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Letter to the Editor

Beyond "leave nothing behind": reconsidering biological restoration after drug-coated balloon coronary intervention

«*No dejar nada atrás*»: *una nueva perspectiva sobre la restauración biológica en la intervención coronaria con balón farmacoactivo*

Ramazan Astan,[a,*] Fehmi Kaçmaz,[b] Ersin Sarıçam,[c] and Erdoğan İlkay[c]

[a] *Department of Cardiology, Batman Training and Research Hospital, Batman, Turkey*
[b] *Department of Cardiology, Memorial Ankara Hospital, Ankara, Turkey*
[c] *Department of Cardiology, Medicana International Ankara Hospital, Ankara, Turkey*

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To the Editor,

In their insightful editorial discussing the evolving "leave nothing behind" philosophy, Colombo et al.[1] highlight one of the most compelling conceptual shifts in contemporary interventional cardiology. With the progressive development of drug-coated balloon (DCB) technologies, minimizing permanent metallic implantation has emerged as an increasingly attractive therapeutic concept. Nevertheless, equating the absence of a permanent metallic scaffold with genuine vascular restoration may oversimplify the inherently complex biology of coronary healing.

Undoubtedly, DCB-based approaches reduce metallic burden and may preserve a more physiological vascular geometry. However, vascular restoration cannot be defined solely by the absence of metal within the vessel wall. Endothelial integrity, vasomotor responsiveness, vessel wall biology, local inflammatory signaling, and microvascular adaptation remain among the most critical, yet incompletely understood, determinants of postinterventional recovery. Therefore, the concept of "less metal" should not automatically be interpreted as synonymous with physiological vascular normalization.

Perhaps the more fundamental question is not how little metal we leave behind, but to what extent vascular biology is truly restored. Although the "leave nothing behind" strategy may reduce the burden of permanent implants, balloon-induced vascular trauma, endothelial disruption, vessel wall stress responses, and biological remodeling do not entirely disappear. In other words, leaving no metal behind does not necessarily mean leaving no biological footprint behind.

Importantly, the expanding DCB literature reflects not only the evolution of device technology, but also the emergence of a distinct procedural philosophy.[2,3] Yet, the conceptual boundaries of what truly constitutes a "DCB strategy" remain insufficiently defined. Lesion preparation intensity, acceptable recoil thresholds, bailout stenting criteria, dissection tolerance, inflation duration, and hybrid transition algorithms vary considerably across studies.[2-4] Consequently, substantially different procedural paradigms are frequently grouped under the same therapeutic label, potentially complicating the interpretation of pooled and metaanalytic outcomes.

For this reason, future DCB research may need to move beyond the binary question of "metal vs no metal" and instead focus on defining what genuine vascular restoration actually means. Studies integrating coronary physiology, endothelial function, vascular imaging, and biological healing parameters may ultimately clarify whether the "leave nothing behind" philosophy represents merely a form of mechanical minimalism or a truly physiological model of vascular recovery.

Perhaps the next major transformation in interventional cardiology will not be defined by the disappearance of metal, but by the emergence of biology-guided vascular restoration.

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CONFLICTS OF INTEREST

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*** Corresponding author.**
E-mail address: drastan80@gmail.com

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