When to Choose the Road Less Traveled

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Two roads diverged in a wood
—Robert Frost (1)

In a recent Editor’s Page, I raised 10 questions that do not have clear answers based on evidence. We know that most of our competencies in interventional cardiology are based on experience, even as we advocate for more evidence to support what we do. One of these questions that does not have clear evidence-based answers is how to approach coronary bifurcation lesions that seem to require 2 stents. In this issue, a State-of-the-Art paper from a highly experienced group details recommended methods for deploying stents in bifurcation lesions when 2-stent techniques are required (2). A second paper describes the outcomes in patients receiving 2 stents for bifurcation lesions (3). Finally, Dr. Kimura (4) puts 2-stent strategy and problems in perspectives in an editorial in which he calls for a large cooperative registry review of all the methods of bifurcation stenting followed by randomized controlled trials of methods that generate interesting hypotheses and appear appropriate for various bifurcation types. It is a difficult assignment, but one that will be necessary if more complex bifurcation lesions, especially in the left main location, are to be managed with percutaneous coronary intervention as well as with bypass surgery.

All 3 papers support the guideline recommendations to use a 1-stent technique when that is possible. That road most traveled has gained substantial support and, as Dr. Kimura (4) points out, when a single-stent approach is possible for left main interventions, the choice of percutaneous intervention over surgery seems reasonable. However, if a 2-stent strategy is going to be required, the enthusiasm for left main stenting should be less.

The Korean Bifurcation Registry (3) provided confirmation of the predictors of target vessel failure over a 3-year follow-up. They were left main bifurcations, SYNTAX (Synergy Between PCI With Taxus and Cardiac Surgery) score, and diabetes. The use of second-generation stents and final kissing balloon inflation with noncompliant balloons was associated with better long-term outcomes. Various techniques were utilized in this registry with some form of crush technology dominating.

Many questions regarding bifurcation stenting remain. How much preparation of the lesion should be accomplished? Is atherectomy required for heavily calcified lesions? Can endovascular imaging with optical coherence tomography or intravascular ultrasound improve results? Will dedicated bifurcation stents ever be superior to the current stents? Can bioresorbable scaffolds play a role in bifurcation stenting? A recent paper by Kawamoto et al. (5) explored the methods necessary if bifurcation scaffolds are to be tried in bifurcation lesions. The ongoing EXCEL (Evaluation of Xience Prime Everolimus Eluting Stent System [EECSS] or Xience V EECSS or Xience Xpedition EECSS or Xience Pro EECSS Versus Coronary Artery Bypass Surgery for Effectiveness of Left Main Revascularization) trial will be very important in comparing the Xience stent with coronary bypass surgery in patients with left main disease and SYNTAX scores of <33. Most of these patients will likely have a single-stent approach to the left main, leaving the question of how to deal with left main stenting requiring 2 stents still unanswered. The single-stent approach crossing the side branch and “jailing” it was, at one time, considered problematic, but vast experience by many and popularized by S.J. Park convinced most that the single-stent crossover was the best current approach to left main stenting. From these papers, it is clear that 1 solution does not fit all lesions. The angle of the side branch from the main branch, the size of the side branches, the extent of myocardium served by the side branch, and the extent
of atheroma involving branches all influence the decision of experienced operators.

In deference to Robert Frost, taking a road most traveled has been the most successful. On the other hand, technology never stands still and even those specialized bifurcation stents have not made major progress so far. Who knows whether down the road less traveled a solution may be found that will “make all the difference.”

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REFERENCES