

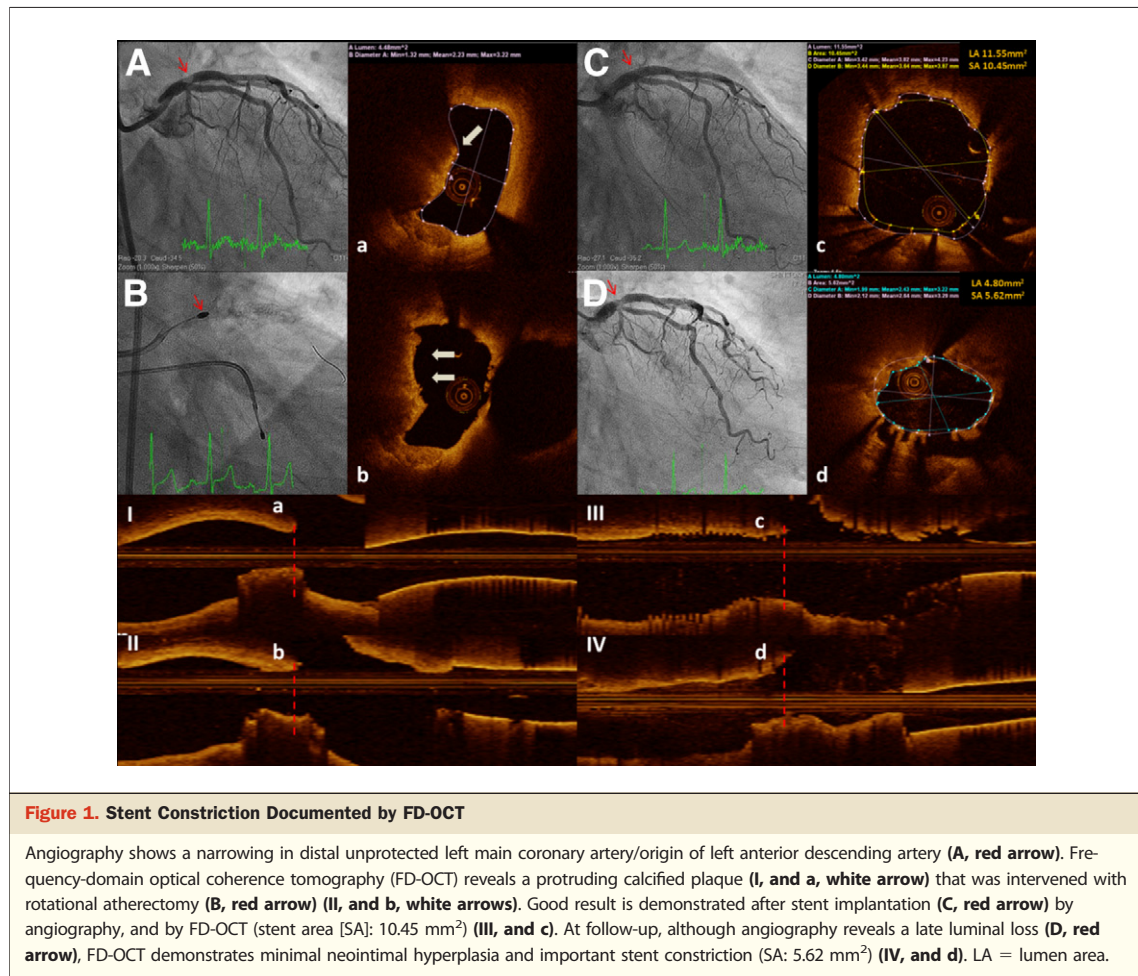
# Frequency-Domain Optical Coherence Tomography Assessment of Stent Constriction 9 Months After Sirolimus-Eluting Stent Implantation in a Highly Calcified Plaque

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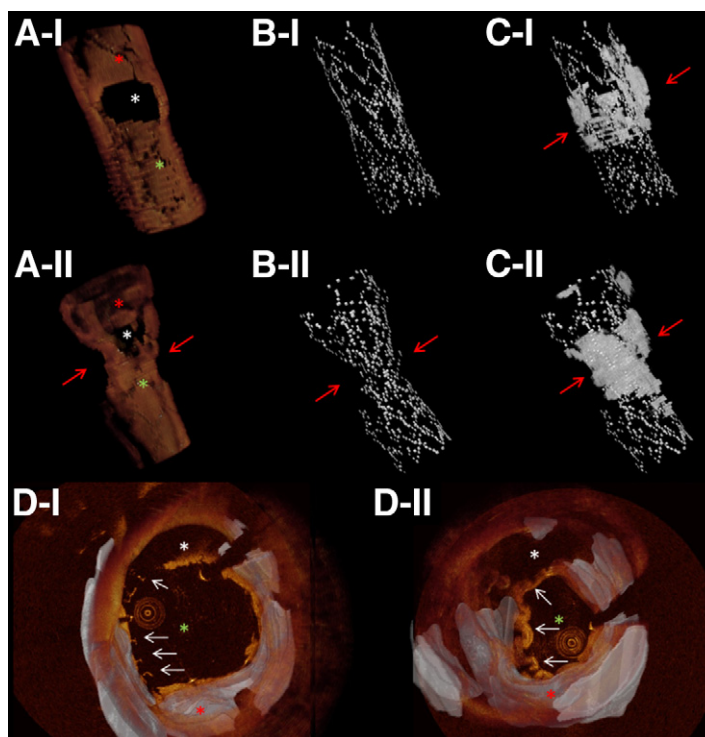
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A 60-year-old man with a history of chronic renal failure in hemodialysis was admitted due to angina

symptoms. Coronary angiography showed an eccentric lesion of distal unprotected left main coro-



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**Figure 2.** 3D FD-OCT Assessment of Stent Constriction

(A-I) A 3-dimensional (3D) frequency-domain optical coherence tomography (FD-OCT) reconstruction of the left coronary artery after stent implantation. Longitudinal assessment of stent expansion is shown in (B-I), whereas (C-I) reveals the stent relationship with calcium (highlighted in light gray, red arrows). At follow-up, 3D reconstruction demonstrates late luminal loss (A-II, red arrows). Stent 3D rendering demonstrates marked constriction (B-II, red arrows) and its relationship with calcium (C-II, red arrows). In (D-I and D-II), respectively, baseline and follow-up 3D views of the region of interest demonstrate stent struts (white arrows) and their relationship with calcium (highlighted in light gray). Red, white, and green asterisks represent the unprotected left main coronary artery, left circumflex ostium, and left anterior descending artery, respectively.

nary artery involving the ostium of left anterior descending artery (Fig. 1A). Frequency-domain optical coherence tomography (FD-OCT) revealed a calcified plaque protruding to the lumen (Fig. 1-a). Rotational atherectomy with a 2.0-mm burr (Fig. 1-b) was conducted before the implantation of a 3.5 × 18 mm sirolimus-eluting stent at 12 atm., which was followed by intra-stent post-dilation with a noncompliant 4.0 × 12 mm balloon at 18 atm. (Fig. 1C, c).

The patient underwent 9-month follow-up coronary angiography that showed luminal loss (Fig. 1D). The FD-OCT imaging exhibited a constricted sirolimus-eluting stent (Fig. 1-d). Three-dimensional FD-OCT images revealed a well-expanded stent at baseline, whereas stent constriction was depicted in a highly calcified region at follow-up (Fig. 2).

Although a rare phenomenon, stent constriction might be responsible for target lesion failure (1). In the present case,

FD-OCT images helped clarify the mechanisms that led to late luminal loss, demonstrating the longitudinal distribution of stent constriction, as well as its relationship with a highly calcified plaque, therefore playing an important role in treatment proposal.

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#### REFERENCE

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**Key Words:** FD-OCT ■ sirolimus-eluting stent ■ stent constriction.