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Sky is the limit for Impella-assisted percutaneous coronary intervention: Four technologies, three vessels, two bifurcations and one chronic total occlusion

Aleksandra Gąsecka et al., Impella-assisted PCI

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A 73-year-old woman after percutaneous coronary intervention (PCI) of the left main (LM), left anterior descending (LAD) artery and diagonal branch with implantation of 5 drug-eluting stents (2020) was admitted due to heart failure exacerbation. Echocardiography showed left ventricular ejection fraction (LVEF) of 13%, severe secondary mitral regurgitation (MR) and moderate tricuspid regurgitation (TR). Coronary angiography demonstrated multivessel disease (SYNTAX score 47.5; Fig. 1A, B) with in-stent restenosis of the LM and LAD and chronic total occlusion of the circumflex (Cx). Considering the high risk of mortality (EuroSCORE II 22.1%), the Heart Team opted for PCI supported with percutaneous ventricular assist device. An Impella CP pump was inserted via the right femoral artery (Fig. 1C). Fielder XTR wire supported by the SuperCross 90 microcatheter was used for Cx antegrade penetration. Following multiple predilatations, intravascular lithotripsy was performed in the LM, proximal LAD and proximal Cx (3.0 × 12 mm, 3.5 × 12 mm balloons). LAD segments were further treated using drug-eluting balloons (3.5 × 20 mm, 3.0 × 30 mm). Next, everolimus-eluting stent (3.5 × 15 mm) was implanted into the ostium and proximal Cx using T-stenting and protrusion technique, followed by kissing balloon inflation in the LAD and Cx (4.0 × 12 mm, 3.5 × 12 mm, respectively) and proximal optimization technique (5.0 × 8 mm). Intravascular ultrasound confirmed proper expansion and apposition of the stents (Fig.

1D, E). Impella was removed 2 days after the procedure. Echocardiography at 3 months showed LVEF of 23%, moderate MR and mild TR. The use of Impella provided hemodynamic stability, enabling to successfully perform extremely high-risk PCI.

Figure 1. Coronary angiography demonstrating a 90% stenosis in the distal segment of the right coronary artery (**A**), in-stent restenosis of the left main (LM) artery and left anterior descending (LAD) artery and chronic total occlusion (CTO) of the circumflex artery with proximal bending of close to 90 degrees and calcifications (**B**). Impella CP pump was inserted through a 14 F peel-away sheath via right femoral artery and 7 F EBU 3.75 catheter was introduced through the Impella sheath (**C**). Good final result of the percutaneous coronary intervention of in-stent restenosis of the LM and LAD and CTO of the circumflex artery using T-stenting and protrusion technique confirmed in intravascular ultrasound (**D**) and angiography (**E**).

