Self-Expanding Stent Peeling Away From Overlapping Balloon-Expandable Stent Causing Late Acquired Aneurysm Formation and Stent Malapposition

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A 48-year-old man underwent elective percutaneous coronary intervention of a mid–left anterior descending (LAD) artery bifurcation lesion. A dedicated bifurcation self-expanding biolimus-eluting stent (3.0 × 14 mm AXXESS, Biosensors International, Morges, Switzerland) was implanted in the mid-LAD abutting the carina of the LAD and first diagonal (D1) bifurcation. Three balloon-expandable biolimus-eluting stents (Biomatrix, Biosensors) were placed proximal to the previous stent and in the distal main branch and the D1 side branch overlapping the AXXESS stent in a Y-configuration (Fig. 1A). High-pressure post-dilation of the proximal main vessel was performed with a 3.0-mm noncompliant balloon.

The patient underwent a 12-month follow-up coronary angiogram that showed a large coronary aneurysm in the mid-LAD (Fig. 1B). Optical coherence tomography showed significant positive

Figure 1. Angiogram of LAD at Baseline and at 1-Year Follow-Up

(A) Baseline angiogram showing 3.0 × 14 mm self-expanding bifurcation stent deployed at middle segment of left anterior descending (LAD) artery (red dotted lines) and 3 balloon-expandable stents (yellow dotted lines) implanted proximal and distal to the bifurcation stent. (B) Angiogram at 1-year follow-up showing a large aneurysm (red arrow) in the segment covered by the self-expanding stent.

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remodeling in the segment covered by the self-expanding stent that peeled away from the overlapping balloon-expandable stents (Fig. 2, Online Video 1). There was evidence of endothelialization of both the inner balloon-expandable stent and the outer peeled-away self-expanding stent (Fig. 2C). As a result, there was late acquired incomplete stent apposition within the overlapping stented segment.

Coronary artery aneurysm after drug-eluting stent implantation is rare. A possible cause is localized hypersensitivity reaction to the antirestenotic drug, polymer, or the stent material (1). The rationale of a dedicated self-expanding bifurcation stent is to provide an anatomically-tailored treatment of the bifurcation with optimal stent apposition and maximum drug coverage (2,3). Four biolimus-eluting stents with the same biodegradable
polymers were implanted in our patient, but aneurysmal change only occurred in the segment covered by the self-expanding stent. It is unknown whether the self-expanding force contributed to the positive remodeling and aneurysmal changes. Our case demonstrated that caution should be taken when overlapping self-expanding and balloon-expandable stents. Although stent apposition may be maintained by the self-expanding nature, late acquired stent malapposition may occur in the overlapping segment.

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