

Myocardial infarction with nonobstructive coronary arteries in a young woman: the key role of optical coherence tomography

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Optical coherence tomography (OCT) is an intracoronary imaging technique that provides detailed morphological information on coronary lesions. It also facilitates an accurate diagnosis and the selection of an appropriate treatment strategy.

A 26-year-old smoking woman with no previous medical history and no other risk factors for coronary heart disease was admitted to a local hospital with an anterior ST-segment elevation myocardial infarction. On arrival, she reported chest pain lasting several hours. Electrocardiography (ECG) revealed ST-segment elevation in all precordial leads, while echocardiography showed regional motion abnormalities in the anterior wall of the left ventricle with significantly impaired ejection fraction (~35%). The patient immediately received a loading dose of aspirin and ticagrelor and was transferred to a catheterization laboratory for coronary angiography (CA) and primary percutaneous coronary intervention.

Coronary angiography revealed a thrombus in the middle segment of the left anterior descending (LAD) artery, with a lumen narrowing of about 50% (FIGURE 1A). No stenotic lesions were observed in other segments of the coronary arteries. The operator decided on conservative treatment with antithrombotic (abiximab) and antiplatelet (ticagrelor, aspirin) drugs. During the next hours, the patient reported the resolution of symptoms. Additionally, a marked reduction of anterior ST-segment elevation was seen on ECG. After 6 days, control CA revealed an almost complete thrombus resolution (FIGURE 1B). On the next day, the patient was discharged from the hospital with

the suggestion to undergo control CA and OCT in a reference center.

After 6 months, the woman was hospitalized in our center for clinical and angiographic reevaluation. She presented symptoms of heart failure (New York Heart Association functional class II). Echocardiography revealed dyskinesia of the apex and akinesia in the apical segments of the left ventricle with an ejection fraction of about 35%. Coronary angiography did not show stenotic or thrombotic lesions in any coronary arteries (FIGURE 1C). However, OCT revealed fibroatheroma and fibrous plaques in the mid and proximal LAD. In the area of the previous thrombus, a healing ruptured atherosclerotic plaque was visualized (FIGURE 1D-1F). Due to the absence of anginal symptoms and no significant narrowing of the coronary artery, we decided to continue conservative treatment.

Plaque rupture and ulceration are a frequent cause of myocardial infarction with nonobstructive coronary arteries (MINOCA) in women.¹ However, has known limitations in the assessment of lesion severity. Optical coherence tomography provides a superior resolution (10 μm) of plaque morphology and can facilitate a better understanding of the origin of MINOCA. It can identify unstable features of the atherosclerotic plaque, as well as a culprit (infarct-related) lesion.^{2,3} Moreover, it has a very high sensitivity, specificity, and positive and negative predictive values for detection of healed histologically defined plaques. The presence of features of vascular vulnerability and local and systemic inflammation of a healed plaque may predispose the patients to develop acute coronary syndrome.⁴ Thus, this group of patients may benefit from more aggressive secondary prevention

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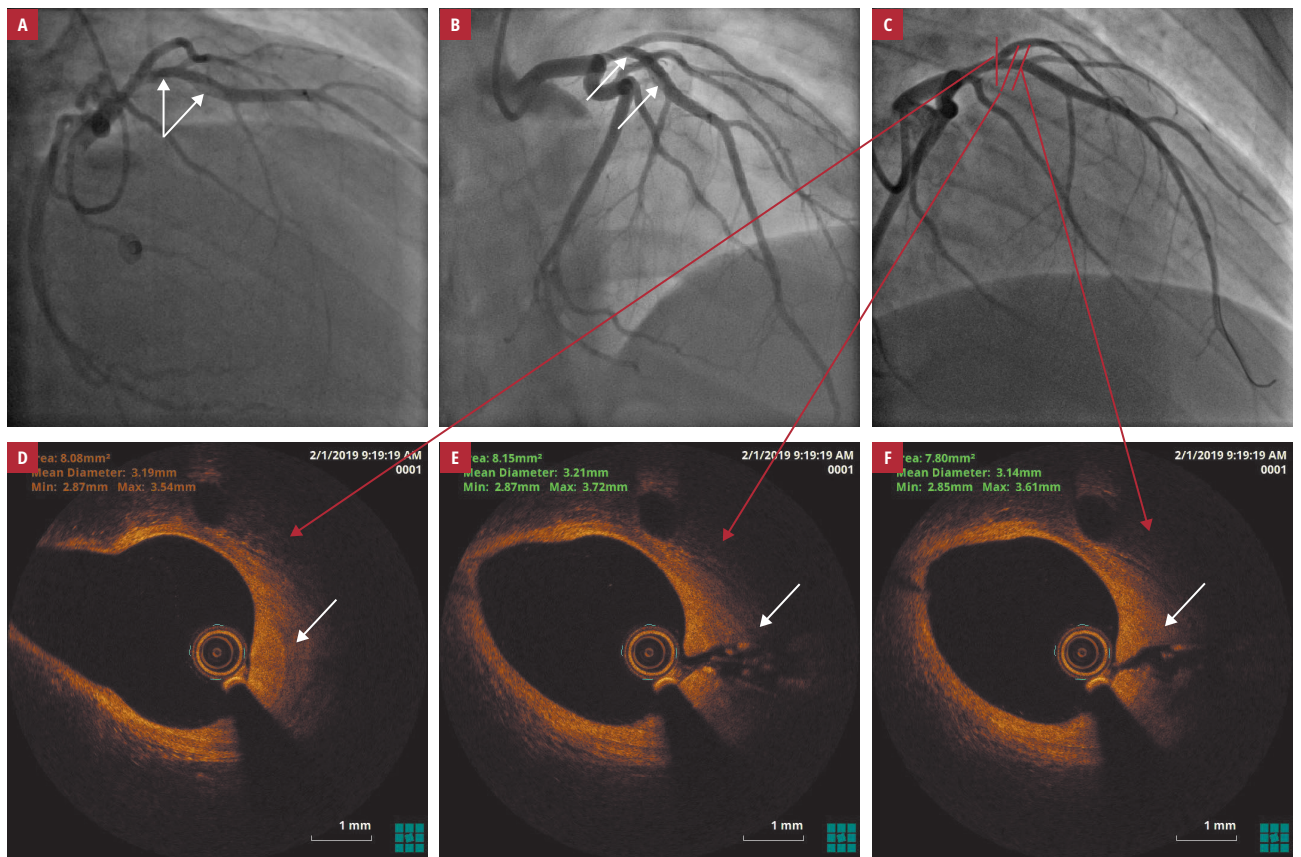


FIGURE 1 Coronary angiography and optical coherence tomography (OCT) findings; **A** – coronary angiography revealed a thrombus (arrows) in the middle segment of the left anterior descending artery; **B** – control angiography (after 6 days) revealed thrombus resolution (arrows); **C** – control angiography (after 6 months) revealed normal coronary arteries; **D** – OCT demonstrated atherosclerotic plaque (arrow); **E** and **F** – OCT with plaque rupture (arrows)

aiming at the suppression of inflammation and platelet activity.⁵

ARTICLE INFORMATION

CONFLICT OF INTEREST None declared.

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REFERENCES

- 1 Thygesen K, Alpert JS, Jaffe AS, et al. Fourth universal definition of myocardial infarction (2018). *Eur Heart J.* 2019; 40: 237-269.
- 2 Reynolds HR, Srichai MB, Iqbal SN, et al. Mechanisms of myocardial infarction in women without angiographically obstructive coronary artery disease. *Circulation.* 2011; 124: 1414-1425.
- 3 Olinic DM, Spinu M, Homorodean C, et al. Vasa vasorum-induced LAD dissection and haematoma in an anterior STEMI patient with nearly normal angiography: the role of OCT. *Kardiol Pol.* 2017; 504-504.
- 4 Fracassi F, Crea F, Sugiyama T, et al. Healed culprit plaques in patients with acute coronary syndromes. *J Am Coll Cardiol.* 2019; 73: 2253-2263.
- 5 Ha FJ, Giblett JP, Nerlekar N, et al. Optical coherence tomography guided percutaneous coronary intervention. *Heart Lung Circ.* 2017; 26: 1267-1276.