Beyond Luminal Narrowing: Does CCTA Truly Provide Superior Prognostic Information?

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Dear Editor,

I read with great interest the article by Da Luz et al.[1] comparing long-term clinical outcomes after coronary computed tomography angiography (CCTA) and invasive coronary angiography (ICA) in patients with nonobstructive coronary artery disease (CAD). The study provides valuable long-term data and further emphasizes that nonobstructive CAD is associated with clinically relevant cardiovascular risk. However, I believe that the interpretation of the principal findings may benefit from an alternative perspective.

The authors conclude that CCTA more closely reflects long-term clinical outcomes than ICA. An equally plausible interpretation, however, is that CCTA does not necessarily possess superior prognostic capability but instead provides a more comprehensive characterization of coronary atherosclerosis. Unlike ICA, which primarily depicts luminal stenosis, CCTA evaluates both the coronary lumen and the arterial wall, thereby providing information on overall plaque burden and atherosclerotic morphology.[2] Consequently, patients classified as having nonobstructive CAD by CCTA are not necessarily biologically equivalent to those classified similarly by ICA. The two imaging modalities therefore interrogate different pathological manifestations of coronary artery disease rather than identical disease entities.

This distinction has important implications for interpreting the reported prognostic differences. An imaging modality capable of detecting coronary atherosclerosis before substantial luminal narrowing would be expected to demonstrate stronger associations with subsequent cardiovascular events. Accordingly, the observed prognostic advantage of CCTA may primarily reflect more comprehensive disease characterization rather than intrinsically superior prognostic performance. From this perspective, the study may be comparing different biological definitions of nonobstructive CAD instead of directly comparing the prognostic performance of two imaging techniques.

This interpretation is also consistent with contemporary concepts of coronary CT imaging. Current reporting systems emphasize that the clinical value of CCTA extends beyond stenosis severity by incorporating plaque burden and plaque characteristics into cardiovascular risk assessment.[2,3] Therefore, the present findings may be viewed as further evidence that the biological information obtained by CCTA differs fundamentally from that obtained by ICA, making direct comparisons between the two modalities inherently challenging.

Accordingly, I believe that the findings may be interpreted not only as evidence supporting the prognostic value of CCTA but also as reflecting the complementary biological information provided by different imaging modalities. Future prospective studies integrating plaque morphology, high-risk plaque characteristics, functional ischemia assessment, and longitudinal treatment effects may help clarify whether the observed prognostic differences primarily reflect imaging performance or differences in disease characterization.

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