

Use of mechanical circulatory support guided by imaging modalities in treatment of influenza myocarditis: a case report

 **Luka Mitar**^{1,*},
 **David Palijan**¹,
 **Dubravka Šipuš**^{1,2},
 **Jure Samardžić**^{1,2},
 **Dora Fabijanović**^{1,2},
 **Marijan Pašalić**^{1,2},
 **Hrvoje Jurin**^{1,2},
 **Boško Skorić**^{1,2},
 **Davor Miličić**^{1,2},
 **Daniel Lovrić**^{1,2}

¹University of Zagreb, School of Medicine, Zagreb, Croatia

²University Hospital Centre Zagreb, Zagreb, Croatia

KEYWORDS: myocarditis, extracorporeal membrane oxygenation, pulmonary edema.

CITATION: *Cardiol Croat.* 2023;18(5-6):164. | <https://doi.org/10.15836/ccar2023.164>

***ADDRESS FOR CORRESPONDENCE:** Luka Mitar, Medicinski fakultet, Šalata 2, HR-10000 Zagreb, Croatia. / Phone: +385-99-573-8982 / E-mail: lukamitar25@gmail.com

ORCID: Luka Mitar, <https://orcid.org/0000-0002-6765-2447> • David Palijan, <https://orcid.org/0000-0002-4263-2415>
Dubravka Šipuš, <https://orcid.org/0000-0002-5631-0353> • Jure Samardžić, <https://orcid.org/0000-0002-9346-6402>
Dora Fabijanović, <https://orcid.org/0000-0003-2633-3439> • Marijan Pašalić, <https://orcid.org/0000-0002-3197-2190>
Hrvoje Jurin, <https://orcid.org/0000-0002-2599-553X> • Boško Skorić, <https://orcid.org/0000-0001-5979-2346>
Miličić Davor, <https://orcid.org/0000-0001-9101-1570> • Daniel Lovrić, <https://orcid.org/0000-0002-5052-6559>

Introduction: Influenza affects millions worldwide every year. Although most cases are mild, severe complications can occur, including myocarditis¹. Extracorporeal membrane oxygenation (ECMO) is a treatment option for patients with severe respiratory and/or cardiac failure. We present a case report of a patient with influenza-induced myocarditis and subsequent heart failure treated successfully with ECMO.

Case report: 21-years-old male with no known history of medical illness presented to the Emergency Department at University Hospital Centre with fever, cough, and shortness of breath starting three weeks earlier. Chest X-ray showed pneumonia, PCR was COVID-19 negative but influenza positive. 12-lead electrocardiogram showed diffuse ST-segment elevation, cardiac biomarkers were elevated, and echocardiography verified reduced left ventricular ejection fraction (LVEF) of 44% with pericardial effusion. Patient was diagnosed with acute myopericarditis and pneumonia, admitted to hospital and started on broad-spectrum antibiotics. Four days later patient's respiratory distress worsened requiring intubation and mechanical ventilation. Hemodynamic status deteriorated requiring noradrenaline and dobutamine support. Bedside echocardiogram showed akinesia of inferolateral and anterolateral wall with severely reduced LVEF. Due to escalation of support and hemodynamic instability, decision was made to initiate veno-arterial (V-A) ECMO support. During the procedure patient had cardiac arrest and was successfully resuscitated two times. Two days later, patient was transported to University Hospital Centre Zagreb. Echocardiography showed LVEF of 20% while the chest X-ray showed signs of severe congestion interpreted as ECMO lung oedema. Due to that, an immediate implantation of Impella was performed. However, as soon as Impella established adequate cardiac output, a severe case of Harlequin syndrome developed which required conversion of ECMO configuration to V-A-V that stabilized the situation and enabled conversion into V-V ECMO two days later. Following further stabilization, VV ECMO was removed two days later, Impella the following day, and patient was extubated. Cardiac recuperation was dramatic and cardiac MRI showed an LVEF of 57%. Patient was discharged home after 24 days.

Conclusion: This case highlights the appropriate use of different mechanical circulatory support modalities guided by different imaging modalities for bridging a case of severe influenza-induced myocarditis from a cardiac arrest situation to successful hospital discharge.

RECEIVED:
March 25 2023

ACCEPTED:
March 29, 2023



LITERATURE 
1. Rezakalla SH, Kloner RA. Influenza-related viral myocarditis. *WMJ.* 2010 Aug;109(4):209-13. **PubMed:** <https://pubmed.ncbi.nlm.nih.gov/20945722/>