

Multiple Arterial versus Single Arterial Grafting in Patients with Diabetes Undergoing Coronary Artery Bypass Surgery

Objective:

Data on long-term outcomes in patients with diabetes receiving multi-arterial grafting (MAG) vs. single arterial grafting (SAG) are limited.

The objective of this study is to compare long-term outcomes between MAG and SAG for coronary artery bypass graft surgery (CABG) in diabetic patients.

Methods:

A total of 24,944 patients with diabetes who underwent CABG (2,955 MAG and 21,989 SAG procedures) between 2000-2016 were identified using New Jersey State mandatory clinical registry linked with death records and hospital discharge data (last follow-up 12/31/2019). Emergent salvage, re-operative and concomitant valve procedures were excluded.

Patients were matched by propensity score. Cox proportional hazards model was used to investigate long-term survival and competing risk analysis for secondary outcomes.

Results:

In patients with diabetes undergoing coronary artery bypass surgery, the rates of multi-arterial grafting procedures utilized by surgeons decreased from 20% to 8% between 2000 and 2016. Diabetic patients receiving MAG were younger (61.88 vs. 66.71, $P<.0001$), predominantly males, with a lower prevalence of hypertension, peripheral vascular disease, congestive heart failure, chronic lung disease, renal failure and dyslipidemia. The median follow-up time was 6.8 years.

Multi-arterial CABG was associated with a lower 10-year mortality compared to single arterial CABG in 2882 propensity-matched pairs (HR: 0.75, 95% CI: 0.68-0.83). MAG was also associated with lower risks of myocardial infarction (HR: 0.87, 95% CI: 0.80-0.95), repeat revascularization (HR: 0.86, 95% CI: 0.76-0.97) and composite outcome (HR: 0.79, 95% CI: 0.74-0.85). These results were confirmed in subgroup analyses of females, males, younger (age<70) and older patients (age≥70) with diabetes (Figure).

Conclusions:

Patients with diabetes benefit from receiving MAG over SAG; improved long-term survival, lower hazards of secondary and composite outcomes. Coordinated efforts are needed to offer MAG to diabetic patients.

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Figure. Risk of mortality and composite (mortality, MI, stroke, revascularization) for patients with diabetes who underwent single arterial (reference group) vs. multi-arterial graft revascularization for multivessel coronary artery disease.

