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STUDIUM PRZYPADKU / *CLINICAL VIGNETTE*

The first successful bridging with an Impella CP® to minimally invasive HeartMate 3 LVAD implantation in Poland

Pierwsze skuteczne zastosowanie Impelli CP jako pomostu do małoinwazyjnej implantacji HeartMate 3 LVAD w Polsce

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A 37-year-old female with non-compaction cardiomyopathy and history of mitral valve replacement in 2015 (Carpentier-Edwards Perimount 29 mm) was admitted to the cardiac emergency department in a tertiary centre due to rapidly progressing decompensation of chronic heart failure. The patient had a history of recurrent hospitalisations and was on an active transplant list. Marked symptoms and signs of pulmonary and peripheral congestion were visible. Echocardiography revealed left ventricular ejection fraction (LVEF) of 10%, left ventricle diameter 63/60 mm and right ventricle 33 mm with tricuspid annular plane systolic excursion of 11 mm. Despite intensive medical management (diuretics and inotropic support) the patient progressed to cardiogenic shock. A temporary mechanical circulatory support — an Impella CP® (Abiomed, USA) — was percutaneously inserted via the right femoral artery (Fig. 1A), generating up to 4 L/min of flow. Inotropic agents were gradually reduced, as the patient's clinical and haemodynamic condition improved. Appropriate anticoagulation was achieved with unfractionated heparin titrated to activated partial thromboplastin time of 60–80 s. Despite careful repositioning of the Impella CP, clear evidence of haemolysis and the subsequent haemolytic anaemia was observed 24 h later. An attempt to wean the Impella's support was made, but failed. The patient was qualified to an emergency upgrade to long-term mechanical ventricular support and transferred to our centre. On the fifth day, a less-invasive, sternum-sparing left ventricular assist device (LVAD) implantation was performed (Fig. 1B). Via a left anterolateral thoracotomy, the HeartMate 3™ LVAD as well as its outflow graft — connecting the pump with the ascending aorta — were placed extrapericardially (Fig. 2), to minimise the risk associated with pericardial dissection. A reversed T-upper mini-sternotomy was used to anastomose the outflow-graft to the ascending aorta. The Impella CP was surgically removed after completion of the LVAD procedure. However, a thrombectomy with a surgical reconstruction of the right femoral artery was necessary. The partially thrombosed rotor of the Impella was found on inspection of the pump. The patient was extubated 8 h later with minimal inotropic support and transferred to an intermediate care unit two days later. Improvement of LVEF to 20% as well as liver and renal function was observed. Resolution of haemolysis was immediate. We report here the first successful bridging with an Impella CP to less invasive LVAD implantation in a Polish patient with cardiogenic shock refractory to intensive medical therapy. This case confirms that the Impella CP is safe and effective for temporary stabilisation of a failing heart, allowing for subsequent upgrade for mechanical circulatory support. Minimally invasive, video-assisted LVAD implantation provides a safe option in patients after cardiac surgical procedures and allows for anastomosis of the outflow graft with the ascending aorta. The patient is at home in overall very good condition and with restored quality of life.

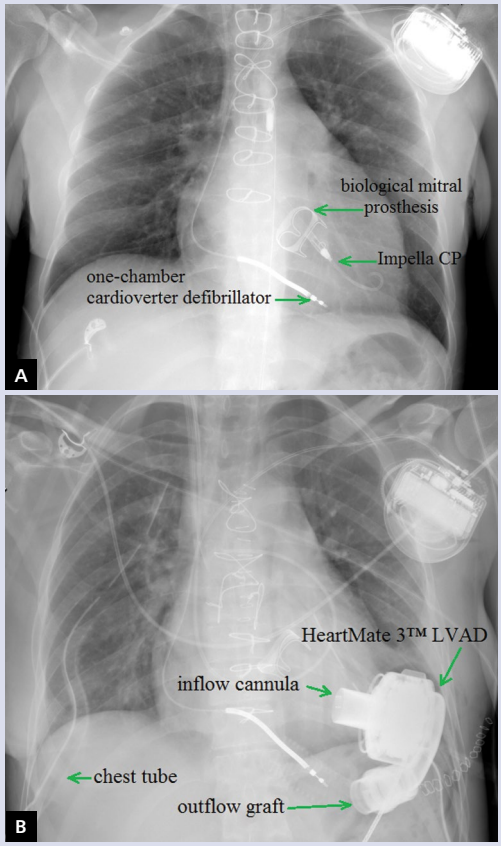

Figure 1. **A.** Chest X-ray illustrating correct placement of percutaneous transaortic Impella CP; **B.** Chest X-ray showing placement of HeartMate 3™ LVAD pump housing with inflow cannula anastomosed to the left ventricular apex and the optimal position of the outflow-graft

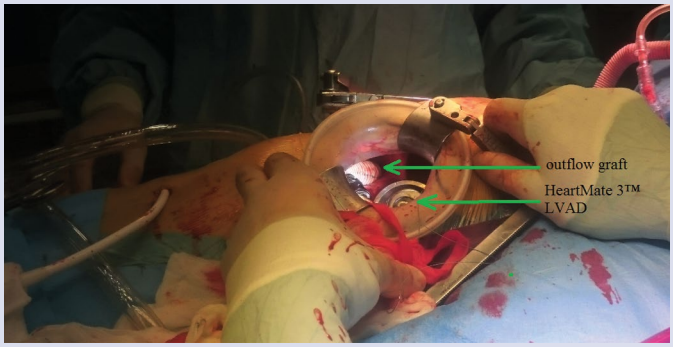

Figure 2. Left anterolateral thoracotomy; the view of HeartMate 3™ LVAD and the outflow-graft in the extrapericardial position

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Conflict of interest: *Michał O. Zembala — Consultant for Symetis SA, Vascutek Terumo, Abbott and AtriCure.*