The utility of high-power energy for a superior vena cava isolation

Shun Akai
Hitoshi Mori
Tsukasa Naganuma
Akira Hamabe
Toyokazu Kimura
Mitsuki Yamaga
Takumi Osawa
Daisuke Kawano
Akane Kawai
Hirotugu Tabata

Introduction: Although high power (HP) ablation can obtain a larger lesion size within a shorter duration, the lesion geometries differ from those of the low power (LP) ablation. The lesion diameters with HP ablation are significantly larger and the lesion depths significantly smaller than those with LP ablation. Deep lesions could be related to collateral damage, such as of the esophagus or diaphragm nerves. The aim of this study was to investigate the utility of the HP for a superior vena cava isolation (SVCI).

Methods: Eighty-one patients underwent a circumferential SVCI between January 2016 and April 2019 at our hospital. Thirty-seven patients underwent an SVCI with lower power (15W-25W) and forty-four with high power (25W-35W). We analyzed the number of touch up sites, ablation time, and ablation parameters between the two groups.

Result: There were no significant differences regarding the number of ablation points, SVC perimeters (HP vs. LP; ablation points, n, 15.1±3.6 vs. 16.4±4.5, p=0.14; SVC perimeters, mm, 6.7±1.1 vs. 6.5±0.8, p=0.38). Touch up ablation was needed in 3 patients (6.8%) in the HP group and 14 (37.8%) in the LP group (p=0.005). Touch up ablation was needed at an area close to the diaphragm or sinus node. The total energy deliver time was significantly shorter in the HP group (HP vs. LP, sec; 231.1±71.9 vs. 338.6±78.6, p<0.0001). The ablation power, contact force (CF), and ablation index (AI) were significantly higher in the HP group (HP vs. LP; power, W, 28.6±3.0 vs. 22.8±2.7, p<0.0001; CF, g, 14.9±5.8 vs. 12.1±5.0; AI, 354.5±29.0 vs. 345.6±45.4 p<0.0001). No patients exhibited any prolonged phrenic nerve paralysis or sinus node injury.

Conclusion: HP energy may be useful for an SVCI without increasing the complication rate.