Editorial Comment

Validation of a Method for Estimating Success and Complication Rates of Multivessel Angioplasty
A Key to the Future

Thomas J. Ryan, MD

A major tenet of the guidelines for percutaneous transluminal coronary angioplasty recently recommended by the American College of Cardiology (ACC)/American Heart Association (AHA) Task Force on Assessment of Diagnostic and Therapeutic Cardiovascular Procedures is that in addition to operator experience, procedural success "relates to certain patient characteristics and, very importantly, to angiographic characteristics of the lesion or lesions to be dilated." Relying on the accumulated experience of a panel of experts and a knowledgeable review of the existing literature, the ACC/AHA subcommittee proposed a lesion-specific classification of the morphological characteristics of vessels to be considered for balloon dilation. Using 26 descriptors, they stratified coronary lesions into three types according to the likelihood of achieving a successful dilation as well as the likelihood of developing a procedural complication.

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Type A lesions are defined as those in which the anticipated success rate is 85% or higher and the risk of abrupt vessel closure is low (<4%). Type B lesions are those in which the anticipated success rate ranges from 60% to 85%, the risk of abrupt vessel closure is moderate (<8%), or both. Type C lesions are those in which the anticipated success rate is less than 60%, the risk of a procedural complication is high (>8%), or both. Attempts to dilate these latter lesions were not recommended.

It is both refreshing and significant that this lesion-specific classification, drawn largely from conventional wisdom, has received its first validation in a relevant report by the Multivessel Angioplasty Study Group (MAPS) in this issue of Circulation. These researchers retrospectively analyzed the cineangiograms of 350 patients with multivessel coronary artery disease who had been studied consecutively at each of four participating centers; they then stratified them according to lesion type. More than 70% of the patients had severe angina, and the vast majority (78%) had two-vessel coronary disease. Only 30% of the population had type A lesions, whereas 61% had lesion characteristics for which the success rates were in the 60–80% range (type B); 10% of the patients had type C lesions. This case mix underscores the reality of angioplasty, namely, the majority of patients undergoing the procedure have complex disease.

The major contribution of this labor-intensive study is the demonstration that both the procedural success and complication rates (death, myocardial infarction, or emergency bypass surgery) of percutaneous transluminal coronary angioplasty (PTCA) can be predicted with good accuracy by careful assessment of lesion morphology. Using the ACC/AHA lesion-specific classification, the authors found a 92% success rate and a 2% complication rate for type A lesions, 80% success and 7% complication rates for type B lesions, and 61% success and 10% complication rates for type C lesions. Of importance, the study group found this classification somewhat lacking in discriminating risk among the most frequently encountered patient group—those with type B lesions. By further stratifying this group into those with type B1 or B2 lesions, they refined their predictive ability such that type B1 (one type B characteristic) lesions had a success rate of 84% with a complication rate of 4%. For patients with type B2 lesions (two or more type B characteristics), the success rate decreased to 76% and the complication rate increased to 10%.

It is emphasized that these researchers conclude that patients with type B2 or C lesions should be seriously considered for surgical revascularization in lieu of PTCA. This translates to 37% of a population routinely accepted for coronary angioplasty at four major US medical centers during 1986–1987. This
revascularization may be considered initially, but the results of the MAPS group analysis suggest that the physician may have been correct in favoring surgery. This study, therefore, is an important corollary to the previous reports and underscores the importance of considering lesion morphology in deciding whether surgery is needed. If the physician and patient are in agreement, there may be a very high success rate. In light of these results, the relative success rates for the MAPS group and the clinical practice in the present study will need to be compared. Although there are several limitations to this study, including the relatively small number of patients and the fact that the MAPS group study was retrospective in nature, these results do provide important insights into the relative success rates for the different revascularization procedures. In conclusion, the results of the current study provide valuable information for the clinical practice of coronary angioplasty. The results of the MAPS group study also provide important insights into the relative success rates for the different revascularization procedures. In conclusion, the results of the current study provide valuable information for the clinical practice of coronary angioplasty.
TABLE 1. Ongoing Randomized Trials Comparing Percutaneous Transluminal Coronary Angioplasty With Coronary Artery Bypass Graft Surgery in Multivessel Coronary Disease

<table>
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<tr>
<th>Intervention (BARI)</th>
<th>Emory Angioplasty or Surgery Trial (EAST) (S. King, MD, Atlanta, Ga.)</th>
<th>Bypass Angioplasty Revascularization Intervention (BARI) (R. Frye, MD, Rochester, Minn.)</th>
<th>Veterans Administration Trial of Angioplasty Compared to Optimal Medical Therapy (ACME) (A. Parisi, MD, Providence, RI)</th>
<th>Coronary Angioplasty Bypass Revascularization Intervention (CABRI) (M. Bertrand, MD, Lille, France)</th>
<th>Randomized Intervention Trial of Angina (RITA) (E. Sowton, MD, London)</th>
<th>German Angioplasty Bypass Revascularization Intervention (GABRI) (W. Bleifeld, MD, Hamburg, FRG)</th>
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<td>Principal Investigators given in parentheses.</td>
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Intervention (BARI) trial will amply test the three-vessel disease cohort as well as the two-vessel disease “market”; all of the studies should provide comparison data relative to “completeness of revascularization” and its importance, if any, in similar patients. Accordingly, it would seem incumbent on the clinical community to put aside its biases and enthusiastically enroll all eligible patients in these critically important trials as they enter their final stages of recruitment.

References


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