©Copyright by Croatian Cardiac Society. This is an Open Access article distributed under the terms of the Creative Commons Attribution License (https://creativecommons.org/licenses/by/4.0/) which permits users to read, download, copy, distribute, print, search, or link to the full texts of these articles in any medium or format and to remix, transform and build upon the material, provided the original work is properly cited and any changes properly indicated.

Mechanical circulatory support during percutaneous coronary intervention in biventricular systolic dysfunction: a case report

Vedran Radonić*

University Hospital "Merkur", Zagreb, Croatia

KEYWORDS: mechanical circulatory support, percutaneous coronary intervention, biventricular dysfunction.

CITATION: Cardiol Croat. 2026;21(11-12):294. | https://doi.org/10.15836/ccar2026.294

***ADDRESS FOR CORRESPONDENCE:** Vedran Radonić, Klinička bolnica Merkur, Zajčeva 19, HR-10000 Zagreb, Croatia. / Phone: +385-91-7877-085 / E-mail: vedran.radonic91@gmail.com

ORCID: Vedran Radonić, https://orcid.org/0000-0002-2115-2826

Introduction: Mechanical circulatory support (MCS) is widely used to facilitate high-risk percutaneous coronary intervention (PCI) in patients with isolated left ventricular systolic dysfunction. However, the role of MCS and the optimal support strategy in patients with biventricular dysfunction remain less clear, although this topic has been explored to some extent[1]. Important challenge of utilizing left-sided devices like the Impella CP (Abiomed Inc, Danvers, Massachusetts) or iVAC-2L (PulseCath BV, Arnhem, Netherlands) in biventricular dysfunction is the risk of suction-induced pump failure due to inadequate right-sided forward flow. Positioning a pulsatile MCS device in a supra-aortic position may theoretically mitigate the risk of suction events while still providing a degree of circulatory support. Earlier in 2026, a case report described the use of the iVAC-2L in a supra-aortic position during successful PCI and transcatheter aortic valve implantation (TAVI)[2]. The present report describes the use of supra-aortic iVAC-2L support during multivessel PCI in a patient with left and right ventricular systolic dysfunction.

Case report: 78-year-old man presented with progressive dyspnea and lower-extremity edema. His comorbidities include atrial fibrillation and diabetes. Echocardiography revealed a dilated left ventricle (66 mm) with severely reduced ejection fraction (25%) and diffuse hypokinesia, most pronounced in the septal and anterior segments. The right ventricle was also dilated (47 mm) with impaired systolic function, as evidenced by a tricuspid annular plane systolic excursion (TAPSE) of 15 mm, a tissue Doppler-derived tricuspid annular systolic velocity (S') of 7 cm/s, and a fractional area change (FAC) of 21%. Echocardiography further demonstrated moderate mitral regurgitation, moderate-to-severe tricuspid regurgitation, and signs of pulmonary hypertension. Coronary angiography revealed significant stenoses of the mid left anterior descending artery (LAD), proximal obtuse marginal branch (OM), and mid right coronary artery (RCA). The patient was subsequently scheduled for multivessel revascularization with MCS. PCI was performed via right femoral arterial access, while the iVAC-2L device was introduced through the left femoral artery and positioned in ascending aorta, immediately above the aortic valve. The device provided pulsatile circulatory support synchronized with ventricular contractions. Following multiple balloon dilatations, one drug-eluting stent was successfully implanted in each of the LAD, OM, and RCA. The patient remained hemodynamically stable throughout the procedure. Final angiography demonstrated an optimal result. At the one-month follow-up, the patient reported symptomatic improvement, with a reduction in dyspnea.

Conclusion: Multivessel PCI was successfully performed in a patient with biventricular dysfunction using supra-aortic iVAC-2L MCS position, without periprocedural complications.

RECEIVED:
October 16, 2026

UPDATED:
November 4, 2026

LITERATURE

1. Rommel KP, Bonnet G, Bellumkonda L, Lansky AJ, Zhao D, Thompson JB, et al. Right Ventricular Dysfunction in Patients Undergoing High-Risk PCI with Impella. J Card Fail. 2024 Oct;30(10):1244-1254. https://doi.org/10.1016/j.cardfail.2024.08.001
2. Elia E, Lombardi M, La Malfa G, Patty G, Secco GG, New sheathless supra-aortic pulsatile mechanical support via subclavian access for combined protected percutaneous coronary intervention and transcatheter aortic valve implantation in hostile vascular disease: a case report. Eur Heart J Case Rep. 2026 July;10(7):ytag502. https://doi.org/10.1093/ehjcr/ytag502