BRIEF COMMUNICATIONS

CORONARY REVASCLARIZATION WITH THE DESCENDING BRANCH OF THE LATERAL FEMORAL CIRCUMFLEX ARTERY AS A COMPOSITE ARTERIAL GRAFT

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In October 1996 we began the use of the descending branch of the lateral femoral circumflex artery (LFCA)¹ to revascularize a 48-year-old obese patient for whom we had received a nonsatisfactory Allen test for both radial arteries and bilateral vein stripping. The left internal thoracic artery (LITA) was used to revascularize the left anterior descending (LAD) artery, and right internal thoracic artery (RITA) was used to revascularize the right coronary artery (RCA). The descending branch of the LFCA was used to revascularize a lateral branch of the circumflex artery extending the RITA pedicle (in a Y shape). Immediate success of this procedure led us to initiate a consecutive series submitted to evaluation.

Methods. Between October 1996 and May 1998, 35 coronary artery bypass graftings were carried out with the descending branch of the LFCA. Thirty-one patients were men, and 4 patients were women (mean age, 60.1 years). The average bypass per patient was 3.2; the average arterial bypass per patient was 3. The LAD artery was revascularized with the LITA in all cases.^{2,3} Both internal thoracic arteries (ITAs) were used in 16 of these cases (45.71%), and the radial artery was used in 11 patients (31.4%). Preoperative evaluation of patients in this series was based on history and symptoms: no patient showed signs of peripheral vascular disease of the lower limbs. If the superficial femoral artery is occluded, the use of the descending branch of the LFCA is contraindicated because of the important role this vessel has in collateral circulation of distal lower limbs.

Anatomy and surgical technique. The lateral femoral circumflex artery has 3 main branches: ascending branch, transverse branch, and descending branch. In the inferior area of the triangle of Scarpa, the femoral circumflex artery is observed immediately behind the rectus femoris muscle. Both transverse and descending branches can be seen here. The descending branch runs laterally until it reaches a position between the vastus lateralis muscle and the rectus femoralis muscle.

The artery is approached through an incision, 15- to 20-cm in length, on the anterolateral aspect of the thigh. The tensor fascia lata is incised in both its aponeurotic area and muscular portion. After a careful dissection, the vessel can then be observed between the vastus lateralis muscle and the rectus femoralis muscle. The descending branch of the LFCA is generally accompanied by 2 veins of large caliber that are left undisturbed. Once all collateral branches are ligated, dissection is completed, without involving the femoral nerve branches that accompany the artery. This graft can be used over a length of 12 to 15 cm because its diameter does not decrease abruptly, but an acceptable inner diameter (ie, a 2- to 2.5-mm proximal inner diameter and 1.5- to 2-mm distal inner diameter). To avoid vasospasm and reduce the ischemia time to the minimum, the graft was not extracted immediately after being dissected. On the contrary, it was left in situ covered by gauze with physiologic solution and papaverine. The thin walls of the descending branch of the LFCA permitted an excellent anastomosis to the ITA.

In 31 cases, the proximal anastomosis was made end-to-side with a continuous 8-0 polypropylene suture and forming a T or Y shape.⁴ In 3 cases, anastomosis was end-to-end between the descending branch of the LFCA and the RITA to revascularize the very distal branches of the RCA (Fig 1, A). In 1 of these cases the descending branch of the LFCA was divided to extend both ITA pedicles. In 2 cases the descending branch of the LFCA was used as free graft (aorta-coronary) because of its large inner diameter. A single vessel (RCA, diagonal, or circumflex branches) was revascularized with this graft in 32 cases (88.88%), and 2 branches were revascularized sequentially with the same graft in 4 cases (11.11%). When proceeding with the proximal anastomosis to the ITA, its distal end was cut, and dilute papaverine was injected through it.⁵ After a few minutes, the proximal end was cut. Then the proximal anastomosis of the descending branch of the LFCA was carried out to the ITA before the bypass was continued. The distal anastomoses were completed with extracorporeal circulation.

Results. As a result of respiratory distress with multiorgan failure, 1 patient died (2.8%). There were no reoperations for bleeding, and there were no instances of perioperative myocardial infarction or mediastinitis. Furthermore, no local complications related to the procedure, such as lower limb motor disorders or ischemia, were observed. The average hospital stay was 6.3 days.

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Fig 1. A, Postoperative day 5 angiogram shows RITA, the LFCA, radial artery (RA), circumflex (CX), and RCA. **B,** Six-month postoperative angiogram shows LITA, LAD artery, LFCA, side-to-side anastomosis in the diagonal branch (DG), and end-to-side anastomosis in the circumflex artery.

Follow-up. A 100% follow-up was carried out. All patients were asymptomatic with no signs of occlusion in those grafts that had been used. Eighteen patients (51.7%) were studied by cineangiography that showed patency in all bypasses: 1 patient was studied 11 months after operation; another patient was studied 6 months after operation (Fig 1, B), and another patient was studied 3 months after operation (Fig 2, A). The remaining 15 patients were studied on postoperative day 5 or 6 (Fig 2, B). Seventeen patients who were studied with thallium 201 scintigraphy, at rest and during exercise, showed no ischemic areas of revascularized segments. Average follow-up was 7.5 months, with a range from 2 to 17.5 months.

Conclusion. From our experiences, we have drawn the following conclusions: (1) The descending branch of the LFCA, used mainly as composite arterial graft in coronary artery bypass grafting, proves to have good early patency. (2) Use of this graft permitted us to extend the RITA end-to-end for the purpose of revascularizing distal branches of RCA. (3) The descending branch of the LFCA deserves to be taken into account as an alternative graft. (4) It is necessary to analyze larger series on a multicenter basis and with a long-term follow-up before determining the routine use of this graft in coronary artery bypass grafting.

Fig 2. A, Three-month postoperative angiogram shows LITA, the LFCA, LAD artery, and circumflex artery (CX). **B,** Postoperative day 7 angiogram shows LITA, the LFCA, LAD artery, and circumflex artery.

The use of the descending branch of the LFCA is especially attractive as a conduit to obtain multiple arterial revascularization in young patients, either in combination with 1 or 2 ITAs.

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