Comparison of effective regurgitant orifice area by the PISA method and tricuspid coaptation gap measurement to identify very severe tricuspid regurgitation and stratify mortality risk

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Background: Various definitions of very severe (VS) tricuspid regurgitation (TR) have been proposed based on the effective regurgitant orifice area (EROA) or tricuspid coaptation gap (TCG). Because of the inherent limitations associated with the EROA, we hypothesized that the TCG would be more suitable for defining VSTR and predicting outcomes.

Purpose: To compare EROA and TCG for outcome prediction in patients with severe TR.

Methods: In this French multicentre retrospective study, we included 606 patients with ≥ moderate-to-severe isolated TR (without structural valve disease or an overt cardiac cause) according to the recommendations of the European Association of Cardiovascular Imaging. Patients were further stratified into VSTR according to the EROA (≥60 mm²) and then according to the TCG (≥10 mm). The primary endpoint was all-cause mortality and the secondary endpoint was cardiovascular mortality.

Results: The relationship between the EROA and TCG was poor (R²=0.21), especially when the size of the defect was large. Four-year survival was comparable between patients with an EROA <60 mm² vs. ≥ 60 mm² (67±3% vs. 64±4%, p=0.64), even after adjustment, for all-cause (p=0.72) and cardiovascular mortality (p=0.18). A TCG ≥10 mm was associated with lower four-year survival than a TCG <10 mm (53±7% vs. 69±3%, p<0.001). After adjustment for covariates, including age, comorbidity, right heart failure, dose of diuretics, and right ventricular dysfunction, a TCG ≥10 mm remained independently associated with higher all-cause mortality (adjusted HR[95%CI]=1.46[1.15-2.18], p=0.015) and cardiovascular mortality (adjusted HR[95%CI]=1.95[1.22-3.14], p<0.001), whereas an EROA ≥60 mm² was not associated with all-cause or cardiovascular mortality (adjusted HR[95%CI]=1.07[0.76-1.51], p=0.726, and adjusted HR[95%CI]=1.35[0.87-2.09], p=0.176, respectively).

Conclusion: The correlation between the TCG and EROA is weak and decreases with increasing defect size. A TCG ≥10mm is associated with increased all-cause and cardiovascular mortality and should be used to define VSTR in isolated TR.

Correlation between EROA and TCG
Event free survival curves