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VASCULAR COMPLIANCE CHANGES OF THE CORONARY VESSEL WALL AFTER BIORESORBABLE VASCULAR SCAFFOLD IMPLANTATION IN THE TREATED AND ADJACENT SEGMENTS

i2 Poster Contributions
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Background: Implantation of a metallic prosthesis creates local stiffness with a subsequent mismatch in compliance between the scaffolded and the immediate adjacent segments. This process may potentially create disturbances in flow and heterogeneous distribution of wall shear stress with subsequent risk of stent thrombosis or restenosis. Bioresorbable ABSORB scaffolds (Generation 1.0 and 1.1, tested in ABSORB Cohort A and Cohort B trials respectively) made of polylactide have less stiffness compared to metallic platform stents and are completely bioresorbed in the long-term. We sought to analyze the mismatch in vascular compliance after ABSORB scaffold implantation and its long-term resolution with bioresorption.

Methods: A total of 83 patients from the ABSORB trials underwent palpography investigations (30 and 53 patients from ABSORB Cohort A and B respectively) to measure the compliance of the scaffolded and adjacent segments at various time points (from pre-implantation up to 24 months). The mean of the maximum strain values in all cross sections was calculated per segment by utilizing the Rotterdam Classification (ROC) score and expressed as ROC/mm.

Results: Scaffold implantation leads a significant decrease in vessel compliance (median [IQR]) at the scaffolded implantation segment (from 0.37[0.24 - 0.45] to 0.14[0.09 - 0.23], p<0.001). After scaffold implantation mismatch in compliance was evident in patients with paired analyses between the scaffolded and adjacent segments (proximal: 0.23[0.12 - 0.34], scaffold: 0.12[0.07 - 0.19], distal: 0.15[0.05 - 0.26], p=0.042). This reported compliance mismatch disappeared at short and mid-term follow-up (6 and 12 months).

Conclusions: The ABSORB scaffold decreases vascular compliance at the site of scaffold implantation. A compliance mismatch is present immediately post-implantation and in contrast to metallic stents disappears in the mid-term likely leading to a normalization of the rheological behavior of the scaffolded and adjacent segments.