

Ablation Index-guided 50W ablation for left atrial posterior wall isolation compared with lower powers: feasibility and lesion level analysis

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Background

Posterior Wall Isolation (PWI) is increasingly performed for Atrial Fibrillation (AF). The use of Ablation Index (AI)-guided 50W ablation for PWI has not been described, nor the interplay between ablation parameters at this power when compared to lower powers.

Methods

40 consecutive AF patients (26 males, 65.5 ± 10.0 years. 95% non-paroxysmal AF) underwent PWI following pulmonary vein isolation. A roof line and floor line were created with point-by-point ablation, targeting a contact force (CF) of 10-30g, AI 550-600 on the roof and 400-450 on the floor, and inter-tag distance of <6mm. 35-40W powers were used for the first 20 patients, and 50W used for the next 20. Generator impedance was monitored in real time for each lesion. Ablation inside the box was delivered in case of failure of first pass isolation (FPI). All VisiTags (n = 959) were analyzed retrospectively.

Results

PWI was successful in 19(95%) of the 35-40W group and in all 20 patients in the 50W group, with FPI seen in 8(40%) and 10(50%) respectively, p = 0.53. The mean CF and number of RF applications on the roof, floor and inside the box were similar between the two groups. Ablation time per lesion (10.4 [8.8-12.5]sec) and total ablation time per patient (3.84[3.34-4.66] min) were shorter in the 50W group as compared to 35-40W (13.0 [11.6-16.2] sec and 5.86 [4.23-7.73] min respectively), p < 0.005. The mean AI and Impedance Drop were larger in the 50W group (Table). There was no steam pop observed in any of the 959 radiofrequency applications.

Conclusion

Ablation Index guided 50W ablation has a very high success rate for posterior wall isolation with shorter ablation times and higher impedance drop compared to conventional powers. Steam pops may be avoidable by targeting CF < 30g, and by monitoring impedance in real-time.

	50W Group (N = 458)	35-40W Group (N = 501)	p-value
Number of lesions (s, IQR)	21.5 [19.5-26.3]	24.0 [20.8-29.5]	0.33
Roof line	7.0 [5.8-9.0]	8.0 [6.0-10.0]	0.18
Floor line	13.0 [10.8-14.3]	12.5 [10.8-14.0]	0.85
Additional ablation inside box	6.0 [6.0-6.8]	5.5 [2.8-9.0]	0.59
Ablation Time per lesion (s, IQR)	10.4 [8.8-12.5]	13.0 [11.6-16.2]	<0.005
Roof line	13.0 [10.9-16.0]	14.5 [12.4-19.0]	<0.005
Floor line	9.9 [8.7-11.4]	12.7 [11.4-15.9]	<0.005
Additional ablation inside box	8.1 [6.9-9.0]	11.8 [10.6-14.0]	<0.005
Total RF Time (min, IQR)	3.84 [3.34-4.66]	5.86 [4.23-7.73]	< 0.005
Roof line	1.54 [1.15-1.90]	1.98 [1.62-2.59]	0.019
Floor line	2.06 [1.68-2.54]	2.78 [2.28-3.25]	0.009
Additional ablation inside box	0.79 [0.65-1.07]	1.07 [0.59-1.42]	0.50
Impedance Drop (ohms, IQR)	7.4 [5.2-10.3]	6.9 [4.8-9.7]	0.007
Roof line	8.7 [6.1-11.3]	7.5 [5.1-10.0]	0.04
Floor line	6.9 [5.0-10.1]	6.0 [4.2-8.3]	< 0.005
Additional ablation inside box	7.1 [5.4-9.8]	8.3 [5.8-10.9]	0.17
Contact Force (g, IQR)	21.1 [14.5-30.3]	21.2 [14.9-28.1]	0.56
Roof line	23.9 [17.8-32.7]	24.3 [17.2-30.3]	0.45
Floor line	19.2 [13.2-25.3]	19.0 [14.1-25.0]	0.87
Additional ablation inside box	25.5 [18.5-36.9]	23.1 [16.9-31.7]	0.21

	50W Group (N = 458)	35-40W Group (N = 501)	p-value
Ablation Index (IQR)	471 [441-519]	461 [434-493]	< 0.005
Roof line	560 [509-571]	502 [466-541]	< 0.005
Floor line	453 [436-475]	446 [426-464]	< 0.005
Additional ablation inside box	461 [430-488]	455 [434-478]	0.59

Lesion level analysis for Posterior Wall Isolation