

ORAL PRESENTATION

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# Prognostic value of MRI T2 quantification in heart transplant patients: a 5-year outcome study

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## Background

Endomyocardial biopsy (EMB) is the current gold standard to monitor patients for heart transplant rejection. Quantification of myocardial T2 relaxation time using cardiac magnetic resonance (CMR) has been shown to have high sensitivity and specificity to detect rejection episodes. In this study, we evaluated the prognostic value of myocardial T2 to predict adverse cardiovascular outcomes during 5-year follow-up after initial CMR.

## Methods

49 cardiac transplant patients (mean age,  $48 \pm 14$  years; 65% male) were recruited from a single institution. CMR at 1.5T was performed in all patients, with subsequent quantifications of regional and global myocardial T2. Clinical data was gathered post-CMR over a 5-year period. EMBs were graded according to the International Society of Heart & Lung Transplantation criteria. Rejection episodes were defined by EMB  $\geq 2R$ , new onset heart failure (HF), LV ejection fraction  $< 40\%$ , or death. Adverse cardiovascular events gathered included coronary artery disease, cardiomyopathies, arrhythmias, and different types of HFs. Multivariable logistic regression and Kaplan-Meier analysis was performed to measure the prognostic value of myocardial T2.

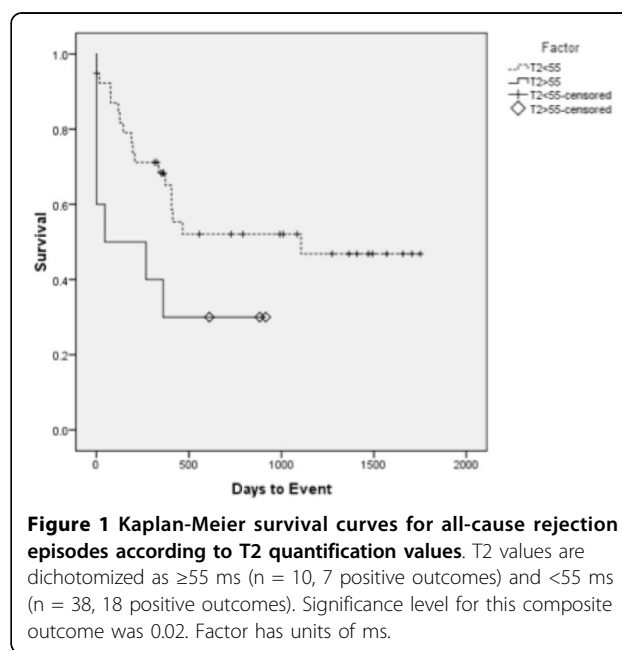
## Results

Myocardial T2 was found to increase with worsening EMB grade from 53.0 ms (0R, no rejection) to 59.9 ms (3R, severe rejection). ROC analysis using two groups (EMBs  $\leq 1R$  and  $\geq 2R$ ) showed T2 = 55.0 ms to have the highest specificity and sensitivity. In multivariable analysis that considered T2 measures, age, length of

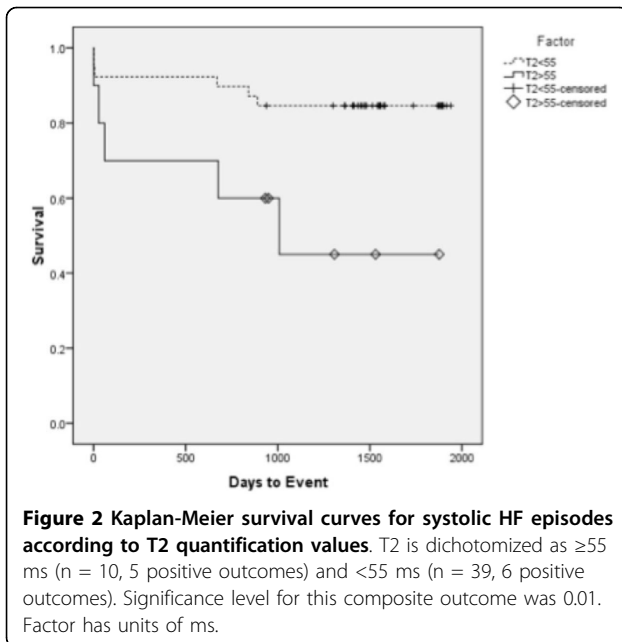
surgery, donor ischemic time, and BMI, both peak T2 ( $p = 0.038$ ) and septal T2 ( $p = 0.035$ ) were significant predictors of EMB grade  $\geq 2R$ . Kaplan-Meier analysis showed a significant higher probability of developing EMB  $\geq 2R$ , new onset HF, or death with a global T2  $\geq 55$  ( $p = 0.02$ ). Adverse cardiovascular outcomes of systolic HF, acute systolic HF, and chronic diastolic HF had a higher probability of developing in patients with global T2  $\geq 55$  ( $p = 0.01$ ,  $p = 0.01$ , and  $p < 0.01$ , respectively).

## Conclusions

CMR T2 quantification demonstrated prognostic value for all-cause rejection and various types of HFs in cardiac transplant patients. These findings suggest that



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CMR may be a suitable modality to non-invasively monitor cardiac transplant patients for rejection.

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