Lesion size of Repeated ablation at the same point After Irrigated Radiofrequency Ablation in a Porcine Model

Introduction: Radiofrequency (RF) catheter ablation is the therapy of choice for several cardiac arrhythmias. During ablation, it is prefer to obtain an effective lesion and to avoid excessive heating that can possibly lead to thrombus formation, steam pop, and/or perforation. Sometimes, repeat ablation at the same point is inevitable. The lesion size about repeat ablation at the same point is lacking.

Methods: RF lesions were created on porcine myocardial slabs by using an open-tip irrigated catheter capable of real-time monitoring of catheter-tissue contact force and lesion size index (LSI). Initially, 4 power settings groups of 25, 30, 35 and 40W were used with a fixed CF of 10 g. In each group, LSI values of 4.5, 5, 5.5 and 6 were targeted respectively. Thereby, it is yield to a total of 16 ablation groups. Repeat ablation from one to five times at the same point in each group. After RF delivery, the myocardium was cross-sectioned at the level of each lesion. The maximum width and depth values of the blanched zone of the lesion were measured.

Result: In a fixed power and LSI, Lesion width and depth were correlated with the repeat times of ablation at the same point. And the lesion depth of four and five times repeat ablation at the same point were significantly higher than the one to three times repeat ablation (p < 0.01) in each group.

Conclusion: In this in vitro model, repeat ablation at the same point caused more lesion dimensions. The lesion depth at more than four times repeat ablation were higher, regardless of the targeted LSI and power.