Commentary: The Radial Artery: The Optimal Second Arterial Conduit of Choice
Oz M. Shapira, MD
Department of Cardiothoracic Surgery, Hadassah Hebrew Medical Center, Jerusalem, Israel

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Corresponding Author: Oz M. Shapira, MD
Dept. of Cardiothoracic Surgery
Hadassah Hebrew University Medical Center
PO Box 12000
Ein Kerem, 91120, Jerusalem, Israel
Tel: +972 2 677 6960; Fax: +972 2 677 6961
E-mail: oz.shapira@mail.hui.ac.il
Central message: The superior patency rates of the radial artery compared with saphenous vein up to 28 years postoperatively, coupled with lack of impact on sternal wound infection are convincing reasons to select the RA as the second arterial graft of choice.

Central Picture Legend: Oz M. Shapira, MD

Introduced by Alan Carpentier, abandoned shortly thereafter due to early grafted and rejuvenated in the early 1990’s (1), the radial artery (RA) never received wide acceptance as a conduit for coronary artery bypass grafting (CABG) despite its multiple advantages, including ample length reaching any coronary target, particularly when used as a composite graft, ease of surgical handling, good size-match with the native coronary artery, simultaneous harvesting with other conduits, lack of impact on the risk of sternal wound infection and favorable physiologic properties such as enhanced nitric oxide production (2). Low adoption of the RA is mostly related to inconsistent long-term patency data.

In this issue of the Journal, Royse, et al compared the long-term patency (median follow-up 8.6 years, range 0-28 years) of two arterial conduits – the internal thoracic artery (ITA, 1,153 anastomoses) and the RA (1539 anastomoses) with saphenous vein graft (SVG, 1539 anastomoses) in patients (n=983) undergoing multi-vessel CABG (5). In the vast majority of cases graft patency was assessed by coronary angiography performed for symptoms. The patency and perfect patency rates of the RA (86.9%, 86.4%) and the ITA (93.9%, 93.5%) were similar and both superior to that of the SVG (72.8%, 46.2%). Graft
patency of all three conduits was higher in the left anterior descending territory compared with the circumflex and right coronary artery territories.

This paper adds to the large body of evidence documenting that RA long-term patency is similar to that of the ITA and superior compared with SVG (3). Failure of both arterial grafts occurred mostly during the first three months postoperatively, whereas failure of SVG was progressive throughout the study period, indicating that arterial graft failure was caused by technical problems and or competitive flow, whereas SVG failure was mostly secondary to accelerated atherosclerosis.

The improved long-term patency rates of the RA in recent reports are likely due to better understanding of this conduit’s physiology, leading to three key modifications in practice: a) The RA wall is largely perfused by the vasa vasorum. Therefore, it should never be harvested as a “skeletonized” vessel, but rather as a pedicle with its accompanying fat and vasculature; b) The RA is prone to vasospasm, requiring treatment by antispasmodic agents, mostly during the first postoperative year, after which the vasoreactivity is substantially decreased. Interestingly, in the current report, despite inconsistent and variable antispasmodic treatment regimens, graft patency was outstanding; c) The RA is vulnerable to competitive flow. Hence, this conduit should only be used to graft native coronary vessels with tight stenoses. During the current study period, the authors raised the threshold from >50% to >60-70% stenosis. These levels are substantially lower of the current acceptable threshold of >80-90% (4).

Higher conduits patency rates directly translate into improved long-term clinical outcomes after CABG (3, 4). The superior patency rates of the radial artery compared with saphenous vein up to 28 years postoperatively, coupled with lack of impact on sternal wound infection are convincing reasons to select the RA as the second arterial graft of choice.
References


