

Which method should be used for demonstrating the improvement in left ventricular pump function in isolated mitral valve surgery?

İzole mitral kapak cerrahisinde sol ventrikül pompa fonksiyonundaki iyileşmeyi göstermek için hangi yöntem kullanılmalıdır?

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Dear Editor,

Onan et al.^[1] reported their experiences in mitral valve repair surgery. As a reader deeply interested in mitral valve repair surgery, such articles about the results of repair^[1] or interventions^[2] in mitral valve performed in our country in particularly are definitely pleasing. We appreciate authors for the great efforts performed during the mitral valve repair surgery. Herein, we also would like to make some contribution and discuss the results of the study.

Initially, classifying the terms with the 'pathophysiological triad' including 'Etiology', 'Lesion' and 'Dysfunction', as first described by Dr. Carpentier, would be suitable for gaining a better understanding and communication among cardiologists and surgeons. With this regard, the term of 'pathology' was used in the article to define not only the 'lesion', but also the 'etiology' and 'dysfunction'. These terms are completely different from each other in meaning. Moreover, the myxomatous etiology is used for defining

the structural deterioration, specifically in Barlow's disease. In other words, the term of 'myxomatous etiology' should not be used for the definition of the degenerative diseases. Likewise, an isolated chordal rupture is a lesion, often observed in fibroelastic deficiency, but not a disease as depicted in Table 1^[1]. Similar examples can be withdrawn from the article. It is obvious that aforementioned issues make the article more complicated for analyzing the results.

The second point to be discussed is that which echocardiographic measurement method should be used to demonstrate improved left ventricular pump function. In general, the left ventricular ejection fraction (LVEF) is widely accepted measurement method for determining the pump function. The LVEF is a simple measure of how much of the end-diastolic volume is ejected or pumped out of the LV with each contraction. However, this method is readily influenced by loading conditions of LV.^[3] This issue was also confirmed by the authors,^[1] since the expected improvement in LVEF could not be achieved in the postoperative period (LVEF in preoperative, early postoperative and late postoperative periods were 54.3±9.7, 52.0±9.3, and 52.3±10.0, respectively), whereas expected decreases in dimensions were achieved. Basically, there are two ways for the calculation of LVEF, including M-mode calculation and modified biplane Simpson calculation. M-mode calculation directly depends on the percentage of fractional shortening of the square of the short and long axes of left ventricle, which are not related to 'regurgitant fraction'. On the other hand, the Simpson calculation directly depends on the left ventricular volume changes without considering 'regurgitant fraction' observed in mitral insufficiency. That is the reason why expected improvement in LVEF could not be achieved in postoperative period. With this regard, M-mode calculation or fractional shortening may be preferred for determining myocardial contractility in isolated mitral insufficiency. In a different point of view, regurgitant fractions should be taken into account while calculating LVEF in the Simpson method preoperatively in isolated mitral insufficiency. Similarly, ventricular outflow tract systolic acceleration (LVOTAcc) which reflects changes in the LV contractility independently from the loading conditions,^[3] or preoperative and



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postoperative volume changes in LV or stroke volumes should be considered in determining the affectivity of performed mitral surgery.

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Author's Reply

To the Editor,

We read with great interest the additional commentary of the author on our recent study. In this study, we reported the outcome of mitral valve repair in different valve pathologies and our clinical results in 100 consecutive patients.^[1] We would like to thank the authors for their invaluable and kind contributions to our report on mitral valve repair procedures.

In our study, the preliminary results of different valve pathologies including ischemic, rheumatic and degenerative were presented. The major aim of this study was to present the feasibility of mitral valve repair in different valve etiologies as well as to encourage

both cardiac surgeons and cardiologists to increase the number of repair procedures in Turkey. As stated by the authors, clinical classification systems help clinicians to communicate in the same fashion within a similar aspect of the subjects or topics. We agree with the author in the fashion that the study includes a relatively heterogeneous population and subtitles. Classifying the terms with the 'pathophysiological triad' including 'Etiology', 'Lesion' and 'Dysfunction' might contribute to the refined study results.

As highlighted in your letter, there are different options in echocardiographic examinations to assess left ventricular function after mitral valve repair such as EF or ventricular outflow tract systolic acceleration. Definitely, it is important to exclude left ventricular loading conditions or parameters that affect optimal calculation of the left ventricular performance after mitral valve repair. This can be considered a limitation of our study. Although the left ventricular end-diastolic and end-systolic diameters significantly decreased after repair procedures, we could not show the actual improvement in left ventricular performance. As mentioned, preoperative and postoperative volume changes in LV or stroke volumes should be considered in determining the affectivity of performed mitral surgery. On the other hand, the population of our study was relatively heterogeneous, not an isolated mitral repair group. A total of 35% patients had coronary artery bypass grafting and 34% had tricuspid valve surgery. Therefore, the echocardiographic results in this study might be influenced by heterogeneous etiologies of the patients.

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