

Synergistic value of hemodynamic assessment and intracoronary imaging for clinical decision making

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Background/Aims: Relying only on a single modality, whether it is hemodynamic assessment or intracoronary imaging, provides limited insight into stenotic vessels. Comprehensive usage of both modalities is necessary to thoroughly understand lesion characteristics and appropriately select vessels that need intervention. We aimed to investigate the synergistic effect of Murray law-based quantitative flow ratio (μ QFR) and intravascular ultrasound (IVUS).

Methods: Out of the 901 vessels in the IVUS-guided group of FLAVOUR study (NCT02673424), PCI was deferred for 375 vessels (357 patients). Baseline μ QFR measurement and risk calculation using both μ QFR and IVUS parameters were performed (259 vessels, 252 patients). Risk calculation was done using three high-risk categories which are quantitative high-risk plaque (MLA $\leq 3.4\text{mm}^2$ or plaque burden $\geq 70\%$; qn-HRP), qualitative high-risk plaque (attenuated plaque, plaque rupture, or remodeling index > 1.05 ; ql-HRP), and μ QFR ≤ 0.80 . The primary endpoint was 2-year target vessel failure (TVF).

Results: The mean baseline μ QFR was 0.89 ± 0.07 with 20 vessels being measured 0.8 or less. The hazard ratio (HR) for TVF of vessels with baseline μ QFR ≤ 0.8 was 5.122 (95% confidence interval 0.994-26.4, p-value 0.051). Difference in IVUS parameters alone were not associated with increased risk of TVF. However, cumulative incidence of TVF showed a proportional increase in vessels that possessed a greater number of risks (Figure 1; p-value for trend = 0.032). For vessels with more than 2 risks, incidence of TVF was numerically higher compared with IVUS-guided PCI vessels (Figure 1; 3.30% for PCI vessels, 5.66% for vessels with 2 risks, 12.50% for vessels with 3 risks).

Conclusions: Vessels with increased risks, considering both μ QFR and IVUS parameters, showed a proportional escalation in the cumulative incidence of 2-year TVF. Utilizing both hemodynamic and intracoronary imaging measurements will give a better understanding on adverse outcomes of vessels with intermediate stenosis and guide clinicians to make decisions.

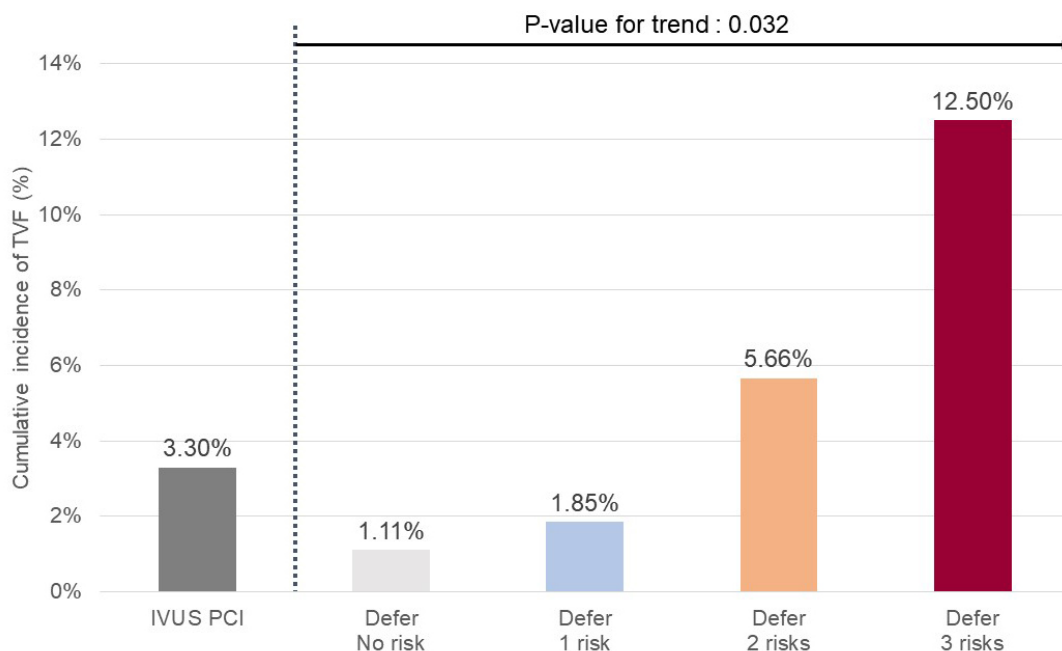


Figure 1. Cumulative incidence of TVF according to number of high-risk categories