High-risk percutaneous coronary angioplasty with rotational atherectomy and left ventricular assist device of chronically occluded left ascending artery in an obese patient with very low ejection fraction

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Successful percutaneous coronary intervention (PCI) of chronic total occlusion (CTO) remains one of the most challenging procedures in interventional cardiology. Combining various percutaneous techniques allows procedural and clinical success in the most severe cases.

A 58-year-old male patient was admitted to the cardiology department having a history of progressive exertional dyspnea with exercise capacity of functional class III/IV according to the New York Heart Association (NYHA). He was treated with maximally tolerated doses of an angiotensin-converting enzyme inhibitor and aldosterone antagonist. The β-blocker was not administered due to bradycardia. Echocardiography showed severely decreased left ventricular ejection fraction (LVEF) of 15% with akinesia of the inferior wall and post-myocardial infarction scar characteristics. Coronary angiography revealed diffused atherosclerosis with occlusions in the left descending artery (LAD) and right coronary artery (RCA) (Figure 1). Stress echocardiography with dobutamine confirmed the viability of the myocardium territory supplied by the LAD and an increase of LVEF from 15% to 37%. Nonetheless, the RCA territory remained acinetic. The patient was referred to PCI LAD CTO with a percutaneous left ventricle support device (pLVAD) and rotational atherectomy under the control of intravascular ultrasound (IVUS).

After obtaining left femoral access, the angiography was performed to confirm proper conditions for insertion of the pLVAD. Then, the Perclose ProGlide System (Abbott Vascular, Santa Clara, CA, US) was partially deployed and large bore access was used to deliver the Impella System (Abiomed, Danvers, MA, US) to the left ventricle. The right femoral artery was used to introduce the 7-French extra backup guide catheter to the LAD ostium. The Gaia Second guidewire was swapped to the Sion Blue S after crossing the lesion. During pre-dilation, the balloon stuck to calcifications and eventually ruptured. Consequently, rotational atherectomy was conducted. The Rotawire was used to cross the lesion with the assistance of the Caravelle microcatheter. Subsequently, couple pecking motions with a 1.5 burr were carried out, allowing pre-dilatation with 2.5 × 20 mm and 3.0 × 20 mm non-compliant balloons. Afterwards, the OCT probe was used to assess the anatomy and dimensions of the LAD. Three drug-eluting stents: 2.5 × 33 mm, 3.0 × 48 mm, and 3.0 × 12 mm were implanted consecutively, from the distal end to the ostium of the vessel. After post-dilation, optimal stent apposition was confirmed via OCT. The pLVAD was withdrawn and the large bore access was sealed with PP System deployment and the 6-French Angioseal (AS; St. Jude Medical, St. Paul, MN, US).

During ambulatory observation, the patient showed improvement on the NYHA functional scale, from class III to class II. Moreover, his LVEF raised by 5%, which is a result comparable to observational data indicating an increase in LVEF by 6.4% [4, 5]. The pharmacological treatment was optimized by the implementation of a beta-blocker and nepri-

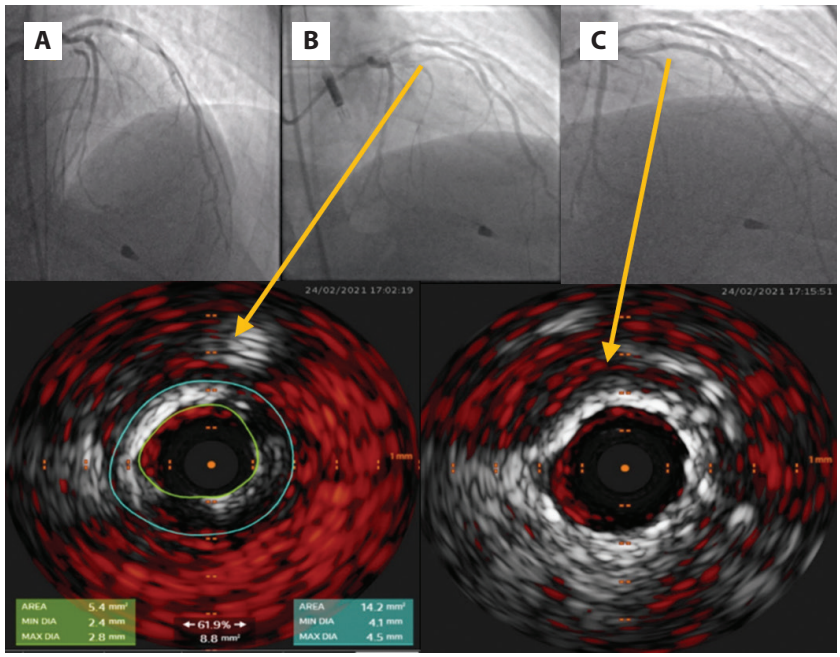

Figure 1. A. Initial left descending artery (LAD) arteriography. **B**. LAD arteriography after recanalization with intravascular ultrasonography (IVUS) showing significant stenosis in the medial segment of LAD. **C.** Final effect with proper stent apposition confirmed via IVUS

lysin inhibitor. After 3 months of optimal medical treatment, the patient will be re-assessed for cardioverter-defibrillator implantation.

Despite some studies showing no benefits of PCI CTO in comparison with optimal medical therapy, there is a growing body of evidence from randomized controlled trials indicating that PCI CTO may improve quality of life due to less residual angina, better exercise tolerance, and even improvement in depression [1–3]. Moreover, there are some studies in which improvement in long-term outcomes is suggested following successful CTO revascularization [4, 5]. Therefore, we assume that such technically challenging procedures are worth trying after careful clinical evaluation, assessment of myocardial viability, and comprehensive discussion with a patient about the procedure.

Article information

Conflict of interest: None declared.

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