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## Commentary: Cause for concern or 1 in 33 million?

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### CENTRAL MESSAGE

Acute thrombus formation on a bioprosthetic aortic valve in a COVID-positive patient raises questions of frequency and the issue of routine warfarin anticoagulation after AVR.

Coronavirus disease 2019 (COVID-19) cases worldwide exceed 33 million, with more than 1 million deaths. In the United States alone, more than 7 million cases and more than 200,000 deaths have been reported.<sup>1</sup> Primary lung involvement predominates, and disease severity ranges widely from asymptomatic subclinical infection to severe and potentially fatal respiratory distress syndrome. An associated coagulopathy seemingly mimics disseminated intravascular coagulopathy, with related thrombotic events, most commonly venous thromboembolism including pulmonary embolus.<sup>2,3</sup> Cardiac manifestations, including arrhythmias, acute myocardial injury, and myocarditis, have been increasingly recognized and reported.<sup>4-6</sup>

In this issue of *JTCVS Techniques*, Manghat and colleagues<sup>7</sup> report an interesting case of a 73-year-old female patient readmitted 2 weeks after surgical aortic valve replacement (AVR) and mammary artery bypass to the left anterior descending artery with complaints of chest pain, hypotension, low-grade fever, and hypoxia. Troponin-T, platelet, fibrinogen and D-dimer levels are elevated. Trans-thoracic echo and computed tomography (CT) initially demonstrated left lower-lobe pulmonary embolus, moderate pericardial effusion without tamponade, normally functioning valve prosthesis, and acute apical myocardial infarction with a patent bypass graft. She subsequently suffered a retinal artery embolus but apparently responded to oxygen and vasoconstrictor therapy. Her COVID-19 test, negative

during the previous admission, was now positive. The CT scan was re-read by a “cardiac radiologist” on day 4, with a finding of extensive thrombus formation attached to the aortic valve frame and near the left main stem ostium. Anticoagulation with heparin and warfarin was initiated, with eventual resolution of the thrombus at a follow-up CT scan 11 weeks later.

The presence of venous and arterial thrombotic/embolic complications associated with coagulation abnormalities in this COVID-19–positive patient, although not conclusive of itself, certainly warrant the authors’ suspicion that the demonstrated aortic thrombus may represent a previously unrecognized complication of COVID-19 disease. The recommendation, then, for “more judicious” follow-up of those with suspected, or perhaps more practically, demonstrated COVID-19–positive status, seems fitting. With a caveat for “careful thought with respect to anticoagulation strategy,” the authors also recommend that all postoperative patients during this time of COVID-19 be treated with warfarin therapy.

COVID-19 aside, despite evidence for subclinical leaflet thrombosis after both transcatheter AVR and surgical AVR, and an American Heart Association/American College of Cardiology Guideline recommendation for routine anticoagulation of bioprosthetic aortic valves for 3 to 6 months “...until the prosthetic valve is fully endothelialized,” consensus regarding routine anticoagulation with vitamin K antagonists remains lacking.<sup>8-14</sup> In this context, routine warfarin anticoagulation for all patients after tissue AVR

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on the basis of this single case seems, if not excessive, then at least premature.

Understanding whether this case, as the authors suggest, "...serves as a timely reminder of the consequences of COVID-19..." will indeed require additional study going forward. It does, however, as they to their credit very transparently acknowledge, demonstrate the importance of "clinical and radiological vigilance." This includes not only considering the appropriate diagnostic tests, but importantly, having timely access to the requisite expertise needed to accurately interpret and report the findings from these increasingly sophisticated radiologic and echocardiographic examinations essential to our diagnostic capabilities.

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