RESPECT VERSUS RESECT: TWO DIFFERENT REPAIR TECHNIQUES OR TWO DIFFERENT TOOLS IN THE TOOLBOX?

To the Editor:

With great interest, we read the systematic review and meta-analysis of chordal replacement versus leaflet resection for posterior mitral leaflet prolapse by Mazine and colleagues.¹ The authors compare the results of both techniques in pooled analyses of 1 randomized controlled trial and 7 observational studies. As the authors acknowledge, the literature on this topic is scarce and the conclusions are hypothesis generating. Nevertheless, the authors speculate that chordal replacement might be associated with greater freedom from reoperation and improved postoperative left ventricular function compared with leaflet resection.

The observed difference in the freedom from reoperation needs to be interpreted with care. The authors¹ speculate that (functional) mitral valve stenosis might occur with the leaflet resection techniques. The observed difference in the freedom from reoperation is driven largely by the data from studies by Lange and colleagues² and Seeburger and colleagues³ that combined 1067 patients who underwent valve repair for posterior leaflet prolapse. Of importance, no reoperations due to mitral valve stenosis were reported in the resection group. Moreover, most reoperations were performed shortly after the initial operation, indicating technical failure. Indeed, ring dehiscence was the most common cause of reoperation. Although not reported as a cause of reoperation, determining the optimal length of neochoords can be challenging and may also result in early repair failure. It should be kept in mind that even “classic” leaflet resection is not a single surgical technique and ranges from limited triangular resection, quadrangular resection with leaflet sliding, to quadrangular resection with annular plication (nowadays seldom in use). Hypothetically, elevated gradients could result from excessive leaflet resection (impairing leaflet motion) and are thus possibly related to the technical execution of the resect technique rather than the technique itself. Furthermore, because ring sizing is based on the

FIGURE 1. A systematic “respect and resect” approach to posterior leaflet prolapse.

surface area of the anterior leaflet, the larger annuloplasty ring sizes found in the respect group indicate larger mitral valve orifice areas. In our experience, both techniques remain of high value, and a comprehensive approach to posterior leaflet prolapse will be adapted to valve-specific characteristics, in particular to the presence of excessive tissue in height or width (Figure 1). In certain situations, the resect will be preferred (eg, annular calcification or excess tissue in width), whereas in other situations (eg, leaflet prolapse/flail with no excessive tissue or excessive tissue in height only) the respect technique might be preferred. Last, the type of annuloplasty device could cause unwanted, clinically significant functional mitral valve stenosis, and possibly, partial or flexible devices should be favored in cases of a small mitral valve annulus.⁴ Further studies are needed to identify the predictors of clinically significant (functional) mitral valve stenosis after valve repair.

The surgical approach to posterior leaflet prolapse has evolved, and a durable valve repair should be feasible in nearly all patients today. Even with the respect techniques, leaflet resection for excessive tissue in width will still be needed frequently.⁵ The respect and resect techniques are to be seen as powerful tools that all lead to the same goal.

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References

1. Mazine A, Friedrich JO, Nedadur R, Verma S, Ouzounian M, Jüni P, et al. Systematic review and meta-analysis of chordal replacement versus leaflet resection

Authors have nothing to disclose with regard to commercial support.

for posterior mitral leaflet prolapse. *J Thorac Cardiovasc Surg.* 2018;155:120-8.e10.

2. Lange R, Guenther T, Noebauer C, Kiefer B, Eichinger W, Voss B, et al. Chordal replacement versus quadrangular resection for repair of isolated posterior mitral leaflet prolapse. *Ann Thorac Surg.* 2010;89:1163-70.
3. Seeburger J, Falk V, Borger MA, Passage J, Walther T, Doll N, et al. Chordae replacement versus resection for repair of isolated posterior mitral leaflet prolapse: a egalite. *Ann Thorac Surg.* 2009;87:1715-20.
4. Mesana TG, Lam BK, Chan V, Chen K, Ruel M, Chan K. Clinical evaluation of functional mitral stenosis after mitral valve repair for degenerative disease: potential affect on surgical strategy. *J Thorac Cardiovasc Surg.* 2013;146:1418-25.
5. Perier P, Hohenberger W, Lakew F, Batz G, Urbanski P, Zacher M, et al. Toward a new paradigm for the reconstruction of posterior leaflet prolapse: midterm results of the “respect rather than resect” approach. *Ann Thorac Surg.* 2008;86:718-25.

<https://doi.org/10.1016/j.jtcvs.2017.09.085>

FIGURE 1. Publications by year in PubMed with search terms of “meta-analysis” and “cardiac surgery.” Asterisk indicates that 2017 includes publications from January through August only.

MITRAL VALVE REPAIR WITH RESECTION VERSUS NEOCHORDAE: A CALL FOR HIGH- QUALITY EVIDENCE Reply to the Editor:

We thank Tomšič and colleagues for their comments on our article¹ and agree with their assessment of our study. Specifically, we acknowledge the paucity of comparative data in the literature between leaflet resection and chordal replacement mitral repair techniques, and we emphasize that our study should be regarded as hypothesis generating.

A systematic review and meta-analysis can be a useful tool in evidence-based medicine, and a crude search on PubMed for the terms “meta-analysis” and “cardiac surgery” by year illustrates the exponential increase in use of this tool to offer insights in our field (Figure 1). The systematic review itself is helpful to compile the known literature of articles that aim to address a specific question. Meta-analysis of data from multiple studies allows the calculation of point estimates from a pooled analysis, which can be more precise than the individual studies. Meta-analysis can also be a blunt tool, however, with the potential to introduce bias, and the results must be interpreted with caution.² For a meta-analysis to be meaningful, the studies should be sufficiently homogeneous with respect to subjects, interventions, and outcome measures.

With respect to subjects, we chose to include studies of patients undergoing isolated posterior leaflet prolapse, the most common mechanism of mitral insufficiency. As Dr. Tomšič and colleagues point out, we could not distinguish between possible etiologies of mitral regurgitation—

fibroelastic deficiency versus myxomatous disease—which are often addressed with different repair techniques. Although there were some differences in baseline characteristics between the neochordae and resection groups in the observational studies, however, the groups were comparable with respect to age. This is important, because patients with myxomatous disease typically present at a younger age than those with fibroelastic deficiency. The single propensity-matched study included in this meta-analysis did not match according to leaflet pathology, but it did show similar patient baseline characteristics. Finally, in the only prospective randomized trial included in this meta-analysis, all subjects were deemed amenable to repair with either technique before randomization.

With respect to interventions, we agree that there is much art to the mitral repair with both techniques, including the amount of leaflet to resect, the length and number of neochordae, and choice and size of ring. As Tomšič and colleagues highlight in their central illustration, a successful mitral valve repair depends on the surgeon’s ability to recognize the etiology of mitral disease, the lesions that result from the disease, and the leaflet dysfunction produced by these lesions. The mitral surgeon must then apply the appropriate repair techniques, tailored to the individual valve’s morphology and function. Such a tailored approach requires skill and experience. It is worth noting that most of the studies included in this meta-analysis were performed in high-volume, expert centers.

The initial inspiration for this study were reports by the Ottawa Heart Institute group demonstrating that patients with leaflet resection may be at risk for functional mitral stenosis.^{3,4} This refers to an elevated gradient across a repaired mitral valve with exercise or physiologic stress, resulting in functional limitation and possibly heart failure. This clinical entity is particularly relevant for young, active adults who can generate large transmitral