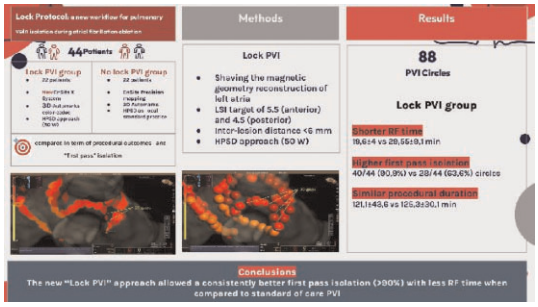

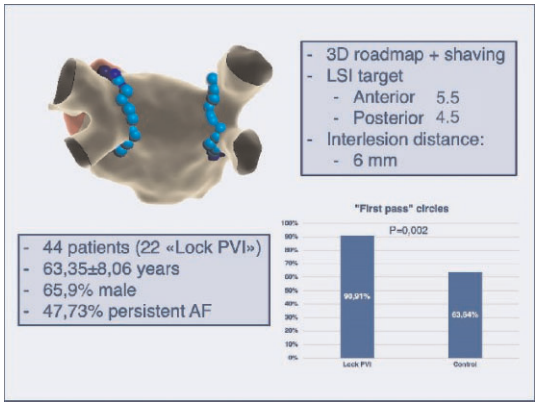

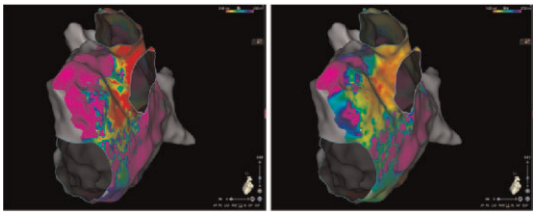

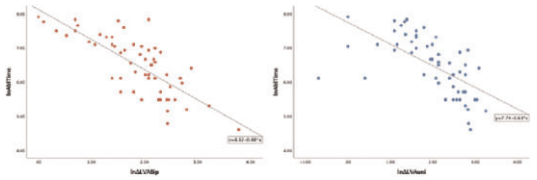

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ATRIAL VOLTAGE ANALYSIS FOLLOWING VEIN OF MARSHALL ETHANOL INFUSION PREDICTS MITRAL LINE BLOCK

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Background: The vein of Marshall (VoM) is a promising target for atrial fibrillation (AF) treatment, matching with the 'Coumel triangle' by housing triggers, autonomic connections, and serving as a substrate for perimitral flutters. Lateral mitral line (ML) represents a fundamental part for AF treatment, but achieving bidirectional block through endocardial ablations is challenging. VoM ethanol infusion (VOM-EI) facilitates ML block, with the newly-formed bipolar lesion serving as an effectiveness index. Voltage analysis assessment after VOM-EI in predicting ML block is poorly investigated.
Purpose: To compare unipolar and bipolar low-voltage areas (LVAs) along VOM trajectory after VOM-EI, and their role in predicting ML block.
Methods: We enrolled 59 patients undergoing catheter ablation of persistent AF or ML-dependent atrial flutter. High-density voltage mapping of left atrium was followed by VOM-EI and LA remapping. The area width difference was obtained and defined as ΔLVA. Normal bipolar voltage cutoffs were 0.50 mV in sinus rhythm or 0.29 mV in AF. Unipolar cutoffs were 2.7 mV and 1.1 mV, respectively. After VOM-EI, anatomical lesions included PVI, linear lesion for dome and ML isthmus. Systematic lines block validation was performed, defining ML block after coronary sinus (CS) electrograms sequence inversion (septal-to-lateral) during left atrial appendage pacing. Radiofrequency (RF) applications into the CS-great cardiac vein targeted epicardial gaps if present. Ablation time for ML block (AblTime) was obtained.
Results: In our cohort, 94.5% achieved ML block. Bipolar and unipolar low voltage areas after VOM-EI were 9,9 ± 6,9 cm2 and 12,2 ± 5,9 cm2 respectively. Bipolar ΔLVAs were significantly lower than unipolar ΔLVA (8.2 ± 6.5 cm2 vs. 9.4 ± 6.0 cm2; p=0.03) (Fig 1). A strong linear correlation between AblTime and bipolar ΔLVA (R: 0.76), and a significant correlation between AblTime and unipolar ΔLVA (R: 0.6) were found (Fig 2). Patients requiring RF applications into the CS for ML block (13/59, 22%) showed lower ΔLVAs in logistic regression for both bipolar (p<0.01) and unipolar (p=0.03) analyses.
Conclusions: VOM-EI induces unipolar LVAs wider than bipolar along the mitral isthmus trajectory. Unipolar and bipolar voltage analysis predicts a short time ML block achievement. Moreover, wider unipolar and bipolar LVAs following VOM-EI correlates with higher likelihood to avoid the targeting of epicardial gaps via the CS musculature.