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IMAGES IN INTERVENTION

Longitudinal Stent Compression Demonstrated by Angiographic "Wedding Band" and 3-Dimensional Optical Coherence Tomography

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A 69-year-old man presented with a non–ST-segment elevation myocardial infarction. He underwent coronary angiography revealing a hazy, 90% lesion in the proximal left anterior descending (LAD) artery and a 60% lesion in the ostial first diagonal (D1) (Fig. 1A). The LAD lesion was treated with aspiration thrombectomy and implant of a 3.5 × 16 mm Promus Element (Boston

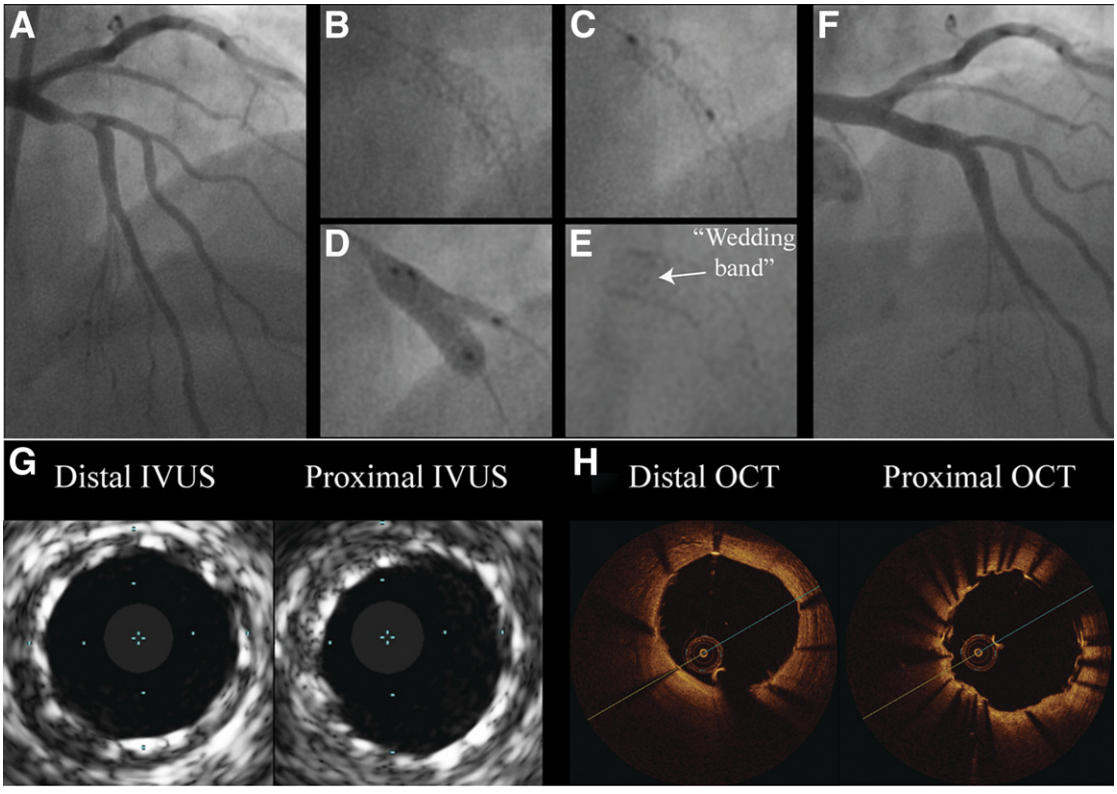

Figure 1. Longitudinal Stent Compression

IVUS= intravascular ultrasound; OCT=optical coherence tomography.

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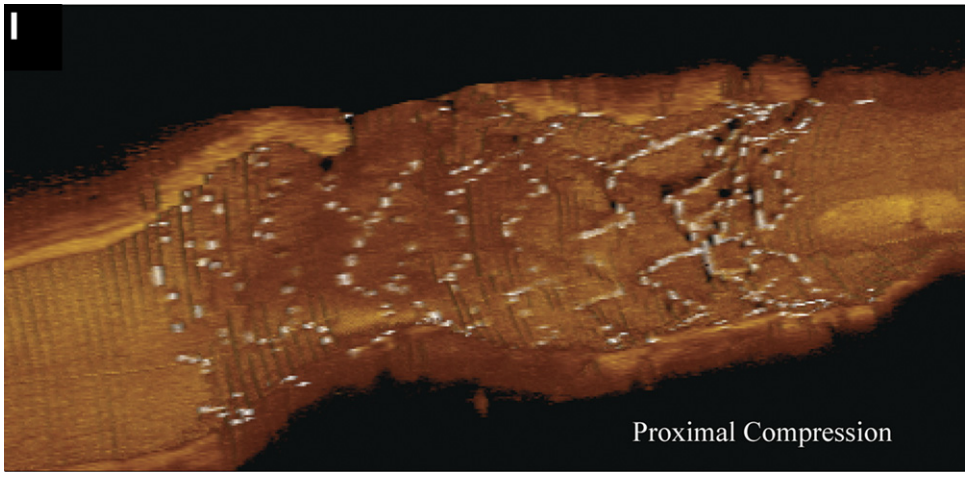

Figure 1. Longitudinal Stent Compression Continued

Scientific, Natick, Massachusetts) at 12 atm (Fig. 1B). Following post-dilation with a 3.5-mm noncompliant balloon, the stent appeared compressed with obvious shortening and a proximal "wedding band" effect due to increased strut density (Figs. 1C and 1E). This bunching of stent struts was confirmed by intravascular ultrasound (Fig. 1G). The D1 was then wired through the LAD stent side cell and kissing balloon inflations with a 3.75-mm balloon in the LAD and a 2-mm balloon in the D1 were performed (Figs. 1D and 1E).

He presented with chest pain 4 days later and underwent coronary angiography revealing a widely patent stent (Fig. 1F). Optical coherence tomography was performed, and it revealed a well-apposed LAD stent with compression of the proximal segment by 4 mm (Fig. 1H). Because the stent was well apposed with TIMI (Thrombolysis In Myocardial Infarction) flow grade 3, no intervention was performed. Off-line 3-dimensional rendering of the optical coherence tomography data were performed confirming the longitudinal compression (Fig. 1I).

Designed for improved deliverability, the platinum alloyed Promus Element stent has 81-μm struts and fewer connecting elements than the original Promus stent does. Bench-top models suggest that this design increases vulnerability of longitudinal compression and elongation (1). As next-generation stents strive for improved flexibility, the optimal treatment strategy and long-term consequences of longitudinal compression warrant ongoing investigation.

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