The choice between percutaneous coronary intervention (PCI) and coronary artery bypass grafting (CABG) should be based mainly on evidence-based medicine. The latter is based, concerning the choice between these procedures, on two types of publications: registries and randomized clinical trials. The information provided by these studies are complementary and help the cardiologist in making the decision individually. Nonetheless, some differences among them should be highlighted. Randomized studies, both individually and in meta-analyses\cite{1,2}, showed no differences in outcomes between CABG and PCI, except for the items (LAD) artery lesion and more patients with left ventricular dysfunction, precisely those who would benefit from the surgery in terms of mortality. On the other hand, the registries\cite{3,4}, except for a recent Asian study\cite{5}, tend to demonstrate superiority of CABG in terms of mortality in subgroups of patients in which is recognized as capable of increasing survival.

Trying to explain these differences, it has been argued that the registries are more representative of the “real world”. This is because they allegedly involve more patients and a higher number of patients with triple-vessel disease, more patients with a proximal left anterior descending (LAD) artery lesion and more patients with left ventricular dysfunction, precisely those who would benefit from the surgery in terms of mortality. The lack of difference between surgery and angioplasty in randomized trials derive, according to advocates of the registries, from the fact that the patients are similar to those for whom the CABG was not superior over medical treatment. Therefore, it is based mainly on the registries that surgery tends to be the best option in situations such as triple-vessel disease, presence of poor ventricular function or two-vessel disease associated with LAD proximal obstruction\cite{6}.

On the other hand, we need to emphasize that randomized studies, unlike registries, distribute all known and unknown prognostic factors, with an equal chance on groups, overwhelmingly decreasing the bias of the samples. Therefore, meta-analyses of good quality clinical trials represent the best level of scientific evidence to guide decision making. Regarding the number of patients, recent meta-analyses\cite{7} represent a number of patients close to some registries considered classical, such as the one from the Duke University\cite{8}. The argument that randomized studies involved few patients with triple-vessel disease does not seem valid in the stent era, where those with triple-vessel disease plus those with left main lesion were in higher number them on those with two-vessel disease. As for the undeniable fact that randomized trials have included few patients with compromised ventricular function, we may argue that 17% (percentage described in the collaborative study by Hlatky et al\cite{9}) is not an insignificant number. Moreover, this percentage may be underestimated due to the non-inclusion of studies such as the AWESOME and CARDia\cite{10}, which showed a larger number of patients with poor ventricular function. In addition, no randomized study suggested that patients with compromised ventricular function benefitted from the surgery compared to angioplasty. In BARII, the only study to address this issue, nondiabetic patients who presented three-vessel lesions or two-vessel lesion with involvement of LAD, associated with poor ventricular function, did not have higher mortality with PCI. In AWESOME, where a number of patients had a decreased ejection fraction, mortality was slightly smaller with angioplasty. Finally, the collaborative study by Hlatky et al\cite{9} did not show decreased ejection fraction, triple-vessel disease condition or obstruction of the proximal LAD may have contributed to the superiority of surgery over angioplasty in terms of mortality. Finally, there is one last argument: the selection of patients in randomized trials. The selection took place, however, both for patients undergoing angioplasty and for surgical patients, which may have improved the results of both. Moreover, the findings on equity of mortality results in randomized trials do not apply to all patient, but to those patients considered with anatomy suitable for both procedures.

Although published in the best medical journals, registries may have selection biases that even the best statistical techniques are unable to eliminate. Patients could be referred to surgery for seeming healthier (assuming a higher survival rate with CABR) due to total occlusion with collateral circulation or for having larger arteries that are more suitable for grafts: all these factors would favor the surgical results. On the other hand, patients could be referred to angioplasty for presenting a shorter life expectancy, due to severe comorbidities, impossibility of grafts, and doctors’ or patients preference, despite inadequate anatomy: all these factors would jeopardize the results of angioplasty. Inquiries to the criteria of allocation and the outcomes of the SYNTAX\cite{11} registry

### Keywords
Angioplasty, transluminal percutaneous coronary; coronary artery bypass graft; meta-analysis.

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suggests that some selection biases mentioned above (severe comorbidity as indication for PCI, total occlusion as indication for CABG, graft failure as an indication for PCI) may have contributed to the superiority of the surgery in this registry as well as in other observational studies.

Because of that, we think that, in choosing between PCI and CABG, we must consider primarily what meta-analyses of randomized trials say (pointing out to equality of results) rather than observational studies (pointing out to the superiority of surgery), as long as patient’s anatomy is suitable for both procedures.

References


