

Impella-supported high-risk percutaneous coronary intervention complicated by a stuck pump and somersault in the aorta

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A 65-year-old man with non-ST-segment elevation myocardial infarction and three-vessel disease was admitted for further invasive treatment. His concomitant diseases included chronic heart failure, hypertension, hypercholesterolemia, and type 2 diabetes mellitus. Echocardiography showed hypokinesis of the inferior and anterior walls with reduced left ventricular ejection fraction of 35%. Coronary angiography showed a chronically occluded right coronary artery and critical left main (LM) bifurcation stenosis (Medina 0,1,1) (Supplementary material, *Videos S1–S3*). The local Heart Team considered the best therapeutic approach. Due to high operative risk (SYNTAX score, 47.0 points; EuroSCORE II, 2.65%) and coronary arteries incompatible with grafting, the patient was disqualified from coronary artery bypass grafting and qualified for high-risk rescue percutaneous coronary intervention (PCI) with the use of Impella CP (Abiomed, Denver, CO, US) support.

The Impella CP was successfully introduced into the left ventricle (LV) *via* the right femoral approach. The catheter needed to be repositioned twice before being placed in the optimal position (**Figure 1A**). When removing the guide wire, the operator noticed that the wire was trapped inside the lumen of the catheter. Following the applied traction, the Impella and trapped guidewire was moved back to the aortic arch and the descending aorta, with simultaneous flexion just distal to the pump motor and further down the catheter (**Figure 1B**). To straighten the kinked Impella catheter, we used a 6 F 12–20 mm Atrieve Vascular Snare™ through the right radial approach.

After several attempts, the distal part of the pump was captured by the vascular snare (**Figure 1C**). The kinks were straightened by gently pulling both the snare and Impella catheter, and the pump was retrieved (Supplementary material, *Video S4*). Due to concerns about the efficiency of Impella, we decided to continue the procedure without protection, allowing the use of the new device as a bailout.

PCI was performed using the 14 F Impella CP sheath with the EBU 3.5 Guide Catheter (7 F). Because of severe calcifications, we performed a rotablation of the LM along with the proximal and middle segments of the left descending artery (LAD). Two drug-eluting stents (DESs), 3.0 × 12 mm and 2.5 × 28 mm, were successfully implanted in the LAD. LM bifurcation was treated with 3.5 × 34 mm DES implantation by the provisional technique. The procedure was completed with the proximal optimization technique (POT) with a 5.0 mm NC balloon. The optimal final angiographic result was obtained and confirmed on the IVUS (**Figure 1D–E**). The patient remained hemodynamically stable throughout the procedure.

Complex PCI in a patient with poor LV function is one of the indications for the use of Impella CP [1, 2]. In the presented case, the procedure was successfully performed without hemodynamic support, mainly due to the operators' experience and only moderate LV dysfunction.

A possible cause of problems with retrieving the guidewire may be its distal kink and damage that occurred during Impella's repositioning, hence we suggest using a new

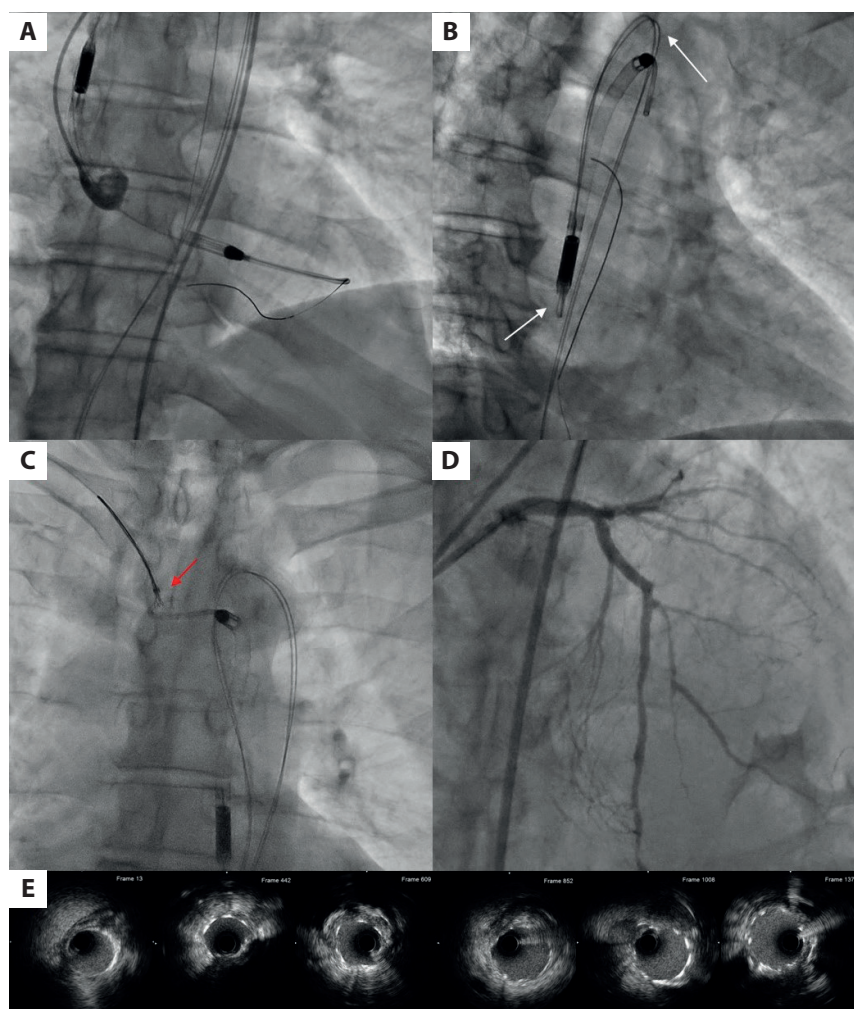


Figure 1. **A.** Angiographic view of the Impella CP placed in the left ventricle. **B.** Angiographic view of the Impella and guidewire displaced in the descending aorta, with flexion just behind the pump and further down the catheter (white arrows). **C.** Angiographic view of the distal part of the pump captured by the vascular snare (red arrow). **D.** The final angiographic result. **E.** Final IVUS cross-sections of the left main (LM) and anterior descending artery (LAD) with a well-expanded stent

guidewire in such cases. The presented case shows also that snaring can be effectively and safely used to capture and reposition or remove kinked Impella catheters [3].

Supplementary material

Supplementary material is available at https://journals.viamedica.pl/kardiologia_polska.

Article information

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REFERENCES

1. Glazier JJ, Kaki A. The Impella Device: Historical Background, Clinical Applications and Future Directions. *Int J Angiol.* 2019; 28(2): 118–123, doi: [10.1055/s-0038-1676369](https://doi.org/10.1055/s-0038-1676369), indexed in Pubmed: [31384109](https://pubmed.ncbi.nlm.nih.gov/31384109/).
2. Iwańczyk S, Klotzka A, Skorupski W, et al. Impella-supported intracoronary lithotripsy of left main in-stent restenosis. *Kardiol Pol.* 2022; 80(3): 357–358, doi: [10.33963/KP.a2022.0007](https://doi.org/10.33963/KP.a2022.0007), indexed in Pubmed: [35014012](https://pubmed.ncbi.nlm.nih.gov/35014012/).
3. Burzotta F, Trani C, Doshi SN, et al. Impella ventricular support in clinical practice: Collaborative viewpoint from a European expert user group. *Int J Cardiol.* 2015; 201: 684–691, doi: [10.1016/j.ijcard.2015.07.065](https://doi.org/10.1016/j.ijcard.2015.07.065), indexed in Pubmed: [26363632](https://pubmed.ncbi.nlm.nih.gov/26363632/).