Methods: Since beginning to utilize ICE to guide LAAO in April 2021, our center employed either ICE or TEE for implantation guidance based largely on the availability of pre-procedure CT imaging. For patients undergoing ICE-guided WATCHMAN FLX implantation, we created a 3D reconstruction of the left atrium utilizing the CARTOSOUND module. A single transseptal puncture was performed, through which both the device delivery sheath and the ICE catheter were advanced. Contrast injection through a 6 Fr pigtail catheter was used to confirm appropriate device sizing, and LAAO was confirmed with both contrast injection and ICE imaging in four traditional planes.

Results: Of the 30 patients undergoing ICE-guided implantation, 55% were male with an average age of 80. The mean procedure and fluoroscopy time were 72.1 and 9.1 minutes, respectively. The implantation success rate was 97% under ICE guidance alone, with one case requiring TEE confirmation. An additional 33 patients had LAAO with TEE guidance at our center over this period, of which 57% were male with an average age of 81. The mean procedure and fluoroscopy time were 42.5 and 9.5 minutes, respectively. All TEE-guided LAAO implantations were successful.

Conclusion: 3D-mapping-facilitated, ICE-guided implantation of the WATCHMAN FLX device is feasible and can optimize resource utilization. Higher procedure times may be offset by improved lab efficiency.

<table>
<thead>
<tr>
<th>Table 1: Characteristics of ICE and TEE group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>Age</td>
</tr>
<tr>
<td>Procedure Time</td>
</tr>
<tr>
<td>Fluoroscopy time</td>
</tr>
</tbody>
</table>

PO-639-05

ANATOMIC DISTRIBUTION OF ACTIVE SOURCES IDENTIFIED USING ELECTROGRAPHIC FLOW MAPPING

David E. Haines MD, FHRS; Melissa H. Kong MD, FHRS; Peter Ruppnersberg MD; Vivek Y. Reddy MD; Petr Neuzil MD; Stefan G. Spitzer MD, FHRS; Andreas Rillig MD; Kostiantyn Ahapov MS and Tamas Szili-Torok MD, PhD

Background: Electrographic flow (EGF) mapping is a novel method for detecting putative atrial fibrillation (AF) drivers and/or triggers. Targeting mechanistically relevant areas may improve ablation outcomes and minimize empiric ablation.

Objective: Characterize the biatrial anatomic distribution of EGF-identified active AF sources.

Methods: From 09/27/2019 to 09/27/2021, 85 patients (pts) with persistent (Pers) AF underwent biatial contact mapping of AF with a 64-pole basket catheter followed by catheter ablation. Raw unipolar electrograms recorded after confirmation of intact pulmonary vein isolation (PVI) were processed using EGF mapping algorithms to identify sources with activity level > 20%. Relevant sources were then localized using corresponding 3D electroanatomic maps. 5 patients excluded as they had no sources with activity > 20%.

Results: EGF mapping was performed prospectively in 89 procedures on 80 pts with Pers AF. Mean age was 66 years, BMI 29 kg/m², CHA2DS2-VASc score 2.4 and LA diameter 4.4 cm. There were 259 sources with average source activity level > 20%: 2.9 sources identified/procedure; 47.5% in RA and 52.5% in LA; 60 patients had sources in both atria. In the RA, SVC/RA junction was the most common source location (24.7%). In the LA, 20.1% of sources were seen in the anterior LA, LAA and/or ridge between LAA/LSPV and 20.1% in posterior wall (see figure). Only 4.2% of sources localized to the interatrial septum.

Conclusion: EGF mapping can detect and visualize extra-pulmonary sources of AF throughout the RA and LA. Most extra-PV source locations represent anatomically feasible targets for

PO-639-04

WATCHMAN VS AMULET LEFT ATRIAL APPENDAGE OCCLUDER FOR STROKE PREVENTION

Jalaj Garg MD; Kuldeep Bharat Shah MD; Mohit K. Turagam MD; Rahul Bhardwaj MD; Tahmeed Contractor; Ravi Mandapati MD, FHRS, CCDS, CEPS-P and Dhanunjaya R. Lakireddy MD, FHRS

Background: Left atrial appendage Occlusion (LAAO) is an alternative to oral anticoagulation to reduce stroke risk in patients with non-valvular atrial fibrillation (NVAF).

Objective: We aimed to assess the safety and effectiveness of the Amulet vs Watchman LAAO device.

Methods: The meta-analysis was performed using a meta-package for R version 4.0/RStudio version 1.2. Hartung-Knapp-Sidik-Jonkman method with the random-effect model was used to combine the transformed proportions. Outcomes measured included at implant - acute procedure success, periprocedural pericardial effusion, in-hospital mortality, and at follow-up - acute procedure success, periprocedural pericardial effusion, in-hospital mortality, and all-cause mortality.

Results: This systematic review of 7 studies incorporated a total of 2,847 patients (mean age 75.5 ± 7.6 years, 39.9% women, mean BMI 29 kg/m², mean CHA2DS2-VASc score 2.4 and LA diameter 4.4 cm). There were 259 sources with average source activity level > 20%: 2.9 sources identified/procedure; 47.5% in RA and 52.5% in LA; 60 patients had sources in both atria. In the RA, SVC/RA junction was the most common source location (24.7%). In the LA, 20.1% of sources were seen in the anterior LA, LAA and/or ridge between LAA/LSPV and 20.1% in posterior wall (see figure). Only 4.2% of sources localized to the interatrial septum.

Conclusion: EGF mapping can detect and visualize extra-pulmonary sources of AF throughout the RA and LA. Most extra-PV source locations represent anatomically feasible targets for
and 235 controls (142 [60%] female, mean age 24 years) were included. Both groups had similar increases in LQT2, 55 LQT3; 146 [60%] female, mean age 30 years.

Results: Therapy at the time of their test were excluded. Patients on beta blocker (BB) therapy on test results, patients on BB protocol test.

Objective: The treadmill exercise stress test (TEST) can unmask concealed long QT syndrome (LQTS), especially LQT1, by identifying a maladaptive QT response during the TEST's recovery phase. Additionally, the supine-stand test may aid in LQTS diagnosis as patients fail to shorten their QT interval in the supine position. Among LQTS patients, the mean supine QTc was 54%, and increased in 6%, p = 0.2). No difference in QT between controls and LQT1, 2, and 3 was observed. Lastly, receiver-operator curve analysis to test the diagnostic ability of QT performed poorly in differentiating LQTS from control subjects with an of AUC 0.52 (p = 0.4).

Conclusion: The standard protocol TEST used in clinical exercise laboratories throughout the world fails to elicit the so-called 'Viskin stretch' in QT/QTc as demonstrated previously when using the official supine-stand test with proper times of patients being supine and standing.

PO-639-07

AUTOMATIC UNIPOLAR ELECTROGRAM MORPHOLOGY ANALYSIS USING A CONVOLUTED NEURAL NETWORK CLASSIFIER

Nathan A. Angel PhD; Pratik Shah PhD; Derrick Chou PhD and Min Zhu PhD

Background: Unipolar electrogram (EGM) morphology contains information of near-field cardiac substrate properties and the relative source-sink interactions of the wavefront as it approaches and leaves. S wave unipolar morphology indicates a region of electrical source and may physiologically represent a site of focal activation or the rapid spread of activation from activity leaving a conducting isthmus. An R morphology indicates a region of electrical sink and may physiologically represent wavefronts propagating into an unexcitable obstacle such as an ablation line. An RS wavefront generally indicates normally conducting tissue with relatively balanced source-sink relationship. Finally, a fractionated/multi-component EGM, represents a region of complex source-sink relationships, and may physiologically represent a region of multiple wavefronts, wavefront turning, or slow conduction through an isthmus. EGM morphology may help determine arrhythmia mechanism. Automatically detecting and displaying regions with characteristic EGM morphologies may aid arrhythmia diagnosis and treatment.

Objective: Evaluate the accuracy of a CNN (convolutional neural network) classifier to classify unipolar electrogram morphology as compared to manual, human classification accuracy.

Methods: Charge density unipolar electrograms (n = 44,622) were acquired from 15 AT/AFL/SR patients using the AcQMap mapping system (Acutus Medical). Training set EGMs (n = 43,586, from 15 patients) were annotated as either RS, R, S, or multi-component/fractionated by an expert reviewer. Test set EGMs (n = 1,036) were annotated from one patient by two expert reviewers. Labeled EGMs on which the reviewers agreed were used as the test set (n = 836). A 1-dimensional CNN based classifier was developed, trained and evaluated.

Results: The CNN was able to achieve an accuracy of 0.82 for classifying EGM morphology. The accuracy of the CNN is comparable to human vs. human agreement between two experts who achieved an accuracy of 0.79.

Conclusion: CNN classifiers can classify unipolar EGM morphology with high accuracy that rivals human level accuracy. Automatic algorithms to classify unipolar EGM morphology may aid physicians in diagnosis and treatment of arrhythmia.

A) EGM Classes

<table>
<thead>
<tr>
<th>EGM Classes</th>
<th>Input into Network</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS</td>
<td>Subsample EGM to 50 amplitude features</td>
</tr>
<tr>
<td>R</td>
<td></td>
</tr>
<tr>
<td>S</td>
<td></td>
</tr>
<tr>
<td>Frac</td>
<td></td>
</tr>
</tbody>
</table>

Figure 1: Methodology for EGM. All EGM classes include: RS morphology defined as greater than 90% of signal energy balanced around the isoelectric line. R morphology defined as greater than 90% of signal energy above the isoelectric. S wave defined as greater than 40% of the signal energy below the isoelectric line. Multi-component defined as a multi-component EGM that was manually identified. Segmented EGMs were subsampled into 50 discrete equally spaced points and used as the input to a CNN machine learning model.