Sequential Composite Grafting for Triple-Vessel Coronary Artery Disease: the Relevance of the Surgical Revascularization Technique to the Progression of Functional Mitral Valve Regurgitation

Objective:
The effect of two different coronary surgical revascularization techniques (Figure) featuring skeletonized double mammary artery (BIMA) as T-graft on the postoperative evolution of functional mitral valve regurgitation (FMR) is studied.

Methods:
Early postoperative and mid-term outcome of complete BIMA revascularization (C-T-BIMA) versus left-sided BIMA with right-sided aorto-coronary bypass (L-T-BIMA+R-CABG) is analyzed by multivariable logistic regression, Cox-regression and Kaplan-Meier analysis in a series of 204 consecutive patients treated for triple-vessel coronary disease (3v-CAD).

Results:
The L-T-BIMA+R-CABG technique (n=104) enables higher number of total (4.02 ± 0.87 vs. 3.71 ± 0.69, p=0.015) and right-sided (1.21 ± 0.43 vs. 1.02 ± 0.32, p=0.001) coronary anastomoses and improves total bypass flow (125.88 ± 92.41 vs. 82.50 ± 49.26 ml/min, p<0.0001), bypass flow/anastomosis (31.83 ± 23.9 vs.22.77 ± 14.23 ml/min, p=0.001) and completeness of revascularization (84% vs.69%, p=0.014) compared to C-T-BIMA strategy (n=100), respectively.
The C-T-BIMA strategy (HR= 4.2, p=0.01) and preoperative presence of RCA-occlusion (HR= 3.006, p=0.023) are relevant risk factors of FMR-progression, while L-T-Graft+R-CABG technique protects against FMR-progression (X2= 14.04, p <0.0001) independent of the preoperative anatomic complexity (Syntax-score I: HR= 16.2, p= 0.156), of comorbidities (Syntax-score II: HR= 1.901, p= 0.751; Euroscore-II: HR=0.00, p= 0.680), and without enhancing MACCE at 30-days (0.02% vs. 0.08%, p= 0.055), early mortality (0.96% vs.2%, p= 0.617) and mortality at 5-years (5.8% vs. 4%, p= 0.748) when compared to C-T-BIMA, respectively.

Conclusions:
FMR worsened more after revascularization with C-T-BIMA technique (Figure).
When treating 3v-CAD, surgical replication of anatomical traits by providing two-inflow coronary revascularization, such as accomplished with the L-T-BIMA+R-CABG technique, leads to improved completeness of revascularization and attenuates the postoperative progression of FMR independently of Syntax-scores and without increasing the risk for MACCE.

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Progression of Functional Mitral Valve Regurgitation after CABG for 3v-CAD