

Meeting abstract

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## 223 Adverse functional significance of delayed enhancement on cardiac MRI in primary systemic amyloidosis

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### Introduction

Primary systemic amyloidosis (AL), a plasma cell dyscrasia, is often associated with a fatal outcome if there is advanced cardiac involvement. Myocardial delayed enhancement (DE) has been reported on cardiac MRI but the functional significance of such finding is not established.

### Purpose

Our aim is to determine the functional significance of myocardial delayed enhancement (DE) on MRI by comparing systolic and diastolic function of AL patients with delayed enhancement (DE+) versus those without (DE-) using MRI and echocardiography.

### Methods

23 patients (11 females;  $61 \pm 10$  years) with biopsy-proven AL were grouped into DE+ (N = 17, 74%) and DE- (N = 6, 26%). Left ventricular ejection fraction (LVEF) and diastolic function (early diastolic filling rate DFR and early diastolic filling volume 1/3 FF on MRI, and ratio of early transmitral inflow to mitral annular velocity E/Em and deceleration time DT on echo) were compared. Automated simple linear curve fitting of early (first 1/3) diastolic filling curve was used to calculate DFR (slope of curve) and 1/3 FF was filling volume of first 1/3 of diastole.

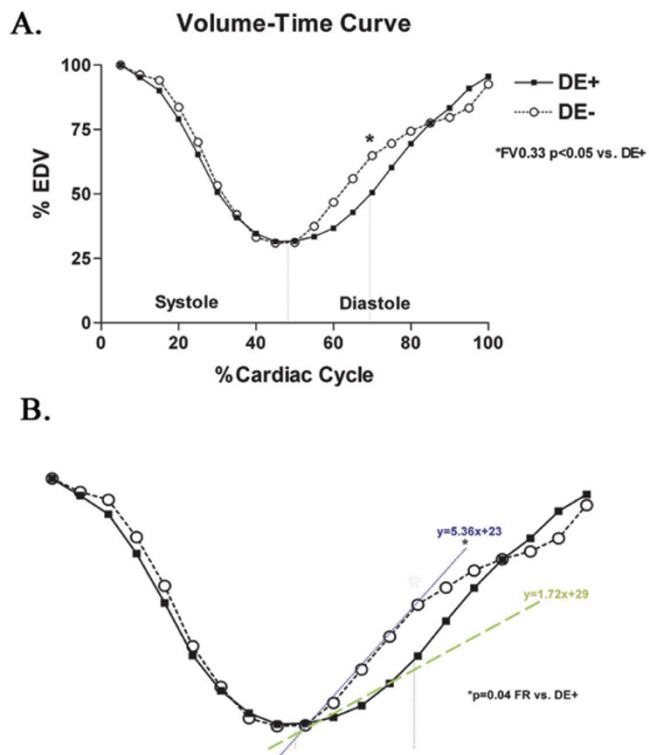
### Results

LVEF (DE+ vs. DE-:  $67.3 \pm 17$  vs.  $68.8 \pm 12\%$ , p = NS) was similar. However, DFR ( $1.7 \pm 2$  vs.  $5.4 \pm 3\%$  enddiastolic

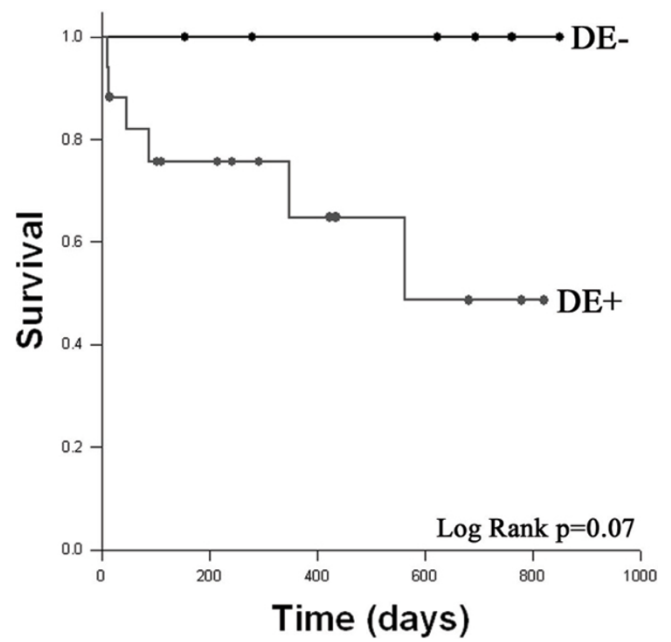
volume/% cardiac cycle, p = 0.04, Figure 1) and 1/3 FF ( $19.8 \pm 13$  vs.  $36.3 \pm 23\%$  enddiastolic volume, p = 0.03) were lower in DE+ patients. E/Em was higher in DE+ patients ( $17.4 \pm 9$  vs.  $7.9 \pm 3$ , p = 0.02) while DT was shorter ( $219 \pm 62$  vs.  $288 \pm 64$  ms, p = 0.03). There was a nonsignificant trend towards reduced survival in DE+ subjects ( $304 \pm 273$  vs.  $560 \pm 280$  days, p = 0.07, Figure 2).

### Conclusion

Delayed enhancement, present in 74% of AL patients, is associated with significant diastolic dysfunction and may be important for noninvasive evaluation of primary amyloidosis.



**Figure 1**  
The functional significance of delayed enhancement in primary systemic amyloidosis is not defined. We found amyloid patients with delayed enhancement on MRI have significant diastolic dysfunction compared to those without.



**Figure 2**