



CASE REPORT

Improved vascular healing after the successful treatment of very late sirolimus-eluting stent thrombosis with a bare metal stent implantation – A serial optical coherence tomography study



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Received 3 May 2014; accepted 30 May 2015

Available online 6 April 2016

KEYWORDS

Optical coherence tomography;
Sirolimus eluting stent;
Stent thrombosis;
Treatment

Abstract We present the case of a patient with non-ST-elevated myocardial infarction due to very late stent thrombosis 2 years after a sirolimus-eluting stent implantation (SES). Optical coherence tomography (OCT) imaging identified vessel wall destruction of the whole stented coronary segment with multiple cavity formations along the entire stent length, severe strut malapposition and thrombi. The patient was treated successfully with the implantation of a bare metal stent (BMS). Follow-up OCT imaging at 12 months revealed the improvement of vascular healing with complete re-endothelialization of the distal parts of the new BMS, while the stent body remained partly uncovered, suggesting vascular toxicity due to the old SES.

Short abstract: The current case is the first to demonstrate the vascular response to a bare metal stent (BMS) implantation inside an old sirolimus-eluting stent with very late stent thrombosis *in vivo* using optical coherence tomography (OCT). Treatment of very late stent thrombosis with a new BMS resulted in a favourable outcome with improved vascular healing at 12 months, as identified by OCT.

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Peer review under responsibility of Hellenic Cardiological Society.

Introduction

Clinical studies have shown that drug-eluting stents (DES) inhibit neointimal proliferation and dramatically reduce in-stent restenosis.^{1,2} However, DES may affect the normal vascular healing process, resulting in delayed endothelialization and increased susceptibility to late stent thrombosis, an infrequent but life threatening complication.^{3–5} Optical coherence tomography (OCT), which offers ultra-high image resolution, offers a unique opportunity for *in vivo* assessment of the vascular response to DES.⁶ We present the case of a patient with non-ST-elevated myocardial infarction due to very late stent thrombosis 2 years after a sirolimus-eluting stent (SES) implantation. OCT identified vessel wall destruction of the stented coronary segment, suggesting a severe localized hypersensitivity reaction to SES. Follow-up OCT at 12 months after successful treatment with a bare metal stent revealed improved vascular healing.

Case report

A 44-year-old man without cardiovascular risk factors was admitted to our hospital because of a non-ST elevated

myocardial infarction. The patient had a history of percutaneous coronary intervention (PCI) with a sirolimus-eluting stent (SES) that was 3.0 mm in diameter and 23 mm in length (Cypher stent, Cordis, Johnson & Johnson, Miami, Florida) and was implanted in the mid left anterior descending artery 2 years prior. During his current admission, coronary angiography revealed non-significant coronary artery stenosis. However, at the site of the old Cypher stent, peri-stent contrast staining was observed (Fig. 1A). OCT imaging found that along the entire stent length there was severe strut malapposition and multiple cavity formations between stent struts with a depth range of 0.5 to 2.1 mm (Fig. 1C and 1D). Moreover, at the proximal part of the stent, multiple red thrombi were observed (Fig. 1B) that almost obstructed the lumen of the vessel. Interestingly, most of the stent struts were totally covered by a layer of tissue similar to neo-endothelium (Fig. 1C, 1D). We decided to treat the patient with a new bare-metal stent (BMS) that was 2.75 mm in diameter and 30 mm in length. After stent implantation, we performed multiple dilatations with a 3.0 mm balloon under high atmosphere, with a good angiographic result (Fig. 2A). OCT imaging of the new BMS showed good expansion and apposition of the stent (Fig. 2B); however, some large cavities were still present between the stent struts (Fig. 2C and 2D). Notably,

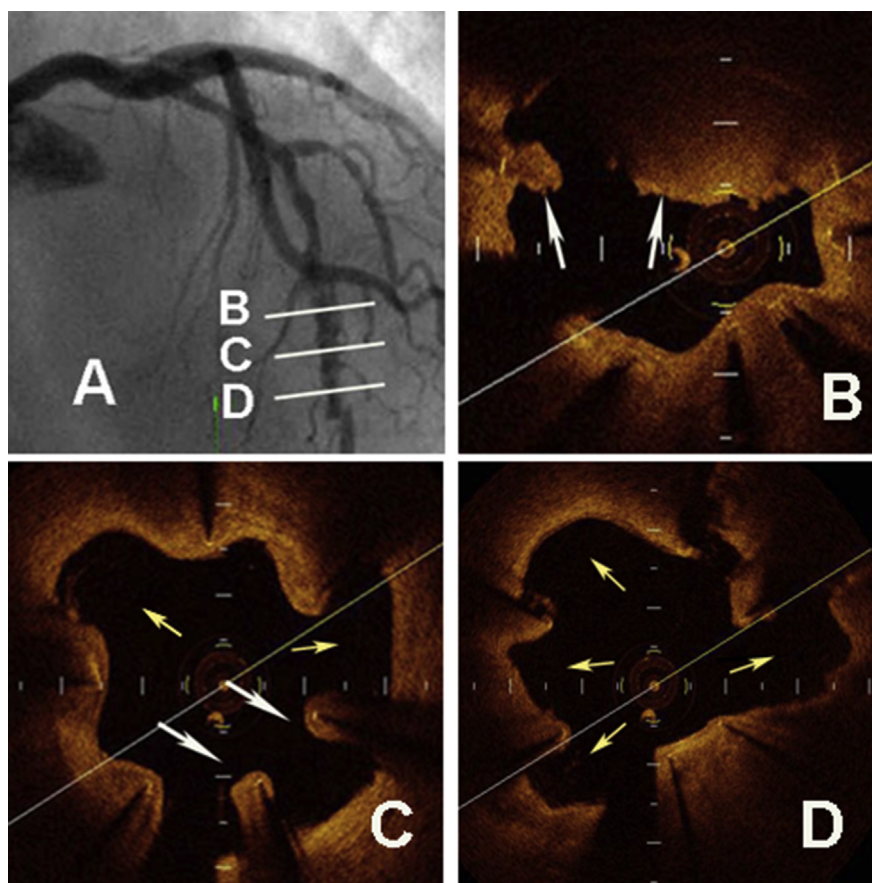


Figure 1 Baseline angiographic and OCT findings. A. Peri-stent contrast staining in mid LAD (the coronary artery segment between lines B and D). B, C and D. OCT images reveal: B. the proximal part of the old Cypher stent with multiple red thrombi (arrows) C. and D. Severe strut malapposition (white arrows) and multiple cavity formations (yellow arrows). Interestingly, most of the stent struts are covered by a layer of tissue similar to neo-endothelium.

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