DIAGNOSTIC ACCURACY OF MYOCARDIAL T1 MAPPING IN CARDIAC AMYLOIDOSIS

Poster Contributions
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Introduction: Amyloidosis is a systemic infiltrative disorder in which insoluble protein fibrils are deposited in the extracellular matrix (ECM). T1-mapping is a cardiac magnetic resonance (CMR) technique which allows absolute quantification of T1 values in the myocardium and allows assessment of ECM expansion.

Methods: Consecutive patients referred for CMR with a final diagnosis of cardiac amyloidosis (as defined by positive endomyocardial biopsy and/or typical, diffuse, predominantly subendocardial pattern of delayed contrast enhancement) were retrospectively analyzed. Clinical, electrocardiographic, and echocardiographic were collected. Indexed left ventricular (LV) volumes and mass, LV ejection fraction, and LV basal anteroseptal and inferolateral wall thicknesses were determined from cine CMR. Myocardial, endocardial, blood and skeletal muscle were quantified after Gd-DTPA administration on a previously validated Look-Locker sequence using dedicated software. Receiver operating curve (ROC) analysis was performed in order to evaluate the diagnostic accuracy of this technique.

Results: We included 125 patients (85 males [68%], age 68 ± 13 years) evaluated at 1.5 Tesla (n=59) or 3 Tesla (n=66). Patients with cardiac amyloidosis presented more frequently with low voltage, RBBB, had significantly worsening NYHA functional class and a more severe pattern of diastolic function compared to patients without cardiac amyloidosis. Myocardial and endocardial T1 times were lower in patients with cardiac involvement than in those without (table 1). T1 mapping had good diagnostic accuracy for the detection of cardiac amyloidosis (table 2), slightly better for 3.0 tesla. T1 endocardial/blood ratio T1 times from 3 tesla population presented the highest diagnostic yield (AUC= 0.859, 95% CI 0.756-0.963; p<0.001), (figure 1).

Conclusions: The ratio of endocardial/blood T1 times as quantified with T1-mapping provides an objective and quantitative method to demonstrate myocardial amyloid infiltration with good accuracy, as demonstrated by this large clinical series.