

MINI-FOCUS ISSUE: CORONARIES

INTERMEDIATE

IMAGING VIGNETTE: CLINICAL VIGNETTE

Woven Coronary Artery Anomaly

Optical Coherence Tomography Versus Intravascular Ultrasound



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ABSTRACT

Woven coronary artery anomaly is a rare congenital anomaly, and intravascular ultrasound and optical coherence tomography are useful for the diagnosis. We performed both imaging techniques for woven coronary artery anomaly and evaluated which was superior. We concluded that optical coherence tomography was the preferred imaging modality in this case. (**Level of Difficulty: Intermediate.**) (J Am Coll Cardiol Case Rep 2020;2:1698-9) © 2020 The Authors. Published by Elsevier on behalf of the American College of Cardiology Foundation. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

A 68-year-old man with a history of hypertension, dyslipidemia, and previous myocardial infarction involving the right coronary artery had exertional chest pain and was admitted for percutaneous coronary intervention to treat residual stenosis of the left anterior descending artery. On admission, his vital signs were normal. The electrocardiogram showed pathological Q waves in his inferior leads. Coronary angiography before for percutaneous coronary intervention showed a small, twisting channel around the left anterior descending lesion (**Figure 1A**). The differential diagnosis of this channel included a bridging collateral vessel, recanalized thrombus, spontaneous coronary dissection, or woven coronary artery anomaly (WCAA).

We performed both intravascular ultrasound (IVUS) and optical coherence tomography (OCT) to evaluate this channel. IVUS showed an additional lumen connecting to the distal lumen of the main vessel (**Video 1**). OCT demonstrated the extra lumen more clearly (**Video 2**). Bridging collateral vessels develop in chronic total occlusions, but in this case the coronary artery was not occluded. If this channel had been caused by recanalized thrombus, the extra lumen should have been present within the coronary lumen. IVUS appeared to show that the extra lumen was outside the tunica media, but it was unclear (**Figure 1B**). OCT demonstrated that the lumen was clearly outside the tunica media (**Figure 1C**). The IVUS appearance could have been consistent with intramural hematoma (**Figure 1D**), which is occasionally observed in spontaneous coronary dissection, but we were unable to demonstrate an intimal tear with OCT (**Figure 1E**). On the basis of the OCT findings, we confirmed that the correct diagnosis was WCAA. A drug-eluting stent was implanted (**Figure 1F**), and both IVUS and OCT showed a well-deployed stent with a diminished additional lumen (**Videos 3 and 4**).

WCAA is a very rare congenital anomaly that is usually considered benign, and accurate diagnosis is difficult to establish. IVUS and OCT are useful for the diagnosis (1,2), but few reports have used both techniques to

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determine which is superior for the diagnosis of WCAA. In this case report, OCT was superior to IVUS for confirming the presence of WCAA.

This patient remained symptom free during 1-year follow-up.

In conclusion, OCT was better for the diagnosis of WCAA when we detected an abnormal structure around a coronary artery.

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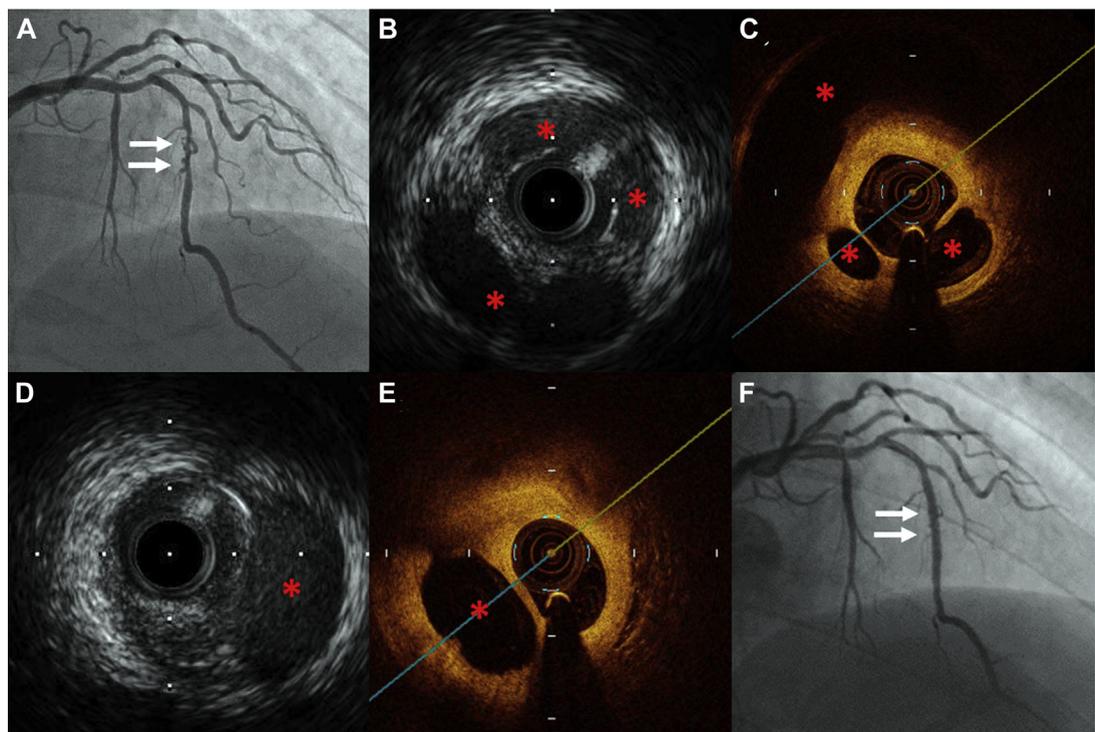
**ABBREVIATIONS
AND ACRONYMS**

IVUS = intravascular
ultrasound

OCT = optical coherence
tomography

WCAA = woven coronary
artery anomaly

FIGURE 1 Imaging of WCAA



(A) Coronary angiogram before stent implantation (arrows show the small, twisting channel). (B) Extra lumen (asterisks) outside the vascular lumen seen on intravascular ultrasound. (C) Extra lumen (asterisks) outside the vascular lumen seen on optical coherence tomography. (D) Extra lumen (asterisk) outside the vascular lumen seen on intravascular ultrasound. (E) Extra lumen (asterisk) outside the vascular lumen seen on optical coherence tomography. (F) Coronary angiogram after stent implantation (arrows show the small, twisting channel). WCAA = woven coronary artery anomaly.

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KEY WORDS coronary artery disease, intravascular ultrasound, optical coherence tomography, woven coronary artery anomaly

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