

preliminary data suggest that longitudinal strain measured by speckle tracking may be a powerful independent predictor of mortality in patients with primary amyloidosis and normal LV ejection fraction (5).

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doi:10.1016/j.jcmg.2010.05.008

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REPLY

We appreciate Dr. Ballo's letter concerning our recent article (1) on the prognostic significance of strain Doppler imaging in light-chain (AL) amyloidosis. The correspondent's major concern pertains to the perception that "established prognostic factors," such as left ventricular (LV) ejection fraction, New York Heart Association functional class, natriuretic peptide level, cardiac troponins, indexed left atrial volume, mitral annular velocity determined by pulsed tissue Doppler (TD) imaging, right ventricular function, and renal function, were not considered in our study.

We did not intend to suggest in our article (1) that strain imaging should be the sole technique for assessing prognosis in AL amyloidosis. Certainly, the prognostic value of cardiac biomarkers is well established, and these measurements may be useful in clinical assessment. However, the emphasis of our work is on cardiac function assessed by echocardiographic techniques. Our data were a continuation of our previous published work on this topic. As mentioned in the introduction to our study, we previously demonstrated that systolic dysfunction can be detected in cardiac amyloidosis by using strain/strain rate Doppler imaging, when dysfunction is not apparent by other echocardiographic techniques (2). No report on the prognostic value of strain and strain rate Doppler imaging in AL amyloidosis has yet been published; therefore, we further developed these methods to test the hypothesis that strain

and strain rate Doppler imaging may be additional tools for defining prognosis in this disease. Ejection fraction was addressed in our previous reports and showed no significant difference among the 3 groups studied (3,4); thus, we excluded the parameter from prognostic analysis. Mitral annular velocity was indeed assessed in the current study (early diastolic tissue velocity at base in Fig. 2, Table 2, and Table 3), but the prognostic value was found to be poor. Although renal function was not directly assessed, it is well recognized that cardiac involvement in AL amyloidosis is the predominant negative prognostic factor of any organ, a feature again noted in our study. The clinical impact of myocardial dyssynchrony has yielded conflicting results and needs to be validated in a large population of AL amyloidosis. In contrast to the more "traditional" prognostic factors described on echocardiography, strain imaging is highly sensitive to minor changes in cardiac function, and basal longitudinal strain value clearly detected differences of longitudinal LV myocardial deformation among the 3 groups. For this reason, we selected basal LV strain as a representative of LV longitudinal strain in contrast to mid- and apical LV strain. We are certainly interested in speckle tracking imaging, and LV torsion may be a key parameter as a prognosticator in AL amyloidosis (5). With current techniques of strain imaging, LV strain can be easily and quickly obtained and our data confirmed, and it may become a useful additional prognostic tool in this uncommon but potentially treatable disease.

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doi:10.1016/j.jcmg.2010.05.007

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