Novel magnesium Freesolve bioresorbable scaffold combined with intravascular optical coherence tomography guidance in management of MINOCA

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A 62-year-old woman with a history of hypertension and hyperlipidemia was referred to our center with suspected non-ST-elevation myocardial infarction (episode of chest pain, no significant ST-T changes on resting electrocardiogram [ECG], mildly elevated cardiac necrotic markers). The initial coronary angiography did not show any significant stenosis on the angiographic assessment.

Despite the initial absence of significant lesions in the coronary angiogram, the patient experienced a recurrence of chest pain during the post-procedural period. An echocardiographic examination showed segmental wall motion abnormalities in the interventricular septum with preserved ejection fraction. Moreover, laboratory analysis demonstrated an elevation in high-sensitivity troponin T level from 140 to 350 pg/ml, although ECG did not show any notable abnormalities. Given the unclear clinical presentation, the patient underwent a reevaluation with coronary angiography complemented by optical coherence tomography (OCT) imaging.

The OCT evaluation showed the presence of a lipid-rich lesion in the mid portion of the left anterior descending artery, accompanied by the presence of a ruptured atherosclerotic plaque (Figure 1A). The area of stenosis was assessed at 60%, with a minimal lumen area of 1.85 mm^2.

In light of the patient's clinical presentation, percutaneous coronary intervention (PCI) was deemed the most appropriate course of treatment. Initial predilation with a non-compliant balloon (NC) 3.0 × 20 mm (16 atm) was followed by novel magnesium bioresorbable scaffold (BRS) Freesolve (Biotronik, Berlin, Germany) 3.0 × 30 mm implantation (12 atm) with additional optimization with an NC 3.25 × 15 mm (17 atm). The OCT assessment showed a suboptimal proximal landing zone, which was subsequently treated with an additional Freesolve BRS (3.0 × 18 mm, 12 atm) implanted in an edge-to-edge manner. In order to achieve adequate stent apposition, an additional dilatation with an NC 3.5 × 12 mm (16 atm) balloon was performed. The final OCT assessment demonstrated optimal stent expansion (>90%) with minimal stent area 7.17 mm^2 (Figure 1B). During the rest of her stay in hospital, the patient remained asymptomatic and was discharged 3 days after the PCI.

Myocardial infarction with no obstructive coronary artery disease (MINOCA) represents up to 15% of all acute coronary syndromes. MINOCA is a board preliminary diagnosis based on the clinical presentation, supported by laboratory assay abnormalities (troponin T) and potential changes in ECG patterns. Additionally, no significant (>50%) lesion should be present on coronary angiogram [1]. The etiology of this phenomenon is complex and multifaceted [1]. Moreover, intravascular imaging, particularly OCT, remains a crucial element in differential diagnosis, facilitating the identification of the direct mechanism underlying the etiopathogenesis of this condition [2].

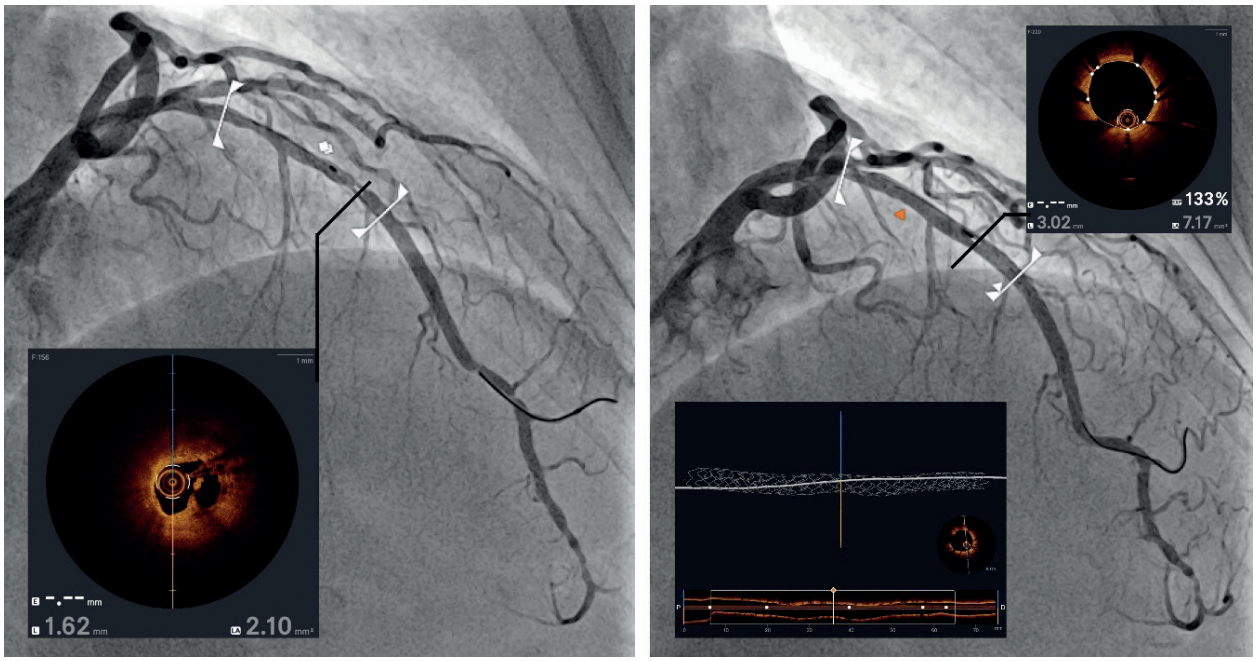

Figure 1. A. Baseline angiography: cross-sectional view of LAD in OCT with lipid-rich ruptured atherosclerotic plaque. **B.** Angiographic result after 2 BRS implantations, cross-sectional view of a vessel with optimal BRS apposition, 3D reconstruction of 2 BRS stents

Abbreviations: BRS, bioresorbable scaffold; LAD, left anterior descending; OCT, optical coherence tomography

In view of the uncertain outcomes of pharmacological treatment, novel therapeutic approaches are being explored to provide the most convenient clinical outcome [3]. Recently published data suggests favorable outcomes of novel magnesium BRS-Freesolve [4] which, combined with fundamental principles of the BRS concept related to providing short-term support of vascular healing during the acute phase after the PCI and subsequent complete biosorption [5], predisposes this scaffold to meet the unnamed need in the field of MINOCA interventions.

The presented case suggests that the use of a novel bioresorbable metallic scaffold (Freesolve) in the field of vulnerable plaque interventions might be a relatively safe alternative to a conservative approach. However, further larger studies are necessary to fully evaluate this potential novel therapeutic option.

Article information

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