Intravascular Ultrasound Guidance for Stent Implantation

To the Editor:

The impact of intravascular ultrasound (IVUS) guidance for stent implantation was addressed in a recent issue of Circulation with the results of the Can Routine Ultrasound Influence Stent Expansion (CRUISE) trial. In addition to its primary end point, IVUS measurements of stent expansion, this study assessed the clinical benefit of IVUS guidance in routine stent implantation.

The main finding of this study was greater stent expansion in the group treated with IVUS-guided stents, as assessed by angiography or by IVUS. The late clinical impact of this “luminological” result was the significantly lower rate of target vessel revascularization. Surprisingly, the authors did not report the results of the secondary end point, which they defined as a composite of major cardiac events, namely death, myocardial infarction, and target vessel revascularization. The composite event rate was 34/270 in the IVUS-guided group versus 49/229 in the control group, and this difference was not statistically significant (P = 0.09). Instead, the authors claim that a significant reduction in the rate of target vessel revascularization was observed, but this cannot serve as surrogate for reporting the secondary end point.

Also surprising was the lack of precision as to the IVUS guidance method, ie, the criteria used to define adequate stent expansion. In the past, several studies have demonstrated the impact of the choice of IVUS criteria on the rate of overdilatation, procedural complications, and angiographic and clinical outcome. The lack of precision as to the IVUS criteria therefore prevents the findings of the CRUISE study from practical application in a clinical setting.

Lastly, the sentence, “No previous study . . . has directly addressed the impact of IVUS-guided stenting leads to improved results . . .” is not accurate. In fact, the randomized, multicenter RESStenosis after Intravascular-guided STenting (RESIST) study had a similar goal, and the results were published in 1998 in the Journal of American College of Cardiology and were presented in the main European and American meetings.

I do not understand how the authors failed to compare the results of these two studies because the studies are somewhat complementary: The improvement in stent expansion thanks to IVUS guidance demonstrated in the RESIST study was confirmed in the CRUISE trial, and the significantly larger lumen area at found after 6 months in RESIST corresponded to the lower rate of vessel revascularization found in CRUISE.

For an operator-dependent technique like IVUS guidance, the confirmation of the results of a randomized study by a larger registry performed in other centers and in other countries is methodologically interesting. The consistency of the results of these two studies pleads in favor of the benefit of IVUS guidance and, rather than diminishing the interest of the CRUISE trial, the comparison with the RESIST study actually reinforces its conclusion—that IVUS guidance in stenting results “in more effective stent expansion”—and offers the “luminological” explanation for the reduction in the vessel revascularization rate.

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