

中文題目：二尖瓣閉鎖不全對左心房容量之影響

英文題目：The Influence of Mitral Valve Regurgitation on Left Atrial Volume

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**Background:** Enlargement of left atrium is a common finding during echocardiographic examination. Clinically, we know some illnesses can always lead to enlargement of left atrium, such as hypertensive cardiovascular disease, atrial fibrillation, mitral valve stenosis and mitral valve regurgitation. The purpose of this study was to investigate whether mitral valve regurgitation could serve as an independent causal factor of left atrial enlargement.

**Materials and Methods:** Conventional M-mode and two-dimensional color Doppler echocardiography was performed with Agilent SONOS 5500<sup>TM</sup>. Concentric left ventricular hypertrophy was defined as both the thickness of anterior and posterior wall measured more than 14mm. Subjects having concentric left ventricular hypertrophy, mitral valve stenosis or atrial fibrillation were excluded from our study. Color flow mapping was applied to determine the severity of mitral valve regurgitation. We divided the severity into 6 grades: "none", "trivial", "mild", "mild to moderate", "moderate" and "moderate to severe". Left atrial volumes were calculated with modified biplane Simpson's formula:  $8(A_1)(A_2)/3\pi(L)$ . Briefly speaking,  $A_1$  and  $A_2$  represented the maximal planimetered area of left atrium acquired from the apical four- and two-chamber views, respectively, and L was the length. In order to avoid inter-observer bias, all the measurements were made by a single physician. Among the groups of different mitral valve regurgitation grades, ANOVA and Student's t-test were done to test the difference of left atrial volumes. P value below 0.05 was considered as statistically significant.

**Results:** A total of 630 adult subjects were enrolled in this study. In the "none" group, left atrial volumes were  $47.4 \pm 16.0$ ml ( $n=195$ ). In the "trivial" group, left atrial volumes were  $49.6 \pm 17.9$ ml ( $n=93$ ). In the "mild" group, left atrial volumes were  $55.1 \pm 19.6$ ml ( $n=246$ ). In the "mild to moderate" group, left atrial volumes were  $68.6 \pm 25.7$ ml ( $n=38$ ). In the "moderate" group, left atrial volumes were  $81.4 \pm 24.9$ ml ( $n=55$ ). In the "moderate to severe" group, left atrial volumes were  $128.7 \pm 69.2$ ml ( $n=3$ ). Results of ANOVA revealed a significant overall difference of left atrial volumes with respect to the grades of mitral valve regurgitation ( $p < 0.001$ ). The more severe mitral valve regurgitation was, the larger left atrial volume would be. Subjects with higher grades of mitral valve regurgitation tended to get larger left atrial volumes. Then we analyzed the difference of left atrial volumes between two groups of neighboring grades using Student's t-test. The p values were significant in most comparisons except the setting of "trivial" vs. "none".

**Conclusions:** After elimination of other risk factors including hypertensive cardiovascular disease, mitral valve stenosis and atrial fibrillation, our research demonstrates a strong association between the severity of mitral valve regurgitation and left atrial volume. Mitral valve regurgitation plays a pathologic role in left atrial enlargement. In other words, it is reasonable that one with higher grade

of mitral regurgitation is expected to have a larger left atrium. As the severity of mitral valve regurgitation increases, left atrial volume increases. Moreover, even from "trivial" to "mild" grade, the change of left atrial volume is still remarkable and should not be neglected.