



Case Report

Observation of early strut coverage after polymer-free biolimus-A9 coated stent by optical frequency domain imaging



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ABSTRACT

An 80-year-old male patient with an acute myocardial infarction in the mid left anterior descending artery was treated with a BioFreedom stent (2.5 × 24 mm) (Biosensors Inc., Newport Beach, CA, USA). Thirty days post procedure, the patient was re-admitted with chest pain. A significant coronary artery stenosis in the mid left anterior descending artery more progressive than the previous one (not involving proximal stent-edge) was treated with percutaneous coronary intervention. Following this, optical frequency domain imaging of the BioFreedom stent revealed a fully expanded stent with complete stent apposition in its entire length and strut coverage with neointimal hyperplasia.

<Learning objective: For patients with high bleeding risk, BioFreedom stent (Biosensors Inc., Newport Beach, CA, USA) may be considered a sufficiently effective device with shortened duration of dual antiplatelet therapy.>

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Introduction

Percutaneous coronary intervention (PCI) with drug-eluting stent (DES) implantation is the standard treatment strategy of coronary artery disease. However, the issue of the duration of dual antiplatelet therapy (DAPT) after DES implantation has not been fully resolved. In particular, shortened DAPT is expected in patients with high-bleeding risk [1]. In our report, which observed early strut coverage of a polymer-free biolimus-A9 coated stent (BioFreedom, Biosensors Inc., Newport Beach, CA, USA) by optical frequency domain imaging (OFDI), it may be considered as further evidence to support a shortened DAPT for the indication.

Case report

An 80-year-old male (current smoker) was admitted to our facility due to sudden onset of chest pain. He had a previous history of an operation relating to gastric cancer. Given an electrocardiogram (ECG) revealed anterior ST-segment elevation and biochemically cardiac enzyme was elevated, he was diagnosed as having a myocardial infarction. He was referred for coronary angiography

(CAG), which revealed the occlusion in the mid left anterior descending artery (LAD) (Fig. 1A). Following a loading dose of aspirin and prasugrel, he was successfully treated with a BioFreedom stent (2.5 × 24 mm) (Fig. 1B).

Thirty days post-PCI, he presented with a complaint of chest pain. ECG revealed an unchanged ST-segment and there had been no interruption in DAPT (aspirin 100 mg daily and prasugrel 3.75 mg daily). CAG showed a significant stenosis in the mid LAD more progressive than the previous one, yet did not involve the proximal stent-edge (Fig. 1C). PCI overlapping the previous BioFreedom stent was performed (Fig. 1D). Then, the BioFreedom stent strut coverage and culprit lesion were observed by a supplementary OFDI (Terumo Corporation, Tokyo, Japan). OFDI images on the previous BioFreedom stent revealed a fully expanded stent without malapposition and strut coverage with neointimal hyperplasia with a coverage rate of 95.6% (Fig. 2).

Discussion

Whereas there is a bleeding risk induced by prolonged DAPT, current guidelines [2,3] suggest the implantation of DES with 3–6 months DAPT for patients with a high bleeding risk, but the recommendation is based on limited evidence. The LEADERS FREE trial [1] showed that BioFreedom stent with a 1-month DAPT is significantly effective and safe compared with a bare-metal stent (BMS) in high bleeding risk patients. The trial showed that in the

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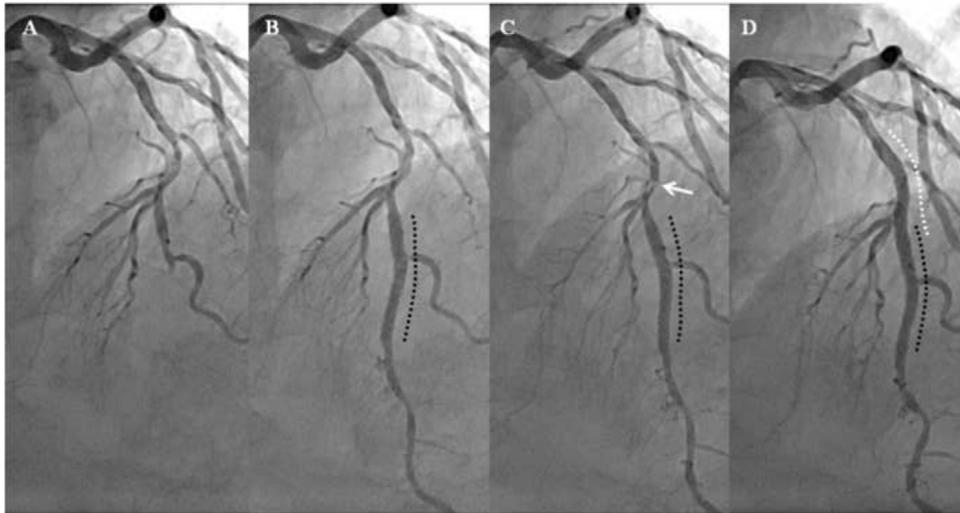


Fig. 1. (A) Baseline coronary angiography (CAG) showing an obstructive lesion in the mid left anterior descending (LAD) artery. (B) Successful implantation with a 2.5 × 24 mm BioFreedom stent (black line). (C) CAG 30 days after LAD-stenting showing a significant stenosis in the mid LAD more progressive than the previous one, while not involving proximal stent-edge (white arrow). (D) Percutaneous coronary intervention (white line) overlapping the previous BioFreedom stent was performed.

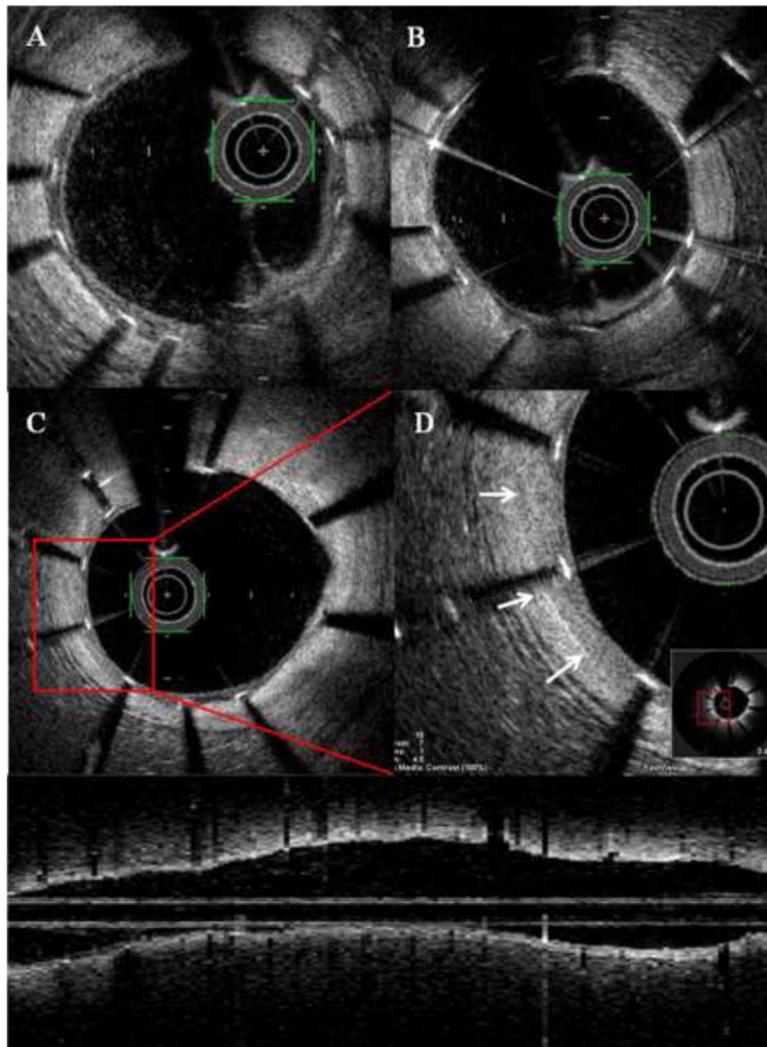


Fig. 2. A supplementary optical frequency domain imaging (OFDI); upper and middle rows show cross sectional OFDI images of the previous BioFreedom stented segment of the mid left anterior descending artery (A, B) distal-mid region of the stented segment. (C) Mid-proximal region of the stented segment. (D) Image in enlarged and emphasized (C) shows mature neointimal hyperplasia having high signal (white arrows). BioFreedom stent shows a fully expanded stent without malapposition and with neointimal coverage.

high-risk population the rate of bleeding was high with 7.2% of patients in spite of a short course of DAPT. In our case report to support shortened DAPT, strut coverage with neointimal hyperplasia was observed by OFDI a month post-PCI with the BioFreedom stent.

In the acute coronary syndromes population at high risk of bleeding, the sub-study [4] demonstrated that BioFreedom stent implantation has an efficacy and a safety similar to that of current DES compared with BMS in a 1-month DAPT. Despite a course of only 1 month DAPT, the incidence of the bleeding events was similar and >20%, and the rate of severe bleeding was >9% during the 390 days of follow-up. For patients with a bleeding risk presenting with acute coronary syndrome, the use of BMS might no longer be recommended.

Conclusion

BioFreedom stent may be considered as a sufficiently effective device with shortened DAPT for high bleeding risk patients.

Conflict of interest

The authors declare no conflicts of interest in association with the present study.

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