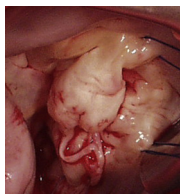


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IS THE FATE OF THE ANTERIOR LEAFLET DETERMINED BY ORIGINAL SIN OR BY THE WEAKNESS OF MAN?

To the Editor:

I support the important findings of Brescia and colleagues¹ regarding the feasibility of routinely achieving successful repair of degenerative anterior mitral leaflet (AML) disease. They compared 309 patients with AML disease, and 309 with posterior leaflet (PL) disease. AMLs were repaired with polytetrafluoroethylene (PTFE) neochords (51%), chordal transposition (33%), leaflet resection (24%), and a semirigid partial ring annuloplasty. They found no significant differences in outcomes up to 15 years after surgery.

During 1999, I started a transition from Carpentier techniques to PTFE neochordae to the AML with fully flexible annuloplasty rings.² In 152 AML repairs between 1983 and 2004, PTFE neochords were used in 85% of patients with no differences with PL in reparability, reoperations (92% freedom at 3 years), or recurrent mitral regurgitation (MR) (6% by echocardiogram at 3.2 ± 3.3 years). In 2016, we reported on 301 patients with AML operated on between 2001 and 2014.³ No leaflet resections were performed. Repair rate was 100% for AML, bileaflet, Barlow's, and PL. At 26 months (range, 1-113 months) the reoperation rate of 4% and 90% probability of no 3+ or 4+ MR by echocardiogram at 5 years were similar to the 451 PL patients.

These results and those of Brescia and colleagues¹ suggest there are no intrinsic properties of AMLs that make a properly performed repair less feasible or durable.



However, compared with PL, the AML and annulus have very different anatomy and function. Unlike PLs, which can tolerate substantial resection, almost any loss of AML area by resection or plication can have major effects on its normal contour and motion. Because of the highly dynamic motion of the aortic-mitral continuity to which its annular margin is attached, inhibition of motion or distortion of the anterior mitral annulus can affect leaflet apposition or cause systolic anterior motion.

Brescia and colleagues¹ have successfully adopted neo-chordal replacement as a substitute for leaflet resection or chordal transposition. We did the same and recognized its superior results and ease of use immediately. They accomplished satisfactory annular function by the use of partial bands that largely do not inhibit the motion of the anterior annulus. We have used a fully flexible adjustable annuloplasty ring for reasons described elsewhere.³

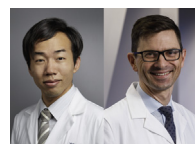
These authors have achieved excellent results. I agree with their conclusion that all degenerative AMLs should be repairable.

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REPLY: GENERALIZABILITY OF EXPERT OUTCOMES

Reply to the Editor:

We appreciate the comment on our article.¹ Lawrie has outlined his excellent outcomes of anterior mitral leaflet repair to support the notion that anterior mitral leaflet repair is safe and durable. We agree that it is possible to safely repair anterior mitral valve leaflets; however, applying the data from a specialized referral center to conclude that such repair is routinely feasible should be accompanied by a proper conditional statement. The value of such reports coming out of referral centers showing excellent outcomes is to benchmark what can be achieved when all the proper resources and experience align to treat complex patients and pathologies. Expert



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mitral valve surgeons should be expected to successfully repair both anterior and posterior leaflet pathology, but the same expectation should not be applied to less experienced surgeons.

We believe that a conservative and safe interpretation of such highly contextualized reports is that the safety of anterior mitral leaflet repair is conditional to the surgeon's and the center's expertise. Variable performance across centers and volume as a useful surrogate have been demonstrated for a long time in cardiac surgery,² specifically including mitral valve repair.³ If one desires to generalize the outcome of a report from an expert center, we must make active efforts toward case regionalization. This is all the more pertinent in mitral valve pathology where the vast majority of the US population lives within a reasonable distance from a referral center and regionalization may be feasible.⁴

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REPLY: NO SECRETS WITH THE ANTERIOR MITRAL LEAFLET

Reply to the Editor:

Mitral valve repair is the procedure of choice in patients with severe mitral regurgitation caused by degenerative mitral valve

disease. Although resection and creation of artificial chordae provide generally equivalent results in those with posterior leaflet prolapse,¹ this dictum does not hold for anterior leaflet prolapse. Like Drs Lawrie² and Bolling,³ virtually all experienced surgeons rely on artificial chordae (with an annuloplasty) to correct anterior leaflet prolapse.^{3,4} Other approaches to the anterior leaflet have important drawbacks. Anterior leaflet resection is almost never appropriate, as this approach reduces the surface area of the anterior leaflet and diminishes the probability of creating a competent, non-stenotic mitral valve. Chordal transfer generally requires detachment and transposition of a portion of the posterior leaflet, an unnecessarily complex procedure. Finally, the edge-to-edge technique can leave patients with some degree of mitral stenosis.

When creating artificial chordae, certain principles apply. Chordae should not cross the valve's midline in their path from the papillary muscle head to the free edge of the leaflet. We generally recommend affixing the chordae to a posterior papillary muscle head, as this moves the point of coaptation away from the left ventricular outflow tract and reduces the risk of systolic anterior motion. Many patients with isolated anterior leaflet prolapse have a small and restricted posterior leaflet; in such patients, we favor a complete annuloplasty ring that is undersized by 1 or 2 sizes to create enough posterior support for the coaptation. Finally, great care must be taken to ensure proper chordal length. If premeasured loops are employed, chordal length is based on the length of a normal chord to an adjacent region of the anterior leaflet. If free-hand chordae are created, it is useful to judge chordal length by considering a reference point that is not diseased; the P1-A1 region often suffices in this regard.

By following these principles, the surgeon can virtually always achieve an excellent mitral valve repair in the patient with anterior leaflet prolapse.

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