and staff 4. Faster pre-op work up and promote ERAS protocols 5. Encourage follow-up visits closer to home 6. Modify treatment protocols to accommodate for NACT
Israel	<ol style="list-style-type: none"> 1. Avoid screening delays to avoid delays in diagnosis 2. Back up plans in place to avoid cancellation of cancer surgical procedures 3. Critical role of government funding to maintain cancer surgery during catastrophic events 	<ol style="list-style-type: none"> 1. Develop strategies to avoid screening delays
Italy	<ol style="list-style-type: none"> 1. Cancer surgical procedures should not be put on hold 	<ol style="list-style-type: none"> 1. Create dedicated units/hospitals to continue cancer care uninterrupted
Japan	<ol style="list-style-type: none"> 1. Obtain accurate information about burden of COVID-19 2. Ensure adequate supply of PPE, ICU beds, and healthcare workers 	<ol style="list-style-type: none"> 1. Maintain vigilance to activate emergency protocols 2. Coordinate with regional centers to share the burden of care during catastrophic events 3. Create local stockpiles of PPE, drugs, and other medical equipment to be used for future events
Republic of Korea	<ol style="list-style-type: none"> 1. Adequate preparation with equipment and facilities to deal with patients during infectious disease-related catastrophic events 2. Strategies in place to determine sequence of deployment of personnel and resources 	<ol style="list-style-type: none"> 1. Both patients and physicians to maintain hand hygiene and masks during interactions 2. Liberal use of PPE, double gloves, face masks, goggles, etc.

Table 5 (continued)

Country/ region	Lessons learned	Strategies for the future
	3. Enhance the role of online educational platforms	3. Plans in place with alternative treatment strategies in case of cancellation of surgical procedures
Mexico	1. Promote strategic teamwork 2. Incorporate compassion	1. Be vigilant and prepared
Pakistan	1. Promote teamwork to help each other and maintain morale 2. Promote safe surgical principles 3. Viable communication channels to deliver information and encourage counselling services 4. Avoid cancellations of cancer surgical procedures	1. Enhance collaboration with different groups to learn from each other 2. Research to create preparedness protocols for any future emergencies 3. Focus on the safety of surgeon as well 4. Strategic prioritization of surgical procedures 5. Multidisciplinary management and implementation of health policies to keep infectivity and fatality low 6. Geography-specific research to develop evidence-based guidelines to suit the local environment.
United States of America	1. Importance of flexibility with ability to postpone procedures with likely minimal impact 2. Focus on patients with a reassuring attitude 3. Develop prioritizing strategies 4. Maintain vigilance for COVID-19 testing 5. Minimize cases that may need ICU stay	1. Be proactive and work on scenario planning 2. Develop in-built systems to promote the ability for rapid redeployment of personnel 3. Safety of staff is just as important 4. Memorize lessons learned from this pandemic for any future events and streamline healthcare delivery 5. Promote comfort to encourage people to step into new roles

ERAS Enhanced Recovery After Surgery, PPE personal protective equipment, ICU intensive care unit; NACT neoadjuvant chemotherapy

hospitals for cancer care may be beneficial. This can facilitate uninterrupted cancer surgical care regardless of any other detrimental factors. Promoting collaboration between the various surgical oncology societies across the world to cross pollinate best and worst practices will be beneficial. Efforts to advocate for the physical, emotional, and financial well-being of all healthcare professions should be prioritized. A heightened sense of vigilance combined with rapid initiation of back up emergency protocols can be useful in avoiding interruptions in delivery of surgical cancer care. Some felt that there could be a benefit in continuing the current precautionary practices even after the pandemic subsides. Other proposed strategies include avoiding screening delays, create local stockpiles of PPE and other equipment, and promote geography-specific research in real-time to develop evidence-based practices.

DISCUSSION

The primary and specific goal of this article is to summarize the opinions from the leaders of the GFCS about the impact of COVID-19 pandemic on cancer surgery. The leaders of the GFCS hail from different parts of the world and represent nearly three-quarters of the global cancer burden by incidence and mortality.

The members of GFCS also hold leadership positions in the respective surgical oncology societies of their country/region. Through these leadership positions, they tend to be involved in steering and guiding the educational paradigms, research platforms, and delivery of cancer surgery in their respective geographic region/s. As a result, the opinions of these leaders on matters related to cancer surgery tend to be strategic, visionary, pragmatic, broadly applicable in scope, and extremely valuable.

It is not surprising that the leaders felt that the pandemic had a devastating effect on nearly every aspect extending from clinical care, education, and research with equally detrimental effects on well-being and financial status. Clinical care was noted to be severely compromised with delayed or canceled elective procedures due to various reasons, such as diversion of efforts to address COVID-19, lack of PPE, unpredictability of workflows, and lack of screening amongst several other factors. It is ironical to note that cancers with well-established screening strategies (breast, colorectal) were affected the most. Many felt that this degree of disruption in cancer care will have a negative prognostic impact in the long-term and may contribute to a new phenomenon of stage migration.¹³ Severe interruptions also were noted in delivery of education and conduct of research.

The increased costs associated with delivering care under new/extra precautions combined with lost revenue resulting from fewer surgical procedures had a major financial impact on individual surgeons as well as hospitals. The fear of uncertainty, extremely unpredictable work schedules, social isolation, and inability to interact with peers on a regular basis adversely impacted the well-being of surgeons as well as every other health profession.

Despite the persistent duress of the pandemic for a prolonged period, there were some redeeming aspects highlighted as well. Many appreciated the hitherto underappreciated, dynamism, adaptability, and resilience of the surgical oncology community and witnessed the true spirit of collaboration with our colleagues in medical and radiation oncology. Although research overall was severely compromised, this pandemic provided a new opportunity for research related to COVID-19 and cancer surgery, which may be beneficial for any future catastrophic events. The additional funding provided by the respective governments served as lifelines during the pandemic. The pandemic also highlighted the benefits of collaboration between individuals and surgical oncology societies across the world to cross-pollinate the best and worst practices.

There are several limitations to this paper. It is based exclusively on the opinions of surgical oncologists rather than on any prospective or retrospective study design. Although the members of the GFCS hold leadership roles, it is likely that their opinions may not represent the views, outcomes, and practices of the entirety of the country or region they represent. Similarly, it is not clear why some cancers were affected more than others. It could be a reflection of various factors, such as the availability of specific resources, complexity of treatment required, availability of adjuvant options, and aggressive or indolent nature of each specific cancer.

It was felt by everyone at the virtual meeting that we need to develop strategies to guide the global surgical oncology community. These strategies will be extremely helpful to guide cancer surgeons, hospitals, policy makers, and governments across the world to deliver uninterrupted surgical care for cancer patients in the event of another catastrophic event in the future. The Global Forum of Cancer Surgeons is well suited for this purpose and will embark on this as its next initiative.

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