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REPLY FROM AUTHORS: ANATOMICAL OR FUNCTIONAL REPAIR FOR ISCHEMIC MITRAL REGURGITATION: FIND THE RIGHT ANTIDOTE!

Reply to the Editor:

We appreciate the thoughtful feedback provided by Nappi and Singh[1] on our editorial commentary.[2] They echo our proposal regarding the use of anterior mitral valve leaflet (MVL) patch augmentation as an effective strategy for repairing ischemic mitral regurgitation (IMR). A fundamental lesson learned from the Cardiothoracic Surgical Trials Network multicenter randomized investigations is the nonexistence of a universal repair method that fits all types of patients with severe IMR.[2] We cannot agree more with Nappi and colleagues[1] that IMR is a dynamic disorder influenced by multiple pathological factors. It in turn demands combined, as well as individualized, surgical therapies. Primarily, we can never overemphasize the importance of complete revascularization of the viable myocardium. Regarding mitral valve repair, the slight difference in our perspectives from the proposal made by Nappi and colleagues[1,3] may warrant further discussion.

The traditional surgical repair strategy for IMR involves restrictive mitral annuloplasty (ie, implantation of an artificial ring 2 sizes smaller than the native annulus), which aims to improve leaflet coaptation by reducing annular dilatation secondary to myocardial infarction-induced adverse left ventricle (LV) remodeling. In addition to this conventional approach, Nappi and colleagues[1,3] advocated subannular repair (namely, papillary muscle approximation), which indeed seems more logical, although the real survival benefit of this technique remains unproven. Taken together, the general concept involves overcorrection or anatomical repair; that is, an attempt to restore the diseased parts (annular or subannular) to normal. Through clinical observations accumulated over decades, we now know that this approach works only in a minority of patients (probably those without a significantly enlarged LV).[3,4] Moreover, the durability of such an anatomical correction appears to be far from adequate, as reflected by a 2-year postoperative MR recurrence rate of almost 60% in the Cardiothoracic Surgical Trials Network severe IMR trial.[4]

Accordingly, we propose a radical modification of the repair concept in patients with IMR with significant LV enlargement: The principle of repair could be "coup with the LV" rather than overcorrection.[2] This functional repair strategy would include MVL patch augmentation and true-sized annuloplasty.[2] Although in our own hands, anterior MVL augmentation is often the procedure of choice,[2] we also perform posterior MVL patch augmentation (Figure 1) in patients with severe posterior leaflet tethering (usually at the P3 segment).

Some technical and other details deserve clarification. First, in contrast with the technique described by Nappi

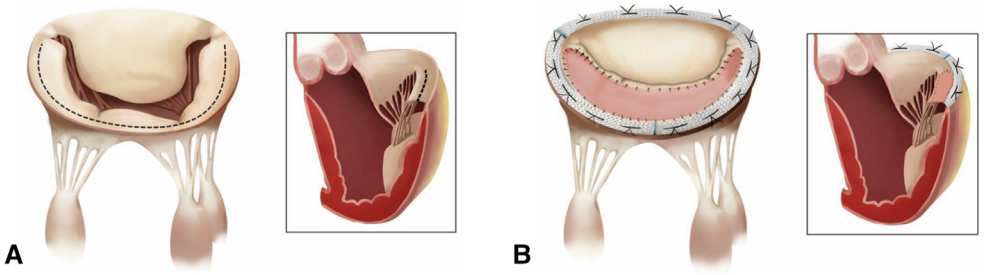

FIGURE 1. Posterior mitral valve leaflet patch augmentation with true-sized annuloplasty in patients with severe ischemic mitral regurgitation due to significant posterior leaflet tethering. A, A commissure-to-commissure incision is made along the posterior mitral annulus (*dashed line*). B, A prepared CardioCel (LeMaitre Vascular, Burlington, Mass) patch slightly larger than the space area succeeding the fall of the posterior mitral leaflet and, mimicking its shape and curvature, is sutured on the leaflet followed by true-sized semirigid ring annuloplasty.

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and colleagues,[1,3] we implant true-sized rings and no longer apply restrictive annuloplasty in patients with significant LV enlargement.[2] Second, to improve the long-term durability of the patch (which remains to be confirmed), we now use CardioCel (LeMaitre Vascular, Burlington, Mass) patches instead of autologous pericardium. Third, we have abandoned the use of rigid rings and instead use semirigid rings in this type of functional annuloplasty. Fourth, the patch size should be slightly larger than the space area succeeding the fall of the MVL after the corresponding anterior or posterior annular incision. In particular, for a posterior MVL augmentation, the patch should be cut to mimic the shape and curvature of the above-mentioned space area. In our preliminary clinical experience we have never observed the phenomenon of systolic anterior motion following such a functional repair. Last but not least, the definition of a significantly enlarged LV in a patient with severe IMR remains under debate and may require further validation. We selected an LV end systolic dimension of 40 mm as the cutoff value in our population of Asian patients. However, other parameters could also be considered, such as the LV end systolic volume/body surface area $\geq$65 mL/m^2 as mentioned by Nappi and colleagues.[1,3] This subject certainly merits future clinical evaluations with larger sample sizes.

Undoubtedly, with respect to long-term patient outcomes, a successful and durable repair (whenever feasible) is always superior to other interventions such as valve replacement or transcatheter procedures. We believe that the principle stated by Carpentier[5] almost 4 decades ago remains true today: "One may define the aim of a valve reconstruction as restoring normal valve function rather than normal valve anatomy."

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