Review Article

Conventional coronary artery bypass grafting

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Abstract: It was in 1969 that Dr. René Favaloro first used a saphenous vein graft the way we use it today to perform an aorto-coronary bypass. Since then, there have been plenty of trials in the literature trying to prove the inferiority or not of conventional coronary artery bypass grafting. Left internal mammary artery to left anterior descending coronary artery anastomosis and saphenous vein grafts to other coronary artery targets performed through full median sternotomy in a safe, motionless and bloodless environment provided by cardiopulmonary bypass and cardioplegic arrest is typical of conventional coronary artery bypass grafting. Non-conventional approaches include bilateral internal mammary artery harvesting or total arterial revascularization instead of saphenous vein grafts, off-pump coronary artery bypass grafting avoiding the use of cardiopulmonary bypass machine and minimally invasive direct coronary artery bypass or hybrid coronary revascularization instead of full median sternotomy. However, conventional coronary artery bypass grafting appears non-inferior to any of the aforementioned approaches in terms of mortality and major morbidity. On the other hand, only highly selected patients can benefit from non-conventional approaches. Furthermore, experience is critical for achieving optimal outcomes with any of these approaches. High-volume centres with expert surgeons can offer the best results. Conventional coronary artery bypass grafting continuously competes with modern alternative approaches. However, which of these is the best remains a contentious affair.

Keywords: Coronary artery bypass grafting (CABG); saphenous vein graft; on-pump; conventional; sternotomy

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Introduction

An old-fashioned conventional coronary artery bypass grafting (CABG) procedure involves cutting the skin through the subcutaneous tissues down to the sternum, accessing the heart through a full median sternotomy, harvesting the left internal mammary artery (LIMA) while saphenous vein grafts (SVGs) being simultaneously harvested, vertically dividing the pericardium, thymic tissue remnant and pericardial fat in the midline, cannulating the aorta and the right atrium, cross-clamping the aorta, arresting the heart via antegrade cold blood cardioplegia, performing distal and proximal anastomoses (1). But is this the whole truth? Is conventional always old-fashioned? Is it less than an optimal option to perform CABG currently?

During the current era of domination of percutaneous coronary intervention (PCI) with drug-eluting stents (DES), coronary artery bypass grafting (CABG) continues to be the gold standard means of revascularization in multivessel coronary artery disease (CAD) (1,2). It was in 1969 that Dr René Favaloro first used an SVG the way we use it today to perform an aorto-coronary bypass (3). Since then, there have been plenty of trials in the literature trying to prove the inferiority or not of conventional CABG. But how is conventional CABG defined? Full median sternotomy, LIMA to left anterior descending coronary artery (LAD) anastomosis and SVGs to other coronary artery targets under the safe, motionless and bloodless environment of cardiopulmonary bypass under cardioplegic arrest is typical of conventional CABG (1) (*Figure 1*). Then what is

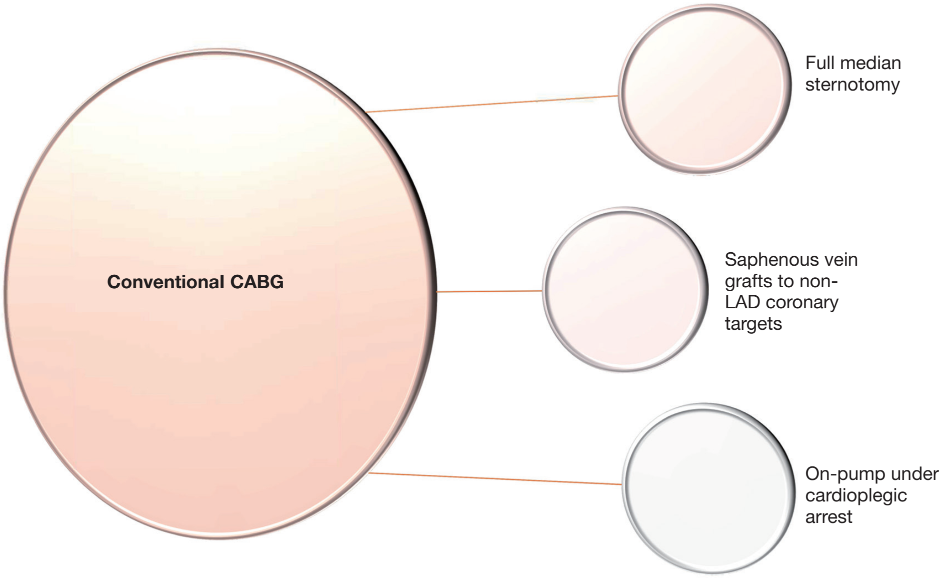

Figure 1 Typical characteristics of conventional coronary artery bypass grafting. CABG, coronary artery bypass grafting; LAD, left anterior descending.

the non-conventional choice? Bilateral internal mammary artery (BIMA) harvesting or total arterial revascularization (TAR) instead of SVGs, off-pump CABG instead of on-pump CABG under cardioplegic arrest and minimally invasive direct coronary artery bypass (MIDCAB) or hybrid coronary revascularization (HCR) instead of full median sternotomy are the non-conventional options. The value of each one of these aforementioned non-conventional techniques is measured by comparing their results to those of conventional CABG (4,5).

Historical insight and current guidelines on myocardial revascularization

From Alexis Carrel who was awarded with the Nobel Prize in Physiology in 1912 for pioneering vascular suturing techniques (6) to direct suturing of LIMA on the anterior epicardial surface of the heart by Arthur Vineberg in late 1940s (7-9), we entered the era when Sabiston performed the first CABG using an SVG in 1962 (10). However, in 1967 (reported in 1969), René Favaloro was the first surgeon who used an SVG as an interposition graft placed between the ascending aorta and the right coronary artery distal to the blockage, just the way we use it nowadays (11-13). Two years later W. Dudley Johnson and coworkers reported their series consisting of 301 CABG cases performed over a period of 19 months (1) and the history of conventional CABG was well on its way.

According to 2018 ESC/EACTS guidelines on myocardial revascularization (2) critical major coronary artery vessel stenosis over 90%, coronary stenosis over 50% with documented ischemia or fractional flow reserve (FFR) less than 0.8 independently of left ventricular function when left main and proximal LAD lesions are concerned, or accompanied with left ventricular ejection fraction (LVEF) less than 35% in case of other two- or three-vessel disease and over 10% of left ventricle area of ischemia by functional testing are indications for revascularization in case of stable angina or silent ischemia. As far as the question of CABG or PCI is concerned, PCI should not be performed in left main CAD with high SYNTAX score (>33) and in three-vessel CAD with more than intermediate SYNTAX score (>22), whereas CABG is a clearly better choice than PCI in case of three-vessel disease with diabetes mellitus even with low SYNTAX score (0–22) and in left main CAD with >22 SYNTAX score. On the contrary, PCI is a superior choice in case of one- or two-vessel disease without proximal LAD lesion. Finally, CABG and PCI are equal choices in every other case of one-, two-, or three-vessel CAD (2).

Technical experience is critical for performing CABG surgery. Various studies have reported a significant impact of the volume of CABG surgery per hospital, as well as per surgeon, on in-hospital mortality (14-16). Therefore, 2018 ESC/EACTS guidelines on myocardial revascularization suggest that CABG should be performed in institutions performing over 200 CABG cases annually by surgeons having performed over 200 CABG cases under supervision during their training (2). Interestingly, the cut-off value for performing off-pump CABG (OPCAB), which is more technically demanding for the surgeon, was estimated at 50 cases per year for the largest improvement and above 150 cases per year for the lower mortality to be achieved (17).

BIMA or conventional CABG?

Although BIMA grafting is recommended in recent European guidelines on myocardial revascularization (2), its current adoption in clinical practice is limited, as there are thoughts about rendering a CABG operation more complex and because of being accompanied by higher deep sternal wound infection (DSWI) rates. Moreover, its long-term survival benefit is doubted (2,18-22). Although superiority of BIMA grafting in terms of long-term survival compared to single internal mammary artery (SIMA) grafting has been reported by pooled observational studies (19,23), thanks to the excellent long-term angiographic patency of the right internal mammary artery (RIMA) (24,25), the Arterial Revascularization Trial (ART)—the biggest randomized trial comparing BIMA to SIMA grafting—revealed no benefit in terms of long-term survival (26). ART compared 1,548 patients with multivessel CAD randomly assigned to BIMA CABG to 1,554 patients with multivessel CAD offered SIMA CABG (26). The interim analysis of the results at 5 years reported no significant difference regarding all-cause mortality, myocardial infarction, or stroke (27) and everyone waited for the final 10-year results. However, no significant superiority was either revealed in terms of all-cause mortality, the composite outcome of death, myocardial infarction, or stroke and repeat revascularization after BIMA grafting. Results remained similar after adjustment for age, sex, diabetes status and ejection fraction. Neither the rate of early major bleeding events differed between the two groups. Moreover, BIMA grafting was associated with a higher incidence of sternal wound complications (3.5%) compared to SIMA group (1.9%) (26).

DSWI, occurring after 1% to 4% of CABG operations, is related to a remarkably high mortality rate of 25% (28). Although BIMA grafting is a risk factor for sternal wound complications, especially in diabetic patients (29), skeletonization of the mammary grafts partly mitigates the hazard of mediastinitis (30). However, obesity and diabetes are strong independent predictors of mediastinitis (31-33). Therefore, according to the 2018 European guidelines, there is skepticism concerning BIMA grafting in obese patients, those with diabetes mellitus, chronic pulmonary obstructive disease or previous mediastinal radiation. The more of these factors are present, the higher is the possibility of DSWI (26,27,34-36).

TAR OR conventional CABG?

Long saphenous vein in addition to LIMA is the most widely second-choice graft used in the vast majority of patients in North America and Europe (37). Although observational studies reported a clinical benefit from multiple arterial grafts use, randomized clinical trials did not confirm the latter. Therefore, TAR has not gained most surgeons' trust (38). Arterial grafts such as gastroepiploic artery and others have been described. However, radial artery grafts are most widely utilized when TAR is performed.

Several trials have detected angiographic patency superiority of radial artery grafts (RA) against SVGs (38). Moreover, the most complete retrospective multicenter analysis comparing TAR to conventional CABG in 384 propensity matched pairs of patients, revealed a statistically significant superiority in terms of 15-year survival (54% *vs.* 41% respectively) (39). However, no significant survival benefit related to the aforementioned superior patency rates was reported by a patient-level combined analysis of randomized, controlled trials performed by the RADIAL investigators (38,40). Six randomized trials comparing clinical outcomes between 534 patients who received RA and 502 patients who received SVGs were analyzed. Although significantly lower rate of the composite primary outcome of death, myocardial infarction, or repeat revascularization at mean follow-up of 50 months was detected in the former group, there was no difference in all-cause mortality (40).

However, various factors may impact RA graft patency. Target vessel size and its runoff and severity of stenosis with the subsequent possibility of competitive flow are some of them. Coronary vessel stenosis less than 70% has a negative impact on RA patency (41,42). In the prospective, randomized Radial Artery Patency Study (RAPS), stenosis over 90% was related to 5.9% occlusion rate which was significantly lower than the 11.8% occlusion rate when the stenosis was 70–89% (43). Moreover, grafting the right coronary bed is related to higher graft failure rate (44-46). RAPS prospective randomized trial reported better 1-year patency of RA (92%) compared to SVGs (86%) (43). However, each patient received both an RA and an SVG in different coronary targets which may have affected the final result. Indeed, a later prospective randomized trial comparing angiograms 10 to 14 months postoperatively between 212 patients who received an RA and 203 patients who received SVGs, and angiograms after 14 months postoperatively between 37 RA patients and 47 SVG patients, revealed no significant difference in 1-year graft patency between the compared groups (42). Interestingly, RA had significantly lower patency rates than SVGs in diabetic patients. Significant differences favoring SVGs were also reported with regard to incidence of 99% occlusion, as well as severe stenosis (75–100%), whereas no significant difference in terms of adverse events and deaths were reported. The difference maker from RAPS study was that each patient received only one study graft, either an RA or SVGs (42).

OPCAB or conventional CABG?

The association of cardiopulmonary bypass with systemic inflammatory response, release of cytokines, activation of the clotting cascade, metabolic disturbances and microembolization led to the evolution of OPCAB. However, initial enthusiasm based on the aforementioned rationale was not translated to better clinical outcomes. No significant difference in 30-day or 1-year clinical results comparing on- with off-pump CABG performed by experienced surgeons were detected by two large, international randomized trials (47-49). Moreover, on-pump CABG (ONCAB) is related to excellent short- and long-term outcomes (5,49-52).

The first large, multicenter, randomized trial examining OPCAB against ONCAB was ROOBY. ROOBY included 2203 patients at Veterans Affairs Centers (5). This trial revealed the superiority of ONCAB as the composite endpoint of mortality, myocardial infarction and repeat revascularization at 1 year was significantly better after ONCAB (9.9% *vs.* 7.4%, respectively) (5). CORONARY and GOPCABE were subsequent large, randomized trials conducted to answer the question of superiority OPCAB or ONCAB. The CORONARY trial (48,49), the largest randomized trial to date, included 4,752 high-risk patients randomized to OPCAB or ONCAB. No significant differences in terms of 30-day (9.8% *vs.* 10.3%, P=0.59) or 1-year (12.1% *vs.* 13.3%, P=0.24) composite primary endpoint of mortality, myocardial infarction and stroke were detected between the two groups. However, patients with higher EuroSCORE derived some benefit from OPCAB (48,49). Similar results showing no difference in terms of composite primary endpoint of death, stroke, myocardial infarction, repeat revascularization or new renal replacement therapy at 30 days (7.8% *vs.* 8.2%, P=0.74) and at 1 year (13.1% *vs.* 14.0%, P=0.48) were reported by GOPCABE which randomized 2539 high-risk patients, older than 75 years old to OPCAB or ONCAB (47). Three-year survival rates were also comparable between OPCAB and ONCAB patients in a large observational study by Hannan *et al.* (52).

Optimal outcomes and durability of CABG are largely affected by completeness of revascularization (53,54). Therefore, completeness of revascularization should not be compromised by the choice of OPCAB. According to ROOBY trial, more patients had fewer than initially planned grafts completed after OPCAB compared to ONCAB (17.8% *vs.* 11.1% respectively) (5), with higher incomplete revascularization rates reported in the OPCAB group (17.9% *vs.* 11.1%; P<0.0001). Similarly, inferior rates concerning complete revascularization were reported for the OPCAB group (11.8% *vs.* 10%, P=0.05 respectively) in the CORONARY trial (48,49), as well as in the GOPCABE trial (34.0% *vs.* 29.3%) (47). However, whether this ONCAB superiority has an impact on long-term outcomes is debatable. A post-hoc analysis of the ART to assess 5-year outcomes comparing 1260 patients who underwent OPCAB versus 1700 patients who underwent ONCAB was conducted. Five-year mortality and major cardiac and cerebrovascular event (MACCE) risk did not significantly differ between the two groups (55). Similar 5-year outcomes were also reported by the CORONARY trial (56). Furthermore, Takagi *et al.* (57) conducted a meta-analysis including 5 randomized trials (1,480 patients) and 17 adjusted observational studies (102,820 patients) to explore long-term all-cause mortality after OPCAB or ONCAB. Increased long-term mortality associated with OPCAB was revealed in observational studies, but this was not confirmed by randomized trials showing similar results (57). Moreover, a single-centre retrospective analysis comparing 5,995 OPCAB and 4,875 ONCAB procedures showed no impact of choice of approach on risk of stroke, postoperative haemofiltration, late survival (median follow-up of 12 years) or reintervention (58).

Emergent conversion from OPCAB to ONCAB is another fear related to OPCAB. A meta-analysis of 14 randomized controlled trials reported an incidence

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of off-pump to on-pump conversion rate from 0% to 13.3%. Surgeons were mostly forced to convert due to haemodynamic instability and the presence of intramyocardial-coronary vessel course. The most-experienced were the surgeons, the less was the conversion rate (59). Increased mortality rates ranging from 6% to 15% are reported after such an emergent on-pump conversion (60-64). The ROOBY trial reported a 12.4% conversion rate (5). These patients had significantly poorer 1-year composite outcome of all-cause mortality, myocardial infarction and revascularization (5). Interestingly, elective conversion to ONCAB does not have an impact on adverse outcomes. The aforementioned post-hoc analysis of the ART trial detected a 2.3% conversion rate and this conversion was associated with remarkably higher in-hospital mortality rates compared to cases without conversion (10.3% *vs.* 0.7% respectively; P<0.001). There was also a persistent trend of worse outcomes after conversion at 5 years follow-up (55).

On the contrary, there is evidence that OPCAB can be advantageous for high-risk patients. High-risk patients refer to women (65), patients with left ventricular dysfunction (66,67), ST-elevation myocardial infarction (68), prior stroke (69), advanced age (70), renal insufficiency (71-73), reoperative cardiac surgery (74,75), cirrhosis (76), and obese or cachectic patients (<25 BMI >35) (77). The CORONARY trial also revealed a trend for improved outcomes in such patients in the highest EuroSCORE tertile (49). A recent large meta-analysis of RCTs concluded that off-pump can effectively reduce operative morbidity in high-risk patients (78). Consequently, European guidelines state that OPCAB is recommended in case of significant atherosclerotic aortic disease and it should be considered in high-risk patients but only by experienced off-pump surgeons (2).

MIDCAB or conventional CABG

Conventional CABG requires a sternotomy approach which is related to variable surgical trauma and subsequent wound complications. Minimally invasive approaches mainly aim to avoid these issues. MIDCAB was proposed in mid1990s (79-83) as a less invasive and attractive alternative for revascularization of isolated LAD stenosis (84). The LIMA-LAD anastomosis is performed on the beating heart through a left anterior small thoracotomy. Excellent results have been reported for MIDCAB in current literature. Immediate and 6-month angiographic patency rates of over 94% (82,85,86), a 24-month overall survival of 92.4%±0.2% and 24-month MACCE-free survival of 96.1%±1.7% at 24 months (87) are attributed to MIDCAB. Holzhey and colleagues reviewed their 13-year single-centre experience with MIDCAB in 1768 patients showing in-hospital mortality of 0.8% (despite EuroSCORE-predicted mortality of 3.8%), stroke rate of 0.4%, conversion to sternotomy rate of 1.7%, a 95.5% early patency rate and 3.3% early-reintervention rate. Remarkably 5- and 10-year survival rates were 88.3% and 76.6% respectively whereas 85.3% and 70.9% were the corresponding freedom from MACCE and angina (88). However, there was no superiority of MIDCAB regarding operative mortality, early myocardial infarction or stroke, late survival and need for repeat revascularization at a mean follow-up of 6.2 years compared to full sternotomy approaches (89,90). Furthermore, MIDCAB is a technically demanding procedure which is appropriate for selective patients and for selective, experienced surgeons. It is estimated that 100-150 MIDCAB cases are necessary to achieve acceptable complication and conversion to sternotomy rates (91). European guidelines report that MIDCAB should only be considered in isolated LAD lesions or as a part of hybrid procedures, provided that expertise exists (2). Subsequently, MIDCAB is currently adopted by a minority of dedicated centres and it is performed by few expert surgeons (92).

Evolution of minimally invasive techniques continues. Therefore, robotic CABG, as well as totally endoscopic coronary bypass grafting (TECAB) have been performed by experienced surgical teams showing excellent results, similar to those with conventional CABG (93-99). However, technical demands are increased and intense training is required thus rendering these approaches even more difficult to reproduce (92).

HCR or conventional CABG?

Parallel to minimally invasive procedures, the concept of HCR, firstly described by Angelini *et al.* in 1996 (100) has also gained popularity combining advantages of both percutaneous and surgical approaches. The rationale of HCR consists of a surgical LIMA-LAD anastomosis accompanied with PCI to the other abnormal non-LAD territories (101). According to Harskamp *et al.* (102), the LIMA-LAD anastomosis is superior to coronary stenting, whereas DES coronary stents are not inferior to venous grafts to non-LAD territories (102). Clinical outcomes after HCR are comparable to outcomes after conventional CABG, but only as far as experienced minimally invasive revascularization centres are concerned (103). However, no study has managed to show superiority of HCR over conventional CABG so far (104-107). Even in these experienced minimally invasive revascularization centres, although similar results in terms of survival and freedom from MACCE rates are reported, HCR is significantly inferior to conventional CABG regarding the need for repeat revascularization, mainly due to in stent restenosis or stent thrombosis (102,108). The randomized POL-MIDES study of 200 patients compared two groups of patients with multivessel CAD randomly assigned to conventional CABG or HCR. No significant difference in all-cause mortality, myocardial infarction, stroke, repeat coronary revascularization and MACCE at 1 year and at 5 years was detected (107,109). Similarly, the most recent, randomized, pilot study, the MERSING trial (101), comparing 40 hybrid patients with three-vessel CAD with 20 conventional CABG patients revealed no significant differences in terms of late safety and efficacy. The 2-year major cardiovascular event rate including death, myocardial infarction, stroke or repeat revascularization was 19.3% in the hybrid group versus 5.9% in the conventional group (P=0.2) (101). According to 2018 ESC/EACTS guidelines on myocardial revascularization, HCR has a IIb recommendation for specific patient subsets at experienced centres (2). Although relatively healthy patients with CAD may benefit from conventional CABG, avoiding in-stent restenosis risk, those who are unfit for conventional CABG due to advanced age, frailty, obesity, lack of conduits, poor non-LAD target vessels and porcelain aorta are candidates for HCR (103,108).

Saphenous vein grafts

Apart from sternotomy approach and cardiopulmonary bypass use, SVG harvesting is typical of conventional CABG. In practice, SVG remains the second most commonly used conduit in CABG after LIMA. It is a graft that can be easily harvested; it is available in abundance; it is versatile; it is minimally affected by spasm and there are plenty of studies exploring its long-term results. However, its late graft patency is questionable. There is plenty of data in the literature addressing the higher failure rates of SVGs. Various strategies like venous external stents, no-touch SVG harvesting techniques and post-harvesting vein storage in various preservation solutions along with optimal post-CABG medical treatment have been studied to indicate their impact on vein graft failure (92).

Many studies report the significance of optimal medical treatment for reducing post-CABG mortality. Aspirin administration within 48 hours postoperatively reduces postoperative mortality, myocardial infarction, stroke, renal failure and bowel infarction (110). Graft atherosclerosis rate and subsequent need for repeat revascularization is reduced by aggressive use of lipid-lowering agents to achieve a low-density lipoprotein cholesterol less than 100 mg/dL (111,112). As far as the technical part is concerned, an SVG can be harvested either openly or endoscopically (2). The latter approach leads to significantly less leg wound complications (113-116) which reduces morbidity of conventional CABG. Although there is some evidence of detrimental effect of endoscopic vein harvesting on graft patency (117), randomized and non-randomized trials do not demonstrate inferior clinical outcomes with endoscopic vein harvest (113,114,118,119). The most recent randomized REGROUP trial demonstrated no significant difference between the two approaches (120). However, if the endoscopic approach is chosen, it should only be performed by experienced, high-volume personnel (121-123). Furthermore, harvesting the vein with a pedicle of surrounding tissue via the "no-touch" technique has gained popularity. According to a randomized study of 104 patients, the no-touch technique is related to significantly better angiographic patency rates at 18 months (95%) compared to conventional harvesting technique (89%). No-touch vein graft patency rate was also remarkably superior at 8.5 years (90% *vs.* 76%, respectively). The most important technical factors affecting graft patency were the harvesting technique as well as the vein quality (124). Superior patency rates of no-touch harvested SVGs have been reported in multiple randomized trials (125-128), with a patency rate >80% at 16 years post-CABG (128). Hence, it is critical to take care of the saphenous vein during harvesting similar to the caution exercised during LIMA harvesting. *Table 1* provides with a thorough registration of advantages and disadvantages of each one of the aforementioned approaches.

Conclusions

CABG surgery has remarkably evolved since its introduction by Dr. Favaloro in 1969. Conventional CABG is the cardiac surgeon's "bread and butter". Nowadays, conventional CABG faces challenge from several alternative approaches. BIMA grafting, TAR, OPCAB, MIDCAB or HCR are potential candidates to replace it. However, conventional CABG appears non-inferior to any of the aforementioned

Table 1 Pros and cons of conventional and non-conventional coronary artery bypass grafting

	Pros	Cons
Conventional CABG	Shorter learning curve	Inferior patency rates of SVGs
	Appropriate for every patient	Cardioplegic arrest requirement
	The most long-standing approach	SIRS related to CPB
	Motionless and bloodless field	More surgical trauma and wound complications
	Low DSWI rates	Poorer cosmetic result
	Independent of native coronary vessel stenosis	
	SVGs minimally affected by spasm	
	More easily reproducible and teachable	
	Less need for repeat revascularization	
BIMA grafting	Superior patency rates of RIMA	Appropriate only for selective patients
		More technically demanding
		Higher DSWI rates
TAR	Superior patency rates of RIMA/RA	RA choice only in case of native coronary vessel stenosis >90%
		RA seriously affected by spasm
Off-pump CABG	Improved results in-high risk patients	Longer learning curve
	No cardioplegia required	More technically demanding
	No CPB-related complications	Mobile and bloody field
		Higher incomplete revascularization rates
		Possible conversion to conventional CABG
		Increased mortality and morbidity after emergent conversion
		Less easily reproducible and teachable
		Only by experienced off-pump surgeons
		Only in high volume centres
MIDCAB	Optimal cosmetic result	Longer learning curve
	Less surgical trauma and wound complications	Appropriate only for selective patients
		More technically demanding
		Less easily reproducible and teachable
		Only by expert surgeons
		Only in high volume centres
		Possible conversion to conventional CABG
		Increased mortality and morbidity after emergent conversion
HCR	Appropriate for unfit for conventional CABG patients	Appropriate only for selective patients
	Appropriate for poor non-LAD target vessels	Stent restenosis risk
	Appropriate in case of porcelain aorta	More repeat revascularization rates
	Less surgical trauma and wound complications	Less easily reproducible and teachable
		Possible conversion to conventional CABG
		Increased mortality and morbidity after emergent conversion

BIMA, bilateral internal mammary artery; CABG, coronary artery bypass grafting; CPB, cardiopulmonary bypass; DSWI, deep sternal wound infection; HCR, hybrid coronary revascularization; LAD, left anterior descending; MIDCAB, minimal invasive coronary artery bypass; RA, radial artery; RIMA, right internal mammary artery; SIRS, systemic inflammatory response syndrome; SVGs, saphenous vein grafts; TAR, total arterial revascularization.

approaches (1,2,5,26,47-49,101). Moreover, conventional CABG is for every patient, as well as for every surgeon.

Contrary to its name, conventional CABG is contemporary. It is crucial to improve the outcomes of conventional approach further with optimal post-CABG medical treatment and adoption of modern approaches like no-touch or endoscopic SVG harvesting. Conventional CABG is easily reproducible and continues to evolve. It is not the shadow but the soul of innovations. Conventional CABG sheds light on the path of evolution. Thank you Dr. Favaloro…!

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Footnote

Conflicts of Interest: The author has completed the ICMJE uniform disclosure form (available at http://dx.doi.org/10.21037/amj.2020.03.15). The author has no conflicts of interest to declare.

Ethical Statement: The author is accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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