Additional superior vena cava isolation strategy with radiofrequency catheter ablation is superior to a pulmonary vein isolation only strategy with Cryoballoon ablation

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Introduction: Cryoballoon ablation (CBA) can easily complete a pulmonary vein isolation (PVI) with a short procedural time. However, CBA can only perform a PVI, and has an anatomical limitation. Therefore, it is unclear whether the outcome of a PVI only with CBA is actually similar to that of RFCA, especially, when a superior vena cava isolation (SVCI) is routinely performed.

Methods: We analyzed 490 PAF patients that underwent a first time ablation from January 2015 to June 2018. All patients were followed up for at least 12 months after the ablation. CBA was performed in 79 patients (CBA group) and RFCA in 411 patients (RFCA group). In the RFCA group, we performed all PVI procedures with contact force and stability guidance (CARTO3, VisiTag Module). Two hundred ninety-five cases in the RFCA group (n=411) received an SVCI in addition to the PVI. We strictly selected anatomies suitable for CBA by evaluating the contrast-enhanced CT before the ablation. The first 10 cases in the CBA group were excluded from this study because of the learning curve. We compared the 1 year non-AF recurrence rate between the CBA group (n=69) and RFCA-PVI+SVCI group (n=295).

Result: The baseline characteristics were similar between the 2 groups except for the left atrial diameter (CBA:33.4±5.7mm vs. RFCA:35.4±5.8mm; p=0.01). The total PVI and procedure times were shorter in the CBA group than RFCA group (36±13 vs. 40±12 minutes; p=0.033, 74±19 vs. 139±37 minutes; p<0.001, respectively). There was no difference in the total fluoroscopy time between the 2 groups (26±8 vs. 26±10 minutes, p=N.S). The 1 year non-AF recurrence rate was significantly lower in the CBA group than RFCA group (81.2% vs. 90.2%, p=0.037). There were 7 transient phrenic nerve injuries (2.4%), 3 transient sinus node injuries (1.0%), and 2 cardiac tamponades (0.7%) in the RFCA group, but no major complications occurred in the CBA group.

Conclusion: The PVI only strategy with CBA can be performed with a quicker and safer ablation than RFCA. However, the clinical results might be better with RFCA because RFCA has no anatomical limitations and can approach non-PV foci triggers.