


# Impella-supported endovascular repair of thoracoabdominal aorta dissection

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Although Impella, as a percutaneous left ventricular (LV) assist device, is primarily indicated in high-risk percutaneous coronary interventions (HR-PCI) and cardiogenic shock (CS), emerging alternative indications are arising, i.e. fulminant myocarditis, transaortic valve implantation or ventricular tachyarrhythmia ablation.

In this case, a 47-year-old patient with Marfan syndrome and advanced chronic kidney disease was admitted for thoracoabdominal aorta dissection, extending from the aortic arch to the right iliac artery, with false lumen dilatation to 48 mm and persistent flow through multiple secondary entry tears (Fig. 1A, B). The patient had a history of ascending aortic aneurysm treated with aortic root replacement, complicated with post-operative myocardial infarction and subsequent severe LV systolic dysfunction. He also suffered from thoracoabdominal aorta dissection, treated by thoracic

endovascular stent-graft implantation (EVAR). Given the extremely high mortality risk (EuroScore II 32%), the HeartTeam opted for repeated EVAR with LV support. Impella CP pump (Abiomed, Danvers) was inserted through cutdown of the right axillary artery, allowing for a cardiac output of 7.9 L/min, with minimal noradrenaline infusion (Fig. 2E). A branched graft (E-nside TAAA, JOTEC) was implanted via left axillary and right inguinal access, overlapping with the previously implanted stent-graft (Zenith, Cook Medical) (Fig. 2C, 2D). Angiography revealed no endoleak and Impella was removed after approximately 4.5 hours. After a 2-day stay in the intensive care unit, the patient was discharged home on day 9.

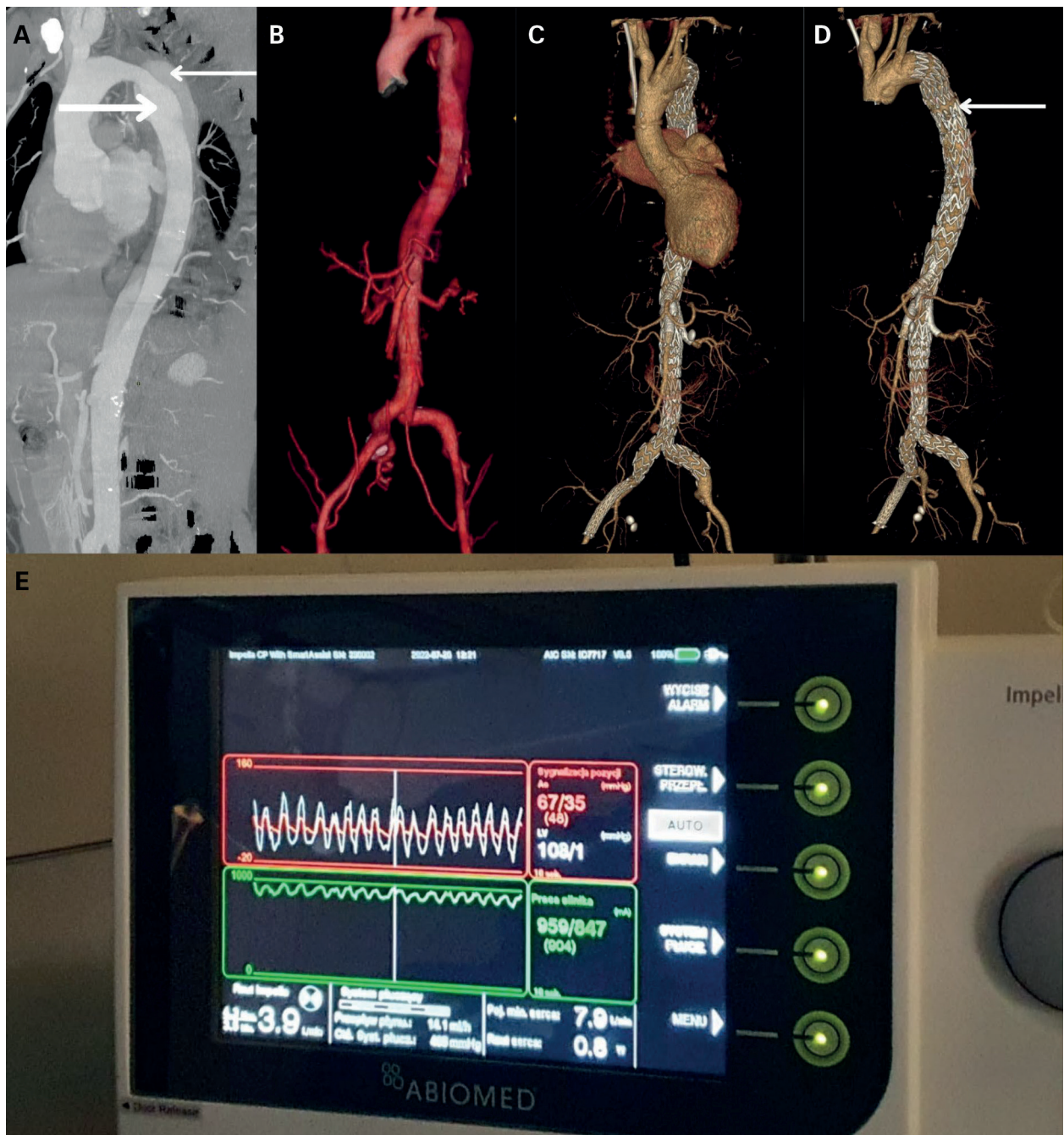
The present report demonstrates the expansion of Impella use to EVAR, suggesting its potential role in any procedure requiring LV support to prevent hemodynamic compromise.

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**Figure 1.** A. Computed tomography of thoracoabdominal aorta dissection. The false and true lumens are indicated with thin and thick white arrows, respectively; B. 3D computed tomography reconstruction of the dissected thoracoabdominal aorta; C, D. 3D computed tomography reconstruction of the aorta after branched endovascular aneurysm repair operation with stentgraft implantation (white arrow); E. Impella device screen during the operation, showing decreased systolic blood pressure (67/35 mmHg) and mean arterial pressure (48 mmHg), but maintained cardiac power output (0.8 Watt)