Functional Mitral Regurgitation of Atrial Origin: Search for Diagnostic Criteria

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Short editorial referring to the article: Development and Validation of a Predictive Model for Atrial Functional Mitral Regurgitation

Identifying the various mechanisms of Mitral Regurgitation (MR) is essential for understanding the disease, prognosis, and planning structural therapeutic approaches. Recently, several studies on valvular heart disease have recognized functional MR. This condition is associated with the impact of cardiac geometry on mitral valve function, rather than primary valvular injury such as rheumatic, degenerative, infectious (endocarditis), or congenital diseases.

Furthermore, within the group of patients with functional MR, a subgroup has been identified that does not present Left Ventricular (LV) dilation or dysfunction.[1] In this subgroup, the likely mechanism of MR is chronic enlargement of the Left Atrium (LA) and the mitral annulus, commonly associated with atrial fibrillation.[2] Preliminary studies suggest associated left atrial dysfunction, which can be measured through tissue mechanics analysis. These factors likely contribute to the reduction of the coaptation surface of the mitral leaflet edges.

Echocardiographic assessment of valve function, and not only of the pathological characteristics of the mitral valve components and annulus, is essential for suspecting MR, although in some cases the diagnosis remains subjective and based on the exclusion of other causes. Echocardiography (ECHO), even in its two-dimensional form, can evaluate LA dimensions and atrial function using the Speckle Tracking technique.[3] However, a more detailed analysis of valve anatomy, particularly of the annulus, requires more advanced assessments, such as two-dimensional transesophageal ECHO or three-dimensional (3D) imaging.[4,5] Nevertheless, the availability of 3D ECHO is still limited by equipment cost and the need for adequate training of echocardiographers.

The study published in this edition presents a diagnostic proposal for atrial MR using a variable derived from two-dimensional transesophageal ECHO. This variable is not merely the linear diameter of the mitral annulus, but its value indexed to body surface area. Importantly, the researchers did not restrict their evaluation to the diagnostic capacity of a single parameter, but rather to the combination of key parameters, including age, presence of atrial fibrillation, and comorbidities such as systemic arterial hypertension, together with ECHO parameters such as LV ejection fraction and indexed LA volume, associated with the indexed annular diameter. Using multivariate analyses and logistic regression, and comparing model performance with the consensus clinical diagnosis of two observers, the study demonstrated good performance of the model incorporating all variables.

Thus, there is a proposed predictive diagnostic model for atrial MR based on the combination of clinical variables and two-dimensional ECHO parameters. The results presented represent an initial proposal, which may in the future be tested against the performance of validated 3D ECHO variables for this diagnosis. It is necessary to evaluate functional MR using different diagnostic techniques in order to identify this subgroup of atrial MR, which is peculiar when compared with MR of left ventricular origin.

Keywords

Mitral Valve Insufficiency; Atrial Fibrillation; Echocardiography.

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References

1. Zoghbi WA, Levine RA, Flachskampf F, Grayburn P, Gillam L, Leipsic J, et al. Atrial Functional Mitral Regurgitation: A JACC: Cardiovascular Imaging Expert Panel Viewpoint. JACC Cardiovasc Imaging. 2022;15(11):1870-82. doi: 10.1016/j.jcmg.2022.08.016.
2. Muraru D, Guta AC, Ochoa-Jimenez RC, Bartos D, Aruta P, Mihaila S, et al. Functional Regurgitation of Atrioventricular Valves and Atrial Fibrillation: An Elusive Pathophysiological Link Deserving Further Attention. J Am Soc Echocardiogr. 2020;33(1):42-53. doi: 10.1016/j.echo.2019.08.016.
3. Tang Z, Fan YT, Wang Y, Jin CN, Kwok KW, Lee AP. Mitral Annular and Left Ventricular Dynamics in Atrial Functional Mitral Regurgitation: A Three-Dimensional and Speckle-Tracking Echocardiographic Study. J Am Soc Echocardiogr. 2019;32(4):503-13. doi: 10.1016/j.echo.2018.11.009.
4. Kagiyama N, Mondillo S, Yoshida K, Mandoli GE, Cameli M. Subtypes of Atrial Functional Mitral Regurgitation: Imaging Insights Into Their Mechanisms and Therapeutic Implications. JACC Cardiovasc Imaging. 2020;13(3):820-35. doi: 10.1016/j.jcmg.2019.01.040.
5. Ito K, Abe Y, Takahashi Y, Shimada Y, Fukumoto H, Matsumura Y, et al. Mechanism of Atrial Functional Mitral Regurgitation in Patients with Atrial Fibrillation: A Study Using Three-Dimensional Transesophageal Echocardiography. J Cardiol. 2017;70(6):584-90. doi: 10.1016/j.jjcc.2017.03.013.