

Tissue Doppler Imaging of the S Wave in Mitral Valve Prolapse Syndrome

In-Cheol Kim, MD¹; Hyungseop Kim, MD^{1,*}

¹Division of Cardiology, Department of Internal Medicine, Keimyung University Dongsan Medical Center, Daegu, Republic of Korea

*Corresponding author: Hyungseop Kim, Division of Cardiology, Department of Internal Medicine, Keimyung University Dongsan Medical Center, Daegu, Republic of Korea. Tel: +82-53250799, Fax: +82-532507034, E-mail: khyungseop@dsmc.or.kr

Received: April 25, 2014; Accepted: May 13, 2014

Keywords: Mitral Valve Prolapse; Echocardiography; Doppler

Dear Editor,

The mitral valve prolapse (MVP) syndrome refers to a combination of various symptoms and clinical findings associated with the MVP (1). Mitral tissue Doppler imaging (TDI) represents the left ventricular (LV) systolic function, is a good surrogate for the diastolic function and can overcome the limitation of the mitral inflow, which is highly left atrial (LA)-volume dependent (2). In this article, Alizadehasl A et al. demonstrated that the Sm wave was prominent in the MVP group, compared to the normal control group (3). Moreover, Em was lower, and Am showed higher tendency. An increased E/Em implies an elevated LA volume and LV end-diastolic pressure (LVEDP). Taken together with these findings, all the other TDI findings in this investigation consistently indicated diastolic dysfunction in the patients with the MVP syndrome. Diastolic dysfunction in the MVP syndrome is well understood by the increased rigidity and decreased ability for relaxation because of increased preload, positive sympathetic feedback, and higher proportion of fibrin in the myocardium (4). With respect to the high Sm wave, the myocardial hypermobility seems to be a result of increased sympathetic nervous system activity and increased blood volume due to the mitral regurgitation flow. In addition, the decreased coronary blood flow and structural disarray near the MVP site resulted in a decreased response to exercise compared to that in normal subjects. However, the major focus of this investigation is the correlation between TDI and MVP. Is there a correlation between the prolapsed site and the lateral Sm wave, or does the degree of prolapse and mitral regurgitation impact on the Sm wave? According to a previous investigation, high spike systolic velocity was selectively seen on the posterolateral mitral annulus, which has low resistance compared to the an-

teroseptal mitral annulus interacting with the right ventricle (5). The correlation between the prolapsed site and the degree of the MVP and a prominent Sm wave has never been investigated. Moreover, the clinical implications of a prominent Sm wave observed in the patients with MVP have never been studied as regards further treatment strategy and prognosis. Based on the observations in this article, future investigations are required to provide further perspectives on these issues.

Acknowledgements

We would like to thank to the staff of the Cardiology Department in Keimyung University Dongsan Medical Center.

Authors' Contributions

In Cheol Kim and Hyungseop Kim both contributed to this article.

References

1. Hayek E, Gring CN, Griffin BP. Mitral valve prolapse. *Lancet*. 2005;365(9458):507-18.
2. Ho CY, Solomon SD. A clinician's guide to tissue Doppler imaging. *Circulation*. 2006;113(10):e396-8.
3. Alizadehasl A, Azarfarin R. Tissue Doppler Imaging Findings Including Prominent S Wave in Patients With Mitral Valve Prolapse Syndrome. *Arch Cardiovasc Imaging*. 2014;2(1):7-10.
4. Zampoulakis JD, Karavidas AI, Matsakas E, Lazaros GA, Karaminas NT, Fotiadis IN, et al. Tissue Doppler echocardiography reveals insufficient contractile reserve recruitment during effort in subjects with mitral valve prolapse and those with thick mitral valve. *Echocardiography*. 2006;23(2):114-9.
5. Dagdeviren B, Bolca O, Eren M, Akdemir O, Arikani E, Gurlertop Y, et al. An unusual pulsed-wave tissue Doppler pattern in mitral valve prolapse: spikes on systolic velocities. *Echocardiography*. 2002;19(5):367-72.