90 ms). There was a modest inverse correlation between DF and OI of EGMs (R=−0.58, p<0.001). There was no correlation between these indices & the same EGMs classified according to other measures (OI vs CFAEmean, R<0.01, OI vs SCI, R=−0.11, OI vs ContA, R=−0.06, all p>0.5, similar for DF). Only 2±1% of EGMs were in the top quintile of fractionation by all 3 indices of CFEmean, ContA and SCI. Only high OI (ROC AUC=0.64 p<0.01) at ablation site and lesion number (p<0.01) predicted an increase in AF cycle length. The image shows a typical left atrial map following analysis. Yellow areas represent 20% most fractionated by OI, blue represents CFAEmean, Red indicates areas of both high OI and CFAEmean. Lesions are shown, green if AFCL increased with lesion and red if AFCL was unchanged.

Conclusions The classification of fractionated EGMs is very sensitive to user-selected characteristics. Interpretation of results of "fractionation maps" must take into account analysis techniques, OI appears the most promising at guiding appropriate ablation site.
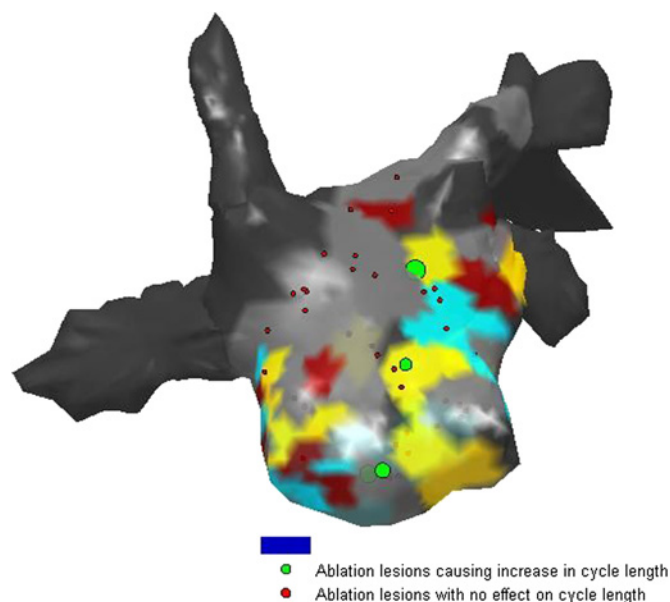
Abstract 051 Figure 1

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052 THE PREVALENCE OF LEFT ATRIAL APPENDAGE THROMBUS IN PATIENTS UNDERGOING CATHETER ABLATION FOR ATRIAL FIBRILLATION MAINTAINED ON WARFARIN

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Introduction Reports of the prevalence of left atrial appendage (LAA) thrombus among patients undergoing catheter ablation for atrial fibrillation (AF) vary and may depend on the anticoagulation regime used prior to the procedure.

Methods We undertook transoesophageal echocardiograms (TOE) in 586 patients (age 59.9±0.4 years old, mean±SE, 64.5% male) undergoing catheter ablation for AF who were anti-coagulated on warfarin (international normalised ratio 2−3) for at least 3 consecutive weeks prior to procedure and maintained on warfarin for the procedure itself.

Results LAA thrombus was identified in 3 patients from 586 (0.5%) despite all 3 having therapeutic INRs (2.2, 2.2 and 3.3 respectively). None of the remaining patients had a peri-procedural stroke. The three patients with LAA thrombus had CHADS$_2$ scores of ≥1 and CHA2DS2-VASc scores of ≥2. All three patients had impaired left

ventricular systolic function (LVSF), and LAA emptying velocities of <40 cm/s (23, 29 and 31 cm/s). Patients with LAA emptying velocities <40 cm/s on TOE (n=111) had significantly (p<0.05) higher CHADS$_2$ (0.9±0.1 vs 0.7±0.001) and CHA2DS2-VASc scores (1.7±0.1 vs 1.4±0.1), and larger LA diameter (4.95±0.09 vs 4.38±0.05 cm, OR for LA >4.6 cm: 2.4, 95% CI 2.13 to 5.41), and were more likely to have impaired LVSF (OR: 2.66, 95% CI 1.52 to 4.66) compared to those with higher velocities on multivariate analysis.

Conclusions The prevalence of LAA thrombus using our anticoagulation regime is extremely low. Providing patients have been therapeutically anti-coagulated, pre-operative TOE need only be performed in patients with a CHADS$_2$ score of ≥1/CHA2DS2-VASc score of ≥2 or when LA diameter is >4.6 cm. This criteria has the highest sensitivity (84%) for identifying LAA velocities of <40 cm/s as well as having a sensitivity of 100% for identifying thrombus and also would reduce the number of TOEs performed by 27.7%.

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053 FACTORS AFFECTING QUALITY OF WARFARIN ANTICOAGULATION IN PATIENTS WITH ATRIAL FIBRILLATION: INSIGHTS FROM AFFIRM

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Introduction The efficacy of warfarin anticoagulation in atrial fibrillation patients at risk for stroke is related to time in therapeutic range (TTR) with an INR 2.0−3.0. Factors predisposing to low TTR have not been investigated comprehensively.

Methods This post hoc analysis of the AFFIRM trial included patients with at least five INR values. "Optimal" anticoagulation was defined as TTR ≥75%; above this level, adjusted-dose warfarin offers the same prognostic benefits as new oral anticoagulants. Binary regression analysis identified independent variables associated with TTR. The impact of TTR on outcomes was assessed further through cox regression analysis.

Results Of 3066 AFFIRM patients, the mean TTR was 0.62 SD 0.2. 975 patients (32%) were "optimally" anticoagulated. These subjects were more frequently male, treated with rate control alone and were less likely to have heart failure, diabetes, myocardial infarction, and hepatic or renal failure (all p<0.05). Cox regression analysis demonstrated TTR was a major determinant of all cause mortality (p<0.001), ischaemic stroke or TIA (p=0.003) and major bleeding (p=0.01). Binary regression analysis revealed female gender (p=0.005), minority status (p<0.001), history of myocardial infarction (p=0.02) and non-treatment with β blockers (p<0.001) were associated independently with sub-optimal anticoagulation.

Conclusion TTR is related strongly to clinical outcomes. TTR is associated with clinical and demographic characteristics. Knowledge of factors associated with low TTR may help better optimise antithrombotic management.

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054 LEFT VENTRICULAR GEOMETRY AND OUTCOME IN PATIENTS WITH ATRIAL FIBRILLATION: INSIGHTS FROM THE AFFIRM TRIAL

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Background Echo determined left ventricular (LV) hypertrophy, an established marker of cardiovascular disease, is related to prognosis

and clinical outcomes but it has not been investigated as a measure of outcomes in atrial fibrillation (AF) patients.

Methods We performed a post-hoc analysis of the AFFIRM trial including patients with available echo data. Patients were stratified based on gender-adjusted echo derived interventricular septal (IVS) thickness, relative wall thickness (RWT), gender-adjusted LV mass and type of LV remodelling (normal LV geometry, concentric hypertrophy, eccentric hypertrophy, and concentric remodelling). Cox proportional hazards models were used for multivariate analyses of time to death and time to ischaemic stroke.

Results Of 4060 patients recruited in AFFIRM, sufficient echo data were available in 2433 patients (60%). Multivariate analysis showed that moderate-severe LV (IVS diastolic dimension >1.2 cm for women, >1.3 cm for men) was associated with all cause mortality (HR 1.45, 95% CI 1.13 to 1.86, p=0.003). Concentric LV hypertrophy was associated with the worst outcome (defined as RWT>0.42 and LV mass >224 g for men or LV mass >162 g for women) (p=0.008 vs, normal geometry—defined as RWT ≤0.42 and LV mass ≤224 g for men or LV mass ≤162 g for women). In a multivariate model, including established clinical, demographic and echo risk factors, moderate-severe LV hypertrophy assessed by IVS thickness was the strongest echo predictor of stroke (HR 2.2, 95% CI 1.3 to 3.7, p=0.002).

Conclusion In the AFFIRM Trial, LV hypertrophy assessed by gender-adjusted IVS thickness is an important risk factor for ischaemic stroke in patients with AF. LV hypertrophy assessed by gender-adjusted IVS thickness is associated with increased all cause mortality in AF patients.

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055 | SUCCESSFUL APPLICATION OF A NOVEL RESTITUTION GRADIENT BASED MARKER OF VENTRICULAR ARRHYTHMIA TO PATIENTS WITH NON-ISCHAEMIC CONDITIONS

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Background There are major limitations with Sudden Cardiac Death (SCD) risk assessment, especially in patients without ischaemic heart disease (IHD). Electrical restitution, that is,. the relationship between action potential duration (APD) and preceding diastolic intervals (DI), is regarded as key to the initiation of ventricular arrhythmias (VAs). We have developed a novel measure of APD restitution heterogeneity based on 12-lead ECG recordings: Regional Restitution Instability Index (R2I2), and shown it to be predictive of VA/death in patients with established myocardial infarcts.[1] This data represents the first application of R2I2 to patients at risk of SCD with non-ischaemic aetiologies.

Method A blinded retrospective study of 57 patients without IHD [Cases], undergoing ventricular tachycardia stimulation studies as SCD risk stratification for ICD, and 29 patients with structurally normal hearts [Controls] undergoing electrophysiology studies for supraventricular arrhythmias. Cases consisted of: 33 patients with dilated cardiomyopathy, 12 Brugada syndrome, 4 non-compaction cardiomyopathy, 3 myotonic dystrophy, 2 arrhythmogenic right ventricular dysplasia, 1 hypertrophic cardiomyopathy and 1 cardiac sarcoidosis. During programmed stimulation, surrogates of APD and DI were obtained from a high resolution surface ECG recording. Restitution curves were plotted with gradients for each lead calculated using overlapping least-squares linear segments.[2] APD restitution gradient heterogeneity was measured and quantified as R2I2 (mean of the SD of the residuals from the mean at each segment for each ECG lead).

Results R2I2 was significantly higher in Cases compared to Controls (mean ±SEM: 0.98 ±0.04 vs 0.63 ±0.04, p<0.001) (scatter plot). Six Cases reached the endpoint of VA/death (mean follow-up 5.2 years). There was a non-significant trend towards higher R2I2 in patients experiencing VA/death (1.12±0.10 vs 0.96±0.05, p=0.27). The graph shows the mean cutaneous restitution curve for all leads and all patients, steeper curves with longer QTp (APD) were seen in the Case group.

Conclusion The R2I2 was higher in patients at risk of SCD than controls. Use of cutaneous surrogates to quantify APD restitution heterogeneity and assess risk of SCD shows promise in patients with non-ischaemic aetiologies.
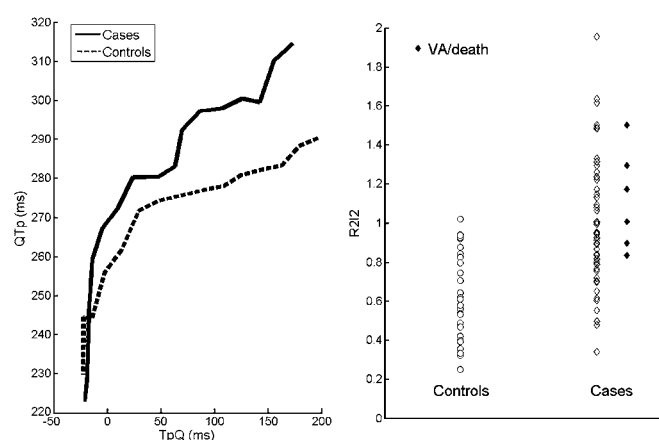
Abstract 055 Figure 1

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056 | LEUCOCYTE TELOMERE/TELOMERASE DYNAMICS IN PATIENTS WITH IMPLANTABLE CARDIOVERTER DEFIBRILLATOR; POTENTIAL BIOMARKER FOR VENTRICULAR ARRHYTHMIAS

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Introduction Implantable cardioverter defibrillators (ICDs) have been shown to reduce mortality in patients with ischaemic cardiomyopathy at a high risk of ventricular arrhythmias (VA), which are the commonest cause of sudden death. However, ICDs are associated with morbidity and mortality Importantly 67% of patients never receive an appropriate shock after ICD implantation under the current indication, suggesting a need for better risk stratification tools. Telomere and telomerase in leucocytes have recently been shown to correlate with biological aging, health status, and also with pathogenesis/prognosis of various cardiovascular diseases. We hypothesise that the leucocyte telomere length and/or telomerase activity correlate with the incidence of VA in ischaemic cardiomyopathy patients.

Methods 73 ischaemic cardiomyopathy Caucasian patients with primary prevention ICDs were recruited to this retrospective study between October 2010 and January 2011 at St Bartholomew's Hospital. Concentrated leucocyte fraction was obtained from venous blood sample of recruited patients and stored at −80°C in an