

EDITORIAL

Heart Team Without Borders: Taking the Heart Team Beyond the Institution

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In the long-standing and ongoing debate over which revascularization strategy leads to better outcomes in multivessel coronary artery disease (CAD), a consistent finding has been that coronary artery bypass grafting (CABG) is superior to percutaneous coronary intervention (PCI) in patients with complex CAD.^{1,2} However, integration of these data into clinical practice has been inconsistent. A study conducted in Ontario, Canada, showed significant interregional variability in practice patterns pertaining to the mode of revascularization among 15 hospitals in the province. Although there was more concordance in the approach to significant left main disease—80.8% to 94.2% CABG and single vessel disease—88.4% to 99.0% PCI—the variability in practice was most pronounced when addressing nonemergent multivessel coronary artery disease.³ This type of practice pattern variability raises questions about the underlying factors that drive bedside decision-making regarding revascularization. For example, structural factors like the availability of on-site cardiac surgery or the specialty of the physician performing the diagnostic angiogram may influence the recommendation for PCI or CABG.

potential factors associated with PCI:CABG ratios among 19 hospitals based in Ontario, Canada from 2013 to 2017.⁴ Hospitals were divided into tertiles based on their PCI:CABG ratio calculated as observed/expected PCI. The expected PCI rate was calculated by dividing the sum of probabilities of patients within the same institution receiving PCI over CABG by the number of patients in the institution. A score >1 meant that the institution was performing more PCI than expected based on clinical characteristics. Tertiles consisted of low (0.70–0.85, n=17 487), medium (1.01–1.17, n=15 275) and high (1.18–1.29, n=11 526) PCI:CABG ratio institutions. Among the 19 participating hospitals 2 (10.5%) did not perform PCI or CABG, 6 (31.6%) performed only PCI, and 11 (57.9%) performed both PCI and CABG.

After excluding those with acute ST-segment-elevation myocardial infarction, shock, prior PCI, prior sternotomy, and those undergoing emergency procedures, they identified 44 288 patients with multivessel CAD defined as 2-vessel disease involving the left anterior descending artery, 3-vessel CAD, or significant left main CAD who underwent revascularization within 90 days of the index coronary angiography. The primary end point of the study was major adverse cardiac and cerebrovascular events, a composite of myocardial infarction, stroke, or repeat revascularization. Compared with low PCI:CABG ratio hospitals, hazard ratios (HRs) for major adverse cardiac and cerebrovascular events were higher in medium (HR, 1.19; 95% CI, 1.14–1.25) and high ratio (HR, 1.21; 95% CI,

See Article by Rocha et al.

In this issue of the *Journal of the American Heart Association (JAHA)*, Rocha and colleagues investigated the degree of interhospital variation in and

Key Words: Editorials ■ coronary artery disease ■ percutaneous coronary intervention

The opinions expressed in this article are not necessarily those of the editors or of the American Heart Association.

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1.15–1.27) hospitals. Furthermore, the ultimate mode of revascularization was influenced by the operator performing the index diagnostic angiogram. If the angiogram was performed by an interventional cardiologist, the odds of the patient receiving PCI over CABG were higher (odds ratio, 1.37; 95% CI, 1.23–1.52) than when it was performed by noninterventional cardiologists. Additionally, having the diagnostic angiogram at an institution without cardiac surgical capabilities was independently associated with worse outcomes and a higher risk of major adverse cardiac and cerebrovascular events (HR, 1.07; 95% CI, 1.02–1.11), death (HR, 1.09; 95% CI, 1.02–1.18) and myocardial infarction (HR, 1.10; 95% CI, 1.03–1.17). The authors concluded that index diagnostic angiography in hospitals with high PCI:CABG ratio was associated with overall worse outcomes and presence of an on-site cardiac surgeon was associated with better survival.

As the authors state, this study has several limitations. First, it does not take into consideration a number of factors that affect patient survival such as complexity of coronary artery disease (SYNTAX score), patient candidacy for CABG (Society of Thoracic Surgeons or EuroScore) or patient preference for PCI versus CABG. This information was not available to the authors. Second, almost half of the patients from the high PCI:CABG ratio centers had their diagnostic angiogram at institutions without CABG capabilities. It is not at all clear from the presented data whether the worse outcomes were because of periprocedural complications or poor PCI procedural technique. Third, the study does not provide guidance regarding the “optimal” ratio of PCI to CABG procedures as this would be affected by many other variables including patient preference. Finally, although it is a provocative finding that the specialty of the physician performing the diagnostic angiogram influences the choice of revascularization modality, no firm conclusions can be drawn regarding the quality of care provided by interventional cardiologists or invasive noninterventional cardiologists. In a study of the National Cardiovascular Data registry in the United States, there was no difference in outcomes between ad hoc PCI performed by interventional cardiologists after diagnostic angiography by an invasive noninterventional cardiologist and ad hoc PCI performed by interventional cardiologists who had also performed the diagnostic angiogram.⁵ On the other hand, the rate of “rarely appropriate” PCI was slightly higher.

What should clinicians take away from the study by Rocha and colleagues? Perhaps the most significant implication is the importance of better communication among interventional cardiologists, their noninterventional colleagues, and cardiac surgeons and the necessity of stronger multidisciplinary discussions across specialties, that is, the “heart team,” particularly at sites

where there is no on-site cardiac surgery. The idea of using a formalized multidisciplinary group of providers to develop care plans for complex patients originates in the specialty of oncology. Commonly known as the tumor board, a multidisciplinary group comprising surgical oncology, medical oncology, pathology, radiology, and specialty nursing was officially recommended in 1995 by the Expert Advisory Group on Cancer.⁶ A formal, weekly meeting to discuss and plan a specific patient’s care was associated with better outcomes in mortality among patients with advanced malignancies, compared with those treated without a multidisciplinary team meeting.^{6–8} This concept was adapted to cardiology initially as a formal team composed of general cardiology, cardiac surgery, and interventional cardiology to assess candidacy of a patient for randomized controlled trials comparing PCI with CABG. Indirect data from contemporaneous nested registries that accompanied the trials suggested an association between heart team decisions and reduced mortality, likely because patients in the registries were not randomized to treatment but were prescribed treatment after discussion with the interventional cardiologist and cardiac surgeon.⁹ Some data also suggest that when interventional cardiologists and cardiac surgeons are unilaterally asked to make treatment decisions for revascularization on the same patient using the same clinical data, there is significant discordance in their recommendations.⁹ As expected, cardiac surgeons tend to recommend CABG and interventional cardiologists tend to recommend PCI. On the other hand, following heart team discussion about the same cases there is improvement in the concordance of recommendations.

Based on the potential benefit of the heart team, professional society practice guidelines have made heart team discussions for revascularization of nonemergent multivessel coronary artery disease a 1A recommendation.^{10,11} Unfortunately, there are relatively few data on the Heart Team concept—the ideal composition, meeting frequency, timing of decision-making, and outcomes—are all unknown. In one single-center study, formalized data collection on Heart Team decisions for 166 high-risk CAD patients showed that with increasing Society of Thoracic Surgeons predicted risk of mortality score, CABG was performed less often and optimal medical therapy was prescribed more often. Interestingly, there were no apparent trends in PCI versus CABG by CAD complexity.¹² The heart team in this study comprised interventional cardiologists and cardiac surgeons; it did not include the referring physician and patient preferences for treatment were not measured.

In clinical practice, the implementation and composition of heart teams are often inconsistent, especially in lower volume institutions. One likely barrier to this, as noted in the study by Rocha et al., is absence of on-site

CABG capabilities and therefore the cardiac surgery team at some of the PCI-enabled centers—50% of high PCI:CABG institutions where patient outcomes were poor did not have an on-site cardiac surgery team. A straightforward remedy to this gap is the use of telemedicine capabilities that have taken on new significance during the COVID-19 global pandemic. With currently available communication technologies and secure data sharing, the study by Rocha and colleagues serves as an impetus to invest in both intra- and interinstitutional collaboration by expanding the heart teams beyond physical walls and improve patient outcomes.

ARTICLE INFORMATION

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Disclosures

None.

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