



2021 ACC/AHA clinical practice guideline on coronary artery revascularisation—‘turf protection’ or ‘misinterpretation of science’?

Om Prakash Yadava¹

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Recent ACC/AHA/SCAI (American College of Cardiology/American Heart Association/Society of Cardiovascular Angiography and Interventions) Guideline on Myocardial Revascularisation [1] has stirred the aphoristic ‘hornets’ nest’. Ideally, guidelines should be evidence based consensus documents, advising and informing practicing physicians on how to approach a clinical scenario. However, quite often, they end up as controversial and contentious documents, as they are coloured and mired in the interests of the group that the guideline issuing body represents. Every group approaches the matter with its ulterior motives and turf protection has become the zeitgeist of times. As a consequence, vexed professional associations and physicians challenge them and give an alternative view point. More often than not, this leads to discord and even acrimonious disharmony between the feuding factions. It makes one wonder if science is truly scientific and objective or, like all reality, it lies in the mind of the beholder. This does not augur well for either ‘Science’ or the ‘Society’, and for that matter for any of the stakeholders, including the medical profession.

The 2021 ACC/AHA/SCAI Guideline is no exception, and to make matters worse, the two of the bickering parties, the cardiologists and the cardiac surgeons, are in fact intimate bed-partners, incapable of procreating individually. Though the writing committee chairperson was a surgeon and there was a representative each from the Society of Thoracic Surgery (STS) and the American Association of Thoracic Surgery (AATS), the two pre-eminent associations representing the surgical fraternity did not endorse the guideline [2]. The STS expressed disagreement and in protest its nominee withdrew from the guideline writing committee. However, though AATS too did not endorse the guideline, its representative defected honourably and claimed authorship as an ACC/AHA nominee.

Giving the devil its due, notwithstanding the brouhaha and vehement disagreement on certain contentious clauses, the guideline had implicit universal endorsement of a majority of recommendations. Moreover, the document was the need of the scientific community, as the earlier guideline (2011) and the related updates were antiquated. Therefore, this synthesis of six previous guidelines on the subject, laced and upgraded with recent evidence, was necessary and timely, in fact a tad late. With this prologue, let us take a panoramic view of the facts relevant to a coronary surgeon.

For ST elevation myocardial infarction (STEMI), coronary artery bypass graft (CABG) surgery finds a class 1 indication for haemodynamically unstable patients and for those in shock, when percutaneous coronary intervention (PCI) is not feasible. This recommendation is based on the findings of the SHOCK (Should We Emergently Revascularize Occluded Coronaries for Cardiogenic Shock) trial [3]. In PCI ineligible or failed patients, CABG can also be justifiably used to improve outcomes, if there is a large area of myocardium in jeopardy (class 2a). A practical caveat—do not perform CABG after failed primary PCI if there is no-reflow state, poor targets, or absence of ischaemia (class 3: harm) [1]. For patients having undergone primary PCI for a STEMI, CABG has been accorded a class 2a indication, with a rather low level of evidence [‘C-EO’ (Expert Opinion)], for revascularisation for multivessel coronary artery disease (CAD), in a staged strategy.

For mechanical complications of acute myocardial infarction (MI), CABG continues to enjoy a class 1 recommendation. However, ‘No RCT (randomised controlled trial) has examined the benefit of adding CABG at the time of emergent cardiac surgery for treatment of a mechanical complication of STEMI versus emergent surgery for the treatment of a mechanical complication alone. In addition, no RCT has examined the benefit of emergent cardiac surgery for the treatment of a mechanical complication of STEMI versus initial medical stabilization and delayed surgery’ [1].

✉ Om Prakash Yadava
op_yadava@yahoo.com

¹ National Heart Institute, New Delhi, India

For non-ST elevation acute coronary syndrome (NSTEMI/ACS), myocardial revascularisation, as an invasive strategy, has been provided class 1 recommendation, with a view to reducing the risk of cardiovascular events, especially for patients with refractory angina, haemodynamic or electrical instability, and cardiogenic shock. In stabilised patients, who are at a high propensity for ischaemic events, early revascularisation within 24 h has been given a class 2a recommendation. For those with low-intermediate risk, it may be reasonable to offer them predischARGE intervention (class 2a).

In stable CAD, earlier guidelines (2011) recommended revascularisation to either improve survival or alleviate symptoms. In the new guideline, a third track has been introduced, viz. revascularisation to reduce the risk of cardiovascular events like spontaneous MI, unplanned revascularisation, and cardiac mortality, for which both CABG and PCI have been accorded a class 2a: Level of Evidence (LOE) ‘B-R’ recommendation. This advice is based on the Medicine, Angioplasty, or Surgery Study II (MASS II) [4] and Fractional Flow Reserve versus Angiography for Multivessel Evaluation 2 (FAME-2) [5] trials and some meta-analyses. However, for refractory symptoms, coronary revascularisation retains a class 1: LOE ‘A’ indication.

According to the new guideline, CABG has been retained as a class 1: LOE ‘B-R’ recommendation to improve survival in patients with multivessel CAD with severe left ventricular (LV) systolic dysfunction (LV ejection fraction—LVEF < 30%) and for left main (LM) disease. In diabetics with multivessel CAD involving the left anterior descending (LAD) artery, CABG continues to be a class 1: LOE ‘A’ indication.

However, for stable multivessel CAD (sans LM stenosis) with normal LV function, even if it includes proximal LAD stenosis, CABG has been granted a rather weak class 2b: LOE ‘B-R’ recommendation for survival. This incredulous downgrade of CABG surgery from the earlier class 1 recommendation, based on the International Study of Comparative Health Effectiveness with Medical and Invasive Approaches (ISCHEMIA) [6] and the Bypass Angioplasty Revascularization Investigation 2 Diabetes (BARI-2D) [7] trials, caused extreme disconcert in the surgical community. To rub salt to the wounds of the surgeons, CABG was bracketed with PCI (class 2b: LOE ‘B-R’).

No time was lost in drawing a repartee from the STS/AATS [2], European Association of Cardiothoracic Surgery (EACTS) [8], and the Latin American Association of Cardiac and Endovascular Surgery (LACES) [9], besides editorials from leaders in the field [10] and a consensus document from the Indian Association of Cardiovascular and Thoracic Surgeons (IACTS) [11]. The common denominator of all the challenges was, basing guideline recommendations on the ISCHEMIA trial, drawing an editorial commentary, ‘Considering that the ISCHEMIA trial was not powered for death or MI, did not directly compare revascularisation to guidelines directed medical therapy, and followed patients

for less than 5 years, the downgrading of coronary revascularisation procedures, especially CABG, in present guidelines is remarkable’ [10]. Obviously, the editorialists were a bit charitable in their choice of words. However, more direct and incisive comments are presented in the ‘Position Statement’ of the IACTS later in this issue [11], and I rest the matters of the case to the sagacious wisdom of the jury of this readership.

Changing gears, though technical considerations were not the avowed objective of the guideline, it still dwells on the subject. There is a universally held belief that arterial conduits give superior outcomes to saphenous vein grafts, but there is no hard core evidence to choose between the different arterial conduits, beyond the left internal mammary artery (IMA) to LAD. In fact, to the contrary, there is evidence that any other arterial conduit to the LAD would give almost similar long-term results [12]. Therefore, though I see merit in left IMA to LAD having a class 1 status, the recommendation for the conduit for the second most important coronary artery should have been for a generic ‘arterial’ graft, no matter what that graft be—a right IMA, a radial artery (RA), or a gastro-epiploic artery. In regions of the world with a high preponderance of diabetes mellitus in the patients undergoing coronary revascularisation (nearly 50% in Southeast Asia), RA may be preferred over bilateral IMAs to avoid deep sternal wound infection, as also because it has less technical complexity and is time efficient (can be harvested concurrently with left IMA, as against right IMA, which has to be harvested sequentially). I therefore have no qualms endorsing RA being accorded a class 1 recommendation, but the right IMA could have been treated equitably, leaving the choice to the surgeon depending on the patient profile (insulin-dependent diabetics, obese, chronic obstructive airway disease, thin friable sternum receiving RA, and a non-diabetic, non-obese person going in for a right IMA). Notwithstanding the above, use of RA should have been advocated with an unequivocal qualifier with respect to the criticality of the stenosis of the native vessel.

There are some glaring lacunae too in an otherwise all-encompassing guideline.

Minimally invasive coronary surgery (MICS), endoscopic conduit harvest, and robotic-assisted and endoscopic CABG are conspicuous in absence. Also with respect to interventions, institutional operative volumes and operator experience should have been stressed upon, especially for niche areas like multi-arterial sequential grafting, off-pump CABG, and MICS, as they have been conclusively demonstrated to influence outcomes—a fact endorsed and highlighted in the STS/AATS response also [2].

We must also democratise science and it must address the aspirations of the society it is meant to cater to. For developing economies, the availability and affordability should also be factored in decision-making, along with efficacy and

efficiency. Even operator skills, confidence, and experience play a crucial role in outcomes of technically demanding interventions. This has been brought out eloquently in the editorial by Kirtane and Grubb [10]. All the findings of the trials, which are conducted by elite individuals in niche institutions, cannot be applied to the real world, as outcomes may vary dramatically between the experienced and the naïve. Case volumes and experience therefore need to inform decisions and these facts should have been highlighted in the guideline.

Bringing up the rear, future guidelines must even make an effort to integrate alternate fields of treatment and therapies, which have been shown in well-conducted trials, published in peer-reviewed journals, to be effective and holistic answers to this widespread malady of cardiovascular atherosclerosis. Finally, guidelines should always be inclusive, with fair and proportional representation of all stakeholders. Twenty-four cardiologists versus 9 surgeons in the 2021 ACC/AHA/SCAI Guideline Writing Committee can hardly be labelled equitable. Even selection of the writing committee members should be transparent and individual societies should be allowed to nominate them, rather than the guideline commissioning body choosing them, lest conflicts of interest creep in. No brainer, industry, and faculty with relations to the industry, should be kept away with the proverbial barge-pole—but is this a wishful ask?

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