Reviewer's report

Title: Radial Artery vs Saphenous Vein Graft Used as the Second Conduit for Surgical Myocardial Revascularization: Long-term Clinical Follow-up

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Reviewer: James Tatoulis

Reviewer's report:

This manuscript explores the use of the radial artery as a second arterial conduit (after LITA to LAD) versus saphenous vein grafts only in addition to LITA, with particular focus on 8 year outcomes.

The manuscript concept is good in that this study is randomised and the follow up is for 8 years and attempts to address an important question, although there is much in the literature over the last 15 years comparing radial artery, versus saphenous vein as the next graft after LITA, with extremely favourable outcomes for the LITA plus RA combination. Nevertheless, the authors commenced this study in 2001 when some of this information may not have been as clear.

The manuscript could be enhanced by attention to the following comments and queries:

I believe more detail should be included to provide the setting and perspective for the reader, and secondly to enhance and validate the scientific aspects of this manuscript.

With respect to more detail regarding the study –

• Where were the radial artery grafts deployed to? Were they deployed to the next most significant artery with a tight stenoses (> 80%) or were they deployed to whatever artery the surgeon chose at that time?

• The authors should include a table of the distribution of radial artery grafts to make it easy for the reader to follow.

• If the radial artery as a second arterial graft was placed to the diagonal or intermediate arteries in addition to the LITA to LAD, how would this affect (or not) the long term outcome? Could the authors comment on this, as such a combination would essentially be revascularizing the one and same territory.

• How were the radial arteries harvested? Open?, endoharvest? Could the authors comment on the possible influence of the different types of harvest on radial artery graft patency and the subsequent effect on clinical outcomes.

• The authors should describe the spasm prophylaxis for the radial arteries, as this may be an important aspect in both the short and long term performance of these arteries and the effect on the long term clinical results.
• If a radial artery was used to a coronary which was 100% occluded (to avoid competitive flow), it would seem likely that the territory distal to the 100% occluded may well have some or an extensive degree of infarction. Could the authors comment on the usefulness of an arterial graft supplying an infarcted area on the left ventricle. Continuing on this point, there are reports that where there is prior RCA/posterior descending artery occlusion with inferior infarction, then the choice of graft to this area (if grafted at all) may well be irrelevant and of no long term benefit. Can the authors comment on this and weave it in their discussion.

• The authors are to be complimented on the fact there were no intra nor peri-operative deaths in these 200 patients. The authors should provide a description of their myocardial protection techniques.

• 2% to 3% of patients had a TIA or stroke in the peri-operative period. For a group of 56 years median age, this was relatively high. Where side biting clamps used? Could the authors include the proximal anastomotic techniques in their methods description to better inform the reader.

• Were LITA – radial artery Y or T grafts performed, which again may influence the long term results?

• Was there was a philosophy or strategy of using the two arterial grafts to the left coronary system preferentially? Do the authors have a view on this which could be incorporated into the discussion.

Comments and queries design to enhance and further validate the scientific aspects of the paper
• 100 patients in each group of this randomized study seems rather small. Did the authors perform a sample size estimate to ensure they had adequate statistical power to show a difference between the two techniques? Could the authors provide their statistical power calculations?

• In the studies showing benefit for BITA over a single ITA, or two arterial grafts over one arterial graft (published over 15 years ago), a follow up period of 10 years or more was required. Do the authors feel that they have a sufficiently long follow up to determine such a difference or not in their study? Could they please comment on this.

• The mean age of the patients was 56 years, 56% to 61% had double vessel disease, and conversely only 22% to 27% had triple vessel disease. Did the authors expect to see any difference at 8 years?

In the late 1970s and early 1980s, the Veterans Administration Co-Operative Study, the Coronary Artery Surgery Study, and the European Coronary Surgery Study showed no difference between medical treatment and CABG in patients with double vessel disease. Could the authors comment on the possible parallels between these results from 30 years ago and their own results in predominantly
double vessel disease patients.

- Was the follow up complete? It is implied but not stated.

- The authors should show the P values in Table 1 (baseline characteristics).

- Additionally for completeness, they should show the P values on the comparisons for Table 2 (adverse events after index surgery).

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Acceptable

**Statistical review:** Yes, and I have assessed the statistics in my report.

**Declaration of competing interests:**

I declare that I have no competing interests