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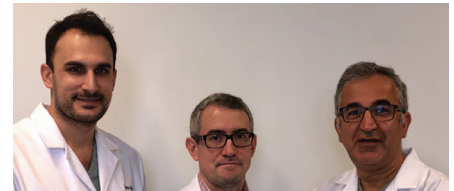
Commentary: Preoperative Screening CT: Not Ready for Primetime in The COVID-19 Era

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The coronavirus disease 2019 (COVID-19) pandemic is not only associated with marked global morbidity and mortality, but also poor outcomes after cardiac surgery.¹ In this setting, an effective preoperative screening tool is necessary to optimize cardiac surgical outcomes, especially among asymptomatic patients who may be SARS-CoV-2 positive by reverse transcriptase polymerase chain reaction (RT-PCR).

In this issue of the journal, Knol and colleagues² reported the results of a prospective observational study in which they evaluated the role of preoperative thoracic computed tomography (CT) to screen patients scheduled for cardiac surgery and asymptomatic for COVID-19. Among the 109 patients who underwent CT the day before surgery, abnormal findings, evaluated using a specific grading system (CO-RADS score), were observed in $n = 8$ (7.3%). Among these, 6 patients had negative RT-PCR for SARS-CoV-2, whereas 1 patient with a normal CT was positive. In a secondary analysis, the screening cohort was matched to a historical pre-COVID-19 control group, in which preoperative chest CT revealed a similar rate of abnormalities (8%, $P > 0.999$). The authors concluded that in patients undergoing cardiac surgery and asymptomatic for COVID-19, preoperative chest CT had low positive predictive value (PPV), and was abnormal in almost 8% of patients, in whom the presence of COVID-19 was unlikely.

The authors should be congratulated for the timeliness of their study. The initial surge of the COVID-19 pandemic has had an unprecedented impact on health care systems, and resource-intensive services such as cardiac surgery have been disproportionately affected.³ The reallocation of resources had led to the deferral of nonurgent cardiac surgeries in many jurisdictions.⁴ The relevance of preoperative SARS-CoV-2 screening has become even more crucial because the early phase of the pandemic has abated, and elective surgeries are resuming. Previous studies^{5,6} have pointed out the high accuracy of thoracic CT in the assessment of symptomatic patients or those with



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Central Message

Thoracic CT as a screening test prior to cardiac surgery for patients who are asymptomatic for COVID-19 remains controversial, but is unlikely to be useful.

high index of suspicion, especially at the beginning of the pandemic when there was uncertainty regarding the availability and reliability of SARS-CoV-2 RT-PCR. However, the utility of chest CT in the screening of asymptomatic patients remains controversial, due to the fact that characteristic imaging features of COVID-19 have been shown to be time-related, and nearly 60% of patients will have a normal CT study during the early phase after the onset of symptoms.^{7,8} Of note, the scoring system used in the study by Knol and colleagues² was primarily devised in order to assess pulmonary involvement in patients with at least moderate COVID-19-related symptoms.⁹ Other limitations include the low number of patients, variable use of RT-PCR, and protocol deviation in 25% of patients with a “positive” CT. Despite these shortcomings, the results reported by Knol and colleagues² are consistent with those of a recent meta-analysis which showed a good sensitivity of chest CT but low specificity, and a low PPV (1.5–48.8%), which in turn is influenced by prevalence (lower PPV in low-prevalence areas).¹⁰ In contrast, the PPV of RT-PCR was much higher (47.3–98.3%). These data suggest that a screening protocol exclusively based on CT imaging would lead to unnecessary postponement of cardiac surgery in as high as 1 in 2 patients. A poorly performing test is especially problematic in the cardiac surgical population, in whom the risk of COVID-19-related adverse outcomes must be balanced against the morbidity associated with an excessive surgical wait time.^{11,12} Thoracic CT screening appears to be valuable in differentiating COVID-19 from viral pneumonitis not related to COVID-19.¹³ The findings of Knol and colleagues² lend further support to

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current guidelines¹⁴ which recommend that thoracic CT should not be performed as a COVID-19 screening tool, but order to assess potential pulmonary involvement in light of clinical history, the presence of symptoms, and the results of SARS-CoV-2 RT-PCR. Further studies are needed to investigate the diagnostic and prognostic values of preoperative chest CT in patients referred for cardiac surgery who could have developed pulmonary sequelae after recovering from COVID-19.

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