



Non Invasive Imaging (Echocardiography, Nuclear, PET, MR and CT)

USE OF DIASTOLIC PARAMETERS ON TRANSTHORACIC ECHOCARDIOGRAM TO PREDICT LEFT ATRIAL APPENDAGE THROMBUS IN PATIENTS WITH ATRIAL FIBRILLATION

Poster Contributions

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Background: In patients with atrial fibrillation, thrombus formation in the left atrial appendage (LAA) is typically diagnosed with transesophageal echocardiogram (TEE). The purpose of our study was to evaluate whether diastolic parameters on transthoracic echocardiogram (TTE) can predict LAA thrombi. We hypothesized that higher lateral e' velocities may be associated with more vigorous LAA contraction and thus a decreased risk of thrombus formation.

Methods: A case-control review was performed of the echocardiogram database at New York University Medical Center for all subjects with non-valvular atrial fibrillation ($n = 2262$) who had undergone TEE between 2010 and 2015 and had a TTE within 1 year of TEE. Cases of LAA thrombus were matched to controls in a 1 to 3 fashion by age, gender, ejection fraction (EF) and anticoagulation status. Baseline differences were assessed through stratified linear regression for continuous variables and conditional logistic regression for categorical ones. Conditional logistic regression analysis was used to assess the association between lateral e' velocity and LAA thrombus.

Results: Thirty-eight subjects (mean age 73 ± 12 , 63% male, EF 47%, 50% on anticoagulation) with a LAA thrombus were identified. In cases compared to controls, there was no difference in mean $CHA_2DS_2-VAS_c$ or their individual components (3.80 vs. 3.28 ; $p = 0.15$ for $CHA_2DS_2-VAS_c$). Compared to matched controls, lateral e' velocity (8.9 ± 2.4 cm/s vs. 10.2 ± 2.6 cm/s; $p < 0.01$), medial e' velocity (5.8 ± 1.7 cm/s vs. 7.3 ± 2.2 cm/s; $p < 0.01$), $E:e'$ ratio (13.7 ± 4.5 cm/s vs. 11.8 ± 4.6 cm/s; $p = 0.03$), and left atrial volume index (43.8 ± 16.2 ml/m² vs. 35.6 ± 12.6 ml/m²; $p = 0.01$) were all significant predictors of LAA thrombi. Analysis assessing the association between lateral e' velocity and LAA thrombus yielded an odds ratio of 0.80 (CI 0.69, 0.93; $p < 0.01$). A lateral e' value of less than 11 cm/s resulted in a 2.6 fold (CI 1.09, 6.14; $p = 0.03$) increased odds of a LAA thrombus. No patient with a lateral e' velocity over 13 cm/s had a LAA thrombus.

Conclusions: In individuals with atrial fibrillation undergoing TEE to rule out a LAA thrombus, reduced e' velocity on TTE represents a strong independent predictor of LAA thrombi.