



Results and Significance of Preoperative COVID-19 Testing for Cancer Surgery in Brazil

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As we approach the third year of the coronavirus disease 2019 (COVID-19) pandemic, it is important to reflect and remember the tremendous sacrifices that hospital and healthcare workers have endured in the care of cancer patients. From crowded emergency rooms to overbooked intensive care units and delayed or cancelled oncologic procedures and operations, the physical, emotional, and spiritual toll on cancer providers has been impossible to calculate. The emergence of the delta and omicron variants and their resultant surges in 2021 have stressed several healthcare systems to the brink of collapse. One of the many highlights of the resilience in hospital systems in the face of this adversity has been the implementation of isolation protocols, COVID operating rooms, and universal testing for admitted patients. In addition, much of the progress in fighting the spread and impact of this disease has been the development and implementation of novel messenger RNA (mRNA) vaccines to the spike protein. However, all these efforts have not been enough to eradicate the pandemic, particularly in areas of the world where access to infection prevention, disease mitigation, and life-saving treatment such as extracorporeal membrane oxygenation (ECMO) may be limited.

In this issue of *Annals of Surgical Oncology*, Lopes et al. present their singular experience with a universal PCR testing protocol for patients prior to oncologic surgery in Sao Paulo, Brazil, during the beginning of the pandemic.¹ Between May and October 2020, 1636 tests were

performed for 1298 procedures, resulting in the detection of COVID-19 infections in 102 asymptomatic patients, or 6.2% of the entire cohort. Besides testing, the investigators also placed several precautionary measures in place to limit inpatient transmission between healthcare workers and patients or vice versa, including (1) no admission of COVID-19 patients; (2) transfer of COVID-19 patients to other facilities; (3) physical separation of COVID-19 patients from others; and (4) limitation of hospital visitors. With these procedures in place, 27 patients presented with postoperative symptoms of COVID-19, of whom 12 (0.9%) ultimately tested positive for the virus, resulting in one death from pulmonary complications within 30 days of surgery. However, increased length of stay and readmission were correlated with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection, with the majority occurring early during the study period. In the preceding period prior to routine testing in March 2020, there were 104 cases of COVID-19 in cancer patients at the same institution resulting in 43 deaths, of which 29 were in the postoperative period.

We have learned that immunocompromised patients, such as those undergoing cancer therapy, including surgery, may be more susceptible to the effects of the SARS-CoV-2 virus. As a result, the Society of Surgical Oncology published a set of guidelines for the evaluation, triage, and management of cancer patients requiring surgery during the pandemic.² These recommendations included how to maintain a safe hospital and clinic environment, protect the healthcare workforce, modify operating room workflows, and establish multidisciplinary teams to incorporate cancer care priorities with public health and system constraints. The Brazilian Society of Surgical Oncology (SBCO) also published their own set of recommendations, assimilating many of the same recommendations that were tailored to particularly affected regions with limited resources.³

It is important to note that the present study and its results occurred prior to the development of the mRNA and other vaccines for the SARS-CoV-2 virus. In one of the most rapid and efficient accomplishments between industry and government, the mass inoculation of susceptible populations such as the elderly, immunocompromised, and healthcare workers that began in December 2020 in the US clearly saved countless lives, especially when it was expanded to the general adult public and finally to children aged 5 years and above. The delta variant surge in 2021 rapidly exposed the importance of vaccination status, as those infected patients who failed to be immunized filled hospitals and intensive care units with one of the most severe forms of COVID-19. According to the World Health Organization, 67% of the population in Brazil has been fully vaccinated compared with 61% of the US population and 76% of Canadians (www.paho.org/en). The metropolis city of Sao Paulo, where the current study originates and widely considered the largest city in the Western Hemisphere, has recently reported a 100% rate of vaccination for its citizens (www.washingtonpost.com/world/2021/12/13/coronavirus-brazil-sao-paulo-vaccination/).

More recently, a third booster shot was recommended by the US Food and Drug Administration (FDA) and Centers for Disease Control and Prevention (CDC) due to waning immunity over time in adults. This was shown to be especially important for immunocompromised cancer patients. In a phase I trial of 20 patients with solid tumors, a third dose of the BNT162b2 mRNA vaccine resulted in a threefold higher neutralizing antibody response in 16 patients, suggesting an improvement in humoral immunity for patients receiving active oncologic therapy.⁴ All of these promising public health factors will hopefully predict a recovery from our current fragile situation and return to a more normal state in the coming year.

As we enter this next phase of the virus where the disease will become endemic, it behooves us as an oncology community to continue providing the highest level of appropriate evidence-based care to expedite backlogs of procedures, resume screening efforts and operate safely on those infected patients requiring urgent cancer operations

in the face of a struggling healthcare system. At our institution, we have implemented a dedicated preoperative medicine clinic protocol to safely evaluate and proceed with restoring surgical care to patients recovering from COVID-19.⁵ This includes a thorough physical examination and laboratory evaluation to determine the risk of major cardiovascular, pulmonary, or coagulation complications depending on whether the procedure is major or minor and requiring sedation versus general anesthesia. A minimum waiting period of 4 weeks for asymptomatic patients was suggested, with a recommended 6- to 8-week period of convalescence for those who were severely ill with the disease. Preoperative COVID-19 testing will continue to be required for the benefit of both patients and their caregivers, especially as we enter this next expected surge with the omicron variant. Coupled with increased vaccination and booster distribution and equity, we hope to minimize any further interruptions to cancer care, particularly in vulnerable nations with resource constraints, as we emerge from this truly global pandemic in 2022 as a united front against the deadly threat of this virus.

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