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IMAGING VIGNETTE

ADVANCED

CLINICAL VIGNETTE

Serial OCT Imaging of Multiple Woven-Appearing Lesions in a Single Patient Demonstrating Long-Term Clinical Stability

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ABSTRACT

We report the case of a 58-year-old man with a history of myocardial infarction presenting with chest pain. Serial coronary artery optical coherence tomography over a 3-year period showed multiple woven-appearing lesions without progression, indicating that this type of lesion is potentially stable. (**Level of Difficulty: Advanced.**)
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A 55-year-old man with previous non-ST-segment elevation myocardial infarction presented with recurrent chest pain. A 90% stenosis in the proximal left anterior descending was treated with a drug-eluting stent. However, angiography showed dilated segments with irregular filling defects in the left circumflex (LCX) (**Figure 1A**) and right coronary artery (RCA) (**Figure 1D**) that, when imaged with optical coherence tomography (OCT) (**Figures 1B, 1C, 1E, and 1F**, Videos 1A and 1B), contained cavitations and septa (woven artery appearance).

Three years later, he presented with chest pain again. The left anterior descending stent was patent, and the LCX and RCA lesions (**Figures 1A′ and 1D′**, respectively) looked similar to baseline. OCT still showed cavitations that appeared unchanged from baseline (**Figures 1B′,1C′, 1E′, and 1F′**, Videos 2A and 2B). Fractional flow reserve (FFR) was 0.96 in the LCX, 0.95 in the first obtuse marginal, and 0.78 in the RCA. Considering the lesions had not progressed and FFR of the RCA was in the gray zone, he was treated with nitrates, aspirin, and clopidogrel (reserving stent implantation if medical therapy failed) and was discharged without chest pain during follow-up.

The underlying cause of multivessel woven lesions is not clear, but, pathologically, they have been shown to represent organized thrombi (1,2). Even in the largest series, a registry of 33 patients, 30 (91%) underwent stent implantation, although only 23 were symptomatic (3). However, there are no long-term follow-up studies with serial OCT imaging. Besides being the only known example of natural history of such lesions as well as an example of serial OCT imaging with intracoronary physiology, the current case indicated that these lesions can be stable and can be treated medically with long-term success. FFR was in the gray zone, the cumulative lumen

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Informed consent was obtained for this case.

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ABBREVIATIONS AND ACRONYMS

FFR = fractional flow reserve

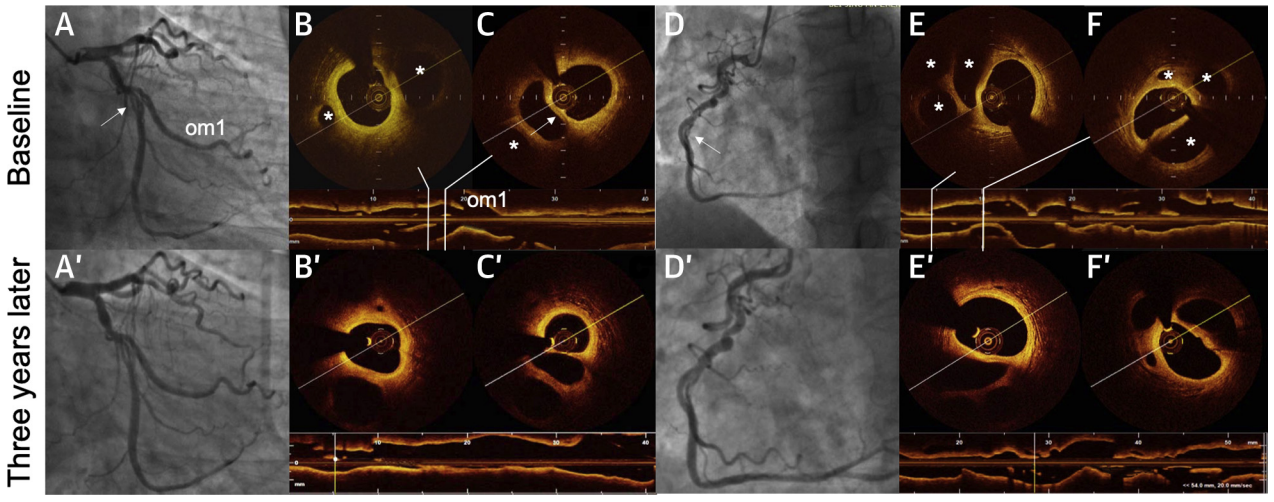
LCX = left circumflex

OCT = optical coherence tomography

RCA = right coronary artery

area of the cavitations was large and unchanged, and the reason for chest pain in these patients is unclear. We hypothesize that one potential explanation for chest pain is the development and distal embolization of platelet thrombi (hence, the use of dual antiplatelet therapy) as has been postulated in cases of symptomatic coronary artery ectasia.

FIGURE 1 Imaging of Multiple Woven Coronary Arteries



Angiography of the left circumflex (LCX) at **(A)** baseline and **(A′)** 3 years later with irregular filling defects **(white arrows)**. Cavitations **(asterisks)** and septa **(arrow)** in matched optical coherence tomography (OCT) images of LCX at **(B and C)** baseline (Video 1A) and **(B′ and C′)** 3 years later (Video 2A). Angiography of the RCA at **(D)** baseline and **(D′)** 3 years later with irregular filling defects **(arrow)**. Similar cavitations **(asterisks)** in matched OCT images at **(E and F)** baseline (Video 1B) and **(E′ and F′)** 3 years later (Video 2B).

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KEY WORDS coronary artery woven structure, fractional flow reserve, optical coherence tomography

APPENDIX For supplemental videos, please see the online version of this paper.