

Should the Left Internal Mammary Be Anastomosed to a Moderately Stenotic Coronary Artery?

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Objectives:

The purposes of this study were to investigate the effects of competitive blood flow on morphological and functional status of Internal Mammary Artery (IMA) grafts anastomosed to the LAD with moderate stenosis.

Materials and Method:

Between September 1995 and September 2011, 42(Group I) patients underwent CABG employing both IMAs. LIMA was anastomosed to LAD in all cases. The postoperative angiographic and flow dynamic data were compared with a matched group of 105 patients (Group II) with LIMA anastomosed to a critically stenotic LAD. Within 1 year after surgery all patients in Group I and II respectively underwent coronary angiography and echocardiography. The mean follow-up was 6.8 ± 2.1 years.

Results:

The string sign of LIMA was found in 12 patients in Group I and 3 in Group II patients ($p=0.001$). The mean LIMA flow was significantly higher in Group II (<0.001). The coronary artery stenosis in patients presenting string sign phenomenon resulted to be 53 ± 4 (%) versus 63 ± 4.7 (%) in the remaining 30 patients in Group I ($p=0.007$). The angiographic control showed a significant progression of the native LAD atherosclerosis in 27 out of 42 in Group I. Instead, in the other 15 patients, the stenotic lesion at the LAD was 58 ± 3.5 (%) versus 53 ± 4 (%) during the early postoperative measurement ($p=0.11$). The linear regression analysis revealed a strong correlation between the LIMA mean flow and the recipient grade stenosis ($b=0.53$, $p=0.00011$), low LIMA free flow ($b=0.37$, $p=0.046$), LIMA caliber ($b=0.21$, $p=0.0018$) and the increased grade of stenosis at the LAD ($p<0.0001$).

Conclusions:

The competitive flow from the native coronary vessel in the presence of a low diastolic flow induces a reduction of LIMA graft flow. With the progression of the native coronary artery disease, the flow of the LIMA graft increases significantly, even in the presence of a string sign phenomenon which should be considered definitively as a reversible phenomenon.