

## Quantification of calcium volume by coronary CT compared to OCT

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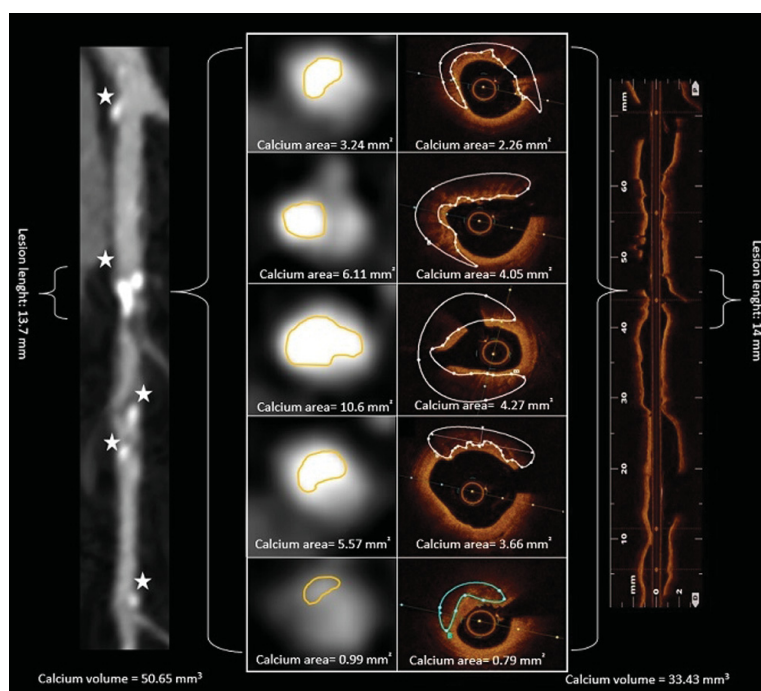
**Background:** Coronary artery calcifications are frequently observed in patients referred for cardiac catheterization. Using OCT, the calcified volume can be determined. CT is a sensitive non-invasive tool to detect coronary artery calcifications and may be useful to guide percutaneous coronary intervention.

**Purpose:** The aim of the study was to investigate the accuracy of CT-derived calcium volume with OCT as a reference in patients undergoing PCI.

**Methods:** 66 calcified plaques (32 vessels) from 31 patients undergoing OCT-guided PCI with coronary CT angiography acquired as a standard of care were included. Coronary CT angiography and OCT images were matched using fiduciary points. Calcified plaques were reconstructed in three dimensions to calculate calcium volume. A Passing-Bablok regression analysis and the Bland-Altman method were used to assess agreement between imaging modalities.

**Results:** 27 left anterior descending arteries and 5 right coronary arteries were analyzed. Median calcium volume by CT angiography and OCT were 18.23 mm<sup>3</sup> [IQR 8.09, 36.48] and 10.03 mm<sup>3</sup> [IQR 3.6, 22.88]. The Passing-Bablok analysis showed a proportional difference without a systematic difference (Coefficient A 0.08, 95% CI: -1.37 to 1.21, Coefficient B 1.61, 95% CI: 1.45 to 1.84); with a mean difference of 9.69 mm<sup>3</sup> (LOA -10.2 mm<sup>3</sup> to 29.6 mm<sup>3</sup>). No significant differences were observed for MLA: median value for CT 2.84 mm<sup>2</sup> [IQR 2.03, 3.74] and for OCT 2.55 mm<sup>2</sup> [IQR 1.91, 4.43].

**Conclusions:** Coronary CT angiography volumetric calcium evaluation overestimates calcium volume by 60% compared to OCT. Accounting for CT overestimation may allow for appropriate interpretation of calcific burden in the non-invasive setting. Coronary CT angiography may emerge as a tool to quantify calcium burden for invasive procedural planning.



Calcium burden comparison CT vs OCT