Letter to the Editor

TAR and the Y-graft: The golden myth, the tragic reality

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The raison d’être of total arterial revascularisation (TAR), namely using arterial grafts to non left anterior descending coronary artery (LAD) territories, is the achievement of the patency rates obtained by grafting the pedicled internal mammary artery (PIMA) to the LAD. Grafting the PIMA to the LAD is the single most important technical factor, in experienced hands, determining the long-term success of the coronary bypass operation (CABG). Moreover, the excellent long term patency rates of the pedicled IMA-LAD graft (>90% at 10 years and beyond) have been readily reproducible, by several generations of surgeons, world-wide. This graft therefore, I believe, is sacrosanct.

The paper by Royse and colleagues [1], on TAR and Y grafting, is a landmark paper. This paper provides unequivocal, angiographic proof that the cornerstone foundation of those advocating TAR is not only unsound, but also critically, that the practice of the Y graft technique is untenable.

In Royse’s paper, at a mean angiographic follow up of 1 year, arterial grafts to the right coronary artery territory (RCA) had statistically significant lower patency rates (81.9%) when compared to patients who received a pedicled and importantly non composite (i.e. no Y graft attached) IMA graft to the LAD (100% patent). Furthermore, Royse states that there were no statistically significant differences between the patency rates of the saphenous vein grafts (SVG) used when compared to all arterial grafts (90.5% vs. 91.1% respectively, \( P = 0.781 \)). Moreover, the patency rates of non-pedicled (free) arterial conduits were significantly inferior to that of the pedicled, non-composite IMA-LAD graft. It is therefore irrefutable, by this data, that using free arterial conduits produces inferior results than that achieved by the non composite PIMA-LAD graft. Indeed, these results are no better (credibly, Royse accepts that their reported patency rates are lower than previous reports) than the results of similar angiographic studies involving the humble SVG [2].

However, the use of the aortocoronary SVG does not have a profound, adverse and early effect on the patency of the PIMA-LAD graft, but use of the Y graft technique however does! It is this aspect of Royse’s paper that I take strong issue with. In Royse’s hands (coming from a group of determined and experienced surgical advocates of TAR and Y grafting) when a Y graft (using either radial or free IMA conduits) is anastomosed to a PIMA used to graft the LAD, the patency of the IMA-LAD segment is adversely affected. The patency of the pedicled, non composite (no Y graft) IMA-LAD graft was 100% (80 patients) compared to 89.4% (84 patients) when the IMA-LAD pedicle was used as a composite conduit (Y graft). It is therefore irrefutable, by this data, that using free arterial conduits produces inferior results than that achieved by the non composite PIMA-LAD graft. Indeed, these results are no better (credibly, Royse accepts that their reported patency rates are lower than previous reports) than the results of similar angiographic studies involving the humble SVG [2].

The relevance of such an explanation is, at best, obscure.

I believe it is axiomatic that an 80% stenosis is haemodynamically significant. Hence, I ask: what has been the management and outcome of these patients with blocked IMA grafts and with an underlying LAD stenosis of 80%? How does Royse justify using the Y graft technique in 90–95% of patients when 11% of these IMA grafts are blocked at 1 year? In patients with native LAD stenosis less than 80% their own data does not support this practice. Royse states that “The concept that the ‘LIMA to LAD’ graft is the key to coronary surgery may be challenged by parts of these data”. This statement aimed at the heart of the practice of...
CABG surgery must not go unchallenged when the premise upon which it is based is seriously flawed. The only thing challenged by the use of the Y graft, I believe, is the integrity of the patency of the PLIMA-LAD graft. Barring exceptional circumstances, relating to a treacherous aorta, the number of coronaries to be grafted and pending the availability of sufficient pedicled arterial conduits, the Y graft has a very limited role in CABG. Use of the Y graft technique fails to meet the gold standard obtained with the orthodox CABG procedure [3]. Logically therefore, to advocate the use of the Y graft to an overwhelming majority of CABG patients is not only unsound but critically, untenable. Such patients receiving the Y graft are being served with a poor operation. Such patients I believe must be informed of the alternative, orthodox, safer and highly reproducible CABG without the Y graft; if they are to be able to make an informed choice.

References