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Title: Bioresorbable Vascular Scaffolds in coronary chronic total occlusions. Clinical, vasomotor and optical coherence tomography findings at 3-year follow-up (ABSORB-CTO study)

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Short title: Long-term follow-up of ABSORB-CTO study

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ABSTRACT:

Aims: Bioresorbable vascular scaffolds(BVS) implantation in total coronary occlusions(CTOs) is a feasible option at mid-term follow-up. Nevertheless, its outcomes

at long-term follow-up are unknown. We sought to evaluate the 3-years follow-up results in terms of clinical events, serial imaging outcomes using quantitative coronary angiography(QCA) and optical coherence tomography(OCT), and the vasomotion response.

Methods and Results: From February 2013 to March 2014, 33 patients (35 CTO lesions) treated with BVS were included in the ABSORB-CTO study. Clinical outcomes, QCA and OCT assessment were analysed at 1-and 3-years follow-up and a vasomotion study was performed.

At 3-years follow-up the device-oriented MACE was 3%, with asymptomatic re-occlusion rate of 11.4%. By QCA, in-scaffold segment presented a late luminal loss of +0.23±0.46 compared with baseline (2.16 vs. 1.88,p=0.001), and a late luminal gain of -0.05±0.29, compared with 1- year control (1.88 vs. 1.93,p=0.220). The distal segment presented a late luminal gain of -0.32±0.49 (1.31 vs 1.63),p=0.003).

By OCT the mean neointimal area stenosis progressed from 10.6% at 12 months to 16.72% at 36 months (p<0,001) and mean scaffold area increased continuously at 12 (+12%; p<0.001) and at 36 months (+14.85%; p=0.001). Late acquired incomplete scaffold apposition(LAISA) detected at 12 months was undetectable at 3 years. Most of cases responded to vasomotor stimuli with a paradoxical vasoconstriction to Ach as the predominant response (45%).

Conclusions: 3-year results suggest that BVS for CTO is associated with favourable clinical and imaging outcomes. Despite vessel motility restoration, successfully treated CTO remain with signs of endothelial dysfunction.