

The authors reported no conflicts of interest.

The *Journal* policy requires editors and reviewers to disclose conflicts of interest and to decline handling or reviewing manuscripts for which they may have a conflict of interest. The editors and reviewers of this article have no conflicts of interest.



**REPLY FROM AUTHORS:
THE SCIENTIFIC
METHOD IS NEEDED
TO CREATE SCIENTIFIC
PRINCIPLES**



Reply to the Editor:

We thank Dr García-Villareal for his comment about our article on 5-year results of transapical mitral neochord implantation (NC).^{1,2} Although we basically agree with the author's comment that the lack of annular ring implantation might be related to worse outcomes in open-heart mitral valve repair, we disagree that the same concept can be extended tout-court to off-pump beating-heart procedures. Scientific principles, correctly advocated by Dr García-Villareal and that should always represent the base of our activity, require the application of the scientific method that is based on observation, data analysis, and drawing of conclusions. All the rest is based on points of view, which are highly respectable but that often are not supported by data. Here are our observations and findings: (1) in our experience, no case of NC failure during follow-up has been related to annular enlargement, (2) mitral annulus remodeling has been observed in patients undergoing NC³; and (3) in patients with favorable anatomy, there is no statistical difference between conventional surgery and NC at follow-up in terms of recurrence of moderate mitral regurgitation (63.9% vs 74.6%), severe mitral regurgitation (79.3% vs 79%), and freedom from reoperation (79.7% vs 85%).⁴ We will keep following these patients to observe further outcomes, and we will keep reporting our findings. Having said that, there are a few more comments that are worth being made. Every innovation undergoes an initial phase of skepticism (especially by the cardiac surgical community, often too "closed" toward new technologies) due to suboptimal results mainly related to 4 aspects: patient selection, physicians' learning curve, technical refinement, and device improvement. This has been observed, for example, in history, regarding 2 well-known and now commonly accepted procedures: transcatheter aortic valve implantation and transcatheter edge-to-edge mitral valve repair. The latter

in particular is performed with no annular stabilization, but this doesn't seem to worry too many interventional cardiologists, who continue to expand indications and perform trials (REPAIR MR [ClinicalTrials.gov Identifier: NCT04198870](https://clinicaltrials.gov/ct2/show/study/NCT04198870) and PRIMARY [ClinicalTrials.gov Identifier: NCT05051033](https://clinicaltrials.gov/ct2/show/study/NCT05051033)) aimed at demonstrating, using the scientific method, that results are good despite the lack of annular stabilization.

Although it's likely that conventional surgery will always guarantee the best optimal results in terms of freedom from mitral regurgitation recurrence and of reoperation, it's also true that early referral and adequate patient selection (non-dilated annulus, favorable anatomy) might favor the choice of a minimally-invasive approach⁵ like NC or transcatheter edge-to-edge mitral valve repair in the near future. Furthermore, NC has already been performed through a trans-septal approach, thus reducing further invasiveness. Will all patients accept an "open-heart" operation to gain a 10% to 15% more freedom from mitral regurgitation over time rather than undergoing a minimally-invasive operation and accepting that 10% to 15% risk? As modern cardiac surgeons, only if we keep all these technologies in our hands, we will be able to offer our patients all available options. This is the only way to provide our patients with an unbiased counseling for a tailored selection of the most-appropriate therapeutic option.

Augusto D'Onofrio, MD, PhD
Gino Gerosa, MD
Division of Cardiac Surgery
University of Padova
Padova, Italy

References

1. D'Onofrio A, Fiocco A, Nadali M, Mastro F, Aruta P, Lorenzoni G, et al. Outcomes of transapical mitral valve repair with neochordae implantation. *J Thorac Cardiovasc Surg.* April 9, 2022 [Epub ahead of print].
2. García-Villareal OA. The anuloplasty ring in mitral valve repair. *J Thorac Cardiovasc Surg Tech.* 2022;11:87.
3. Gammie JS, Bartus K, Gackowski A, Szymanski P, Bilewska A, Kusmierczyk M, et al. Safety and performance of a novel transventricular beating heart mitral valve repair system: 1-year outcomes. *Eur J Cardiothorac Surg.* 2021;59:199-206. <https://doi.org/10.1093/ejcts/ezaa256>
4. D'Onofrio A, Mastro F, Nadali M, Fiocco A, Pittarello D, Aruta P, et al. Transapical beating heart mitral valve repair versus conventional surgery: a propensity-matched study. *Interact Cardiovasc Thorac Surg.* March 2, 2022;ivac053. <https://doi.org/10.1093/icvts/ivac053>
5. Gerosa G, Thourani VH, Borger M, D'Onofrio A. Minimally-invasive cardiac surgery: when less is more—"render to Caesar the things that are Caesar's; and to the surgeon the things that are the surgeons." *Eur J Cardiothorac Surg.* February 14, 2022;ezac084. <https://doi.org/10.1093/ejcts/ezac084>

<https://doi.org/10.1016/j.xjon.2022.05.009>