HHS Public Access

Author manuscript

Circulation. Author manuscript; available in PMC 2018 March 21.

Published in final edited form as:

Circulation. 2017 March 21; 135(12): e785–e786. doi:10.1161/CIRCULATIONAHA.117.026957.

Response to Letter Regarding Article: "Impact of Left Ventricular to Mitral Valve Ring Mismatch on Recurrent Ischemic Mitral Regurgitation after Ring Annuloplasty"

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We thank Dr. Pocar for his insightful comments regarding our study.[1] Several studies focusing on mitral valve (MV) annuloplasty in patients with ischemic mitral regurgitation (IMR) have highlighted a significant recurrence rate of IMR post procedure (>30% at 1-year).[2–4] One of the main mechanisms for this recurrence is the persistence of MV leaflet tethering following restrictive annuloplasty.[5]

MV annuloplasty using a downsized ring size according to inter-trigonal distance or anterior MV leaflet size may exacerbate posterior leaflet tethering, especially if the lateral wall of the LV remains displaced relative to the posterior edge of the mitral annulus. For the same implanted ring size, the larger the size of the LV, the greater the tethering of the posterior leaflet, owing to an increased distance between the papillary muscles and coaptation surface of the posterior leaflet. This can result in exacerbation of mitral leaflet tethering, preventing adequate mitral valve coaptation. The concept of LV-MV ring mismatch which is calculated as a simple ratio between LV end systolic dimension (LVESd) and ring size incorporates the underlying mechanism for recurrence of MR post ring annuloplasty as a measure of disassociation or mismatch between LV and MV apparatus spatial relationship and takes into account abnormalities in MV tethering.

In our large cohort of IMR patients, LVESd relative to the MV ring size (LVESd/ring size) was the only parameter reaching the significance level to predict recurrent IMR at 1-year, suggesting a better predictive value for LVESd/ring size as opposed to LVESd alone. These findings, in addition to the mechanistic basis linking the LV-MV ring mismatch and MV

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Disclosures:

None.

tethering, support the use of the LV-MV ring mismatch to determine patients with high risk of IMR recurrence instead of absolute LV dimensions. Although post-operative predictors are important evaluations mechanistically and prognostically, we focused on preoperative factors to help guide surgical decision making.

Even though our study had a relatively large cohort of IMR patients undergoing MV repair, the statistical analysis was underpowered to provide a definitive cut-off from a Receiver Operator Curve analysis to predict 1-year recurrence of IMR.

There are indeed discrepancies, albeit relatively small, between commercially ring size and real external septal-lateral diameter of the ring. However the choice of the ring size by surgeons is typically done using the labelled ring size provided by the manufacturer rather than the real dimensions of the ring, we therefore used the labelled ring size in order to make this concept more widely applicable.

In conclusion, the identification of patients most likely to benefit from MV repair is an important part of clinical decision making in the management of patients with ischemic mitral regurgitation. The concept of LV-MV ring mismatch provides a quantitative and easily measurable parameter in a clinical setting to stratify the risk of recurrent IMR following restrictive annuloplasty.

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