ST elevation myocardial infarction treated with bioresorbable vascular scaffold: rationale and first cases

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Bioresorbable vascular scaffolds (BVS) have the potential to start new era in interventional cardiology. First clinical studies in stable coronary artery disease have demonstrated a good safety profile and promising results. The use of BVS in ST elevation myocardial infarction (STEMI) has not yet been reported.

The first two implantations of BVS Absorb® during primary PCI for STEMI in humans performed at our institution in December 2012 are described. Both patients have given written informed consent. The first patient, a 54-year-old male, presented with typical chest pain of 90 min duration, ST elevation in inferior leads on ECG and thrombotic occlusion of the right coronary artery. This lesion was predilated and BVS Absorb 3.0/18 mm was implanted with slow 1 Atm/s inflation to 16 Atm, angiographic result was optimal. Optical coherence tomography (OCT) performed with a Fourier-domain, non-occlusive catheter (C7 Dragonfly, St Jude Medical, USA) demonstrated excellent BVS apposition to vessel wall and small residual thrombi as the site of occlusion. Our second patient, a 52-year-old male, was admitted with anterior STEMI. Coronary angiography demonstrated critical thrombotic stenosis of proximal left anterior descending (LAD) artery involving the origin of a diagonal branch (Panel A). LAD was predilated with 3.0/12-mm balloon and subsequent slow flow in the diagonal branch was treated by ostial dilatation with 2.5/15-mm balloon. Optical coherence tomography demonstrated a ruptured plaque beginning 8 mm proximal from the diagonal branch (Panel B); a maximal thrombus burden was detected just proximal from the diagonal branch (Panel C). There was no thrombus or ruptured plaque distal to diagonal branch. Bioresorbable vascular scaffold Absorb 3.5/28 mm was implanted with 1 Atm/s inflation to 16 Atm for 30 s with optimal result (Panel D). Flow in the diagonal branch remained normal. Final OCT demonstrated optimal scaffold apposition (longitudinal view on Panels E and F), widely patent ostium of the diagonal branch with clearly visible residual thrombi (Panel E) and perfect sealing of the ruptured plaque (Panel F). Both patients were treated with dual antiplatelet therapy and in-hospital course was uneventful with discharge on Day 4.

The authors believe that primary PCI in the STEMI setting might represent a suitable BVS indication. Patients with STEMI tend to be younger and any possible benefits of BVS are more likely to become evident with longer term follow-up. Despite the theoretical advantages, there are no clinical data regarding safety of BVS in thrombotic lesions. It seems prudent to ensure that every BVS implanted in highly thrombotic milieu is optimally expanded.