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Conduit Choice for Coronary Artery Bypass Grafting in Women

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Introduction

Although women have a similar incidence of coronary artery disease compared with men, they undergo fewer coronary artery bypass grafting (CABG) procedures and experience worse operative outcomes[1-3]. Several factors may contribute to the disparity in outcomes: women are older at presentation, present with more advanced disease, exhibit atypical symptoms, and have a higher burden of comorbidities. Women also have anatomical and physiologic differences, such as smaller coronary artery diameters, which may influence surgical technique and graft patency.

Despite these differences, most data regarding CABG outcomes have been derived from predominantly male populations. For example, a recent study of 1 million CABG patients found that only 16% were women[4]. This underrepresentation limits generalizability, raising concerns about directly extrapolating results from male-dominated studies to the care of women. The ROMA: Women trial (NCT041244120) is now underway, randomizing women to multiple arterial grafting (MAG) or single arterial grafting[5]. As the first all-female randomized trial in cardiac surgery, this study will provide much-needed data to guide conduit choice in women.

Until then, choice of conduit for women must rely on careful interpretation of existing evidence and should acknowledge sex-specific anatomical and clinical considerations. In this editorial, we summarize current data and provide recommendations for the use of conduits in women. At present, conduit selection for women should follow the same algorithm for men (Figure 1),[6] with MAG prioritized when feasible, while we await sex-specific evidence from ROMA: Women.

Left Internal Mammary Artery

The left internal mammary artery (LIMA) remains the gold standard conduit for the left anterior descending

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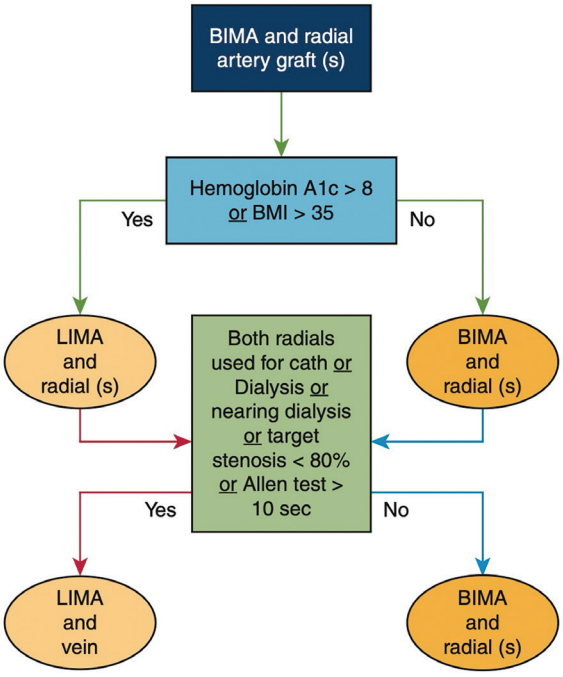

Figure 1. Algorithm for conduit planning in patients undergoing coronary artery bypass grafting
In men and women undergoing coronary artery bypass grafting, multiple arterial grafting is prioritized unless contraindications are present[6]. Figure re-used with permission from Elsevier (license: 6118980552380, obtained 30.09.2025)

BIMA: Bilateral internal mammary arteries, BMI: Body mass index, LIMA: Left internal mammary artery

artery; its use during CABG is recommended as a Class 1 recommendation in current ACC/AHA/SCAI Guidelines; and it is a Society of Thoracic Surgeons quality metric that affects national, publicly available quality metrics[7]. Despite its established benefits, women are less likely than men to receive a LIMA graft[8]. Reasons for non-use differ by sex. Among men, emergency status and prior cardiac surgery are more common explanations. In women, prior mediastinal radiation, subclavian stenosis, and inadequate size or flow were more frequently cited to defend non-LIMA use. Rarely, patients may have had prior breast reconstruction, thereby precluding LIMA use[9]. Given its proven survival advantage, LIMA use should remain routine in women, with rare exceptions (left subclavian stenosis, previous cardiac or thoracic surgery, previous mediastinal radiation, emergent or salvage procedures, absence of bypassable left anterior descending coronary artery disease).

Radial Artery

Current guidelines recommend the radial artery as the preferred conduit for the second-most important coronary-artery target[7]. Evidence shows that women derive the same benefit from radial artery grafting as men do[10,11]. Accordingly, sex alone should not influence the decision to use the radial artery. Contraindications include prior catheterization of both radial arteries, existing or potential hemodialysis access, target vessel stenosis <80%, or inadequate ulnar compensation on the Allen test. Whenever feasible, the radial artery should be used in women as the second-choice conduit.

Bilateral Internal Mammary Arteries

The use of bilateral internal mammary artery (BIMA) grafting is less common in women than in men[12]. A major concern is the increased risk of deep sternal wound infection (DSWI) associated with BIMA, and female sex itself is an independent risk factor for DSWI[13]. As a result, the benefit of BIMA among women has been questioned. Randomized data will be critical in clarifying its role, but based on current evidence, female sex alone should not be considered a contraindication. In women without significant obesity or diabetes –and particularly when the radial artery is unavailable –BIMA remains a reasonable and valuable option. With careful patient selection and surgical technique, BIMA can and should be offered.

Saphenous Vein

Women are more likely than men to undergo CABG with saphenous vein grafts (SVG)[14]. However, SVGs have inferior long-term patency compared with arterial conduits; failure rates are significantly higher at one year than those of the radial artery[15]. Despite these limitations, SVGs remain an essential component of CABG, particularly when arterial conduits are contraindicated or unavailable. Optimal technical strategies (no-touch harvesting) and medical therapy (antiplatelet agents and statins) improve graft durability. Although SVGs should be considered a last resort after arterial options, they remain indispensable in women when arterial conduits are not feasible.

Multiple-arterial Grafting

Current evidence suggests that women derive important benefits from MAG, including improved survival[10] and greater freedom from major adverse cardiac and cerebrovascular events[16]. Despite these advantages, data from large registries demonstrate that women are less likely than men to receive any arterial graft and to undergo complete revascularization[8]. Some of this disparity may be explained by differences in baseline patient factors,[12] but it also reflects ongoing variability in surgical practice. Given consistent benefits reported in current evidence, MAG should be prioritized in women to the same extent as it is in men.

Summary

Conduit selection should be individualized, accounting for patient-specific factors. Overall, the algorithm for women mirrors that for men, with MAG prioritized. Randomized data will be pivotal for providing sex-specific evidence and may help reduce disparities in CABG outcomes between women and men.

Footnotes

Authorship Contributions

Surgical and Medical Practices: Bradshaw AB, Lawton JS, Concept: Bradshaw AB, Lawton JS, Design: Bradshaw AB, Lawton JS, Data Collection and/or Processing: Bradshaw AB, Lawton JS, Analysis and/or Interpretation: Bradshaw AB, Lawton JS, Literature Search: Bradshaw AB, Lawton JS, Writing: Bradshaw AB, Lawton JS.

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