See Article page XXX.

Commentary: Signal or noise?

Joanna Chikwe, MD, FRCS

Remodeling ring annuloplasty to treat secondary mitral regurgitation due to annular dilatation was described in a series of 157 patients by Alain Carpentier in 1980.¹ It is technically straightforward, the saline test is almost always competent, and so is the repair on the postbypass transesophageal echocardiogram. Few surgeons routinely use adjunctive reconstructive techniques or systematically evaluate all such patients at 2 years. This may explain the skeptical response to results of the landmark randomized trial of repair versus replacement for ischemic mitral regurgitation in which recurrent mitral regurgitation in almost 60% of patients was reported 2 years after mitral repair; and the widely prevalent belief that, even if the investigators couldn't consistently achieve durable repairs, the rest of us possessed some secret sauce that would allow us to continue implanting downsized, annuloplasty rings to treat a disease of the ventricle with impunity.²

In this issue of the *Journal*, Misumi and colleagues³ examine their outcomes after downsized ring annuloplasty for secondary nonischemic mitral regurgitation. The authors report that 6 months after repair, mitral regurgitation was present in more than one third of patients and significantly more common (57%) in patients with a preoperative left ventricular end-diastolic diameter more than 2.4 times the diameter of the mitral annuloplasty ring. Increased left ventricular diameters were not associated with recurrent mitral regurgitation in multivariate analysis, and neither tenting height nor coaptation depth were analyzed.

From the Department of Cardiac Surgery, Cedars-Sinai Medical Center, Smidt Heart Institute, Los Angeles, Calif.

Disclosures: The author reported no conflicts of interest. Cedars-Sinai Medical Center receives honoraria from Edwards-Lifesciences and Medtronic for speaker and consulting activity.

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.

Received for publication May 30, 2021; revisions received May 30, 2021; accepted for publication June 1, 2021.

Address for reprints: Joanna Chikwe, MD, FRCS, Department of Cardiac Surgery, Cedars-Sinai Medical Center, Smidt Heart Institute, 8700 Beverly Blvd, Los Angeles, CA 90048 (E-mail: Joanna.chikwe@cshs.org).

J Thorac Cardiovasc Surg 2021; ■:1-2

0022-5223/\$36.00

Copyright © 2021 Published by Elsevier Inc. on behalf of The American Association for Thoracic Surgery

<https://doi.org/10.1016/j.jtcvs.2021.06.006>

Joanna Chikwe, MD, FRCS

CENTRAL MESSAGE

Severe left ventricular dilatation is associated with recurrent functional mitral regurgitation after downsized annuloplasty repair.

Is this ratio a useful new predictive tool that could inform decisions between mitral replacement, repair, and nonsurgical therapy? That depends on whether you believe it represents a statistical signal or noise. Only 66 patients were included, so the analysis is underpowered. This may explain why left ventricular dimensions per se were not associated with recurrent mitral regurgitation in multivariate analysis, even though in univariate analysis the average baseline left ventricular end diastolic diameter was 7.5 cm in patients with recurrent regurgitation, compared with 6.6 cm in those without ($P = .01$).

The small number of patients also means the findings could easily be explained by other chance variations or biases. For example, substantial interobserver variability in reading echocardiograms is well documented; this could contribute to the authors' findings.⁴ In addition, if there was more early mortality in patients with worse ventricular dilatation and mitral regurgitation, then a particularly large bias results from the authors' decision to exclude patients who died before the 6-month echocardiogram. The average mitral annuloplasty ring size (26) was similar in both groups so the findings suggest left ventricular dilatation may be an adverse prognostic marker, even if the study was underpowered to demonstrate this. Small studies can provide great insights, but the inherent limitations of small studies means that many prove unreproducible or wrong.

Meanwhile, the treatment paradigm for secondary mitral regurgitation is shifting away from surgery, driven by 2 randomized trials of transcatheter mitral repair versus pharmacotherapy that highlight the importance

of maximally tolerated medical therapy and the effectiveness of transcatheter repair in highly selected patients.⁵ That is a testament to the power of randomized data, physician and patient preference, and the sobering surgical outcomes so carefully documented here by Misumi and colleagues.

References

1. Carpentier A, Chauvaud S, Fabiani JN, Deloche A, Relland J, Lessana A, et al. Reconstructive surgery of mitral valve incompetence. Ten-year appraisal. *J Thorac Cardiovasc Surg*. 1980;79:338-48.
2. Goldstein D, Moskowitz AJ, Gelijns A, Ailawadi G, Parides MK, Perrault LP, et al. Two-year outcomes of surgical treatment of severe ischemic mitral regurgitation. *N Engl J Med*. 2016;374:344-53.
3. Misumi Y, Kainuma S, Toda K, Miyagawa S, Yoshioka D, Hirayama A, et al. Left ventricular to mitral valve ring size following ring annuloplasty for non-ischemic dilated cardiomyopathy. *J Thorac Cardiovasc Surg*. June 8, 2021 [Epub ahead of print].
4. Thaden JJ, Tsang MY, Ayoub C, Padang R, Nkomo VT, Tucker SF, et al. Association between echocardiography laboratory accreditation and the quality of imaging and reporting for valvular heart disease. *Circ Cardiovasc Imaging*. 2017;10:e006140.
5. Gelijns AC, Moskowitz AJ, O'Gara P, Giustino G, Mack MJ, Mancini DM, et al. Transcatheter mitral repair for functional mitral regurgitation: evaluating the evidence. *J Thorac Cardiovasc Surg*. March 21, 2020 [Epub ahead of print].