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SARS-CoV-2 may not be the Sole Causes of Aortic Thrombus Formation and Sudden Death despite Anticoagulation

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LETTER TO THE EDITOR

We eagerly read the article by Bouratzis et al. on a 67 year-old male with fever attributed to SARS-CoV-2 and a history of coronary heart disease with congestive heart failure and atrial fibrillation which was anticoagulated with acenocumarol [Bouratzis, V. *et al*., 2023]. On hospital day 10, routine echocardiography revealed an aortic thrombus originating from the left sinus Valsalva [Bouratzis, V. *et al*., 2023]. Since the patient was at increased risk of surgery (thrombectomy), only acetyl-salicylic acid was added to acenocoumarol [Bouratzis, V. *et al*., 2023]. Despite these measures, the patient died suddenly a few days later [Bouratzis, V. *et al*., 2023]. The study is appealing but has limitations that should be discussed.

The major limitation of the study is that the patient did not undergo an autopsy. An autopsy could have shown whether an acute ischemic stroke, pulmonary embolism, or myocardial infarction was present. An autopsy could finally have clarified whether the death was really related to a thrombosis, the SARS-CoV-2 infection, or another cause.

Another limitation is that the index patient's vaccination status was not mentioned in the case description. We should know whether the patient had undergone SARS-CoV-2 vaccination, how often, with which brand, and with what latency to the last shot.

A third limitation is that it is unclear whether the patient died from sepsis, multi-organ failure, ischemic stroke, asystole, malignant ventricular arrhythmias, or pulmonary embolism. Thrombus detachment on emergency echocardiography does not necessarily mean that embolism was present. The detachment could have been caused by the cardiopulmonary resuscitation.

A fourth limitation is that the causal relationship between SARS-CoV-2 infection and the development of aortic thrombosis remains unproven. We should know how often the INR was measured and whether it was in the therapeutic range at the last measurement before death. Although one value was within the therapeutic range, it is conceivable that the anticoagulation became ineffective because the dosage was too low, poor absorption, rapid metabolism, or rapid elimination.

Overall, the interesting study has limitations which challenge the results and their interpretation. Addressing these limitations could further strengthen and reinforce the statement of the study.

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