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Is the Metallic Stent a Safe Treatment for Bioresorbable Scaffold Failure?

Insights From Optical Coherence Tomography

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A 58-year-old diabetic man with unstable angina underwent implantation in overlapping of 3 (2.5/28, 2.5/28, and 3.0/28 mm) Absorb bioresorbable vascular scaffolds (BVS) (Abbott Vascular, Santa Clara, California) in a long and heavily fibrocalcified left anterior descending artery stenosis. Post-implantation optical coherence tomography (OCT) showed a severe fracture of the proximal 3.0/28 mm BVS (**Figure 1A**) treated through the metal-in-polymer (MIP) technique with a conventional 3.0/30 mm drug-eluting stent (**Figure 1B**). Four months later because of effort angina a new angiography was performed; the OCT (**Figures 1C and 1D**) revealed multiple evaginations along the segment previously treated by MIP technique, with a different behavior between the metallic struts, which showed a large late-acquired malapposition, and the polymeric struts well apposed to the evaginated vessel wall; furthermore, while the nonapposed metallic struts were still uncovered, the disrupted scaffold struts were well covered and embedded into the vessel wall.

Metallic stent implantation represents a common treatment option for BVS failure, as acute struts fracture, to reduce the risk of future device-related events. However, our case shows that the positive remodeling or evaginations occurring after BVS implantation may lead to a progressive and persistent late-acquired malapposition of the metallic stent when the MIP technique is performed, providing a new trigger for late thrombosis. An OCT evaluation might be planned when MIP technique is used to rule-out a late malapposition before dual antiplatelet therapy discontinuation. Finally, alternative strategies, such as scaffold-in-scaffold implantation with another properly calibrated bioresorbable scaffold, might be considered for BVS failure.

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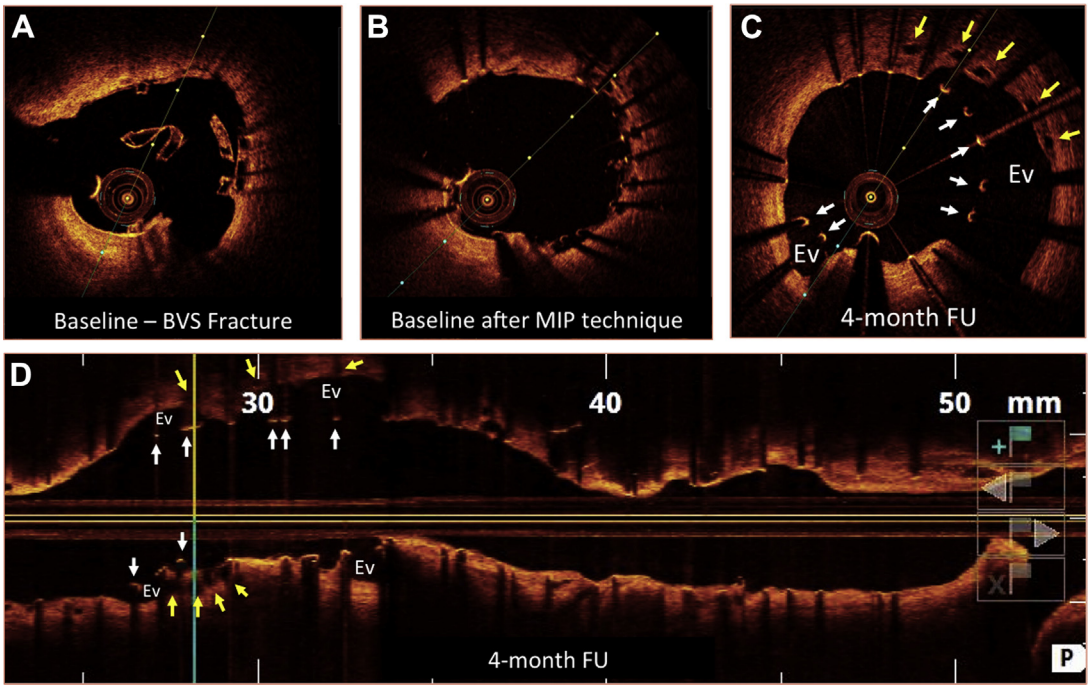
FIGURE 1 Baseline and 4-Month OCT Appearance of MIP Technique



Same-level 2-dimensional optical coherence tomography (OCT) cross sections show the bioresorbable scaffold fracture **(A)** before and **(B)** after metallic stent implantation with well-apposed struts both metallic and polymeric; **(C)** cross-sectional view and **(D)** longitudinal view for the 4-month OCT assessment demonstrate the occurrence of late evaginations (Ev) with a different behavior between the metallic struts **(white arrows)**, which appeared still uncovered with a relevant acquired malapposition, and the disrupted polymeric struts **(yellow arrows)**, which conversely appeared embedded into the evaginated vessel wall. BVS = bioresorbable vascular scaffold; FU = follow-up; MIP = metal-in-polymer.