The use of multimodality imaging in the diagnosis and management of spontaneous coronary artery dissection and intramural hematoma

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A 42-year-old woman developed severe sudden-onset central chest pain. Risk factors included smoking, hypertension, morbid obesity, and a family history of coronary artery disease. A 12-lead electrocardiogram demonstrated anterior ST-segment elevation, prompting immediate transfer to our tertiary cardiac center. Coronary angiography revealed diffuse concentric and smooth stenosis in the mid segment of the left anterior descending artery (LAD) (FIGURE 1A and 1B). Otherwise, her coronary anatomy appeared angiographically normal. Intracoronary administration of nitroglycerine had no effect on the angiographic appearance of the mid LAD. Spontaneous coronary artery dissection (SCAD) was suspected and the lesion was examined using optical coherence tomography (OCT) (ILUMIEN OPTIS PCI Optimization System / Dragonfly OPTIS Imaging Catheter, Abbott Cardiovascular, Santa Clara, California, United States). The examination revealed intramural hematoma filling a circumferential false lumen and compressing the true lumen of the artery (FIGURE 1C; Supplementary material, *Video S1*). It also confirmed the angiographically normal appearance of the artery distal (FIGURE 1D) and proximal (FIGURE 1E) to the stenosed (dissected) segment

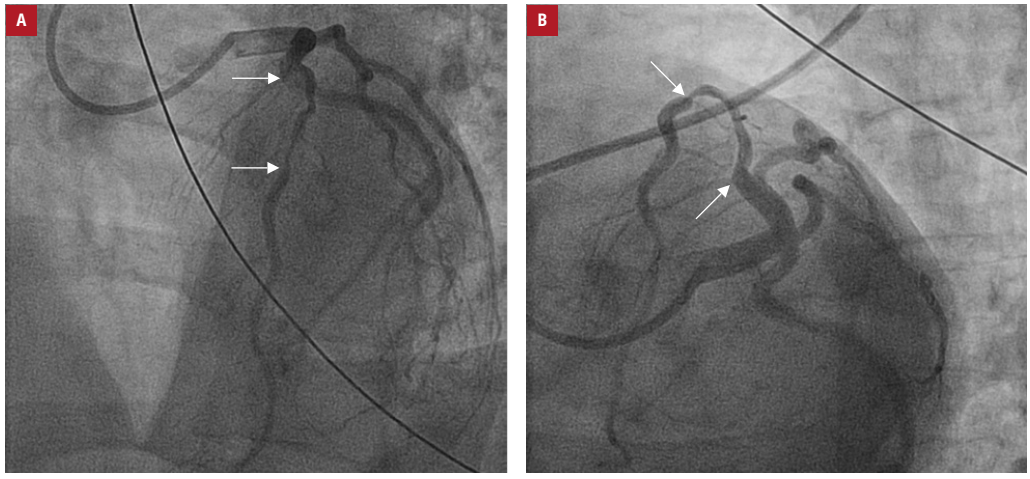

FIGURE 1 Imaging in spontaneous coronary artery dissection: **A** – invasive coronary angiography, left anterior oblique cranial view, showing stenosis in the mid segment of the left anterior descending artery (LAD; arrows); **B** – invasive coronary angiography, left anterior oblique caudal view (spider), showing stenosis in the mid segment of the LAD (arrows)

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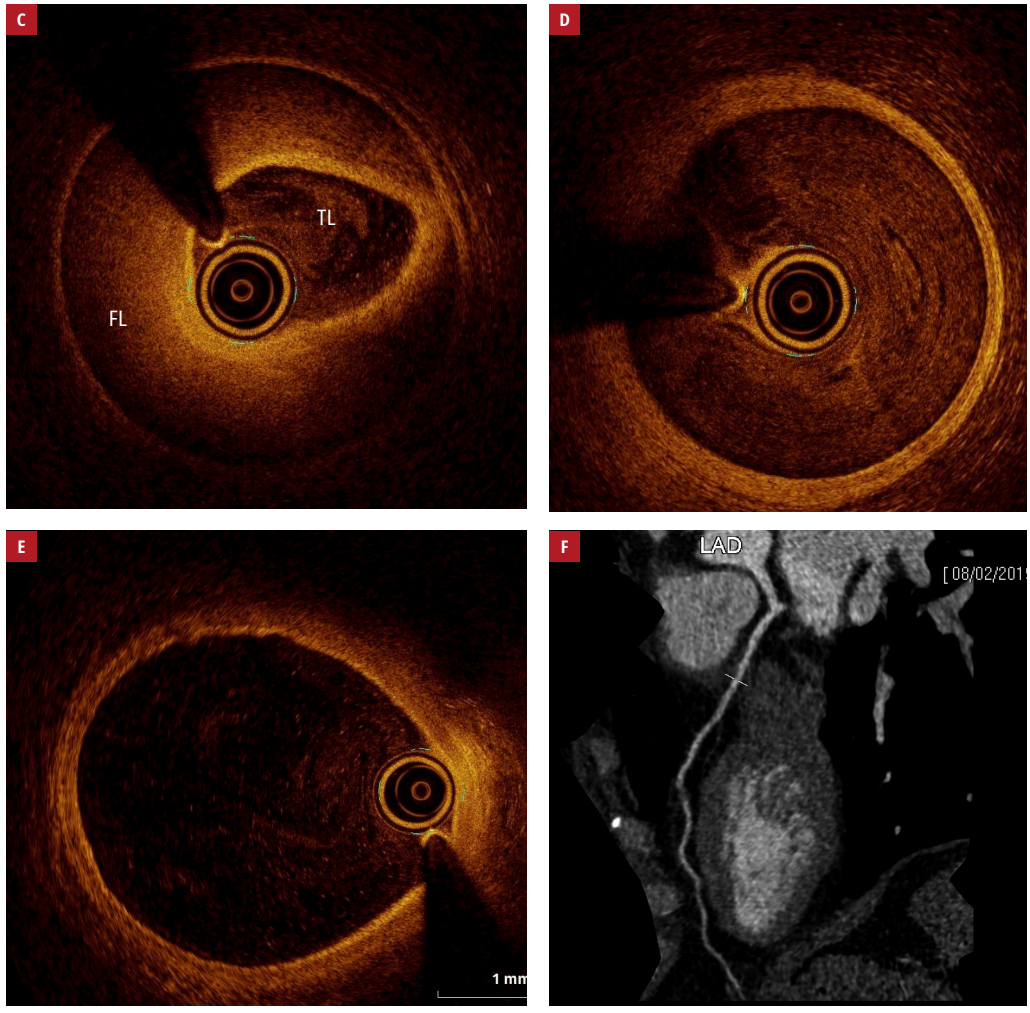

FIGURE 1 Imaging in spontaneous coronary artery dissection: **A** – invasive coronary angiography, left anterior oblique cranial view, showing stenosis in the mid segment of the left anterior descending artery (LAD; arrows); **B** – invasive coronary angiography, left anterior oblique caudal view (spider), showing stenosis in the mid segment of the LAD (arrows); **C** – optical coherence tomography (OCT): cross-sectional visualization of the mid left anterior descending artery (LAD) showing a circumferential false lumen, which compresses the true lumen of the artery; **D** – OCT: cross-sectional visualization of the distal LAD showing the normal coronary artery lumen; **E** – OCT: cross-sectional visualization of the proximal LAD showing the normal coronary artery lumen; **F** – cardiac computed tomography angiography: curved multiplanar reformatted view of the LAD showing absorption of the intramural hematoma in the mid LAD segment and good patency of the artery
Abbreviations: FL, false lumen; TL, true lumen

of the mid LAD, with clear depiction of the intima, media, and adventitia. The OCT examination was not suggestive of a definite entry point of the dissection (endothelial and intimal discontinuity). Disruption of vasa vasorum causing hemorrhage into the tunica media could be a possible mechanism for SCAD and intramural hematoma formation. A conservative strategy was adopted, as thrombolysis in myocardial infarction (TIMI) grade 3 flow in the distal LAD was observed, symptoms had improved, and ST-segment elevation had disappeared in the meantime. Eight weeks later, computed tomography coronary angiography (CTCA) showed resorption of the intramural hematoma and good patency of the artery (FIGURE 1F). Nine months following the acute presentation, the patient remains asymptomatic.

Differentiating SCAD from atherosclerotic plaque rupture with the use of coronary angiography alone is often challenging. Intracoronary imaging provides diagnostic clarity. Optical coherence tomography has spatial resolution superior to intravascular ultrasound and it can better identify localized fenestrations or "entry tears" in the intima.1,2 Intracoronary imaging is also useful in guiding percutaneous coronary intervention (stenting) in patients with SCAD, where this is deemed to be necessary.2-4 The use of CTCA is not currently recommended for the diagnosis of SCAD, however CTCA can be very helpful in follow-up, as in this case.1,2

SUPPLEMENTARY MATERIAL

Supplementary material is available at www.mp.pl/kardiologiapolska.

ARTICLE INFORMATION

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CONFLICT OF INTEREST None declared.

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