Percutaneous coronary intervention of chronically occluded coronary arteries with a mechanical circulatory support system: expanding the indications for the procedure

Marta I. Kałużna-Oleksy, Bernhard Zrenner, Stylianos A. Pyxaras

Department of Internal Medicine, Landshut-Achdorf Hospital, Landshut, Germany

A 57-year-old man with stable angina, severely reduced left ventricular ejection fraction (20%), and decompensated heart failure was diagnosed with chronic total occlusion of the proximal segment of the right coronary artery (FIGURE 1A) supplied by the collaterals from the left anterior descending coronary artery (FIGURE 1B). Elective percutaneous recanalization of the right coronary artery was performed with mechanical circulatory support (MCS), namely, the Impella 2.5 microaxial percutaneous left ventricular assist device (Abiomed, Inc., Danvers, Massachusetts, United States), which was implanted at the beginning of the index procedure (FIGURE 1C). Due to the use of the Impella device and necessity for contralateral injections, triple arterial access was warranted. Coronary artery recanalization was achieved using a primarily retrograde approach with the reverse controlled antegrade and retrograde tracking technique (FIGURE 1D). Subsequently, 2 drug-eluting stents were implanted (FIGURE 1E). During the intervention, the patient remained hemodynamically stable and the Impella device was removed at the end of the procedure. The puncture site was closed using 8F Angio-Seal (Terumo Medical Corporation, New York, United States) and Perclose Proglide (Abbott Laboratories, Chicago, Illinois, United States). Echocardiography performed before discharge showed an improvement in the left ventricular ejection fraction that reached up to 45% (FIGURE 1F).

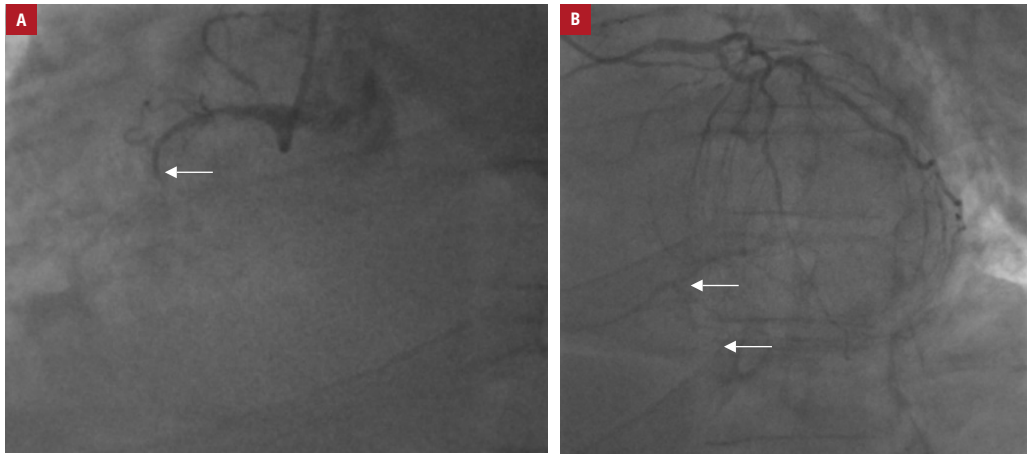

FIGURE 1 Preprocedural coronary angiography: **A** – chronic total occlusion of the proximal portion of the right coronary artery (arrow); **B** – collaterals from the left anterior descending artery to the right coronary artery (arrows)

Correspondence to:
Marta Kałużna-Oleksy, MD, PhD, Department of Internal Medicine, Landshut-Achdorf Hospital, Achdorfer Weg 3, 84 036 Landshut, Germany, phone: +49 08714040, email: marta.kaluzna@wp.pl
Received: July 30, 2019.
Revision accepted: December 16, 2019.
Published online: December 16, 2019.
Kardiol Pol. 2020; 78 (2): 169-170
doi:10.33963/KP.15106

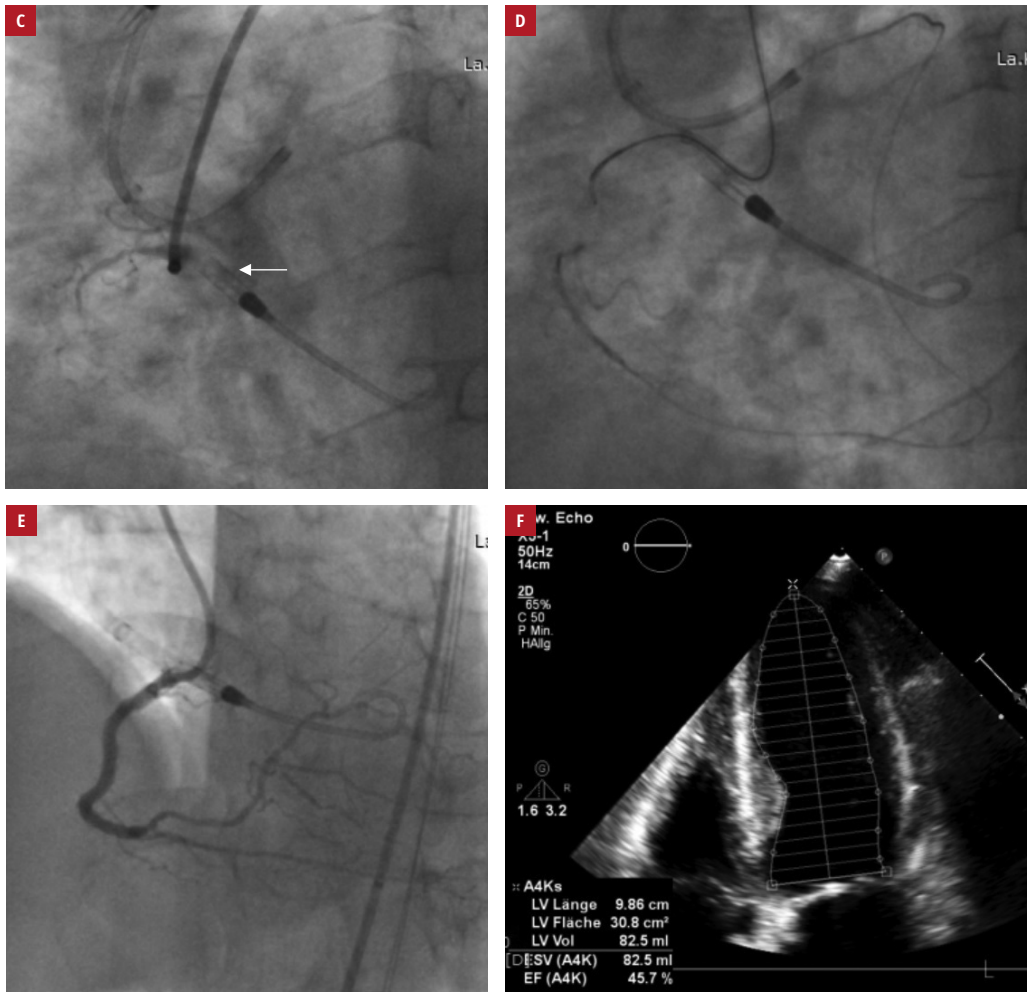

FIGURE 1 Intra- and postprocedural coronary angiography (**C**–**E**) and echocardiography (**F**): **C** – the position of the Impella 2.5 device at the aortic valve line (arrow); **D** – recanalization with the reverse controlled antegrade and retrograde tracking technique; **E** – the result of the procedure; **F** – predischarge echocardiography showing increased left ventricular ejection fraction of up to 45%

Mechanical circulatory support enhances intraprocedural hemodynamic stability, particularly in patients with high procedural risk,[1] multiple comorbidities, and complex anatomy. Accordingly, low-profile percutaneous left ventricular assist devices can enhance the feasibility of complete percutaneous revascularization.[2,3] The most commonly used elective MCS device is Impella 2.5 or Impella CP.[2] The use of MCS is particularly important in complex retrograde procedures, which sometimes are quite challenging.[4]

ARTICLE INFORMATION

CONFLICT OF INTEREST None declared.

HOW TO CITE Kałużna-Oleksy MI, Zrenner B, Pyxaras SA. Percutaneous coronary intervention of chronically occluded coronary arteries with a mechanical circulatory support system: expanding the indications for the procedure. Kardiol Pol. 2020; 78: 169-170. doi:10.33963/KP.15106

REFERENCES

1 Balak W, Wiśniewska J, Ziółkowski M, et al. Hig-hrisk coronary angioplasty protected by an Impella pump combined with simultaneous iliac artery angioplasty. Kardiol Pol. 2019; 77: 726-727.

2 Riley RF, McCabe JM, Kalra S, et al. Impella-assisted chronic total occlusion percutaneous coronary interventions: a multicenter retrospective analysis. Catheter Cardiovasc Interv. 2018; 92: 1261-1267.

3 Danek BA, Basir MB, O'Neill WW, et al. Mechanical Circulatory support in chronic total occlusion percutaneous coronary intervention: insights from a multicenter U.S. registry. J Invasive Cardiol. 2018; 30: 81-87.

4 Gutiérrez-Chico JL, Han SH, Jaguszewski M, et al. Intravascular ultrasound-guided retrograde percutaneous coronary intervention of a chronic total occlusion. Kardiol Pol. 2016; 74: 793-794.