

IMAGES IN INTERVENTION

Optimization of Tryton Dedicated Coronary Bifurcation System With Coregistration of Optical Coherence Tomography and Fractional Flow Reserve

Stylianos A. Pyxaras, MD,* Shengxian Tu, PhD,† Emanuele Barbato, MD, PhD,*
Johan H. C. Reiber, PhD,† William Wijns, MD, PhD*

Aalst, Belgium; and Leiden, the Netherlands

The Tryton-Side Branch Stent (Tryton Medical, Newton, Massachusetts) is 1 dedicated bifurcation system, designed to be implanted in the side branch (SB) along with placement of a standard drug-eluting stent (DES) in the main vessel (1). The procedure is completed by a final kissing balloon dilation of both stents, which requires crossing of

the Tryton-stented SB through the main branch stent struts (Fig. 1). Motorized fractional flow reserve (FFR) pullback (at 1 mm/s) during hyperemia was used to allocate intracoronary pressure gradient variations, allow coregistration with anatomical, optical coherence tomography (OCT)-derived imaging, and verify optimal morphological and



Figure 1. Coronary Angiography Pre- and Post-Stenting of the LAD-D1 Bifurcation Stenoses

(A) Pre-stenting and (B) post-stenting of the left anterior descending coronary artery (LAD)-diagonal (D1) bifurcation stenoses are shown.

From the *Cardiovascular Center, OLV Clinic, Aalst, Belgium; and the †Division of Image Processing, Department of Radiology, Leiden University Medical Center, Leiden, the Netherlands. Dr. Tu is employed by Medis Medical Imaging Systems BV and has a research appointment at the Leiden University Medical Center (LUMC). Dr. Reiber is the

CEO and a stockholder of Medis Medical Imaging Systems BV, and has a part-time appointment at LUMC as Professor of Medical Imaging. All other authors have reported that they have no relationships relevant to the contents of this paper to disclose.

Manuscript received December 7, 2012; accepted January 3, 2013.

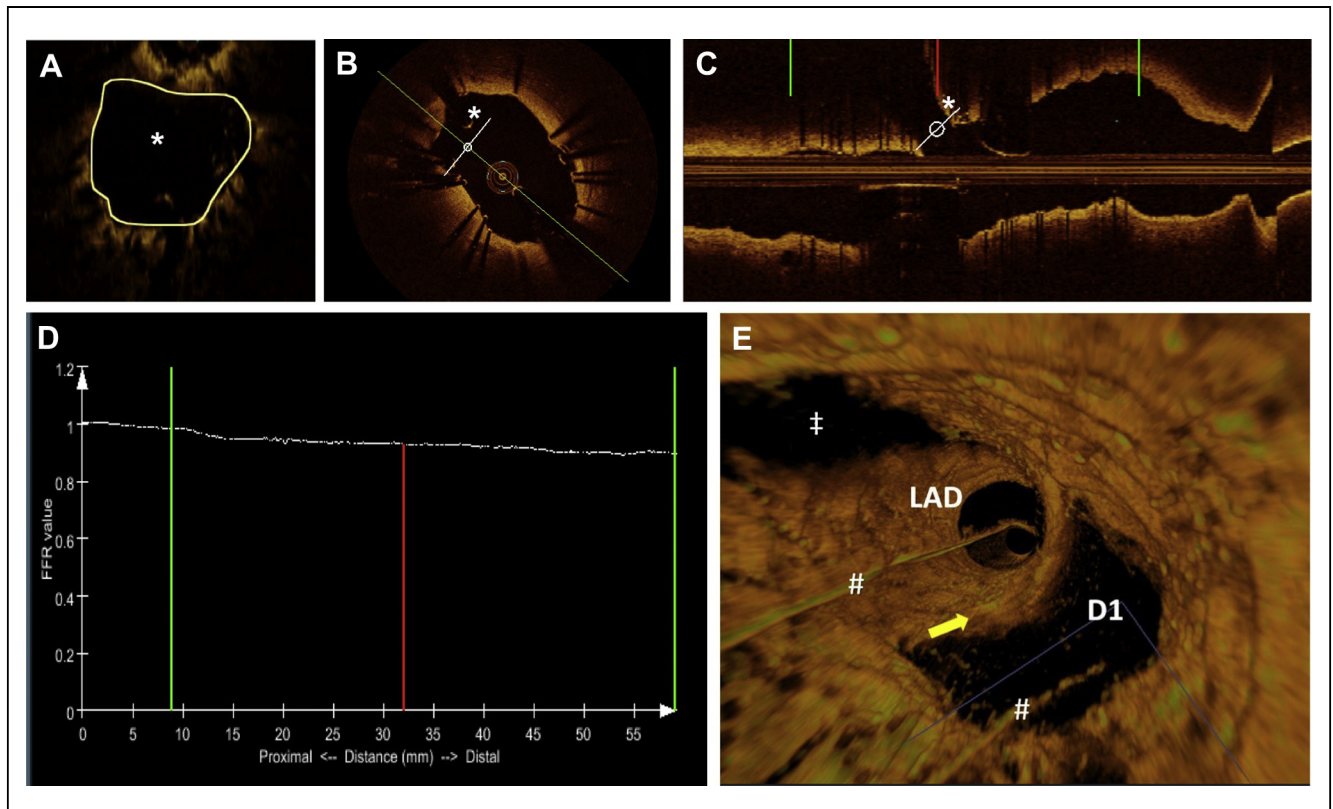


Figure 2. OCT-FFR Coregistration After Tryton SB and Main Stent Dilatation Using Final Kissing Balloon Technique

(A) Visualization of the side branch ostium by optical coherence tomography (OCT) imaging from the main branch. At the “cutting plane” (indicated by the asterisk [*]), the area was measured as 8.32 mm². The same cutting plane is visualized on the conventional OCT cross-sectional (B) and longitudinal (C) views. (D) Fractional flow reserve (FFR) variation during motorized pullback of the pressure wire from the diagonal branch showing no residual pressure drop at the carina level (indicated by the red line). (E) Three-dimensional OCT reconstruction of the bifurcation after Tryton and DES deployment and final kissing balloon inflations. The yellow arrow is indicating the newly created carina at the bifurcation level. The hash mark (#) indicates the guidewire, and the double dagger (‡), the guidewire shadow artifact. Abbreviations as in Figure 1.

functional result of the dilation of the bifurcation stenoses (Fig. 2).

Reprint requests and correspondence: Dr. William Wijns, Cardiovascular Center Aalst, OLV Clinic, Moorselbaan164, B-9300, Aalst, Belgium. E-mail: William.Wijns@olvz-aalst.be.

REFERENCE

1. Magro M, van Geuns RJ. The Tryton side branch stent. *EuroIntervention* 2010;6 Suppl J:J147-50.

Key Words: bifurcation stenting ■ coregistration ■ PCI optimization.