Outcomes of Dragging Laser Application Using Endoscopic Laser Balloon Ablation System for Pulmonary Vein Isolation: Initial Experience at Single Center

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Introduction: The endoscopic laser balloon ablation system (ELAS) was recently approved for pulmonary vein isolation (PVI) of atrial fibrillation (AF) in Japan. Since one laser energy delivery was a point-by-point in 20 to 30 seconds, the conventional method time for PVI procedure. Dragging application leads to reduction of procedure-time, but there are no reports of mid- and long-term results.

Methods: A total of consecutive 50 patients (65±11 years, 39 men) with paroxysmal AF underwent ELAS ablation. The power and delivery time of laser energy were selected from preset protocol with 5.5 to 12 W and 20 to 30 seconds for each application. In 1 to 25 cases, laser application was performed with point-by-point (non-dragging-group). In 26 to 50 cases, that was performed with dragging (dragging-group). The method of dragging was performed by rotating about 30 to 60 degrees within one irradiation time. We compared the recurrence rate of AF lasting longer than 30 seconds between both groups.

Result: In all cases, PVI was successful. PVI procedure time (64.9 ± 20.6 vs. 116.2 ± 39.3 min, p<0.0001) and number of irradiation [LS = 18 ± 7 vs. 36 ± 15 times (p<0.0001), LI = 14 ± 6 vs. 26 ± 8 times (p<0.0001), RS = 18 ± 8 vs. 30 ± 9 times (p<0.0001), RI = 15 ± 5 vs. 27 ± 8 times (p<0.0001)] were significantly lower in the dragging group. There was no significant difference in early (within 90 days after the ablation) recurrence rate of AF between the two groups (2 cases [8%] in the dragging group vs. 5 cases [20%] in the control group, p=0.1474). There were 2 cases of AF recurrence (8%) in the control group and 0 cases (0%) in the dragging group during the mean follow-up period of 245± 49 days (control group) and the mean follow-up period of 164±39 days (dragging group). The recurrence rate of AF after blanking period was no significant difference between the two groups (p = 0.2568).

Conclusion: The dragging method enables PVI with laser energy in shorter time and lower number of times without reducing the mid- and long-term outcomes.