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EFFECTIVE ECHO SCREENING AND INTER MODALITY AGREEMENT IN THE ASSESSMENT OF ASCENDING THORACIC AORTA DIMENSION

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10.1136/heartjnl-2020-BCS.60

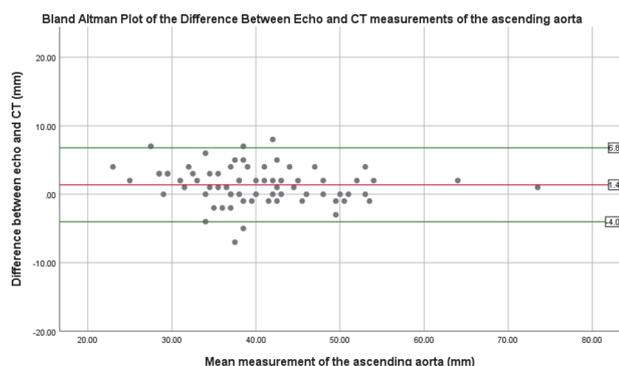
Introduction Accurate measurement and interval monitoring of the ascending aorta for at risk individuals are crucial for prevention of life-threatening complications. Echocardiography (echo) is the first line screening test. Positive results are referred for computed tomography (CT) or magnetic resonance imaging (MRI), both are considered gold standard methods for imaging the whole aorta. These tests involve radiation (CT) and contrast (CT & MRI) exposure. An effective screening echo streamlines subsequent referrals to CT and MRI.

Several published references (1,2,3) are in clinical use. Measurements are normalised to body surface area (1,3), height (2), gender (2,3) and age (3). The aims of this study were:

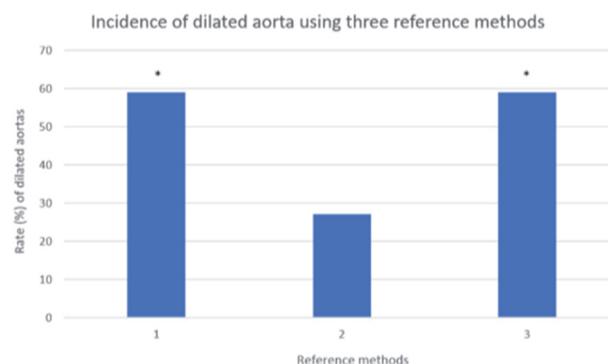
1. Assess the inter-modality agreement of ascending aorta measurements between echo and CT.
2. Compare the rate of 'dilated aorta' using the existing references (1,2,3).

Methods Between Sep 2018 and Sep 2019, 107 patients underwent gated CT thoracic aorta at our institute as per clinically indicated. We retrospectively examined these records. We used Bland Altman plot to assess inter-modality agreement (echo & CT) of ascending aorta measurements. We reported inter and intra-observer variability for echo measurements as coefficient of variation. Echo aorta measurements were coded into 'dilated' or 'normal' after normalising for age, sex, height and weight as per the existing references (1,2,3). The rates of 'dilated aorta' using the three reference methods (1,2,3) were compared using Chi-squared test with Bonferroni adjustment. Statistical analysis was performed using SPSS 25 (IBM).

Results Data were excluded from analysis due to incomplete biometrics (9), poor echo images (27). 71 subjects were included for analysis (age 68 ± 14 years, BSA 1.9 ± 0.2 m², 52.1% male). 16 had bicuspid aortic valves. Intra- and inter-observer variability for echo measurements were 1.2% and 1.4% respectively. Figure 1 shows the inter-modality agreement of ascending aorta measurements. Echo underestimated ascending aorta dimensions by a mean of 1.4 ± 2.7 mm (95% CI 0.7-2.0 mm).



Abstract 60 Figure 1



Abstract 60 Figure 2

There was a significant difference in the rates of 'dilated aorta' using the existing reference ranges (1,2,3): 59% (1), 27% (3) and 59% (2) of subjects had 'dilated aorta', $\chi^2 = 15.3$, $p=0.00$.

Conclusion Echo is an effective screening test for detecting ascending aorta dilatation. In our department, it has excellent intra- and inter- observer variability and good measurement agreement with CT. Normalising aortic dimension (3) resulted in the fewest 'positive test' requiring further imaging; potentially improving clinical efficacy of the service and avoiding contrast and radiation exposure for the patients.

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Conflict of Interest N/A

Cardiac Rhythm Management

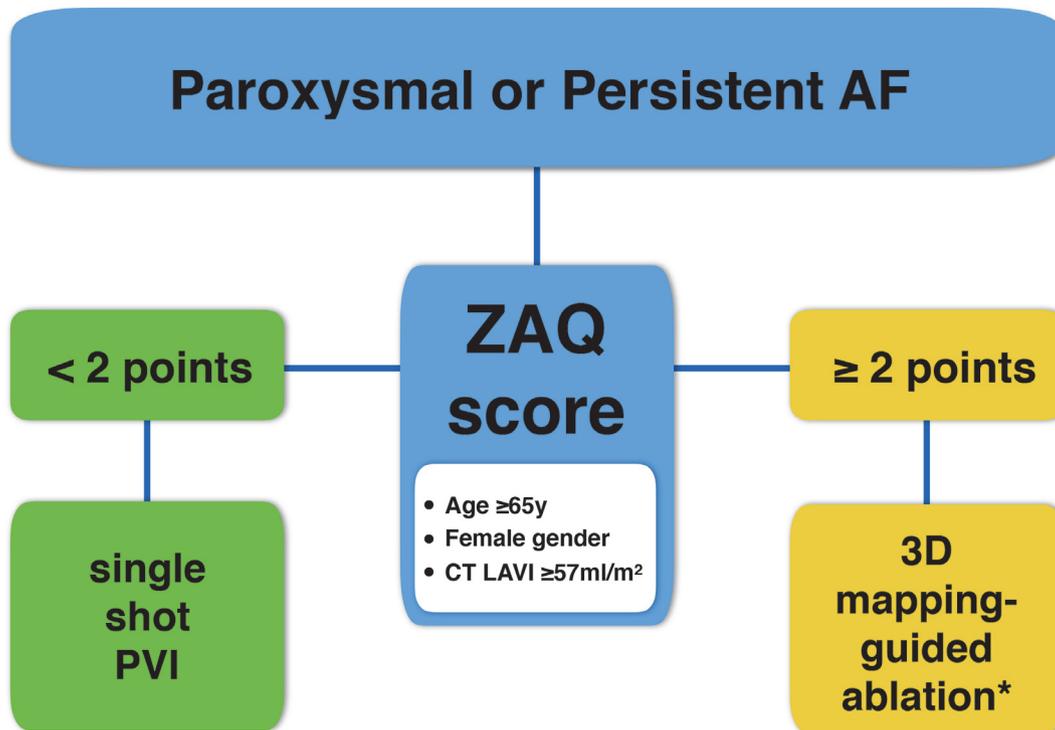
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COMPUTED TOMOGRAPHY-DERIVED LEFT ATRIAL VOLUME INDEX, SEX, AND AGE TO PREDICT THE PRESENCE AND THE EXTENT OF LEFT ATRIAL LOW VOLTAGE ZONES IN PATIENTS WITH ATRIAL FIBRILLATION: THE ZAQ SCORE

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10.1136/heartjnl-2020-BCS.61

Background Pulmonary vein isolation is the cornerstone of catheter ablation in patients with atrial fibrillation (AF). However, with advanced left atrial (LA) structural changes, additional targeted catheter ablation of low voltage zones (LVZs) has produced favorable results. Therefore, with the advent of single-shot techniques, it would be helpful to predict the presence of LVZs before an ablation procedure.



Abstract 61 Figure 1

Objective We hypothesized that computed tomography-derived (CT) left atrial volume index (LAVI), in combination with other objective parameters, could be used to develop a score able to predict the presence of LVZs.

Methods In a large cohort of patients undergoing their first AF ablations, comprehensive echocardiographic evaluations and cardiac CT were performed. During the electrophysiological studies, LA geometry and electro-anatomic voltage maps were created. LVZs were defined as areas $\geq 1\text{cm}^2$ with bipolar peak-to-peak voltage amplitudes ≤ 0.5 mV.

Results In a derivation cohort of 374 patients, predictors of LVZs were identified by regression analysis and used to build the ZAQ score (age ≥ 65 years, female sex and CT LAVI $\geq 57\text{ml/m}^2$). The ZAQ score of 2 points accurately identified the presence and the extent of LVZs (AUC 0.809, 95% CI 0.758-0.861, $p < 0.001$; 3 cm^2 [IQR 1.5-4.5] vs 7 cm^2 [IQR 4-9], $p = 0.001$). In a validation cohort of 103 patients, the predictive value of the score was confirmed (AUC 0.793, 95% CI 0.709-0.878, $p < 0.001$; 4 cm^2 [IQR 2-7] vs 11.5 cm^2 [IQR 8-16.5], $p = 0.001$).

Conclusions The ZAQ score identifies LVZs and may be useful for planning the ablation strategy ahead of time (single shot PVI vs 3D mapping-guided ablation) regardless of whether the AF pattern is paroxysmal or persistent.

Figure legend. Proposed AF ablation workflow independent of the temporal pattern of AF (ie. paroxysmal vs. persistent). (CT) Computed Tomography, (LAVI) Left Atrial Volume Index, (PVI) Pulmonary vein isolation. *Low voltage zones, if present, could be targeted with additional substrate modification ablation

Conflict of Interest None

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GENDER EFFECTS ON PROTEIN EXPRESSION PROFILES RELATED TO ARRHYTHMIC PHENOTYPE IN MURINE VENTRICLES MODELLING CATECHOLAMINERGIC POLYMORPHIC VENTRICULAR TACHYCARDIA

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10.1136/heartjnl-2020-BCS.62

Introduction Catecholaminergic polymorphic ventricular tachycardia (CPVT) is a genetic condition characterized by stress or exercise induced potentially fatal ventricular arrhythmic episodes. It is attributed to mutations in the cardiac ryanodine receptor (RyR2), calsequestrin (Casq2), and calmodulin (CaM) genes. Clinical symptoms and prognosis were reported more severe in male than female patients. Murine hearts carrying RyR2-P2328S showed a pro-arrhythmic phenotype, disrupted Ca^{2+} homeostasis and decreased myocardial action potential conduction velocities (CV) in an absence of evidence for tissue fibrosis, implicated in arrhythmic trigger and substrate.

Methods The present studies investigated for independent and interacting effects of sex and homozygotic RyR2-P2328S (RyR2S/S) genotype on expression levels in molecular determinants of both Ca^{2+} homeostasis (CASQ2, FKBP12, NCX1, SERCA2A, and CaV1.2) and CV (NaV1.5, Cx43, phosphorylated-Cx43, and TGF- β 1) in murine ventricles. Thus, ventricular tissue samples were lysed, and proteins extracted were used for western blotting. Relative