

probably not sufficient to show a difference even in the composite outcome. The decrease in repeated revascularizations in the AFU group compared with the clinically/ischemia-driven one after the first year from the index procedure supports our hypothesis. As the authors state in their discussion, most of the early angiographically proven restenosis later became clinically driven revascularization in the noninvasive FU cohort. In a longer FU, these data could determine a higher incidence of adverse cardiovascular events such as MI or acute coronary syndrome (ACS) caused by abrupt stenosis progression.

Furthermore, both the European and American guidelines (3,4) confine the possibility of an AFU to a low-powered and low-evidence level of recommendation (Class of recommendation IIb, Level of Evidence: C), referring particularly to high-risk patients, such as those with ACS and left main disease (LMD).

The proportion of patients enrolled with an ACS (30%, and just 20% with a MI admission diagnosis) was only a minority of the overall population. These data poorly reflect the real-life population and may limit the applicability of present results to the everyday catheterization laboratory practice. This subset of patients, considering the intrinsic instability of ACS disease and the emergency setting of primary PCI, could benefit from AFU of the index procedure. Another important issue to be argued is the lack of intravascular ultrasound data on coronary lesions. This information would help to understand the underlining mechanism of TLR so as to better focus the target of planned AFU.

Last, but not the least, a very small proportion of enrolled patients had LMD or chronic total occlusion lesions. In the subgroup analysis, a potential benefit, even if not significant, clearly emerged for these types of lesions. It is probably in this selected type of patients that we could see the strongest benefit in terms of lower cardiovascular events, using a planned AFU, especially patients with LMD, where promising results even at long-term FU have been demonstrated recently (5).

In conclusion, the work of Shiomi et al. (1) should not definitively close a window of opportunity for AFU in a selected population of patients undergoing coronary artery interventions, focusing on those with a more complex anatomy, particularly if the index procedure was performed in an ACS context. More data, with longer FUs, are needed to better clarify the usefulness of this strategy.

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REPLY: Angiographic Follow-Up in Patients With Coronary Artery Disease



Is There a Window to Be Definitively Closed?

We thank Bertaina and colleagues for their interest in our study evaluating the clinical impact of routine coronary angiography (CAG) after percutaneous coronary intervention (PCI) (1). As we stated in our paper, we agree with Bertaina and colleagues that our study was underpowered to make a definitive conclusion regarding the clinical impact of routine follow-up CAG after PCI, especially for high-risk patients such as those with left main disease, complex coronary artery disease (CAD), and acute coronary syndrome. We also agree with the importance of longer follow-up to detect the potential benefit of routine follow-up CAG.

Bertaina and colleagues stress potential benefits of routine follow-up CAG in patients with acute coronary syndrome. We think, however, that it remains

unclear whether we should consider patients with acute coronary syndrome and stable CAD differently with respect to management beyond the acute phase of intervention, such as the timing of routine follow-up CAG (typically 8 months to 1 year), because our large-scale cohort reported that patients with acute myocardial infarction compared with those without acute myocardial infarction were associated with similar late cardiovascular event risk beyond 3 months after PCI (2).

Regarding complex CAD such as left main disease and chronic total occlusion, too few patients with a wide 95% confidence interval in our study make it difficult to discuss any potential benefits of routine follow-up CAG in this important category of patients. While expanding the indication of PCI for complex CAD, appropriate management for these patients after PCI is a clinically relevant issue.

However, our study showed no apparent clinical benefits of “routine” follow-up CAG in 700 patients with a median follow-up duration of 4.6 years. Considering the invasive nature of CAG and increased medical expenses, “routine” follow-up CAG after PCI, which is still performed commonly in Japan, is no longer recommended in the majority of post-PCI patients. At the same time, however, we agree with

the notion that a window of investigating the potential benefits of follow-up CAG after PCI in “selected” patients is still open.

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