Valve Endocarditis, to repair or not to repair, is that really the question?

Michele Di Mauro[1], Giorgia Bonalumi[2], Antonio Calafiore[3], and Roberto Lorusso[4]

[1]Maastricht UMC+
[2]Centro Cardiologico Monzino Istituto di Ricovero e Cura a Carattere Scientifico
[3]Henry Dunant Hospital, Athens, Greece
[4]Maastricht University Medical Centre

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Abstract

The meta-analysis by He and collaborators [has the worth to cover, as much as possible, a gap of scientific evidence where conducting a randomized trial appears very complex for ethical and logistical reasons. The authors concluded that mitral valve repair (MVP) provide better pooled results, both early and late, with respect to mitral valve replacement (MVR). However, the superiority of MVP is driven by some single large cohort-studies where surgeons had wide experience in the field of MVP for IE. This finding is also confirmed by other studies. But if mitral repair produces such a better short- and long-term survival than replacement, why are there no clear indications from consensus and guidelines pushing surgeons toward the pursuit of a reconstructive procedure at almost any cost? We wonder but to repair or not to repair, is that really the question? The AATS consensus suggests to repair "whenever possible" but without providing more specific indications. If the two primary goals of surgery are total removal of infected tissues and reconstruction of cardiac morphology, including repair or replacement of the affected valve(s), probably MVP as to perform in case of less extensive tissue detriment by the infection. In more wide valve involvement, MVP may be the choice but only in very expert hands and in Centers with very large volume of valve repairing. This decision cannot therefore be the result of the choice of an individual but must derive from a careful multidisciplinary discussion to be held in an EndoTeam.

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Michele Di Mauro (1), MD, PhD, MSC, FESC, Giorgia Bonalumi, MD (2), Antonio M Calafiore, MD (3), Roberto Lorusso, MD, PhD (1)

1. Cardio-Thoracic Surgery Unit, Heart and Vascular Centre, Maastricht University Medical Centre (MUMC), Maastricht, The Netherlands
2. Department of Cardiac Surgery, Centro Cardiologico Monzino, Milan, Italy
3. Division of Cardiac Surgery A, Henry Dunant Hospital, Athens, Greece

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Corresponding Author:

Michele Di Mauro, MD, PhD, MSC, FESC.

Cardio-Thoracic Surgery Unit,

Heart and Vascular Centre,

Maastricht University Medical Centre (MUMC),

P. Debyelaan 25, 6202 AZ

Maastricht, The Netherlands

Email:*mdimauro1973@gmail.com*

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If the two primary goals of surgery are total removal of infected tissues and reconstruction of cardiac morphology, including repair or replacement of the affected valve(s), probably MVP as to perform in case of less extensive tissue detriment by the infection. In more wide valve involvement, MVP may be the choice but only in very expert hands and in Centers with very large volume of valve repairing. This decision cannot therefore be the result of the choice of an individual but must derive from a careful multidisciplinary discussion to be held in an EndoTeam.

Keywords: mitral valve repair; mitral valve replacement; infective endocarditis

The meta-analysis by He and collaborators [1] has the worth to cover, as much as possible, a gap of scientific evidence where conducting a randomized trial appears very complex for ethical and logistical reasons. The conclusions come from the pooling analysis of 17 retrospective observational studies and looking at table 2 it is possible to deduce how the two cohorts in comparison are different; patients undergoing mitral valve replacement (MVR) showed higher prevalence of heart failure, which is considered a risk factor for worse outcome [2].

Concerning early mortality, although the pooled analysis is in favor of mitral valve repair (MVP), it can be observed that there are only two studies [3,4] leading to this cumulative result, and in particular the one by Toyoda et al [3] which is the only one including a very large cohort.

An interesting finding is the one plotted in the figure 3, where short-term mortality is similar in the two groups until 2010 and instead in the last decade appears significantly better in the MVP group, very likely due to the improvement of reconstructive techniques and the increase of centers with greater experience in the field [3]; in IE of native mitral valve, a successful valve repair can be achieved in 60-to-80% of patients, but the key to reach such a rate is the experience of the surgical team [5-7]

In several risk scores, the choice of procedure is not included among the risk factors [8-10]. In either Italian [8] and North American scores [10], the multivalve involvement was found to be prognostically unfavorable rather than a specific procedure used (repair versus replacement).

A similar meta-analysis was published in 2018 by Harky et al [11]. Where the pooled outcome of 8978 patients (14 articles) was evaluated; The authors Postoperative outcomes (30 days/in hospital events) such as bleeding (P = 0.0047) and recurrence of infective endocarditis

(IE) (P = 0.004) were significantly lower in the MVP group; the authors attributed the lower complication rate to a reduction in CPB time with repair versus replacement, but this can be true only in case of simple repair procedure.

In fact, the two primary goals of surgery are total removal of infected tissues and reconstruction of cardiac morphology, including repair or replacement of the affected valve(s) [12]. Hence, repair is favored when IE affects the mitral valve without an extensive destruction leaflets or in absence of an abscess; after an extensive debridement of the infected tissue, it is of paramount importance to assess of the valve in order to evaluate whether the remaining tissue is of sufficient quality to achieve a durable repair [13]

In the present meta-analysis [1],the study by Toyoda et al drives also long-term survival in favor of MVP, while no difference was found concerning long-term recurrence and reoperation.

Recurrences are rare following IE and may be associated with inadequate initial antibiotic therapy, resistant microorganisms, persistent focus of infection, i.v. drug abuse and chronic dialysis. Patients with IE must be informed of the risk of recurrence and educated about how to diagnose and prevent a new episode of IE. [12]

In Nationwide cohort study of mitral valve repair versus replacement for infective endocarditis [14], long-term results of two propensity-matched groups were reported; At a roughly 5-year follow, long-term mortality was 19.3% and 31% in the MVP and MVR, respectively, with the former having an approximately 50% reduced risk of death compared to the latter (hazard ratio [HR], 0.62; 95% confidence interval [CI], 0.46–0.850.8; P . .003). The Authors failed to evidence any significant difference in terms of reoperation between the two procedures.

However, the most important finding of this propensity-matched study is that patients receiving surgery in hospitals with the highest valve surgery volumes (HR 0.60, 0.40-0.90) benefited from MVP significantly, whereas those who received surgery in the lowest volume hospitals did not (HR 0.63, 0.31-1.27).

But if mitral repair produces such a better short- and long-term survival than replacement, why are there no clear indications from consensus and guidelines pushing surgeons toward the pursuit of a reconstructive procedure at almost any cost?

We wonder but to repair or not to repair, is that really the question?

In our opinion, the application of common sense in dealing with a valve disease presenting with so heterogeneous pathological pictures as to make difficult to standardize a procedural algorithm, is the best answer we can give to the latter question.

In this sense, we found that the AATS consensus [15] clearly stated that although MVP is the preferred choice, it has performed "whenever possible".

But what does actually mean "whenever possible"?

Browsing the literature, we probably found a possible answer to this doubt; Very recently, Rostagno [16] summarized the features that may lead surgeon towards either repair or replacement: single scallop or leaflet valve involvement, isolated vegetation, valve perforation, less extensive valve damage with enough tissue after debridement favor MVP, in all other cases we do not have to fear to implant a prosthesis

When valve replacement is required, there is little evidence that risk of recurrent infection is different between mechanical and tissue prostheses. The use of bioprosthetic valves may avoid postoperative anticoagulation, lowering the risk of hemorrhagic conversion of strokes and other bleeding complications.

So, in conclusion, the choice of technique in vase of MVIE depends on depends on unavoidable factors: extension of the infection, expertise of the surgeon, volume load of the Cardiac Center, age of the patient and his/her willingness to take medications, especially oral anticoagulation.

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