International Journal of Surgery 12 (2014) 952–957

Contents lists available at ScienceDirect

International Journal of Surgery

journal homepage: www.journal-surgery.net

Original research

Y grafts with the left internal mammary artery and radial artery. Mid-term functional and angiographic results. Cohort study

Vito Mannacio [a, *], Anna De Vita [a], Anita Antignano [a, b], Michele Mottola [a], Luigi Di Tommaso [a], Ascanio Graniero [a], Carlo Vosa [a]

[a] Department of Cardiac Surgery, University Federico II, School of Medicine, Naples, Italy
[b] Department of Cardiology, Azienda Ospedaliera Santobono-Pausillipon, Naples, Italy

HIGHLIGHTS

- What is already known on this topic?
- Arterial conduits are the best choice for coronary artery revascularization. Mid-term results of left mammary and radial artery in Y shape is lacking.
- What this study adds?
- This study firstly provides functional and angiographic evaluation of Y-graft. Results support the use of Y grafts for coronary artery revascularization.

ARTICLE INFO

Article history:
Received 19 May 2014
Received in revised form
9 July 2014
Accepted 9 July 2014
Available online 15 July 2014

Keywords:
CABG
Composite Y-grafts
99mTc-sestamibi SPECT
Multi-slice computed tomography

ABSTRACT

Background. This retrospective cohort study investigated the functional and haemodynamic mid-term results over 3-years follow up of the left internal mammary artery (LIMA) conduit in composite Y-graft configuration with radial artery (RA) in a population of patients who underwent off-pump coronary artery bypass grafting (CABG). **Methods**. 148 patients who underwent off-pump CABG with composite Y-graft, were evaluated over 3-year follow up. Two-day dipyridamole induced maximal hyperaemia/rest 99mTc-sestamibi was scheduled preoperatively and 36 months after surgery for functional evaluation. Morphological evaluation was performed by 64 slice multidetector computed tomography (CT) 36 months after surgery. **Results**. Clinical adverse events were rare within 3 years follow up. Minimal to severe scintigraphic evidence of stress induced ischaemia occurred in 24 patients. Left ventricular (LV) hypertrophy (HR 3.1; 95% CI, 1.5–9.3; $p = 0.01$) and poor coronary run off (HR 4.1; 95% CI, 2.1–10.8; $p = 0.005$) were significant multivariate predictors of reversible stress induced ischaemia. 64 slice multidetector CT showed that the main stem of Y composite grafts was patent in all patients, while distal LIMA or RA was stenosed or occluded in 9 patients. **Conclusion**. Composite Y-graft was adequate to meet the flow requirements of target coronary artery either at rest or during maximal hyperaemia. The use of Y-graft should be carefully evaluated in patients with LV hypertrophy and/or poor coronary run-off.

© 2014 Surgical Associates Ltd. Published by Elsevier Ltd. All rights reserved.

1. Introduction

The composite grafts in Y or T configuration have gained wide popularity because they allow sufficient length and maximal arterial graft economy while avoiding unnecessary aortic manipulation in patients at risk of neurologic injury for diffuse circumferential atherosclerotic involvement of the ascending aorta [1–5]. In addition to the left or the right internal mammary artery (LIMA, RIMA), the radial artery (RA) has emerged as the main secondary conduit option for composite Y or T configuration with several studies reporting its superiority compared to saphenous graft or other alternative conduits if used under the most promising conditions [6–9]. However, composite grafts could have an inherent limitation where the newly constructed coronary flow is dependent on a single conduit. Although literature is not uniform, several studies demonstrated that composite Y-grafts are able to supply sufficient flow to distal branches at rest and during maximal hyperaemia [4,5,10–13].

* Corresponding author. Via S. Domenico 62, 80127 Naples, Italy.
E-mail address: vitomannacio2@libero.it (V. Mannacio).

http://dx.doi.org/10.1016/j.ijsu.2014.07.008
1743-9191/© 2014 Surgical Associates Ltd. Published by Elsevier Ltd. All rights reserved.

This retrospective study sought to investigate the functional and morphological mid-term results of the LIMA conduit in composite Y-graft configuration with the RA in a population of patients who underwent off-pump coronary artery bypass grafting (CABG). 64-slice multidetector computed tomography (CT) and 2-day dipyridamole induced maximal hyperaemia/rest 99mTc-sestamibi myocardial perfusion single-photon emission computed tomography (SPECT) were employed for functional and morphological assessment 36 months after surgery.

2. Material and methods

Study design and patient population were compliant with the STROBE criteria (Strengthening the reporting of observational studies in epidemiology) [14].

From May 2005 to June 2010, of a total of 900 patients underwent primary off-pump CABG, 148 patients who received LIMA/RA conduits as a composite Y-grafts were retrospectively collected and analysed. Exclusion criteria were on-pump CABG, age greater than 80 years, low ventricular function (ejection fraction <30%), additional cardiac or surgical procedures, severe systemic comorbidities (dialysis, hepatic failure) and contraindication to pharmacologic (dipyridamole) stress testing or angio computed tomography. Anatomic selection criteria for off-pump operations were vessel size (>1.2 mm) and freedom from diffuse coronary calcifications whereas clinical selection criteria included the absence of mechanical and electrical instability in the operating theatre. Surgical indications were assessed as a greater than or equal to 70% diameter stenosis. Coronary stenoses were evaluated by the Quantitative Coronary Angiography Data System (Centricity Carddas Xi2, GE Healthcare, Burlington, VT). The number of coronary lesions was defined as the total number of stenoses greater than or equal to 70%. Coronary blood flow was assessed by means of the thrombolysis in myocardial infarction (TIMI) frame-counting method with a frame counter on the cineviewer. Corrected TIMI frame count was derived for the longer left anterior descending (LAD) [15]. Demographics and clinical features of the population of study are described in Table 1.

The study protocol was approved by the ethic committee of the University of Naples Federico II. All patients preliminarily granted permission for the use of their medical records for research purposes, hence, individual patient consent was waived for this study. However, individual consent was obtained for each instrumental screening performed at follow-up.

Table 1
Main demographic and clinical characteristics.

Characteristics	148 patients
Age	67 ± 14
Gender (male)	95(64.1%)
BMI kg/m^2	29.2 ± 7.8
History of MI	58(39.1%)
Diabetes	72(48.6%)
Hypertension	55(37.1%)
Dyslipidemia	64(43.2%)
HDL mg/dl	78 ± 15
Chronic obstructive lung disease	62(41.8%)
Creatinine mg/dl	0.8 ± 0.6
Left main stem disease	23(15.6%)
Left ventricular hypertrophy (ILVM > 125 mg/m^2)	38(25.6%)
Preoperative LVEF < 40%	31(21.2%)
Left anterior descending CTFC	29.2 ± 7.3
Peripheral vascular disease	13(8.7)

Values are mean ± SD or numbers. BMI, Body mass index; CTFC, corrected TMI frame count; HDL, high density lipoprotein; ILVM, indexed left ventricular mass; LVEF, left ventricular ejection fraction; MI, myocardial infarction.

2.1. Surgical procedure

The LIMA was harvested as a skeletonized graft as previously described [5,16]. Diluted papaverine (100 mg/100 mL Ringer's solution) was sprayed on the artery then wrapped in papaverine-soaked gauze. Intraluminal papaverine was not routinely used to avoid damages by manipulations and acidic pH. When required by the low flow, it was neutralized by diluting in heparinized blood. The RA was harvested from the nondominant arm as a pedicled conduit preserving the satellite veins and surrounding tissue by means of an Ultracision Harmonic scalpel (Ethicon Endo-Surgery, Cincinnati, OH), distended to a moderate pressure (about 180 mm Hg) with blood diluted papaverine (100 mg/100 mL blood), and placed in a warm solution. The LIMA was always grafted to the LAD while RA was anastomosed to the left coronary artery (diagonal or circumflex).

The RA in the composite Y-graft configuration with the LIMA was used as an alternative to the RIMA when there were contraindications to bilateral IMAs use. As general rule, we did not harvested both IMAs in patients with body mass index >30, diabetes mellitus, chronic obstructive lung disease (associated with severe emphysema and/or long-standing steroid treatment) or in patients with fragile sternum, as from osteoporosis. Proximal critical stenosis (greater than or equal to 85%–90%) and size of at least 1.5 mm and freedom from calcification or extensive atherosclerotic disease (or both) of the target vessel at preoperative cineangiography were mandatory indications for RA anastomosis [17,18]. Wherever required, only saphenous vein grafts were used for additional right coronary artery revascularization. A transit-time flow meter (HT 323-CS; Transonic Systems Inc, Ithaca, NY) was used for graft flow measurements as previously described [5]. Each limb of the Y-graft was evaluated after the Y-anastomosis was completed and after the all conduits were anatomized distally on the target coronary arteries. All measurements were obtained under stable conditions with a mean arterial pressure of 83 mm Hg (mean 77 ± 15) and a heart rate between 70 and 87 beats/minute (mean 82 ± 21). Diltiazem (0.5–1.0 mg/kg) was infused intraoperatively and during the first 24 h after operation and was thereafter prescribed orally (100–200 mg/day) for at least 3 months. Standardized dual antiplatelet therapy was started when chest tube drainage was<20 mL/h [19]. Statins were given 24 h after surgery and continued in all patients [20]. Other drugs were given when appropriate.

2.2. Nuclear imaging

Patients were evaluated by two-day stress/rest 99mTc-sestamibi myocardial perfusion SPECT preoperatively and 36 months after CABG performed 5 days after therapy withdrawal. Pharmacologic (dipyridamole) stress testing was preferred to avoid any potential misleading interference due to different ability to achieve adequate work level with physical exercise.

Dipyridamole stress testing was performed infusing 0.56 mg/kg intravenously over 4 min 99mTc-sestamibi, 555 MBq, was injected intravenously as a bolus 1–2 min before completion of pharmacologic stimulation. Dynamic planar images were acquired for 60 s (4 frames/s) in the anterior view to measure the first transit counts in the pulmonary artery. SPECT was performed 60 min later. No attenuation or scatter correction was applied. Rest imaging was performed on a separate day following the same acquisition protocol. For the assessment of myocardial perfusion 17 segments were automatically scored and scintigraphic variables incorporating the extent and severity of regional wall perfusion defects were calculated. Each segment was scored in a 5-point scale (0 = normal, 5 = absence of uptake). The Summed rest score (SRS) and the summed stress score (SSS) were obtained at rest and during maximal hyperaemia. The summed difference score (SDS), which

Download English Version:

https://daneshyari.com/en/article/6251723

Download Persian Version:

https://daneshyari.com/article/6251723

Daneshyari.com