

## Characteristics of Very High-Power, Short-Duration Radiofrequency Applications

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**Introduction:** Pulmonary vein isolation is the cornerstone of rhythm-control therapy for atrial fibrillation (AF). The very high-power, short-duration (vHPSD) radiofrequency (RF) ablation is a novel technology that favors resistive heating while decreasing the role of conductive heating. Our study aimed to evaluate the correlations between contact force (CF), power, impedance drop (ID), and temperature; and to assess their role in lesion formation with the vHPSD technique.

**Methods:** Consecutive patients who underwent initial point-by-point RF catheter ablation for AF were enrolled in the study. The vHPSD ablation was performed applying 90W for 4 s with an 8 ml/min irrigation rate.

**Results:** Data from 85 patients [median age 65 (59–71) years, 34% female] were collected. The median procedure time, left atrial dwelling time, and fluoroscopy time were 70 (60–90) min, 49 (42–58) min, and 7 (5–11) min, respectively. The median RF time was 312 (237–365) sec. No steam pop nor major complications occurred. A total of 6551 vHPSD RF points were analyzed. The median of CF, maximum temperature, and ID were 14 (10–21) g, 47.6 (45.1–50.4) °C, and 8 (6–10) Ohms, respectively. CF correlated significantly with the maximum temperature ( $p < 0.0001$ ). A CF of 5 g and above was associated with a significantly higher temperature compared to those lesions with a CF below 5 grams ( $p < 0.0001$ ). Bilateral first-pass isolation rate was 84%. The 6-month AF-recurrence rate was 7%.

**Conclusion:** The maximum temperature and CF significantly correlate with each other during vHPSD applications. A CF of 5 g and above leads to better tissue heating and thus might be more likely to result in good lesion formation, although this clinical study was unable to assess actual lesion sizes.

**Keywords:** atrial fibrillation, ablation, very high power, short duration