

### Not only power and energy but also balloon size is correlated with lesion formation in laser ablation model in vitro study

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Funding Acknowledgement: Type of funding source: None

**Background:** Power and total energy were known to correlate with lesion formation during laser balloon ablation for atrial fibrillation. However, it is unclear whether balloon size can influence lesion formation. The aim of this study was to evaluate the impact of balloon size on lesion formation during laser balloon procedure in vitro model.

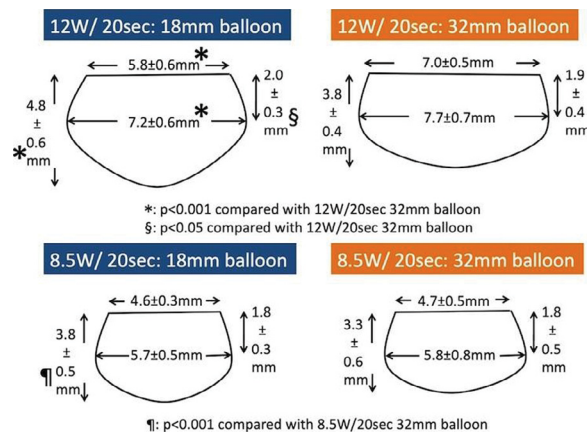
**Methods:** Laser energy was applied to chicken muscles using first generation laser balloon. Laser ablation was performed with different 2 balloon size (18mm and 32mm) using 2 different power settings (12W/20sec and 8.5W/20sec). Forty lesions were evaluated for each setting. We compared maximum lesion width, maximum lesion depth, depth at maximum width and endocardial lesion width between 18mm and 32mm balloon groups at 12W/20sec and 8.5W/20sec, respectively.

**Results:** At 8.5W/20sec, inadequate lesion formation to assess lesion size was observed in 1/40 lesion of 18mm balloon group and in 5/40 lesions

of 32mm balloon group. Thus, at 8.5W/20sec 18 mm balloon group consisted of 39 lesions and 32 mm balloon group consisted of 35 lesions. At 12W/20sec 18 mm balloon group consisted of 40 lesions and 32 mm balloon group consisted of 40 lesions. At both power settings, maximum lesion depth was larger in 18mm balloon than in 32mm balloon group. At 12W/20sec setting, maximum lesion width and endocardial width were larger in 32mm balloon group than in 18mm balloon group. At 12W/20sec setting, depth at maximum width was smaller in 32mm balloon group than in 18mm balloon group. Lesion morphologies were summarized in a figure.

**Conclusion:** Balloon size could affect lesion formation during laser balloon ablation in addition to laser power and energy. Laser ablation lesion were wider but shallower in 32mm balloon group compared with in 18mm balloon group.

	12W/20sec		p value	8.5W/20sec		p value
	18mm balloon group (n=40)	32mm balloon group (n=40)		18mm balloon group (n=39)	32mm balloon group (n=35)	
Maximum depth (mm)	4.7±0.7	3.8±0.4	<0.001	3.8±0.5	3.3±0.6	<0.001
Maximum width (mm)	7.2±0.6	7.7±0.7	<0.001	5.7±0.5	5.8±0.8	0.248
Endocardial width (mm)	5.8±0.6	7.0±0.5	<0.001	4.6±0.3	4.7±0.5	0.209
Depth at maximum width (mm)	2.0±0.3	1.9±0.4	0.020	1.8±0.3	1.8±0.5	0.377



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