Real-Time Severe Coronary Spasm Captured on Intravascular Ultrasound in a Patient With Acute Coronary Syndrome

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Figure. Intravascular ultrasound (IVUS) images and Coronary angiogram (CAG) at the moment of spasm (**A**, **B**, **C** and **D**) and after nitroglycerine injection (**A'**, **B'**, **C'** and **E**). The IVUS images, **A**, **B**, and **C** correspond to the same positions as **A'**, **B'**, and **C'**, respectively. At the moment of spasm, speckled attenuated plaque, and ragged and irregular narrowing of the lumen with medial thickening were detected. After intracoronary administration of nitroglycerin, the same segment revealed smooth and circumferential low-attenuated plaque.

A 68-year-old male patient with hyperlipidemia presented with acute chest tightness, vomiting, and electrocardiogram (ECG) findings of ST segment elevations (Leads II, III, aVF) in the ambulance, all suggestive of acute coronary syndrome (ACS). Therefore, sublingual nitroglycerin 0.3mg was administered, causing symptomatic and ECG improvement during admission.

An emergency coronary angiogram (CAG) showed moderate stenosis in the middle right coronary artery (RCA), suggesting plaque rupture or coronary spasm. However, subsequent intravascular ultrasound (IVUS) demonstrated a ragged lumen with severe stenosis in the middle and proximal RCA (**Figure A–C**; **Supplementary Movie 1**). A second CAG (**Figure D**) showed RCA occlusion, which

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was immediately relieved upon intracoronary injection of nitroglycerine 0.1 mg (**Figure E**); hence, our primary impression was coronary spasm. The second IVUS after the stenosis was released revealed thin, circumferential, smooth, low-attenuation plaque (**Figure A'–C'**; **Supplementary Movie 2**), which was suspected to be ACS due to persistent severe spasm.

Previously, lumen narrowing and intimal gathering during coronary spasm provocation have been detected by IVUS¹ and optical coherence tomography.² In the present case, the moment of plaque aggregation and lumen narrowing due to a thickened intima was captured by IVUS-induced spasm, and the moment when ACS developed due to spasm was confirmed.

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Disclosures

None.

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Supplementary Files

Supplementary Movie 1. Initial IVUS image.

Supplementary Movie 2. IVUS image after intracoronary injection of nitroglycerine.

Please find supplementary file(s);
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