Effect of Annuloplasty for Mitral Valve Prolapse
Beyond the Annulus and Leaflet

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Mitral valve prolapse (MVP) is the most common cause of primary mitral regurgitation (MR), which represents leaflet or chordae elongation and is frequently accompanied by ruptured chordae. In almost all patients with this entity, annular dilatation is a common lesion. It is well known that the normal annulus has a unique saddle shape, but the saddle is flattened in MVP, and its dynamic characteristics are different from those of the normal annulus.

Fukuda et al clearly demonstrated that there is no difference anteriorly into the left atrium and potentially stretch the basal LV and reduced contraction in MVP using 2-dimensional trans-thoracic echocardiography and speckle tracking. One may have suspected that the posterior leaflet would prolapse superiorly into the left atrium and potentially stretch the basal LV wall, which would then affect basal LV contraction. However, Fukuda et al clearly demonstrated that there is no difference in basal wall motion between those with and those without a prolapsed posterior leaflet. They also demonstrated in patients with Barlow’s disease with myxomatous leaflets and bileaflet prolapse, no significant difference was shown in the longitudinal strain between the basal anteroseptal wall where is no connection to the leaflets and the wall connected to the leaflets. They demonstrated that the reduction of basal wall motion was proportional to the annular dilatation but not associated with LV ejection fraction or MR volume, suggesting that annular dilatation is associated with basal LV abnormality in MVP.

One of the most interesting speculations from the findings by Fukuda et al was that annuloplasty possibly improves the basal LV wall motion. In the presence of severe MR, because of the decreased afterload caused by the low impedance pathway of LV ejection into the left atrium, LV strain remains within normal or higher than normal, despite impairment in LV contractility. It is, therefore, natural that ejection fraction or global LV longitudinal strain may be reduced after surgery that eliminates the regurgitant volume. Fukuda et al reported that the postoperative reduction of the basal LV strain was attenuated compared with that of the mid and apical LV strain. This suggests that the basal LV wall motion was possibly improved by annuloplasty, or at least annuloplasty did not reduce the basal LV wall motion. This is a good news for surgeons who consider that annuloplasty somehow attenuates the basal LV wall motion, and mitral repair without annuloplasty may jeopardize late results.

Gillinov et al reported in their study with propensity-matched patients who underwent isolated posterior leaflet repair with 10-year follow-up that mitral repair without prosthetic annuloplasty increased postoperative MR, but did not seem to increase the risk of late reoperation or diminish survival. However, in their study, the majority of patients who did not receive a prosthetic annuloplasty were treated with bovine pericardium annuloplasty or suture annuloplasty. Recently, Dr Alfieri’s group reported at 12-years follow-up in degenerative MR patients who underwent an isolated edge-to-edge leaflet suture without any annuloplasty that freedom from reoperation was 57.8% and freedom from recurrence of more than mild MR was 43%. They concluded that the overall long-term results of the surgical edge-to-edge technique without annuloplasty are not satisfactory.

Fukuda et al clearly demonstrated the difference of the LV wall motion pattern between normal subjects and MVP using 2-dimensional speckle tracking technique. Two-dimensional speckle tracking technique has been widely accepted as a tool for the evaluation of LV contraction, providing incremental information in clinical settings. It is essential for speckle tracking technique to acquire an optimal image. The tracking quality becomes suboptimal if the myocardium is poorly visualized. Even if the image is optimal enough, it is sometimes difficult to precisely identify the mitral annulus throughout the cardiac cycle even visually. Through-plane motion is another issue, which may lead to misinterpretation, especially, in apical strain assessment. Three-dimensional approach may be an alternative to overcome these problems, but 3-dimensional speckle tracking itself still has several issues to be solved, such as stitch artifact or limited temporal and spatial resolution of the 3-dimensional image.

Novel percutaneous approaches for mitral repair, such as Mitral clip or neochord reconstruction techniques, have been produced. Patient selection need to be carefully performed because those procedures do not include annuloplasty. Fukuda et al’s results provide us favorable effects of annuloplasty; however, further investigations are encouraged to assess the long-term effects of annuloplasty for LV function and also to prospectively compare patients with and without annuloplasty for mitral repair.
Disclosures

None.

References


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