POSTER PO-622:
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CHRONIC PULSED FIELD ABLATION LESIONS IN THE PORCINE LV: DOSE DEPENDENCE AND CORRELATION WITH LATE GADOLINIUM ENHANCEMENT MRI
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Background: Pulsed Field Ablation (PFA) is a promising modality for ventricular arrhythmia ablation due to its speed, apparent tissue selectivity, and the potential to create large lesions. Recent work showed that lesions in the left ventricle (LV) increase in size with number of PFA repetitions; however, the potential to create transmural lesions has not been reported.

Objective: Investigate the extent of PFA lesions created using a range of pulse trains and evaluate late gadolinium enhancement (LGE) modality for ventricular arrhythmia ablation due to its speed, with the institutions and operators, and predictors of recurrence. Various ablation strategies were performed to improve the outcome. However, the strategies vary with the institutions and operators, and predictors of recurrence of atrial tachyarrhythmia (AT) among the strategies remain to be elucidated.

Methods: PFA was performed in 8 swine via an 8F, 5 mm tip local catheter setup and R-wave gated biphasic pulse trains of 1300 V (4 trains) and 1500 V (1, 4, 8, and 16 trains). After 6-7 weeks, animals were brought to a 3T MRI (GE) for imaging using LGE (4 trains) and 1500 V (1, 4, 8, and 16 trains). After 6-7 weeks, lesions were created using 1300 Vx4 trains and 1500 Vx4 trains did not differ significantly, either from pathology or MRI. Similar trends were created using 1300 Vx1 train (Fig 2; pathology, p<0.05; MRI, p<0.01). Lesions created using 1300 Vx4 trains and 1500 Vx4 trains did not differ significantly, either from pathology or MRI. Similar trends were observed for lesion width and volume as a function of PFA trains.

Results: PFA lesion dimensions measured using MRI and gross pathology were in strong agreement (Fig 1; R=0.88, p<0.01; bias =0.03±2.1 mm, 95% limits of agreement=[−4.0, 4.1]). Lesion dimensions were measured manually from corresponding MRI and excised tissue slices.

Conclusion: Late gadolinium enhancement MRI accurately visualizes chronic PFA lesions in vivo. Lesions increased in depth and width with the number of PFA trains applied. Increasing pulse voltage and trains can achieve transmurality in the porcine LV.