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EDITORIAL COMMENT

Impact of IVUS Guidance on Single-Session vs Staged Multivessel PCI*

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Complete revascularization in patients with non-ST-segment elevation acute coronary syndrome (NSTE-ACS) without cardiogenic shock and with multivessel coronary artery disease (CAD) is recommended as Class IIa in 2020 European Society of Cardiology (ESC) guidelines for NSTE-ACS.[1] Furthermore, the British Cardiac Intervention Society percutaneous coronary intervention (PCI) database showed significantly lower mortality rates with single-stage complete revascularization compared with culprit lesion-only PCI (adjusted HR: 0.90; 95% CI: 0.85-0.97) at a median follow-up of 4.6 years among 21,857 patients with NSTE-ACS and multivessel CAD undergoing PCI.[2] In the Alberta COAPT (Cardiovascular Outcomes Assessment of the MitraClip Percutaneous Therapy) registry, complete revascularization significantly reduced all-cause death or new myocardial infarction (MI) compared with incomplete revascularization (inverse probability-weighted HR: 0.78; 95% CI: 0.73-0.84) in patients with ACS and multivessel disease (MVD).[3] The superiority of complete revascularization over culprit lesion-only PCI has been established in patients in NSTE-ACS.

However, in terms of the timing of nonculprit lesion PCI, debate still remains. While a substudy in the COMPLETE (Complete vs Culprit-only Revascularization to Treat Multi-vessel Disease After Early PCI for STEMI) trial investigated the timing of nonculprit lesion PCI, both the nonculprit lesion PCI during index hospitalization and the PCI after discharge conferred similar benefits on major cardiovascular events.[4] Whereas the SMILE (Single-Staged Compared With Multi-Staged PCI in Multivessel NSTEMI Patients) trial randomized 584 patients with NSTE-ACS to immediate complete revascularization vs staged complete revascularization, immediate complete revascularization significantly reduced major adverse cardiovascular events (MACE) compared with staged complete revascularization (13.6% vs 23.2%; HR: 0.549; 95% CI: 0.363-0.828).[5] Conflicting evidence has been provided concerning the timing of PCI for nonculprit lesion in patients with MVD. To resolve this issue, Yamamoto et al[6] have focused on the usefulness of intravascular ultrasound (IVUS) during PCI. Intravascular imaging is recommended only in cases of restenosis and stent thrombosis to detect stent-related mechanical problems and to assess and guide PCI in the left main stem (Class IIa) in ESC guidelines for myocardial revascularization.[7] However, recent comparative studies between IVUS-guided PCI and angiography-guided PCI demonstrated that IVUS-guided PCI successfully reduced ischemic events after PCI.[8,9] Furthermore, Kubo et al[10] demonstrated that 1-year clinical outcome was not different between optimal frequency domain imaging (OFDI)-guided PCI and IVUS-guided PCI. Although a recent expert consensus document of the Japanese Association of Cardiovascular Intervention and Therapeutics (CVIT) indicated that IVUS/OCT/OFDI should be considered to detect stent-related mechanical problems, postprocedural imaging assessments—including presence of dissection, degree of incomplete stent apposition, and presence of thrombus protrusion—could subsequently contribute to reducing MACE in long-term follow-up.[11]

In this issue of *JACC: Asia*, Yamamoto et al[6] reported the comparison between single-session and staged multivessel IVUS-guided PCI in 1,021 patients derived from OPTIVUS (Optimal Intravascular Ultrasound)-Complex PCI study multivessel cohort.

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Although 76% of the patients had staged procedures, and the remaining 24% of them had single-session multivessel PCI, staged and single-session multivessel PCIs showed similar in-hospital and 1-year outcomes.[6]

The paper by Yamamoto et al[6] is well written, informative, and contributes to the understanding of the optimal strategy for multivessel PCI in patients with chronic coronary syndrome (CCS) or NSTE-ACS. However, some limitations of the study should be acknowledged, such as the lack of randomization, potential selection bias, and the generalizability to other populations or settings. Therefore, future studies with a randomized design and larger sample size are needed to confirm these findings and further explore the optimal strategy for multivessel PCI.

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