## CA-527-03

### DOES HIGH POWER - SHORT RADIOFREQUENCY ABLATION PRODUCE WIDER ATRIAL LESIONS ?

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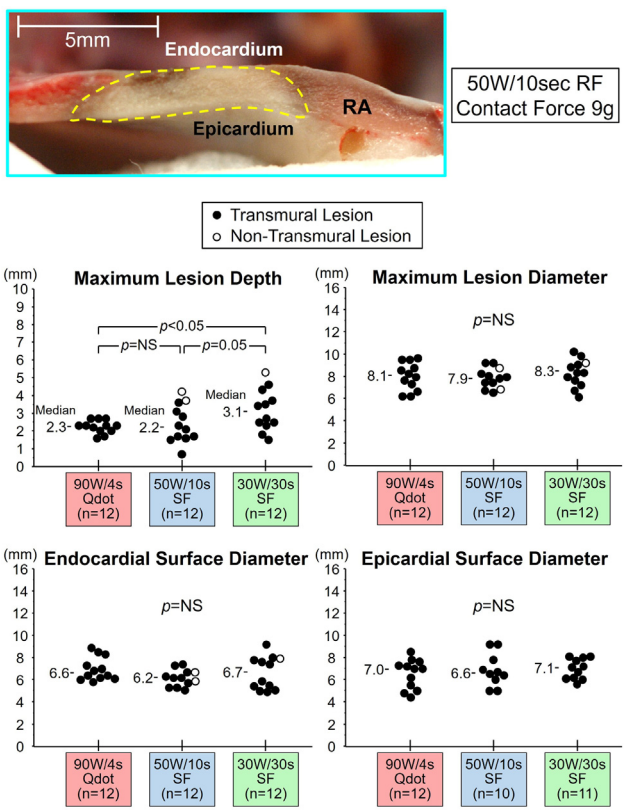
**Background:** It has been proposed that high power-short duration RF applications produce wider but shallower atrial lesions, compared to moderate power-moderate duration RF applications.
**Objective:** To compare atrial lesion size and the incidence of steam pop between RF ablation at 90Watts/4sec, 50Watts/10sec and 30Watts/30sec in the canine beating heart.
**Methods:** Six dogs were studied closed chest. 7.5 Fr ablation catheters with a 3.5 mm electrode and 66 or 56 small irrigation holes (QDOT MICRO or THERMOCOOL SMARTTOUCH SF Catheter, Biosense Webster) were positioned in the right atrium (RA). RF was delivered at 2 separate sites at 90Watts for 4sec (QDOT, 8 ml/min irrigation), 50Watts for 10 sec (SF, 15 ml/min irrigation) and 30Watts for 30sec (SF, 8 irrigation ml/min), total 12 sites in the RA in each dog with contact force 6-22 (median 11) g. After ablation, dogs were sacrificed and RF lesion size was measured by TTC staining for maximum depth, maximum diameter, endocardial diameter and epicardial diameter.
**Results: Figure**. No steam pop or thrombus occurred in any RF. 33/36 (92%) lesions were transmural in the atrial wall. There was no significant difference in maximum diameter between three groups. Endocardial diameter is smaller than epicardial diameter. Lesion depth was slightly smaller with 90W/4sec. Lung lesions were observed at 1/12 (8%) sites with 90W/4sec, 4/12 (33%) sites with 50W/10sec and 5/12 (42%) sites with 30W/30sec.
**Conclusion:** Compared to moderate power-moderate duration RF applications (30W/30sec), high power-short duration RF applications (90W/4sec and 50W/10sec) did not produce wider lesions. Ablation in the thin atrial wall resulted in transmural lesions with all three ablation strategies.




## CA-527-04

### ASSOCIATION BETWEEN LESION SIZE AND FIELD STRENGTH OF PULSED FIELD ABLATION

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**Background:** Electroporation using pulsed field ablation (PFA) is emerging as a promising technology for pulmonary vein isolation. Because of the atria's thin wall, most of the ablations performed in the atrium achieve transmural lesions. However, the association between PFA field strength and lesion size is not well documented.
**Objective:** To evaluate the association between PFA field strength and lesion size
**Methods:** In this study, eight canines underwent bipolar PFA ablations in the ventricles using three different PFA field strengths. Eight dogs underwent right and left ventricular ablations using 1100 V, 1300 V, and 1500 V. Energy was delivered between a decapolar catheter placed either in the coronary sinus or the left pulmonary artery and a standard RF ablation catheter. Canines were humanely euthanized after the ablations and underwent histological study.
**Results:** Thirty-three ablation were performed, and 30 lesions were identified for histological examination. The mean lesion depth was 5.5±1.9 mm for 1100 V (n=11), 6.1±1.5 mm for 1300 V (n=9), and 5.7±1.6 mm for 1500 V (n=10, $P > 0.05$). However, the lesion width has increased by incrementing field strength from 6.9±1.1 mm to 8.6±1.1 mm and 9.8±2.5 mm (Figure). The lesions created by higher doses of PFA were significantly wider than those created with lower PFA doses.
**Conclusion:** This study has shown that the lesion depth was not significantly correlated with PFA field strength; however, the lesion width directly correlated with PFA field strength.