Editorial

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Comparison of Two Different Strategies of Intravascular Ultrasound Guidance during Percutaneous Coronary Intervention; Routine versus Selective

Sang-Wook Kim, MD

Cardiovascular Center, College of Medicine, Heart Research Institute, Chung-Ang University Hospital, Seoul, Korea

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Intravascular ultrasound (IVUS) is an invasive imaging tool designed to find the maximum of efficiency with the minimum of labor. It provides important procedural information before and after percutaneous coronary intervention (PCI). The lumen, the arterial wall, and the atherosclerotic process within the vessel can be of extensive use. Expert consensus documents prepared by the American College of Cardiology and the European Society of Cardiology have set the standards for the methodology and terminology used in IVUS imaging.[1)2)] Recently, optical coherent tomography, a light-based imaging technique, has entered the clinical arena. However, there is little doubt that IVUS continues to play a major role in studies on coronary atherosclerosis and the procedural guidance of coronary intervention.

The importance of IVUS was emphasized again during the drug-eluting stent (DES) era. IVUS is useful in assessing lesion length, severity, and plaque morphology before stent implantation, and to optimize the PCI results such as stent expansion, stent apposition, and lesion coverage; as well as for treating possible complications after stent implantation. The stent underexpansion and residual disease of the reference segment were predictive of stent thrombosis, which can be devastating. It is often underexpanded in the DES-treated lesions that develop thrombosis or restenosis, but underexpansion associated with thrombosis is more severe, diffuse, and proximal in location. The repeated DES stenting of instent restenosis showed a high rate of cardiac events, with the rates of repeated restenosis for that treatment about 20% for the treatment of restenosed DES. A large necrotic core area may predict high risks for myocardial necrosis after PCI. All of these valuable results represent the fruits of many years of IVUS studies.[3-7)] With clinical outcomes depending on the IVUS-guidance, the benefits of IVUS guidance to reduce both DES thrombosis and the need for repeat revascularization have been published. The treatment strategy of DES was impacted by these IVUS results.[8)9)]

In this manuscript, Seo et al.[10)] sought to explore the strategies of IVUS guidance during PCI. The subjects were divided into two groups: routinely IVUS-guided and selectively IVUS-guided. The timing of IVUS imaging was determined by the judgment of the operator (i.e., pre- or post-stent or both). The authors found that PCI under the strategy of 'selective' IVUS-guidance was comparable to PCI under 'routine' IVUS-guidance. Angiographic and clinical outcomes at 1 year were not different between the two groups.

The result of this study should not be considered conclusive, as there remain critical limitations. First, the study has a retrospective design and was non-randomized with a small sample size. The criteria for the routine use of IVUS were obscure. Although IVUS was used after stent implantation in all groups, however, it is necessary to include the pre-interventional IVUS as inclusion criteria in patients with IVUS-guided PCI. Routine use of IVUS should be defined in cases of IVUS guidance at both the pre- and post-stent implantation phases. Secondly, as the authors described, baseline characteristics including gender, dyslipidemia, and vessel territory were different. It showed a lower number of females, a higher percentage of dyslipidemia, and higher left main coronary artery disease in routine IVUS-guided PCI, sufficient to provoke a bias toward inadequate analysis. Thirdly, pre-interventional lesion characteristics were not

Correspondence: Sang-Wook Kim, MD, Cardiovascular Center, College of Medicine, Heart Research Institute, Chung-Ang University Hospital, 102 Heukseok-ro, Dongjak-gu, Seoul 156-755, Korea
Tel: 82-2-6299-2871, Fax: 82-2-823-0160
E-mail: swivus@gmail.com

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included. Pre-interventional angiographic data and IVUS measurements make the results of this study clear. More importantly, IVUS-guided PCI may be helpful in complex lesions such as left main coronary artery disease, bifurcation lesion, and in patients with diabetes and chronic renal disease, etc. Fourth, the procedural indication of post-balloon dilatation was not defined in this study.

Routine IVUS guiding is not necessary in all of PCI, however, the selective use of IVUS may improve clinical outcomes in real world practice.

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