

## Editorial



# What Should We Do for Patients With Mitral Annular Calcification?

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### Conflict of Interest

The author has no financial conflicts of interest.

Mitral annular calcification (MAC) is a degenerative disorder in which there is accumulation of calcium in the mitral annulus.<sup>1</sup> MAC is related to the progression of mitral valve dysfunction and the future development of cardiovascular events and mortality.<sup>2</sup> Because of its anatomic proximity to the conduction system, an association between MAC and atrioventricular (AV) conduction disturbance has been suggested. Although the exact mechanism remains unclear, direct extension of MAC and fibrotic changes in the myocardium may cause conduction disturbance.<sup>2</sup> MAC is a common finding in the era of multimodality cardiac imaging. Echocardiography is commonly used to visualize MAC and evaluate its hemodynamic consequences in the mitral valve and cardiac chambers. Non-contrast computed tomography (NCCT) is superior than echocardiography in localizing MAC with higher specificity and in evaluating its severity.<sup>3</sup> However, most previous studies investigated the association between MAC and AV conduction disturbance using plain radiographs or echocardiography, and not NCCT.<sup>4</sup>

In an issue of the *Journal of Cardiovascular Imaging*, Rasmussen et al.<sup>5</sup> explored the correlation of MAC with cardiac conduction disturbances using a large population-based Danish cohort. The presence and severity of MAC were evaluated using cardiac NCCT with the Agatston method. The primary endpoint was implantation of a cardiac implantable electronic device due to AV conduction disturbance and conduction delay on electrocardiogram (ECG). Participants with pacemakers implanted due to AV conduction disturbance had more severe MAC compared to participants without pacemakers. In the analysis of the correlation between the severity of MAC and ECG findings, prolonged QRS interval was found to be significantly associated with the presence of MAC, while prolonged PQ interval was not. Notably, increased MAC severity on NCCT was independently associated with the future implantation of pacemakers due to AV conduction disturbances. This finding is consistent with those of previous studies that showed an association between MAC and AV conduction disturbance.<sup>6</sup> The Agatston method using NCCT is the gold standard calcium scoring method in clinical practice and is an important contribution to medical research. The Agatston method evaluates the calcium score by using density, area, and number of regions of interest.<sup>7</sup> Unfortunately, the authors were unable to identify the location of MAC and its association with AV conduction disturbance and acknowledged that further studies are needed to investigate the impact of the location of MAC on AV conduction disturbances.

Although this article supports the correlation between NCCT-based MAC score and significant AV conduction disturbance, the exact pathobiology of MAC requires further clinical research. Previously, MAC was considered as a chronic, degenerative tissue change; however, it has been recently recognized as a bioactive inflammatory and lipid deposition process. Cardiac magnetic resonance (CMR) imaging is a novel tool for identifying characteristics of tissues such as the myocardium. CMR images could demonstrate delayed enhancement in the myocardium along with MAC. It suggests that MAC-related fibrotic changes in the myocardium may induce AV conduction disturbances. Further CMR imaging studies are needed to determine the pathobiology of MAC, its impact on the myocardium, and its association with future development of AV conduction disturbance. A key question is “What should we do for patients with severe MAC?” This study was not a prospective study with regular follow-up ECGs. Further studies with prospectively collected ECGs may elucidate the real burden of AV conduction disturbance in patients with severe MAC. It can also provide when patients with severe MAC and/or ECG abnormalities should be referred to an electrophysiologist for cardiac pacing.

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