A 80-year-old man with severe kidney dysfunction (estimated glomerular filtration rate, 26 mL/min/1.73 m²) not requiring hemodialysis presented with effort angina. Diagnostic angiography with minimum contrast showed a diffuse lesion in the proximal right coronary artery (RCA; Figure A). On a later day, optical coherence tomography (OCT)-guided percutaneous coronary intervention (PCI) with dextran injection was performed. Because multiple cracks were seen in the severely calcified lesion after pre-dilation (Figure B, C; Supplementary Movie 1), an everolimus-eluting stent (3.25–3.3 mm) was implanted (Figure D). The final OCT showed sufficient luminal expansion (minimum stent area, 6.01 mm²; Figure E, F; Supplementary Movie 2), and the fractional flow-reserve (FFR) indicated no residual ischemia (Figure G–J). No contrast medium was injected during the procedure.

The alternative dextran injection facilitated OCT of sufficient quality, and further FFR assessment confirmed that PCI was hemodynamically sufficient. Zero-contrast OCT-guided PCI in combination with FFR assessment is a promising option even for severe calcified lesion in patients with severe kidney dysfunction.1

Disclosures
J.A. and Y.M. received lecture fees from Abbott Vascular. The other authors declare no conflicts of interest.

Reference

Supplementary Files
Supplementary Movie 1. Dextran-based OCT pullback showing a diffuse severely calcified lesion.
Supplementary Movie 2. Dextran-based final OCT pullback.

Received April 5, 2019; revised manuscript received May 7, 2019; accepted May 12, 2019; J-STAGE Advance Publication released online May 28, 2019 Time for primary review: 29 days
Department of Cardiovascular Medicine, Kitasato University School of Medicine, Sagamihara, Japan
Mailing address: Yoshiyasu Minami, MD, PhD, Department of Cardiovascular Medicine, Kitasato University School of Medicine, 1-15-1 Kitasato, Minami-ku, Sagamihara 252-0373, Japan. E-mail: nrg12391@yahoo.co.jp
ISSN-1346-9843 All rights are reserved to the Japanese Circulation Society. For permissions, please e-mail: cj@j-circ.or.jp

Zero-Contrast Optical Coherence Tomography- and Physiology-Guided Percutaneous Coronary Intervention for Severely Calcified Lesion

Kiyoshi Asakura, MD; Yoshiyasu Minami, MD, PhD; Takao Shimohama, MD, PhD; Junya Ako, MD, PhD

Figure. (A) Angiogram showing a diffuse lesion in the proximal right coronary artery (RCA; arrowheads) and a moderate stenosis in the mid-RCA (arrow). (B) Dextran-based optical coherence tomography (OCT) showing thick calcification (asterisks) and crack formation (arrow) after balloon dilation. (C) OCT showing cracks (arrowheads). (D) Implanted everolimus-eluting stent (EES). (E) OCT showing the well-dilated lesion with EES. (F) Absence of significant malapposition on OCT. (G) Fractional flow-reserve (FFR) wire positioned at the distal end of a moderate stenosis (arrowhead). (H) FFR at the arrowhead in G. (I) FFR wire positioned at the distal end of the EES (arrowhead). (J) FFR at the arrowhead in I.