

## Trying to Survive A Serious Heart Condition in Time of COVID-19

Josip Varvodic, MD,<sup>1</sup> Verica Mikecin, MD,<sup>2</sup> Irzal Hadzibegovic, MD, PhD,<sup>3</sup> Marko Kutlesa, MD, PhD,<sup>4</sup> Carla Coric, MD,<sup>5</sup> Igor Rudez, MD, PhD<sup>1</sup>

<sup>1</sup>Department of Cardiac and Transplantation Surgery, University Hospital Dubrava, Zagreb, Croatia;

<sup>2</sup>Clinical Department of Anaesthesiology and Intensive Care Medicine, University Hospital Dubrava, Zagreb, Croatia;

<sup>3</sup>Department of Cardiology, University Hospital Dubrava, Zagreb, Croatia;

<sup>4</sup>University Hospital for Infectious Diseases dr. Fran Mihaljevic; <sup>5</sup>Health Centre Zagreb West

### ABSTRACT

The world has suffered over the past year under COVID-19. Unfortunately, people still are getting sick from other, also severe, diseases. Although the COVID-19 infection is present, patients need treatment for other life-threatening conditions. We present the case of a 36-year-old patient with severe infective endocarditis with a large abscess of the aortic root, who also is COVID-19 positive. Definitive diagnostics and treatment were avoided due to COVID-19 infection. In the end, emergent surgery was indicated due to acute cardiac decompensation and the development of heart failure symptoms, and the patient recovered uneventfully after surgery.

### INTRODUCTION

After the outbreak of the SARS-Cov2 virus in December 2019, the world turned to the treatment of COVID-19 patients, who became the biggest global health problem. Intensive care units were full of COVID-19 patients. In heart surgery, elective operations were significantly reduced. Diagnostic procedures, which are invasive and could cause the possible spread of infection to hospital personnel, were avoided. A drop of 49% of TEE procedures performed in contrast to a year earlier was observed [Dillinger 2020]. The number of infective endocarditis cases was reduced, even by one-third by some authors, and the number of surgeries due to endocarditis also declined, respectively [Escola-Verge 2020]. Reasons are not clear, but putting COVID-19 diagnosis in front of all other causes of diseases is one reason. If TEE is avoided due to the possible spread of SARS-CoV19 between medical personnel, we can presume that this is one of the leading causes of the reduced number of new cases. COVID-19

symptoms similar to endocarditis symptoms can lead to poor management of patients with infective endocarditis and worse prognosis than expected by current medical possibilities and guidelines, as seen in this case report.

### CASE REPORT

We present the case of a 36-year-old patient admitted to the hospital, due to vancomycin sensitive *Streptococcus pneumoniae* pneumonia and meningitis on October 20, 2020. Due to severe respiratory failure, he was mechanically ventilated for five days. Acute renal failure developed as a result of vancomycin treatment, so he underwent two hemodialysis treatments. Renal function recovered well afterward, when vancomycin was substituted with ceftriaxone and meropenem. He was moved to another tertiary center on October 30. He developed cardiorespiratory arrest due to gradual deterioration of respiratory status on November 1, due to decompensated heart failure and massive pleural effusions that were conservatively treated because of fear of COVID spread in case of an invasive procedure. The patient successfully was reanimated and mechanically ventilated and weaned off respirator shortly after. Due to hemodynamic instability, transthoracic echo was performed on November 15, showing paravalvular abscess of aortic valve with only mild aortic insufficiency with no vegetations seen at that time on TTE. The abscess was seen on the MSCT aortography scan. (Figure 1) Unfortunately, TEE was not done, due to the risk of COVID-19 spread among healthcare providers. Antibiotic treatment was continued with flucloxacillin. On November 28, due to a routinely performed positive COVID swab, he was again moved to the Infectology clinic with no COVID infection symptoms. CT scan showed bilateral massive pleural effusion with no typical signs of severe COVID-19 pneumonia. (Figure 2) Subsequently, the patient developed bilateral COVID-19 pneumonia with O<sub>2</sub> saturation dropping to 86%. COVID infection was treated with remdesivir and dexamethasone, which effectively treated patients with lower respiratory tract COVID-19 infection requiring oxygen therapy and respiratory support [Biegel 2020]. The patient was moved to our hospital on December 16 because we are the designated COVID-19 hospital center for the City of Zagreb and central-northern regions of Croatia (1.8 million inhabitants). Immediately after admission, transesophageal echo

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Correspondence: Josip Varvodic, MD, Department of Cardiac and Transplantation Surgery, University Hospital Dubrava, Gojko Susak av 6, 10000 Zagreb, Croatia, Telephone +385993553909 (e-mail: [josip.varvodic@gmail.com](mailto:josip.varvodic@gmail.com))

(TEE) was done, taking care of safety measures. TEE showed aortic root abscess with a formed abscess cavity in the projection of the left and non-coronary sinus, destroyed non-coronary cusp (NCC), and left coronary cusp (LCC) with oval mobile vegetations measuring 17x11 mm (Figure 3A and B). (Figure 3) The abscess was spreading under the NCC and the commissure between NNC and LCC and one-third of the LCC, just below the left coronary ostium. The turbulent flow was observed within the abscess cavity, with no fistulas to the left atrium or any other cavity (Figure 3C). This resulted in massive aortic insufficiency with the regurgitation jet filling >75% of LVOT diameter and expanding almost to the left ventricle apex, with pressure-half-time of 100 ms (Figure 3D). The ejection fraction was 45%. Signs of right ventricle deterioration were observed with moderate tricuspid valve insufficiency with a peak pressure gradient of 40 mmHg. The patient had massive bilateral pleural effusion and also signs

of ARDS development. The patient was presented at cardiac surgery consultation on December 16, when emergent surgery was indicated. Surgery was performed on December 17, 2020, through median sternotomy, standard cannulation, and warm blood cardioplegia was used with a cross-clamp time of 54 minutes. The abscess of the aortic root was closed with a pericardial patch (Pericardial Patch with EnCap Technology, SJM, St. Paul Minnesota, USA), and the aortic valve was excised and replaced with a biological aortic valve size 23 (Inspires Resilia Aortic Valve, Edwards Lifesciences, Irvine, California, USA). The CytoSorb absorber (Cytosorbents Corporation of Monmouth Junction, New Jersey, USA) was used during the whole procedure and has proven helpful in patients with endocarditis and prolonged sepsis and ARDS. The patient was admitted to the ICU, weaned off from the ventilator on the same day, and moved toward the third post-operative day. Postoperative recovery was uneventful. Control transthoracic echo showed closure of the abscess cavity with no residual flow and normal function of the biological aortic valve. The patient was discharged from the hospital on December 29, 12 days after surgery.

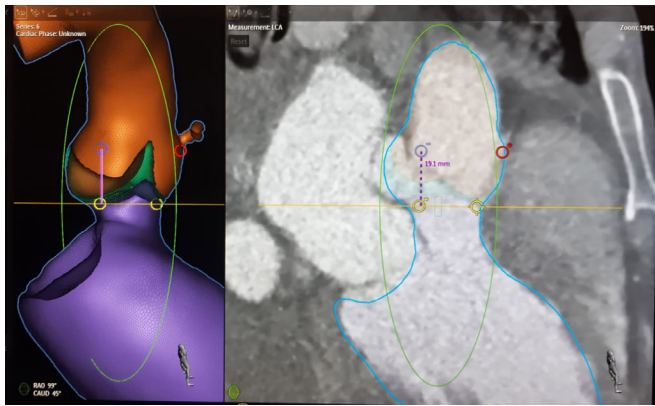


Figure 1. 3D reconstruction of MSCT angiography of aorta, showing no dilatation of ascending aorta and abscess cavity 19.1 x 21 mm in the projection of the left coronary cusp.

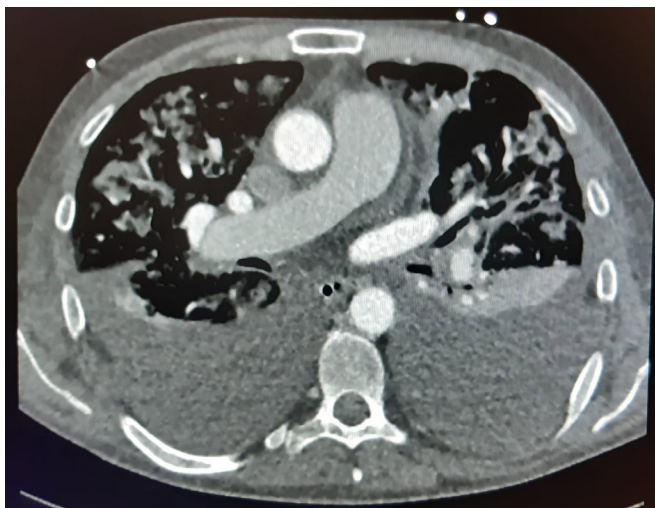


Figure 2. Lung CT scan with massive bilateral pleural effusions, showing no signs of pulmonary embolism and no signs of severe COVID-19 pneumonia.

## DISCUSSION

Guidelines regarding treating patients with endocarditis are clear [Habib 2015], especially with meningitis, end-organ failure, and hemodynamic instability. Early surgery is of utmost importance [Kang 2012]. As you can see in our case, TEE was necessary for the definitive diagnosis. It was avoided until the patient arrived in our hospital due to the risk of SARS-CoV-2 spread to present medical personnel. Due to COVID infection, prolongation of treatment usually is observed, diagnosis can be misleading, and underlying disease can pass undiagnosed. Changes in usual treatment

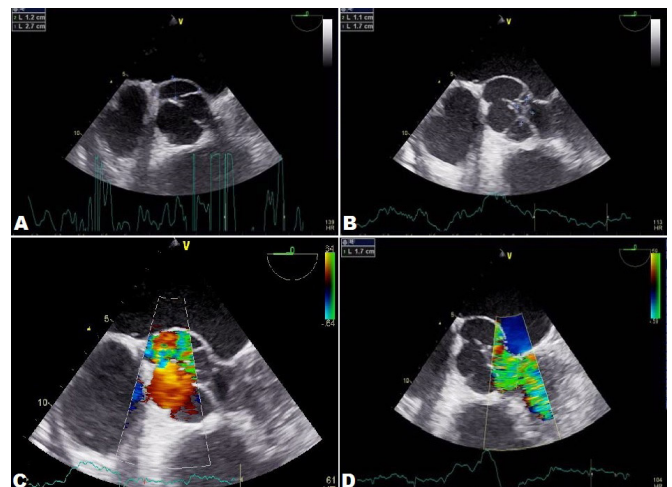


Figure 3. Transesophageal echocardiography. A) Pseudoaneurysm cavity formed due to abscess under the NCC and the commissure between NNC and LCC; B) Destroyed NCC and LCC with vegetation; C) Turbulent flow within the whole pseudoaneurysm cavity; D) Massive aortic regurgitation

have led to worse prognosis with severe complications and increased mortality of infective endocarditis, even twice by some authors [Dillinger 2020]. We have shown in this case report that, unfortunately, TEE was postponed for more than a month and a half, due to COVID-19. Unfortunately, the patient was treated conservatively until hemodynamic instability occurred, and in the meantime, the patient experienced two mechanical ventilation periods, cardiorespiratory arrest and kidney failure. Due to the pandemic and all obstacles caused by the pandemic, the patient was operated on in the end with no residual neural or other symptoms. Our opinion is that although COVID-19 is a global problem and threat, different life-threatening diagnoses must not be ignored because emergent treatment is needed to avoid life-threatening situations and mortality. Emergent surgery can be done and treatment provided with strict following of measures to avoid COVID-19 spread between healthcare workers. Individualized decision-making is necessary during the pandemic to weigh the risk of providing needed medical procedures and potential fatal exposure of the virus to medical personnel. Designated COVID-19 hospitals are equipped with the necessary equipment and educated personnel to provide essential timely treatment.

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