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Successful percutaneous coronary intervention with rotational atherectomy in calcified lesion: Insight from optical coherence tomography

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A 78-year-old woman with a suspicious ischemic heart disease was referred to our clinic because significant myocardial ischemia at the left circumflex artery (LCx) on myocardial perfusion single-photon emission computed tomography with 317 calcium score on cardiac computed tomography was observed. Coronary angiography was performed via left snuffbox approach and it demonstrated intermediate to severe stenosis with focal heavily calcification in the LCx (Fig. 1A). Therefore, the plan was to perform optical coherence tomography (OCT)-guided percutaneous coronary intervention using rotational atherectomy for the LCx lesion using a 7.5 French sheathless guiding catheter (Eaucath, Asahi Intecc, Nagoya, Japan) via the left snuffbox approach. Following successful atherectomy with 1.25 mm and 1.50 mm burr size, post-atherectomy OCT demonstrated large calcium angle and thickness and a minimal lumen area of 1.22 mm^2 in the LCx lesion (Fig. 1B–E; **Suppl. Video 1**). Circumferential and thick calcified plaque led to predilation with a 2.5 mm scoring balloon and then a 3.25 × 33 mm everolimus-eluting stent (Xeince Sierra®, Abbot Vascular, Santa Clara, CA, USA) was implanted. After post dilation with a 3.25 × 12 mm non-compliant balloon at up to 20 atm, post-stenting OCT and co-registration of OCT and coronary angiography demonstrated good stent apposition and a minimal stent area of 5.39 mm^2 at the severe calcified area without stent edge dissection (Fig. 1F–J; **Suppl. Video 2**).

This report highlights the benefit of OCT, which can penetrate calcium to visualize calcium thickness and have the superior resolution to confirm stent optimization in severe calcified lesions.

Conflict of interest: None declared

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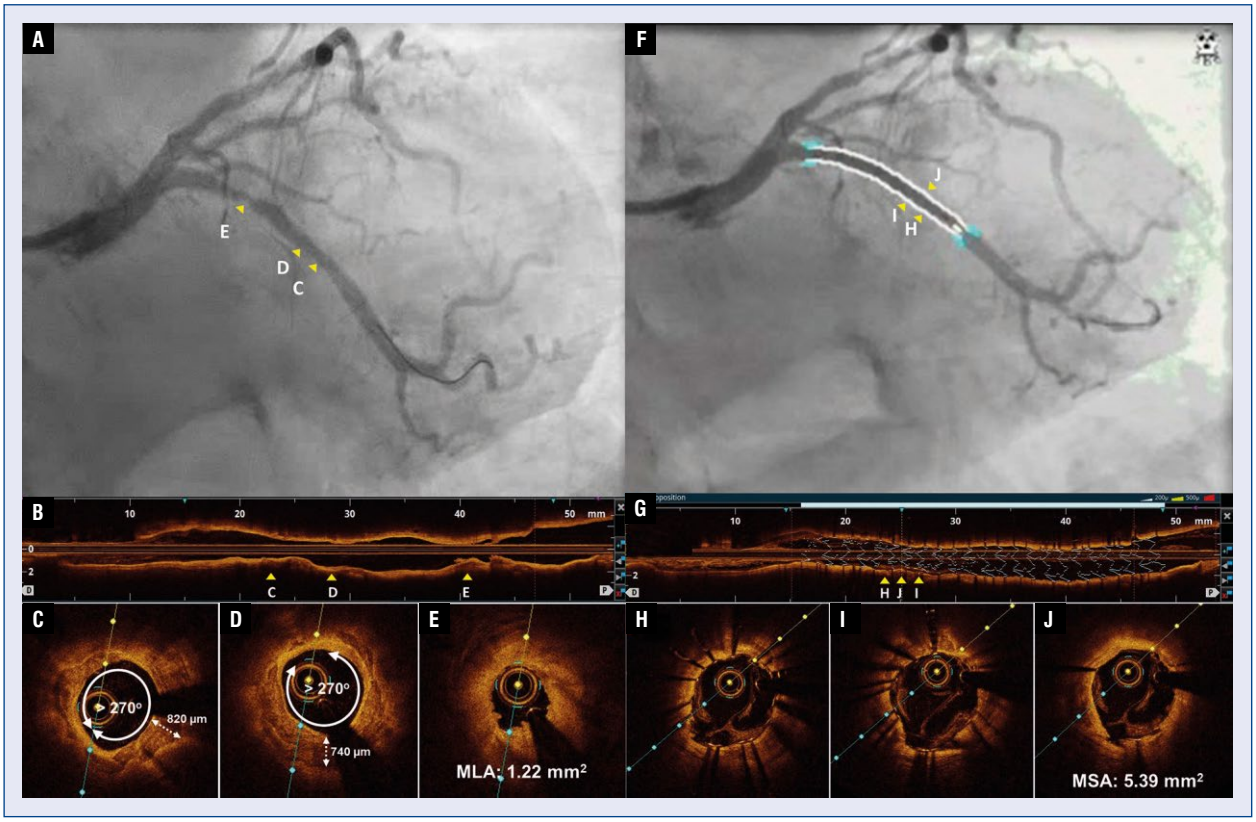

Figure 1. A. Post-atherectomy angiography showing the stenosis along the proximal left circumflex artery (LCx); **B.** A longitudinal optical coherence tomography (OCT) image; **C, D.** Cross-sectional OCT images showing severely circumferential calcified plaque with 820-μm and 740-μm thick layer; **E.** OCT showing the minimal lumen area (MLA) of 1.22 mm^2; **F.** Simultaneous angiography and OCT co-registration image demonstrating no malaposition in stent implantation area.; **G.** Three-dimensional stent rendering image demonstrating successful proximal optimization technique without stent malposition supported by stent apposition index (sky-blue colored bar above OCT image); **H, I.** Cross-sectional OCT images demonstrating successfully expanded stent in severely calcified plaque; **J.** OCT showing the minimal stent area (MSA) of 5.39 mm^2. The positions in longitudinal direction of C, D, and E are shown in A and B as yellow arrowheads. The positions in the longitudinal direction of H, I, and J were shown in F and G as yellow arrowheads.