



Plaque erosion or coronary artery embolism? Findings from clinical presentation, optical coherence tomographic and histopathological analysis in a case with acute coronary syndrome

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A 93-year-old woman was hospitalized due to anterior STEMI. Coronary angiography identified TIMI grade II flow with severe stenosis in the left anterior descending artery (LAD) (Fig. 1a). On optical coherence tomography (OCT) imaging, the surface of culprit lesion was invisible due to its overlying thrombus (Fig. 1b, c, Supplementary-movie). After retrieving red thrombus with thrombectomy catheter, TIMI grade III flow was achieved without any residual stenosis (Fig. 1d). OCT after thrombectomy identified an intact fibrous cap and signal attenuation with adjacent focal signal-rich region, suggesting the small lipidic plaque with superficial macrophages (Fig. 1e, f). Histological analysis demonstrated the presence of fresh red thrombus containing rich platelets and red blood cells (Supplementary-Figure). These findings suggested plaque erosion as a potential cause of STEMI, and therefore stent was not implanted. However, since atrial fibrillation and enlarged left atrium

were observed after PCI, coronary artery embolism was considered as a more plausible etiology of STEMI. She was uneventful after commencing direct oral anticoagulation drug alone.

Recent study has proposed the OCT-based diagnosis of plaque erosion in vivo [1]. In our case, although OCT features of culprit lesion fulfilled OCT-derived criteria of plaque erosion, clinical and angiographical characteristics indicate that STEMI occurred due to coronary thromboembolism rather than plaque erosion. Patients with coronary artery embolism have an embolic source such as atrial fibrillation, and they require anti-coagulation agent [2]. Clinical presentation needs to be considered in addition to OCT images for correct diagnosis and appropriate therapy selection in the setting of coronary artery embolism and plaque erosion.

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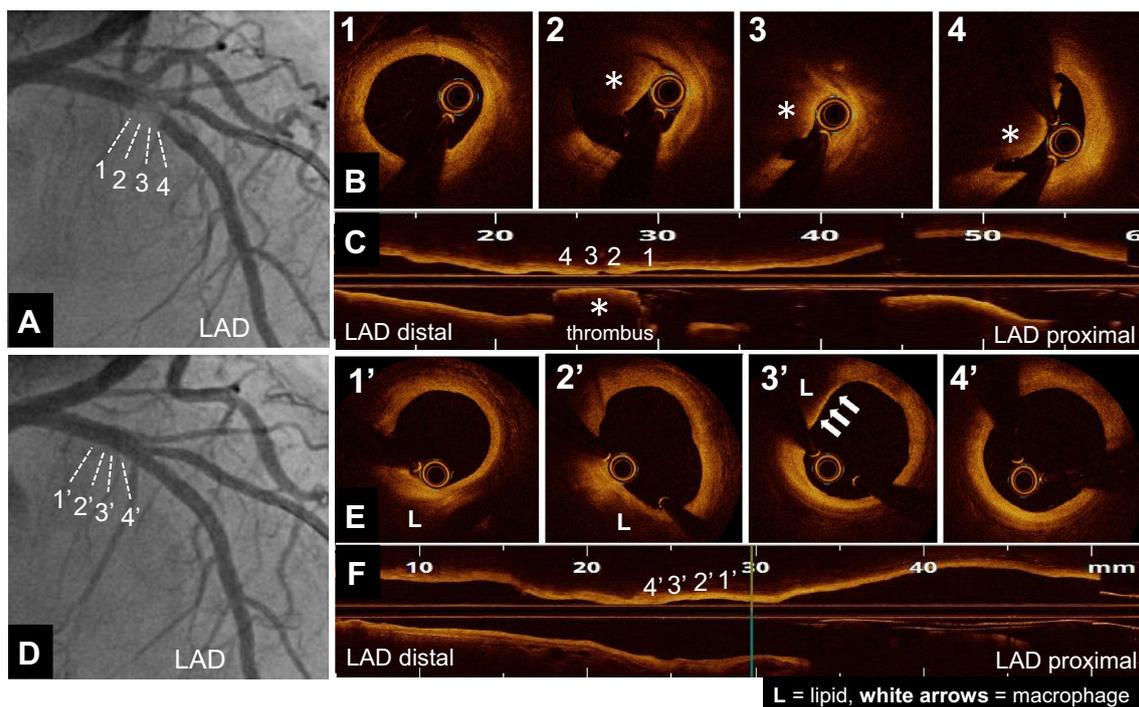


Fig. 1 **a** Coronary angiography. Severe stenosis with luminal haziness was observed in the proximal segment of LAD. **b** Longitudinal OCT image prior to PCI. **c** Cross-sectional OCT images prior to PCI. Thrombus (asterisk) overlying the culprit lesion was identified. Due to the presence of thrombus, the plaque surface was invisible (2–4). **d** Coronary angiography after PCI. After thrombectomy, thrombolysis in myocardial infarction III flow was obtained without any residual

stenosis and luminal haziness. **e** Longitudinal OCT image after PCI. **f** Cross-sectional OCT images after PCI. An intact fibrous cap was visualized after thrombectomy (1'–4'). There was no apparent overlying thrombus. In addition, small lipid plaque (L) with superficial macrophages (white arrow heads) were observed. LAD=left anterior descending artery, OCT=optical coherence tomography, PCI=percutaneous coronary intervention

Compliance with ethical standards

Conflict of interest All authors declare that they have no conflict of interests.

Ethical approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent Informed consent was obtained from the individual participant included in this manuscript.

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