Intravascular findings post-PK Papyrus-covered stent implantation for a coronary artery aneurysm

Yamamoto, Hiroyuki
Miyata, Taishi
Kawai, Hiroya
Takaya, Tomofumi

(Citation)
European Heart Journal : Case Reports,7(5):ytad215

(Issue Date)
2023-05

(Resource Type)
journal article

(Version)
Version of Record

ESC European Society of Cardiology
European Heart Journal - Case Reports (2023) **7**, 1–2
https://doi.org/10.1093/ehjcr/ytad215

Intravascular findings post-PK Papyrus-covered stent implantation for a coronary artery aneurysm

Hiroyuki Yamamoto [1†], Taishi Miyata[1], Hiroya Kawai[1,2], and Tomofumi Takaya [1,2*†]

[1]Division of Cardiovascular Medicine, Department of Internal Medicine, Hyogo Prefectural Harima-Himeji General Medical Center, 3-264 Kamiya-cho, Himeji 6708560, Japan; and [2]Department of Exploratory and Advanced Research in Cardiology, Kobe University Graduate School of Medicine, 7-5-1 Kusunoki-cho, Chuo-ku, Kobe 6500017, Japan

Received 15 December 2022; first decision 3 March 2023; accepted 21 April 2023; online publish-ahead-of-print 24 April 2023

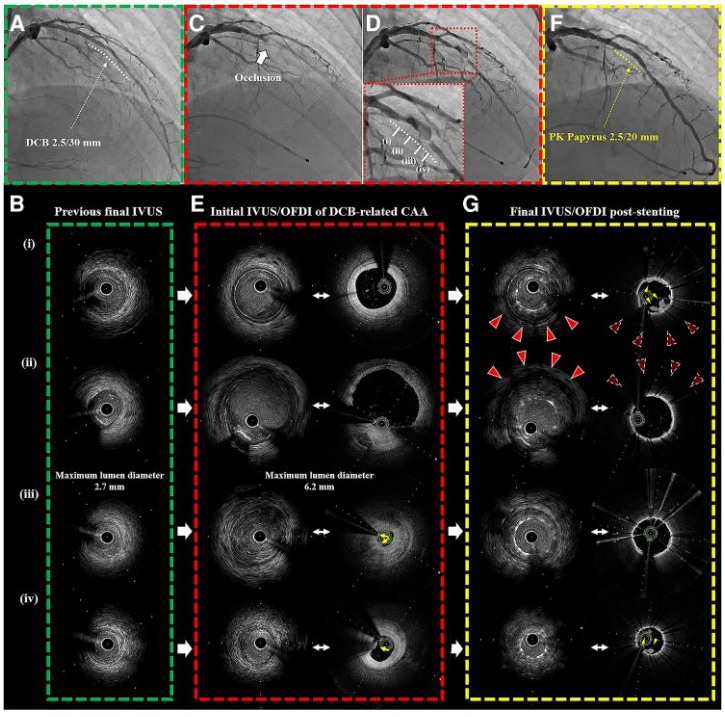

Figure 1 (*A*) Coronary angiography and (*B*) intravascular ultrasound after previous percutaneous coronary intervention with a drug-coated balloon angioplasty. Coronary angiography; (*C*) an acute occlusion in the mid-left anterior descending artery, (*D*) after thromboaspiration and (*F*) PK Papyrus-covered stent implantation. (*E* and *G*) Comparison of intravascular ultrasound and optimal frequency domain imaging findings; (*E*) after thromboaspiration and (*G*) PK Papyrus-covered stent implantation. Intravascular ultrasound visualizes the aneurysm (red arrowheads), but optimal frequency domain imaging cannot visualize it (dotted arrowheads). However, optimal frequency domain imaging indicates thrombus (arrows) before stenting and multiple intra-stent thrombi, which is newly developed after stent implantation (yellow arrowheads).

* Corresponding author: Tel: +81-79-289-5080, Fax: +81-79-289-2080, Email: toto54@hotmail.com
† These authors share the lead authorship and contributed equally to the study.
Handling Editor: Francesco Moroni
Peer-reviewers: Andi Rroku; Aisha Gohar

Case description

A 50-year-old southeast Asian man with exertional angina pectoris underwent elective percutaneous coronary intervention involving the mid-left anterior descending (LAD) artery (small vessel disease <3.0 mm) using a 2.5-/30-mm drug-coated balloon (DCB; SeQuent Please, B. Braun Melsungen AG, Germany). Four months afterward [3-month dual antiplatelet therapy (DAPT) with aspirin 100 mg/day and prasugrel 3.75 mg/day, and subsequent single antiplatelet therapy with aspirin 100 mg/day as per the Japanese guidelines], the patient experienced an anterior ST-segment elevation myocardial infarction (STEMI) (*Figure 1A* and *B*). Emergency coronary angiography revealed an acute occlusion of the mid-LAD artery, in which the DCB had been used previously. Intravascular ultrasound (IVUS; AltaView, Terumo Corp, Japan) and optical frequency domain imaging (OFDI; FastView, Terumo Corp, Japan) after thromboaspiration revealed a coronary artery aneurysm (CAA) (*Figure 1C, D,* and *E*). Drug-eluting stent implantation for the CAA (maximum lumen diameter, 6.2 mm) was considered unsuitable given the risk of acute stent occlusion due to stent malapposition. Therefore, a 2.5-/20-mm covered stent (PK Papyrus, BIOTRONIK, Inc., Germany) was implanted with nominal pressure, resulting in complete coverage of the CAA, as visualized on IVUS images. OFDI did not show the aneurysm (vessel condition) external to the covered stent, but clearly detected luminal conditions, including multiple minor intra-stent thrombi that required additional 3.0-mm non-compliant balloon angioplasties (*Figure 1F* and *G*). The patient was discharged after 11 days without further complications and had an uneventful clinical course for 4 months under the same DAPT regimen.

DCB angioplasty potentially leads to CAA (DCB-related CAA); however, STEMI associated with DCB-related CAA is rare.[1] PK Papyrus-covered stents are reportedly useful for coronary artery perforation and CAAs, despite higher cardiovascular event rates, including stent thrombosis and restenosis, in selected cases.[2] In cases requiring PK Papyrus-covered stent implantation, IVUS and OFDI have varying capabilities in evaluating outer (vessel)/inner (luminal) conditions, which may help clarify the appropriate management for these patients.[3]

Consent: In line with the COPE guidelines, informed consent was obtained from the patient for the participation in this study and publication of the case and accompanying images.

Conflict of interest: None declared.

Funding: None declared.

Data availability

The data included in this study are available in the article and its online Supplementary material.

References

1. Kleber F, Schulz A, Bonaventura K, Fengler A. No indication for an unexpected high rate of coronary artery aneurysms after angioplasty with drug-coated balloons. *EuroIntervention* 2013;**9**:608–612.
2. Will M, Kwok CS, Nagaraja V, Potluri R, Weiss TW, Mascherbauer J, *et al.* Outcomes of patients who undergo elective covered stent treatment for coronary artery aneurysms. *Cardiovasc Revasc Med* 2022;**36**:91–96.
3. Kobayashi Y, Kitahara H, Tanaka S, Okada K, Kimura T, Ikeno F, *et al.* Quantitative precision of optical frequency domain imaging: direct comparison with frequency domain optical coherence tomography and intravascular ultrasound. *Cardiovasc Interv Ther* 2016;**31**:79–88.