SAGE Open Medical Case Reports
Volume 5: 1–3

DOI: 10.1177/2050313X17724059
journals.sagepub.com/home/sco
SAGE

A case with a large intracoronary mobile mass diagnosed with a calcified thrombus using optical frequency domain imaging and intravascular ultrasound

Toshiki Kuno, Kenji Hashimoto, Syohei Imaeda, Toshinobu Ryuzaki, Tetsuya Saito, Hiroyuki Yamazaki, Ryota Tabei, Masaki Kodaira and Yohei Numasawa

Abstract

Objectives: A calcified thrombus is rare, but needs to be recognized and to be differentiated from calcified nodule.
Methods: We report a case of acute coronary syndrome and a large intracoronary mobile mass, which was identified as a calcified thrombus by optical frequency domain imaging and intravascular ultrasound.
Results: Successful direct stenting indicated that mobile mass was a calcified thrombus, not a calcified nodule.
Conclusions: Cardiologists should be aware that an intracoronary mobile mass could be a calcified thrombus. This diagnosis can be confirmed through the combined use of optical frequency domain imaging and intravascular ultrasound.

Keywords

Calcified thrombus, intravascular ultrasound, optical frequency domain imaging, acute coronary syndrome, percutaneous coronary intervention

Date received: 22 December 2016; accepted: 12 July 2017

Case description

An 82-year-old woman presented with chest pain at rest and cold sweats lasting 10 min. Her electrocardiogram showed no ischemic ST changes because she did not have symptoms when she arrived at the hospital. Based on her laboratory data revealing elevated Troponin T (0.102 ng/mL), she was diagnosed with acute coronary syndrome. Then, we applied a 6-F sheath via a right trans-radial approach. Coronary angiography with a 6-F Judkins Right 4.0, Goodtec® (Goodman, Gifu, Japan) revealed a mobile mass with a stalk in the right coronary artery (RCA; Figure 1(a), arrow, and Online Video 1) and moderate stenosis in the left anterior descending artery (LAD) (Figure 1(b), arrow, and Online Video 2). We suspected the mobile mass to be a thrombus, which was the culprit lesion, and decided to perform percutaneous coronary intervention (PCI). We exchanged to 7-F sheath in order to apply a large size Rotablator® (Boston Scientific, Boston, MA, USA) in case of a calcified nodule. First, we engaged Judkins Right 4.0 Profit® (Goodman) and inserted a guide wire, Sionblue® (Asahi Intecc, Nagoya, Japan) and performed intravascular ultrasound (IVUS), ViewIt® (Terumo, Tokyo, Japan). However, it showed a hyperechoic signal with acoustic shadowing suspected to be superficial microcalcifications (Figure 1(c), arrow, and Online Video 3). Then, we performed optical frequency domain imaging (OFDI), FastView® (Terumo, Tokyo, Japan) which revealed a high-luminance protruding mass with attenuation that was suspected to be a calcified thrombus (Figure 1(d), arrow, and Online Video 4). We confirmed the RCA as the culprit and proceeded with direct stent insertion (Promus Premier®, 4 mm × 24 mm, Boston Scientific). The final angiography and IVUS revealed acceptable results (Figure 1(e) and (f) and Online Videos 5 and 6). Then, we performed staged PCI for LAD because we could not conclusively determine the culprit artery. After both PCIs, she remained asymptomatic for 18 months.

Department of Cardiology, Japanese Red Cross Ashikaga Hospital, Ashikaga, Japan

Corresponding Author:
Toshiki Kuno, Department of Cardiology, Japanese Red Cross Ashikaga Hospital, 284-1, 326-0843 Yobe-cho, Ashikaga, Tochigi, Japan.
Email: kuno-toshiki@hotmail.co.jp

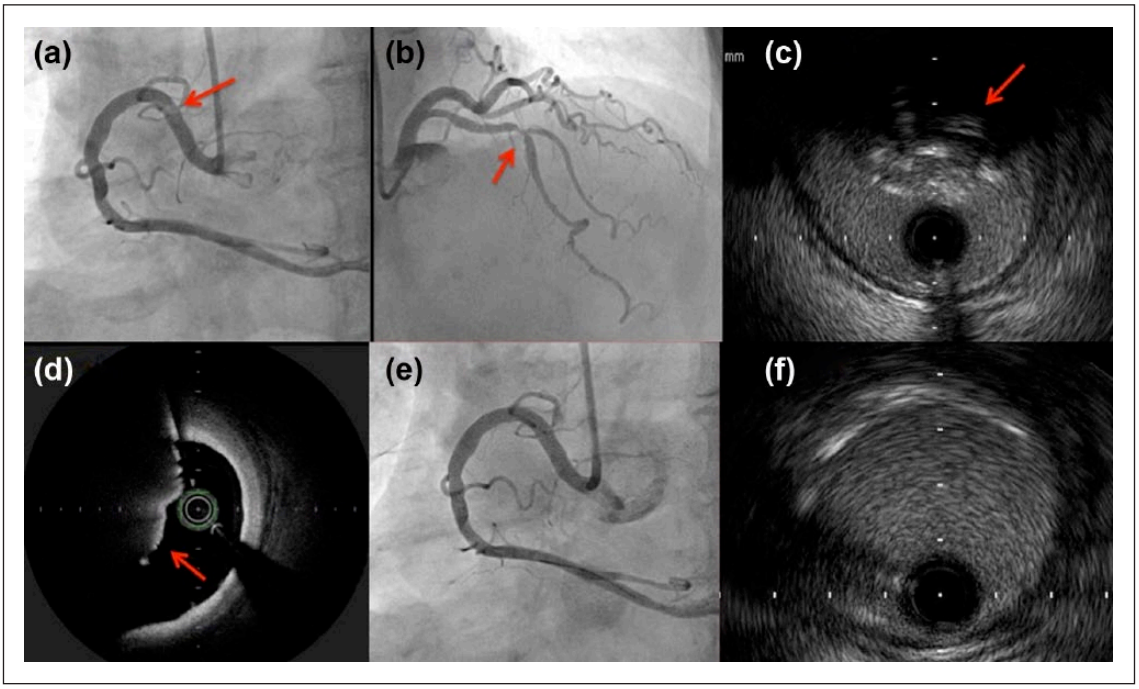

Figure 1. (a) Diagnostic coronary angiogram of the RCA showing a mobile plaque (an arrow), (b) diagnostic coronary angiogram of the LAD showing stenosis in the LAD (an arrow), (c) IVUS image showing a hyperechoic signal with acoustic shadowing (an arrow), (d) OCT image showing a high-luminance protruding mass with attenuation (an arrow), and (e) and (f) final coronary angiogram and IVUS image showing acceptable results.

Discussion

The IVUS image of the mobile mass demonstrated a hyperechoic signal and acoustic shadowing, revealing superficial microcalcifications above the sequence of mild plaque. These results could be caused by a red calcified thrombus or a calcified nodule.[1] Although virtual histology-IVUS imaging may color an intracoronary thrombus,[2] we did not perform this procedure because it might not visualize areas lying behind microcalcifications due to acoustic shadowing. Because OFDI can detect a thrombus clearly,[3] we performed OFDI, which revealed a mass with attenuation, behind the calcification, which was suspected to be a red thrombus. There were no erosions noted from plaque rupture, but a red thrombus could have caused acute coronary syndrome.[4–6] An OFDI image of a calcified thrombus has been previously shown to present as a protruding mass with OFDI-signal backscattering and attenuation.[7] Furthermore, if it was an intracoronary embolus, this mobile mass could be embolized more distally or moved distally with injection of contrast. Moreover, there was no evidence of paroxysmal atrial fibrillation, which is a major cause of intracoronary embolization.[8] Thus, we concluded that this mobile mass was a calcified thrombus and performed direct stenting successfully. Successful direct stenting indicated that mobile mass was a calcified thrombus, not a calcified nodule. Although there was a concern of distal embolization, we did not perform thrombus aspiration or distal protection because there was no data favoring the use of these devices and because the use of such procedures could cause stroke due to thrombus migration.[9,10] Cardiologists should be aware that an intracoronary mobile mass could be a calcified thrombus. This diagnosis can be confirmed through the combined use of OFDI and IVUS.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethical approval

Our institution does not require ethical approval for reporting individual cases or case series.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

Informed consent

Written informed consent was obtained from the patient(s) for their anonymized information to be published in this article.

References

1. Hao H, Fujii K, Shibuya M, et al. Different findings in a calcified nodule between histology and intravascular imaging such as intravascular ultrasound, optical coherence tomography,

and coronary angioscopy. *JACC Cardiovasc Interv* 2014; 7: 937–938.
2. Nasu K, Tsuchikane E, Katoh O, et al. Impact of intramural thrombus in coronary arteries on the accuracy of tissue characterization by in vivo intravascular ultrasound radiofrequency data analysis. *Am J Cardiol* 2008; 101: 1079–1083.
3. Amabile N, Hammas S, Fradi S, et al. Intra-coronary thrombus evolution during acute coronary syndrome: regression assessment by serial optical coherence tomography analyses. *Eur Heart J Cardiovasc Imaging* 2015; 16: 433–440.
4. Tearney GJ, Regar E, Akasaka T, et al.; International Working Group for Intravascular Optical Coherence Tomography. Consensus standards for acquisition, measurement, and reporting of intravascular optical coherence tomography studies: a report from the International Working Group for Intravascular Optical Coherence Tomography Standardization and Validation. *J Am Coll Cardiol* 2012; 59: 1058–1072.
5. Prati F, Guagliumi G, Mintz GS, et al. Expert OCTRD: expert review document part 2: methodology, terminology and clinical applications of optical coherence tomography for the assessment of interventional procedures. *Eur Heart J* 2012; 33: 2513–2520.
6. Alfonso F, Gonzalo N, Nunez-Gil I, et al. Coronary thrombosis from large, nonprotruding, superficial calcified coronary plaques. *J Am Coll Cardiol* 2013; 62: 2254.
7. Koga S, Ikeda S, Nakata T, et al. Diverse findings in calcified thrombus between histopathology and in vivo imaging including intravascular ultrasound, optical coherence tomography, and angioscopy. *Int Heart J* 2015; 56: 661–663.
8. Hashimoto O, Sato K, Numasawa Y, et al. Simultaneous onset of myocardial infarction and ischemic stroke in a patient with atrial fibrillation: multiple territory injury revealed on angiography and magnetic resonance. *Int J Cardiol* 2014; 172: e338–e340.
9. Roffi M and Mukherjee D. Current role of emboli protection devices in percutaneous coronary and vascular interventions. *Am Heart J* 2009; 157: 263–270.
10. Jolly SS, Cairns JA, Yusuf S, et al.; TOTAL Investigators. Outcomes after thrombus aspiration for ST elevation myocardial infarction: 1-year follow-up of the prospective randomised TOTAL trial. *Lancet* 2016; 387: 127–135.