



Percutaneous Revascularization of Patients with History of Coronary Artery Bypass Grafting

Special thanks are due to Dr. Fatemeh Behboudi et al. for their invaluable work on percutaneous intervention on grafted veins as well as native coronary arteries in patients with previous history of coronary artery bypass graft (CABG) surgery.¹ They report 71 patients with a history of CABG, in whom percutaneous coronary intervention (PCI) was performed on native vessels in 60%, on grafted vessels in 32%, and on both in the remaining 8%.

In the modern era of cardiovascular medicine, CABG and PCI are not rivals but could be complementary to each other. With the increasing age of patients with a history of CABG, atherosclerotic changes progress in their native as well as grafted vessels. Within 10 years after CABG, nearly half of saphenous vein grafts (SVGs) fail or demonstrate significant atherosclerotic disease and the patients become symptomatic.² Atherosclerotic plaques in SVGs are always complex and friable and may be associated with thrombus.³

The first approach to the symptomatic stable post-CABG patient is optimizing medical treatment as well as assessing the amount of myocardium in jeopardy and localizing the ischemia by non-invasive tests such as imaging modalities. In case of medical treatment failure or high-risk non-invasive test results, or if the presentation of the patient is acute coronary syndrome, coronary angiography may be indicated and revascularization is on the table. Redo CABG could be an option, but there are some obstacles. Higher mortality and morbidity has been reported compared with first CABG, especially in subjects with advanced age and with comorbid states.⁴ Sternotomy could be a potential hazard for the grafted internal mammary artery. The second approach is PCI on either native coronary arteries or grafted vessels or both whenever feasible and is indicated based on the area of the ischemia. PCI is often the preferred treatment option in this population since reoperation imposes substantial risk on these subjects.

The study conducted by Dr. Behboudi and her colleagues is a report on in-hospital and mid-term outcome of PCI on patients with a previous history of CABG. The favorable outcome of the subjects in this study encourages the cardiologists to perform PCI on this group of patients. Whether the native vessel or the SVG is preferable for PCI

is not answered in this survey. The target vessel for PCI in post-CABG patients is sometimes a matter of debate, and the selection of the native vessel or SVG with significant stenosis for intervention is not always a simple decision. A comparison of the major adverse cardiac events (MACE) rate, procedural complications, and outcome between the two groups can help solve this problem.

The percutaneous treatment of the SVG has been a matter of interest for many years, and there is a large body of data on this procedure. The SVG could be a target because of lesser tortuosity, less calcification, and larger diameter compared with native vessels. The mechanisms of stenosis in the SVG are somehow different from those in native coronary arteries.³ Native coronary artery and SVG atherosclerosis should be considered different diseases. Atherosclerotic plaques in the graft are more diffuse, friable, soft, and lipid-rich. These characteristics render SVG lesions prone to fragmentation and distal embolization during PCI.⁵ The incidence of no reflow and rate of periprocedural myocardial infarction are higher in SVG angioplasty, owing in large part to the embolization of the abundant and friable atherosclerotic debris in diseased SVGs.^{3,6} The use of embolic protection devices (EPDs) has been demonstrated to reduce the major adverse cardiac events rate as well as no reflow in SVG angioplasty⁷ and these devices are recommended in guidelines whenever technically feasible.⁸ Despite these supporting data, EPDs are used only in 22% of patients in the United States.⁹

In this study, Dr. Behboudi et al. mention that PCI on post-CABG patients is feasible and safe. A challenge is that which vessel is better for intervention, the native vessel or the SVG? Was there any difference in the MACE rate between the group who underwent PCI on their native coronaries and those with intervention on their SVGs? It seems that the sample size was not sufficient for such an analysis. Provision of information on the no-reflow rate in the SVG group and utilization rate of EPDs would be helpful. There is room for investigation about the procedural time, radiation dose, and amount of contrast injection in SVG intervention and a comparison with PCI on native vessels in post-CABG patients.

We will encounter more symptomatic post-CABG patients in the future. More PCI procedures will be carried out on these patients either on their native or their grafted vessels. More data are needed to help select the best target vessel to obtain maximal efficacy and minimal risk. Sometimes we have to open as much vessel as we can, especially when the patient remains symptomatic despite opening one target vessel.

The important role of optimal medical treatment should

not be forgotten. Preventive efforts to halt the progression of atherosclerotic changes in grafted veins and native coronary arteries perhaps are the better way ;be that as it may ,the impact of risk factor modification and changing life style on this issue needs to be confirmed with larger scale clinical trials.

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Percutaneous Revascularization of Patients with History of Coronary Bypass Graft: Reply

First of all, allow me to thank you very much for your interest in our study.¹

Our study was performed in a single center with a small group of patients, which may have created some bias in the prediction of adverse outcomes. In addition, the small size of the study population precluded a comparison of the outcomes between those who underwent percutaneous coronary intervention (PCI) on native coronaries and those who received intervention on saphenous vein grafts (SVGs). Nevertheless, the results of our study showed that PCI on native coronaries is more desirable than PCI on SVGs because many of our major adverse cardiac event (MACE) cases were in the SVG group.

With respect to the next question, only 5% of our SVG group cases had no distal protection devices ,and there was one case of non ST-elevation myocardial infarction (NSTEMI) due to the no-reflow phenomenon after stenting a SVG on the optus marginal (OM) artery and no distal protection devices were used. Finally, we had one case of ST-elevation myocardial infarction (STEMI) due to the distal embolization in the PCI of the SVG on the OM artery despite using a distal protection device; however, no no-reflow phenomenon was observed in the native coronaries group. Studies have shown the consistent benefits of embolic protection devices, independent of glycoprotein IIb/IIIa antagonist use. Embolic protection has been established as the standard of care for SVG stenting, with a favorable cost-benefit profile.^{2, 3} Embolic protection devices reduce the secondary phenomena of no-reflow and end organ infarction.⁴⁻⁷

We hope that our explanations will help the esteemed readers to better understand the views mentioned.

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