Response to Letter to Editor Regarding: Equivalent outcomes with minimally invasive and sternotomy mitral valve repair for degenerative mitral valve disease. J Card Surg. 2021; 36:2636-43.

Ramsey Elsayed[1], Brittany Abt[1], and Michael Bowdish[1]

[1]University of Southern California

November 20, 2021

Response to Letter to Editor Regarding: Equivalent outcomes with minimally invasive and sternotomy mitral valve repair for degenerative mitral valve disease. J Card Surg. 2021; 36:2636-43.

Authors: Ramsey S. Elsayed, MD MS[1], Brittany Abt, MD[1], and Michael E. Bowdish, MD MS[1,2]

Institutions and Affiliations: [1]Division of Cardiac Surgery, Department of Surgery, Keck School of Medicine of USC, University of Southern California, Los Angeles, CA, USA

[2]Department of Preventive Medicine, Keck School of Medicine of USC, University of Southern California, Los Angeles, CA, USA

Address for Correspondence: Dr. Michael E. Bowdish, Associate Professor of Surgery and Preventive Medicine; Department of Surgery, Keck School of Medicine of USC; University of Southern California; 1520 San Pablo Street, HCC II Suite 4300; Los Angeles, CA 90033; Phone: (323)-442-5849; Email: Michael.Bowdish@med.usc.edu

Conflicts of Interest/Competing Interests: None

Funding: Research reported in this publication was supported by the Department of Surgery of the Keck School of Medicine of USC. MEB is partially supported by UM1-HL11794 from the National Heart Lung and Blood Institute of the National Institutes of Health.

To the editor,

We would like to thank Song et. al. for their letter regarding our recent publication in the Journal of Cardiac Surgery titled "Equivalent outcomes with minimally invasive and sternotomy mitral valve repair for degenerative mitral valve disease"[1]. They asked some important questions and brought up valuable points that are worthy of discussion.

Regarding the selection criteria we use for operative approach for mitral valve repair operations, it is primarily based on collective surgeon-patient decision making. However, patients with a previous history of cardiac surgery or peripheral vascular disease (which would render peripheral cannulation difficult), and those in need of concomitant cardiac procedures such as coronary artery bypass grafting, aortic replacement, or biatrial ablation, are not offered a minimally invasive approach. Regarding the role of artificial chordae (neochordae) in mitral valvuloplasty, we use elongated polytetrafluorethylene made of interrupted GoreTex (Gore-Tex, WL Gore and Associates, Inc., Flagstaff, AZ) sutures placed in a horizontal mattress fashion. These neochordae are routinely used to repair elongated or ruptured chordae causing mitral valve prolapse or regurgitation.[2] Typically, the neochordae are used in the anterior leaflet of the mitral valve. The etiologies of degenerative mitral valve disease are comprised of myxomatous degeneration of the MV, fibroelastic deficiency including

so called Barlow's valves, and dystrophic calcification of the mitral annulus.[3] While the etiologies are not mutually exclusive and may overlap, myxomatous degeneration and fibroelastic deficiencies resulting in severe, symptomatic MR were the most common indications for operation in our patient population. As mentioned by Song and colleagues, the success and durability of MVr can vary depending on etiology, particularly on how much of the valve apparatus is affected by pathology. While not examined in this paper specifically, previous papers (including Tatum et al. conducted at our institution), have demonstrated that anterior leaflet repair is significantly associated with recurrence and progression of MR after surgery, whereas isolated posterior repair is protective.[3,4]

The operative team was similar in all cases, whereas the senior author (VAS) performed over 85% of the total procedures and nearly 100% of the minimally invasive procedures. The success rate of the minimally invasive cohort was 100% (as defined by the Society of Thoracic Surgeons). There was one conversion to conventional sternotomy in the minimally invasive cohort (.003%) for bleeding control.

Finally, Song and colleagues are to be congratulated on their robotic and thoracoscopic mitral valvuloplasty results. Their 10-year total robotic mitral valve valvuloplasty results showing excellent cardiac function with 93% of patients in NYHA classes I and II.[5] Furthermore, their early thoracoscopic results were very good with one operative mortality and only two reoperations demonstrating thoracoscopic mitral valvuloplasty is a technically feasible, safe, effective, and reproducible technique.[6]

References:

1. Bowdish ME, Elsayed RS, Tatum JM, Cohen RG, Mack WJ, Abt B, Yin V, Barr ML, Starnes VA. Equivalent outcomes with minimally invasive and sternotomy mitral valve repair for degenerative mitral valve disease. J Card Surg. 2021 Aug;36(8):2636-2643. PMID: 33908645.
2. Bortolotti U, Milano AD, Frater RW. Mitral valve repair with artificial chordae: a review of its history, technical details, long-term results, and pathology. Ann Thorac Surg. 2012 Feb;93(2):684-91. PMID: 22153050.
3. David, Tirone E. "Durability of mitral valve repair for mitral regurgitation due to degenerative mitral valve disease." *Annals of cardiothoracic surgery* 4.5 (2015): 417.
4. Tatum, James M., et al. "Outcomes after mitral valve repair: a single-center 16-year experience." *The Journal of thoracic and cardiovascular surgery* 154.3 (2017): 822-830.
5. Zhao H, Gao C, Yang M, Wang Y, Kang W, Wang R, Zhang H. Surgical effect and long-term clinical outcomes of robotic mitral valve replacement: 10-year follow-up study. J Cardiovasc Surg (Torino). 2021 Apr;62(2):162-168. PMID: 33302613.
6. Cui H, Zhang L, Wei S, Li L, Ren T, Wang Y, Jiang S. Early clinical outcomes of thoracoscopic mitral valvuloplasty: a clinical experience of 100 consecutive cases. Cardiovasc Diagn Ther. 2020 Aug;10(4):841-848. PMCID: PMC7487400.