

Successful use of Impella CP[®] in cardiogenic shock after cardiac arrest: a first in Poland

Skuteczne zastosowanie pompy Impella we wstrzasie kardiogennym po zatrzymaniu krążenia: pierwsze w Polsce

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A 19-year-old man developed cardiac arrest at home. This was followed by successful cardiopulmonary resuscitation (CPR). He was admitted to the Emergency Department, where cerebrocranial trauma and pulmonary embolism were excluded by computer tomography (CT) examination. Upon arrival to the Intensive Care Unit (ICU) the patient was unconscious with Glasgow Coma Scale of five points with signs of pulmonary oedema and ventilator treatment. The clinical condition deteriorated into cardiogenic shock (CS). Three hours after admission the patient had a second cardiac arrest with asystole with 15 min of CPR. Despite inotropic support, persistent signs of refractory CS were present. Multiorgan failure developed including hepatic and renal dysfunction. Intoxication was excluded. Echocardiography revealed a left ventricular (LV) ejection fraction (LVEF) of 10% with LV diameter 52/48 mm, right ventricle 25 mm, and no significant valvular pathologies. Coronary angiography showed normal coronary arteries (Fig. 1), and an Impella CP[®] was percutaneously deployed (Fig. 2) with from 3.1 to 3.3 L/min flow; the mean arterial pressure gradually improved, and the vasopressor drugs were reduced. Additionally, levosimendan was used. Bleeding was noted around the Impella access site. Laboratory signs of infection increased, and this was treated with wide-range antibiotic therapy. Blood tests for bacteria and antibodies to viruses were negative. The patient was successfully transferred by air transport to another hospital on the fourth day after admission. Impella was secured in the correct position by plaster cast. Improvement in LVEF from 15–25% on arrival to 35–40% the next day and 55% finally was shown. The patient improved clinically and hepatic and renal function normalised. The Impella was removed after eight days with surgical closure with good haemostasis, and the patient was extubated the next day. He recovered from anoxic brain injury but had transient problems with his short-term memory. Two small ischaemic insults were noted in control CT. Pulmonary emphysema was treated by pleural drainage. Magnetic resonance investigation excluded myocardial inflammation and reversible myocardial injury, so an implantable cardioverter-defibrillator was implanted on secondary prevention indication. Follow-up of the patient demonstrated neurological and functional recovery. He was sent home after a month post cardiac arrest. This presentation supports the feasibility and safety of the Impella in the management of patients with severe LV dysfunction and CS after cardiac arrest. Patients with CS after cardiac arrest have a very poor prognosis. The Impella is a new tool, enables immediate and sustained unloading of the LV, while increasing the overall systemic cardiac output. Impella implantation after cardiac arrest may ensure good haemodynamic support and tissue perfusion as a bridge to recovery. The Impella is a miniaturised, percutaneously inserted, ventricular assist device that can be placed via a retrograde approach across the aortic valve using a femoral arterial access. The device pumps blood from the LV into the ascending aorta and systemic circulation. Vascular complications, such as bleeding from the insertion site and limb ischaemia, are major concerns.

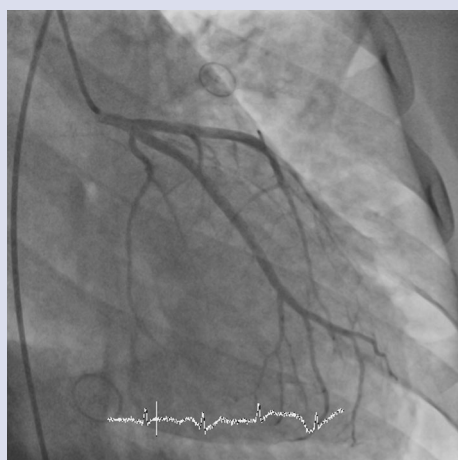


Figure 1. Coronary angiogram demonstrating stenosis-free vessels

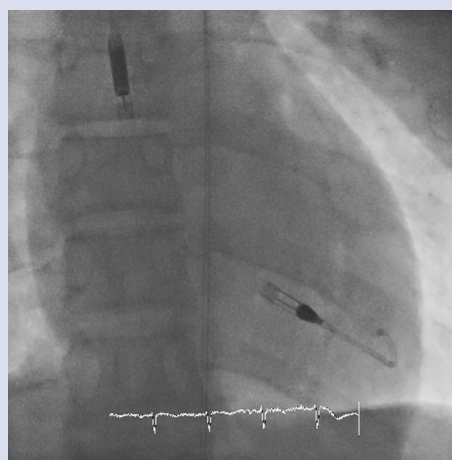


Figure 2. Fluoroscopy confirming placement of the Impella within the left ventricular cavity

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