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Bilateral internal thoracic artery grafting neutralizes detrimental effect of diabetes on survival in patients with ischemic cardiomyopathy

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Background: In ischemic cardiomyopathy patients requiring coronary artery bypass grafting (CABG), the association of diabetic status with outcomes after surgery as well as survival benefit with bilateral internal thoracic artery (ITA) grafting remain largely unknown.

Purpose: We evaluated the associations of diabetic status with postoperative LV reverse remodeling, change in renal function, and late outcome following surgical revascularization, with focus on cases with severely impaired LV function. We also attempted to determine the survival benefit of bilateral ITA grafting over single ITA grafting according to diabetic status.

Methods: We classified 188 patients (mean age 67±9 years) with left ventricular (LV) ejection fraction ≤40% who underwent isolated initial CABG into non-diabetic (n=64), non-insulin-dependent DM (NIDM, n=74), and insulin-dependent DM (IDM, n=50) groups.

Results: At baseline, there were no differences between the diabetic and non-diabetic patients in terms of age, LV function parameters and degree of coronary artery disease, while the diabetic patients were more likely to present chronic kidney disease and peripheral vascular disease. During follow-up (68±47 months), the 5-year survival rate was 84% and 65% in the non-diabetic and diabetic patients respectively (p=0.034). After adjusting for all covariates, both NIDM and IDM were independently associated with increased mortality (NIDM: adjusted hazard ratio 1.9, 95% confident interval 1.0–3.7, p=0.049; IDM: adjusted hazard ratio 2.4, 95% confident interval 1.2–4.8, p=0.016) and composite adverse events defined as mortality and/or heart failure readmission (NIDM: hazard ratio 1.7, 95% confident interval 1.0–2.8, p=0.038; IDM: hazard ratio 3.0, 95% confident interval 1.7–5.1, p<0.001). Diabetic patients showed less improvements in LV dimensions and ejection fraction (interaction effect p<0.05 for all), and steady decrease in the estimated glomerular filtration rate over time after surgery (group effect p<0.05). Among non-diabetic patients, there was no difference in survival rate between single ITA and bilateral ITA grafting (5-year: 86% vs. 80%, p=0.95), whereas among diabetic patients, survival of those who received the latter was better (57% vs. 81%, p=0.004). Multivariate analysis revealed that use of bilateral ITA was significantly associated with decreased risk of mortality (hazard ratio 0.3, 95% confident interval 0.1–0.8, p=0.024).

Conclusion: Non-insulin- and insulin-dependent diabetes was significantly associated with worse long-term clinical outcome after CABG for ischemic cardiomyopathy. Bilateral ITA grafting has potential to improve survival in diabetic patients with ischemic cardiomyopathy.