Use of the novel multi-electrode radiofrequency balloon catheter for pulmonary vein isolation results in significant debulking of the left atrial posterior wall

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Introduction: The extent of posterior wall ablation during pulmonary vein isolation (PVI) has been shown to be associated with success rates of AF ablation. Single shot PVI technologies are associated with variable levels of left atrial (LA) posterior wall ablation. A new multi-electrode radiofrequency balloon catheter (RFB) enables a single-shot approach to PVI with its 10 irrigated, flexible gold surface electrodes to directionally-tailor energy delivery. The level of isolation achieved with RFB has not been studied. We sought to assess the extent of posterior wall ablation by performing electroanatomical voltage mapping (EAM) before and after PVI with RFB.

Methods: Seven patients with paroxysmal AF were studied (age 63.0±5.7 yrs, LA size 42.0±4.4mm). CARTO EAM of the LA was performed with a Lasso catheter, and maps merged with CT/MR imaging. All 28 PVs were isolated successfully; average time to isolation was 11.9±7.1 seconds. EAM was repeated with the Lasso catheter, and automatic surface area measurements were made in the Carto system after tracing the posterior wall limited by a roof line from the superior margins of isolation of superior veins, a floor line from the inferior margins of the inferior veins, and line of voltage transition (voltage less than 0.2mV). This was compared to areas using the same roof and floor lines extending back to the pulmonary vein ostia.

Result: In all 7 patients, the line of isolation extended to the antrum of the posterior wall. In 2 cases with complete delineation of the line of block allowing detailed quantitative assessment, 39.3% of the posterior wall was seen to be ablated (10.9/23cm2 and 10.5/30.2cm2). (Figure)

Conclusion: The compliant multielectrode radiofrequency balloon catheter produces antral lesions with extensive debulking of the LA posterior wall.