

Total Revascularization with Bilateral Internal Mammary Arteries is the Technique of Choice in Coronary Artery Bypass Graft Surgery

La revascularización arterial completa con ambas mamarias es la técnica de elección en cirugía coronaria

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The article “Coronary Artery Bypass Graft Surgery with Double Internal Mammary Artery: Effect on Long-Term Survival” by Navia et.al. (1) published in this issue of the Journal analyzed 3,757 patients undergoing coronary artery bypass grafting (CABG): 2,098 (55.8%) with bilateral internal mammary artery (2IMA) and 1,659 (44.2%) with one internal mammary artery (1IMA) plus another type of conduit (saphenous vein and/or radial artery).

The aim of this retrospective study was to evaluate long-term survival of coronary artery revascularization using 2IMA, compared with patients with 1IMA.

Surgery with double internal mammary artery was done using the Tector technique; (2) the incidence of postoperative stroke was 0.5% for the 2 IMA group and 0.7% for the 1IMA group ($p=0.325$). Anastomosis quality was assessed in the operating room by Doppler flow measurement and velocity.

In the propensity score adjusted analysis, in-hospital mortality was similar in both groups (1.6% 2IMA vs. 2.9% 1IMA, $p=0.196$). Long-term survival at 10 years was significantly higher in the group of patients with 2IMA compared with 1IMA ($81.0\pm4.1\%$ vs. $71.8\pm2.5\%$, $p=0.039$).

The authors conclude that: “Patients with 2IMA CABG evidenced better long-term survival than patients with 1IMA plus another type of conduit.

Despite the excellent performance of double mammary artery CABG published years ago by the Cleveland Clinic (3), the widespread use of double mammary artery is still questioned.

Our group started with the systematic use of double mammary artery in 1994 and has since been our technique of choice for all patients undergoing CABG regardless of age and presence or absence of diabetes. (4-9)

WHAT ARE THE BENEFITS OF USING BOTH MAMMARY ARTERIES?

a) The use of both mammary arteries increases long-

term survival, b) It allows total arterial revascularization, with multiple sequential anastomoses, c) It can be used in diabetic patients, without increasing infection or the mediastinitis index (provided skeletonized mammary arteries are used), d) It does not increase surgical risk and reduces the number of postoperative ischemic events, e) It improves long-term patency if 2IMA are used compared with 1IMA plus another type of conduit.

In patients of the SYNTAX trial undergoing CABG, 3.2 anastomoses per patient were performed, achieving total revascularization with arterial grafts in 18.9% of cases and using double mammary artery in 27.6% (10).

WHAT ARE THE CAUSES FOR THE LOW PERCENTAGE OF DOUBLE MAMMARY ARTERY USE IN CORONARY ARTERY BYPASS GRAFT SURGERY?

It is a difficult technique, which requires a significant learning curve and not all surgeons and residents are trained in arterial surgery with 2IMA. In addition, some cardiac surgeons think that surgery is longer, without associated benefits for the patient and with increased sternal infections.

In 2005 (11) I had the opportunity to attend the VIIth Conference of Surgical Update at the Instituto Cardiovascular de Buenos Aires and to operate on a patient with Dr. Daniel Navia's team. (1) We performed four coronary bridges with both mammary arteries, and I could confirm the high-quality CABG of their institution.

As published in 1999 by Dr. Bruce Little (3), Dr. Daniel Navia and his team (1) demonstrate once again that 2IMA is better than 1IMA.

In diabetic patients it is mandatory that coronary artery revascularization is performed with arterial conduits; the use of the saphenous vein should be banished from surgical practice, except in very specific patients.

In 2004 our group published (12-13) CABG data without extracorporeal circulation, using skeletonized

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double internal mammary artery in 293 diabetic patients, with excellent results, without significant differences with the non-diabetic group in terms of mediastinitis and in-hospital mortality. In 94.5% of patients, total arterial revascularization was performed with 2IMA.

As recently demonstrated with cardiac computed tomography scan, (14) patency is better with 2IMA than with 1IMA plus another type of conduit; graft patency rate was 100% (52/52) for the mammary artery and 91% (70/77) for the radial artery.

WHAT ARE THE LESSONS LEARNT IN CORONARY ARTERY BYPASS GRAFT SURGERY WITH DOUBLE MAMMARY ARTERY?

- Total CABG with both mammary arteries can be performed safely on all coronary territories.
- The use of 2IMA in insulin-dependent diabetic patients improves survival without increasing the rate of infections.
- The use of both mammary arteries has better long-term patency compared with other types of grafts.
- They can be used in all types of lesions regardless of the arterial obstruction ratio.

Total arterial revascularization with both mammary arteries should be used in all patients undergoing CABG regardless of age, gender and the presence or absence of diabetes. (15)

Conflicts of interest

None declared.

(See authors' conflicts of interest forms in the website/Supplementary material).

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