

Successful myocardial recovery with early introduction and escalation of mechanical circulatory support in acute coronary syndrome complicated by cardiogenic shock: a case report

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Introduction: In spite of advances in percutaneous coronary interventions and short term mechanical circulatory support (MCS), cardiogenic shock (CS) complicating acute coronary syndrome still carries high mortality risk.¹

Case report: A 62-year-old male with arterial hypertension and nicotine use presented hypotensive with a 24h progressive back pain and sinus tachycardia with diffuse ST denivelation. Upon admission to Coronary Care Unit he was in refractory CS. Urgent hemodynamic (HD) stabilization was achieved with peripheral venoarterial extracorporeal membrane oxygenation (VA-ECMO) and he was rushed to catheterization laboratory. Coronary angiography revealed chronic total occlusion (CTO) of subostial left anterior descending artery, CTO of mid hypoplastic right coronary artery and acute thrombotic occlusion of dominant proximal circumflex artery (LCX). Drug-coated balloon delivery was used for successful revascularization of the LCX. For the purpose of left ventricular (LV) unloading, the procedure was ultimately completed by implantation of an Impella CP pump via the left femoral artery (FA). Initial echocardiography revealed severely reduced LV ejection fraction (EF) of only 10%. Invasive HD showed mPAP of 26 mmHg, PCWP 19 mmHg and CI under HD support of 2.3 ml/min/m². Echocardiography two days later showed slight improvement of EF to 30%. On the 3rd day VA-ECMO was successfully percutaneously extracted. However, attempt to wean off Impella CP was unsuccessful due to immediate clinical deterioration, so the micro-axial pump was repositioned with immediate HD stabilization. Given there was no appropriate percutaneous option of further revascularization, the patient underwent successful surgical revascularization of the LAD along with escalation to Impella 5.5. Inotropic and vasopressor support was discontinued by post-operative day (POD) 4 followed by levosimendan loading. On POD 5 guideline-directed medical therapy (GDMT) including eplerenone, sacubitril/valsartan, dapagliflozin, bisoprolol was carefully initiated. MCS with Impella 5.5 was gradually weaned off and removed on POD 7. Ultimately, the patient clinically recovered, and pre-discharge echocardiography showed LVEF of 40%. Patient was discharged from hospital 22 days after admission with GDMT.

Conclusion: This case demonstrates that appropriate early implementation and subsequent escalation of MCS optimizes survival and functional recovery in this patient population.

LITERATURE

1. Byrne RA, Rossello X, Coughlan JJ, Barbato E, Berry C, Chieffo A, et al; ESC Scientific Document Group. 2023 ESC Guidelines for the management of acute coronary syndromes. *Eur Heart J.* 2023 Oct 12;44(38):3720-3826. <https://doi.org/10.1093/eurheartj/ehad191>