Anatomic Stabilization and Functional Normalization of a Ruptured Coronary Plaque 12 Months After Implantation of a Bioresorbable Scaffold

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A 61-year-old man with a history of hypertension, smoking, and hyperlipoproteinemia presented to our chest pain unit with typical angina. An electrocardiogram showed ST-segment elevation in the anterior leads, and emergency coronary angiography demonstrated the presence of a ruptured plaque in the proximal left anterior descending coronary artery. The vessel was almost entirely occluded by an intraluminal thrombus (Fig. 1A). The lesion was dilated with a 2.75 × 15-mm balloon (Maverick, Boston Scientific, Natick,
Massachusetts) and a $3 \times 18$-mm coronary bioresorbable scaffold (Absorb, Abbott Vascular, Abbott Park, Illinois) was implanted with a good result (Fig. 1B).

One year later, control angiography demonstrated complete patency of the scaffold (Fig. 1C). Optical coherence tomography (LightLab C-7, St. Jude Medical, St. Paul, Minnesota) showed a good apposition and dilation of the struts. The previously ruptured plaque was covered by a 130- to 150-mm layer of fibrous neointima (Fig. 1D). Both acetylcholine (Miochol E, Bausch and Lomb, Rochester, New York) administered in 3 escalating doses for 3 min each through a microcatheter placed in the proximal left anterior descending artery and nitroglycerin 200 mg caused a dose-dependent coronary vasodilation in the scaffolded segment (Figs. 1E to 1I).

Data on the outcome of unstable plaques treated with bioresorbable scaffolds are currently not available. We provide evidence in support of the concept that, after initial mechanical stabilization with a bioresorbable scaffold, biological processes lead to anatomic and physiological improvement of unstable plaques. A moderate neointimal growth after interventional treatment might in this setting limit the risk of future exposure of thrombogenic tissues, thus stabilizing the plaque; similarly, effective vasodilation in response to acetylcholine reflects an improved endothelial function. Once these processes have occurred, a permanent metal implant might thus be unnecessary. Temporary plaque “sealing” with a bioresorbable scaffold should be evaluated as an alternative to metal stents in the setting of unstable plaques.

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