

Beyond “leave nothing behind”: reconsidering biological restoration after drug-coated balloon coronary intervention. Response

«No dejar nada atrás»: una nueva perspectiva sobre la restauración biológica en la intervención coronaria con balón farmacológico. Respuesta

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To the Editor,

We thank Astan et al. for their thoughtful letter and for emphasizing the inherent complexity of coronary vascular healing.¹ Their central argument, that the absence of a permanent metallic scaffold should not be equated with true biological restoration, is one that we fully endorse.

We agree that the potential to preserve adaptive remodeling and vasomotor reactivity, both of which are constrained by a permanent metallic cage, does not in itself imply recovery of normal vascular biology. Endothelial integrity, inflammatory signaling within the vessel wall, and microvascular adaptation remain only partially captured by current available metrics. Nevertheless, we would argue that preserving these physiological attributes represents an important first step in that direction.² Atherosclerosis is a diffuse and progressive disease that is unlikely to be abolished by any mechanical intervention, regardless of how little it leaves behind.³ Reducing the permanent implant burden while preserving the vessel's capacity to remodel and vasodilate should therefore be regarded as a step toward, rather than a guarantee of, physiological normalization. This response may also vary according to other factors, such as the drug used to coat the balloon⁴ or the patient's sex.⁵

Bioresorbable vascular scaffolds were conceived on precisely the premise that removal of the permanent implant would restore, among other physiological function, vasomotion. However, when this mechanistic hypothesis was prospectively evaluated in ABSORB II,⁶ an everolimus-eluting scaffold failed to demonstrate superior vasomotor reactivity compared with a metallic everolimus-eluting stent at 3 years. The anticipated biological restoration was not achieved simply by removing the metal. We therefore share the authors' view that future research should more clearly define what genuine vascular restoration entails by integrating coronary physiology assessment, endothelial function testing, intracoronary imaging, and markers of biological healing into appropriately designed

studies with long-term follow-up. Whether a drug-coated balloon strategy can fulfill this physiological promise remains a hypothesis that must be proven.

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STATEMENT ON THE USE OF ARTIFICIAL INTELLIGENCE

No artificial intelligence was used for the development of this work.

AUTHORS' CONTRIBUTIONS

A. Colombo: conceptualization, methodology, investigation, data curation, formal analysis, validation, visualization, writing—original draft, writing—review and editing, supervision, project administration. P. Pasquale Leone: conceptualization, methodology, investigation, data curation, visualization, writing—review and editing, supervision, project administration.

CONFLICTS OF INTEREST

The authors declare there are no relationships relevant to the contents of this paper to disclose.

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