A tough calcification versus a tough cardiologist: a case report

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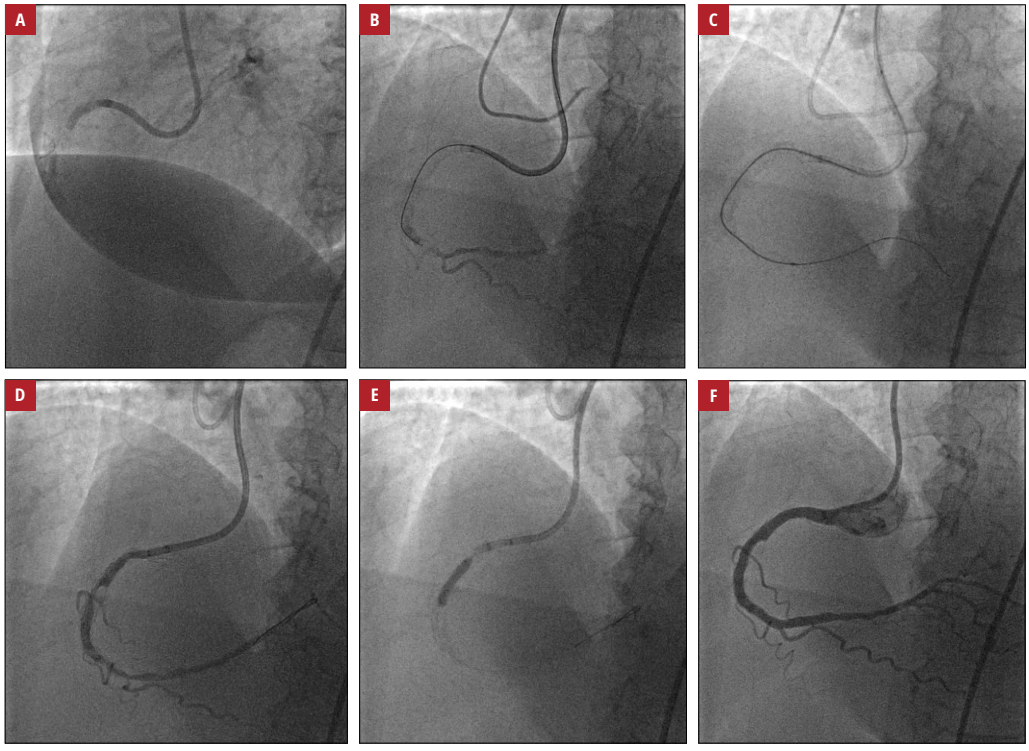

FIGURE 1 **A** – antegrade coronary angiography of the right coronary artery; **B** – lesion crossing under retrograde contrast guidance; **C** – advancement a Turnpike Gold microcatheter through the lesion; **D** – the right coronary artery after predilatation; **E** – delivery of a ShockWave C2 balloon via a Guidezilla 7F catheter; **F** – final optimal angiographic result

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Percutaneous coronary intervention (PCI) in chronic total occlusions (CTOs) remains challenging for interventional cardiology, as it requires the selection of an appropriate method and the use of a wide variety of dedicated devices. Studies showed that CTO angioplasty leads to an improvement of angina symptoms and better long-term outcomes in comparison with optimal medical therapy in cases when viable myocardium is present in the territory of the CTO.[1,2]

A 66-year-old woman with a history of non–ST-segment elevation myocardial infarction,

arterial hypertension, and type 2 diabetes mellitus, was admitted to the cardiology department to undergo an elective PCI of CTO of the right coronary artery (RCA). Previous coronary angiography showed proximal occlusion of the RCA and heavy calcification of the vessel (FIGURE 1A). Contralateral contrast injection to the left coronary artery revealed collaterals starting from the left anterior descending artery and reaching the RCA bifurcation into posterior descending artery and posterolateral branch (Rentrop grade 2) (FIGURE 1B). Transthoracic echocardiography showed hypokinesis of the posterior-basal segment with preserved left ventricular ejection fraction (60%). Due to persistent symptoms of class III angina according to the Canadian Cardiovascular Society classification, the patient was referred for angioplasty of the RCA CTO lesion, following the 2018 ESC/EACTS guidelines on myocardial revascularization.[3]

The index procedure was performed via the right femoral access. Lesion crossing required the use of a FineCross 135 microcatheter (Terumo, Tokyo, Japan) and multiple guidewires: SionBlue (Asahi INTECC Co., LTD., Aichi, Japan), Fielder XT (Asahi INTECC), Progress 140 (Abbot Vascular, Santa Clara, California, United States), and Gaia Third (Asahi INTECC). All attempts to cross the lesion with the FineCross microcatheter and a low-profile balloon (Tazuna 1.25×10 mm, Asahi INTECC) failed. The successful crossing was achieved with Turnpike Gold 135 (Vascular Solutions LLC, Minneapolis, Minnesota, United States), a microcatheter with a threaded tip providing rotational advancement when rotated clockwise (FIGURE 1C). A GrandSlam (Asahi INTECC) CTO guidewire was used. Predilatation of the proximal and medial segments of the RCA was performed with balloon catheters in the following order: Ryujin 2×15 mm (Terumo Corporation, Tokyo, Japan), NC Trek 2.5×15 mm (Abbot Vascular, Santa Clara, California, United States), and NC Emerge 3×15 mm (Boston Scientific, Marlborough, Massachusetts, United States) (FIGURE 1D). Due to suboptimal balloon expansion, vascular lithotripsy was performed[4,5] with a ShockWave C2 3×12 mm catheter (Shockwave Medical Inc., Santa Clara, California, United States) (8×10 applications; FIGURE 1E). Rotablation would be futile in this case due to the fact that previous predilatation with the 3-mm noncompliant balloon would require the use of a large burr. Delivery of the ShockWave balloon required the use of a Guidezilla 7F guide extension catheter (Boston Scientific, Natick, Massachusetts, United States). Afterwards, 3 drug-eluting stents (Resolute Onyx, Medtronic Ireland, Galway, Ireland) sized 3×38 mm, 3×38 mm, and 3.5×15 mm were implanted. Two noncompliant Trek balloons (3.5×15 mm and 3.75×8 mm) were used for stent deployment optimization. Finally, an optimal angiographic result with Thrombolysis in Myocardial Infarction flow grade of 3 was achieved (FIGURE 1F).

A day after the index procedure, elevation of troponin T concentration was observed, with the highest level of 65.9 pg/ml (reference level, 14 pg/ml), and creatine kinase–MB concentration was elevated to 5.11 ng/ml (reference level, 3.77 ng/ml). No significant increase in the level of creatinine was noted. The patient was discharged on the fourth day after the procedure.

The presented case illustrates the high complexity of currently treated coronary lesions. We described a technique of treating severely calcified CTO lesions using a broad range of hardware, such as a threaded-tip microcatheter, a guide-extension catheter, and a vascular lithotripsy balloon.

SUPPLEMENTARY MATERIAL

Supplementary material is available at www.mp.pl/kardiologiapolska.

ARTICLE INFORMATION

CONFLICT OF INTEREST None declared.

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