Correspondence

Response to Letter Regarding Article, “Myocardial Tissue Characterization Using Magnetic Resonance Noncontrast T1 Mapping in Hypertrophic and Dilated Cardiomyopathy”

We thank Ellims et al for their query about the consistency of results from the T1 mapping literature on hypertrophic cardiomyopathy. The letter serves well to highlight an important issue: the fundamental differences between native (or precontrast) T1 mapping and postcontrast T1 mapping as distinct techniques. Native myocardial T1 increases with conditions involving an increase in free water content, whereas postcontrast T1 typically decreases. Results and correlations derived from studies using these different biomarkers should not be expected to demonstrate a direct relationship. Single-time-point postcontrast T1 constitutes a momentary snapshot of the transient effect of the contrast agent on myocardial T1, subject to numerous technical and physiological factors such as the choice and dose of the contrast agent, measurement timing during dynamic redistribution of the contrast, renal function, and native T1 time. To minimize the effects of some of these variables, native T1 can be taken into account by calculating extracellular volume fractions from precontrast and postcontrast T1. However, recent research on this approach indicates growing complexity in the interpretation of postcontrast myocardial T1.

We are not convinced of the use of excluding regions with visual late gadolinium enhancement and then correlating the late gadolinium enhancement of the remaining myocardium in that segment with T1 values. The lack of correlation found by Ellims et al simply reflects the fact that late gadolinium enhancement is not a sensitive tool to detect diffuse changes; rather, late gadolinium enhancement and T1 maps measure different but overlapping aspects along the spectrum of pathological changes in the myocardium.

Precontrast T1 mapping may better reflect the native pathophysiological state of tissue and is a consistent, reproducible method with a tight normal range not confounded by the aforementioned variables, allowing its sensitivity to detect disease states.

Given the above, it is difficult to directly compare results from precontrast and single-time-point postcontrast T1 mapping studies. Future research will shed more light on clinical use of these techniques as biomarkers for health and disease.

Disclosures

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