Three-year Outcomes of Quantitative Flow Ratio-guided Coronary Artery Bypass grafting in Primary Valve Surgery: A Propensity Score Weighted Analysis

Objectives: The guidelines recommend fractional flow reserve (FFR)-guided coronary artery bypass grafting (CABG) during primary valve surgery without evidence. Quantitative flow ratio (QFR) is a novel coronary angiography (CAG)-based FFR. We aimed to compare the three-year clinical outcomes between QFR-guided and CAG-guided CABG in these patients.

Methods: This observational study screened all 2081 patients admitted to our institution for elective primary mitral and/or aortic valve surgery from January 2017 to Sept 2020. Of them, all 188 patients with comorbid coronary artery lesions (visual diametrical stenosis ≥ 50%) were included in this study. Patients were assigned into QFR-guided group when lesions were bypassed only if QFR ≥ 0.80 (N=69) or CAG-guided group when all stenosis ≥ 50% were bypassed (N=119). Propensity overlap weighting was used to neutralize the intergroup imbalance. The primary endpoint was major adverse cardiovascular events (MACE), defined as all-cause death, myocardial infarction, stroke, unplanned repeated revascularization, and rehospitalization for unstable angina, or heart failure.

Results: After propensity score weighting, the baseline characteristics were comparable. Concomitant CABG was performed 58.1% vs 100% in QFR-guided and CAG-guided group, respectively. The mean number of grafts was significantly lower in QFR-guided group than in CAG-guided group (0.9±0.7 vs. 1.6±0.5; p<0.001). The weighted 30-day incidence of MACE was numerically lower in QFR-guided group than in CAG-guided group, but not statistically significant (6.3% vs 11.8%; p=0.429). After a median follow-up of 31.8 months, the weighted risk of MACE, mortality and myocardial infarction were significantly lower in QFR-guided group than in CAG-guided group (MACE: hazard ratio, 0.42; 95% CI, 0.17-1.07; log-rank p=0.009; mortality: hazard ratio, 0.35; 95% CI, 0.10-1.23; log-rank p=0.018; myocardial infarction: hazard ratio, 0.20; 95% CI, 0.02-2.03; log-rank p=0.037).

Conclusions: Compared with CAG-guided CABG, QFR-guided CABG is associated with less grafting and better clinical outcome in primary valve surgery with comorbid coronary artery disease. To confirm this finding, the FAVOR IV-QVAS trial (NCT03977129) is on-going.