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Enlargement of Distal Vessel Diameter after Percutaneous Coronary Intervention of Chronic Total Occlusion – Relationship with Collateral Flow and Intravascular Ultrasound Findings

Yuki Nishimoto1, Koshi Matsuo2, Ryuta Sugihara3, Yasumori Ueda4
1Osaka Police Hospital, Osaka, Japan

Background: Although the vessel diameter distal to the recanalized CTO lesion is often smaller than expected immediately after recanalization, the vessel tends to increase their diameter after one year. Therefore, we assessed how the distal segment vessel diameter would increase at 1-year follow-up.

Methods: Consecutive patients (n=88) who received successfully recanalization of CTO lesions from July 2007 to September 2011 and had 1-year follow-up catheterization were analyzed. We classified them into two groups by the Rintrop collateral flow grade: Group A, grade 0 to 2 and Group B, grade 3. We evaluated by IVUS the plaque burden and minimum lumen diameter of the distal vessel segment immediately after recanalization. Vessel diameter distal to the recanalized CTO lesions (at 10mm from distal stent edge) was compared between follow-up and immediately after recanalization (baseline) by quantitative coronary angiography.

Results: Vessel diameter increased significantly from baseline to follow-up (2.0±0.7mm vs. 2.4±0.7mm, P<0.05). Vessel diameter increased more in Group B than in Group A (76.9% vs. 94.3%, P<0.05). There was no significant difference in IVUS findings between the patients with and without vessel diameter increase.

Conclusions: Vessel diameter in the distal segment of CTO lesion increased at 1-year follow-up especially in the patients with good collateral flow.

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Six-Month Results of the DESolve Novolimus-Eluting Bioresorbable Scaffold for the Treatment of Single, De Novo, Coronary Artery Lesions: Serial OCT Analysis from the Pivotal, Prospective Multicenter DESolve Study

Daniel Chiumie1, Stefan Verhey2, Joachim Schofer3, Jose D. Costa Jr4, Ricardo A. Costa5, Andrea Abizaid6, Yan John7, Vinayak Bhat8, Lynn Morrison9, Sara Torloy10, Alexandre Abizaid11
1Instituto Dante Pazzanese de Cardiologia, Sao Paulo, Brazil, 2Antwerp Cardiovascular Center, ZNA Middelheim, Antwerp, Belgium, Antwerp, Belgium, 3Medicare center Prof Mathey, Prof Schofer, Hamburg University Cardiovascular Center, Hamburg, Germany, 4Instituto Dante Pazzanese de Cardiologia, Sao Paulo, Brazil, 5Instituto Dante Pazzanese, Sao Paulo, Sao Paulo, 6Elizir Medical Corporation, Sunnyvale, CA, 7Elizir Medical Corporation, Sunnyvale, CA, 8Instituto Dante Pazzanese de Cardiologia, Sao Paulo, Sao Paulo, 9Liverpool Heart and Chest Hospital, Liverpool, United Kingdom

Background: DESolve is a novel PLLA-based bioresorbable scaffold (BRS), coated with a bioresorbable polylactide-based polymer that carries and delivers novolimus (5 μg/mm scaffold length). DESolve is designed to provide temporary vessel support along with neointimal suppression, followed by full bioresorption between 1-2 years. The aim of this study is to present the first morphometric changes of the DESolve BRS up to six through serial evaluation by intravascular OCT.

Methods: The DESolve NX study enrolled 126 pts with de novo coronary lesions treated with a single scaffold available in three diameters (3.0, 3.25 and 3.5 mm) and two lengths (14 and 18 mm). The first 40 enrolled pts were part of an invasive imaging substudy with IVUS and OCT, which consisted of paired analysis of automated pullbacks performed at the end of the index procedure (baseline) and at 6 months. All OCT images were analyzed by an independent core laboratory.

Results: 38 (95%) patients had serial images of adequate quality for analysis. Adequate scaffold expansion (96.1±11.83%) was obtained upon deployment. A significant increase in scaffold area (Δ: 16.93 ± 12.90%, p<0.0001) compensated the small amount of NIH (0.70±0.26 mm2) that accrued on top of the struts over time, resulting in only 11.27±4.19% scaffold obscuration, and preservation of the “unobstructed” effective (excluding the inter-strut space) lumen (Δ: 4.23±14.37 %, p<0.0001). Incomplete scaffold apposition (ISA) was seen in 15 pts (39.5%) at baseline, and persisted in 5 pts (13.2%) at 6 months. There was no late acquired ISA. A total of 29,154 struts were analyzed (14,893 at baseline; 14,261 at follow-up). 6-Month rate of covered struts per patient was 98.79±1.69%. NIH thickness on top of the struts measured 100.53±30.58 μm.

Conclusions: The DESolve BRS tolerated very good expansion upon deployment. Significant scaffold expansion, along with low NIH formation, generated a very low percent scaffold obscuration and preservation of the “unobstructed” lumen, contributing to an elevated efficacy profile. A high safety profile was additionally confirmed by the elevated rates of strut coverage and absence of late acquired ISA.