

### Residual quantitative flow ratio to estimate post-intervention fractional flow reserve

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**Funding Acknowledgement:** Type of funding sources: None.

**Objective:** To assess the performance of residual quantitative flow ratio (QFR) to estimate post percutaneous coronary intervention (PCI) fractional flow reserve (FFR).

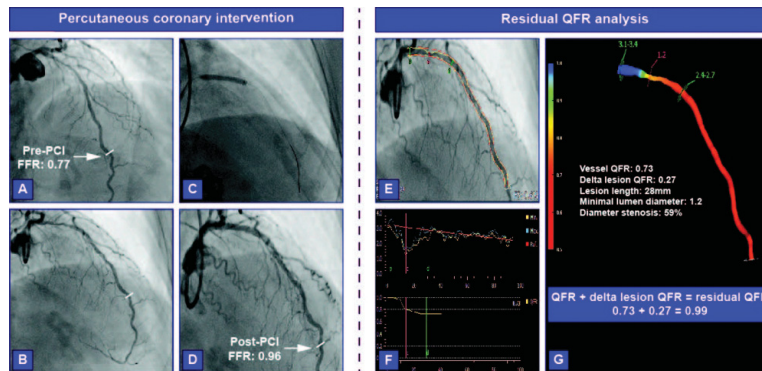
**Background:** QFR computes FFR based on invasive coronary angiography (ICA) images. Residual QFR is a novel tool that assesses the functional outcome of an intervention by estimating post-PCI FFR.

**Methods:** Residual QFR analyses, using pre-PCI ICA images, were attempted in 159 vessels with post-PCI FFR measurements. QFR lesion location was matched with the treated segment to allow virtual removal of the lesion similar to the performed PCI and computation of residual QFR (Picture 1: case example of residual QFR analysis). A post-PCI FFR <0.90 was used to define a suboptimal PCI result.

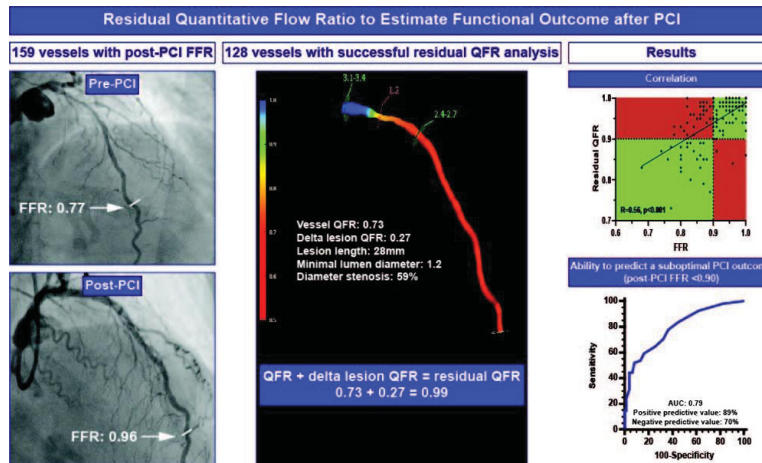
**Results:** Residual QFR computation was successful in 128 (81%) vessels. Median residual QFR was higher than post-PCI FFR (0.96 interquartile range (IQR): 0.91–0.99 vs. 0.91 IQR: 0.86–0.96, p<0.001). A moderate correlation and agreement was observed between residual QFR and

post-PCI FFR (Spearman correlation coefficient=0.56 and Intraclass correlation coefficient=0.47, p<0.001 for both). Following PCI, an FFR <0.90 was observed in 54 (42%) vessels. Specificity, positive predictive value, sensitivity, and negative predictive value of residual QFR for determining a suboptimal PCI result were 96% (95% confidence interval (CI): 87–99%), 89% (95% CI: 72–96%), 44% (95% CI: 31–59%), and 70% (95% CI: 65–75%), respectively. Overall, residual QFR had an accuracy of 74% (95% CI: 66–82%) and an area under the receiver operating characteristic curve of 0.79 for assessing a post PCI FFR <0.90.

**Conclusion:** A moderate correlation and agreement between residual QFR and post-PCI FFR was observed. Residual QFR ≥0.90 does not necessarily commensurate with an optimal PCI result. However, residual QFR <0.90 is a good indicator of a post-PCI FFR <0.90 and might therefore be utilized to determine PCI location in order to obtain a satisfactory PCI result (Picture 2: central illustration).



Case example of residual QFR analysis



Central illustration

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