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Second-generation visually guided laser balloon ablation system for pulmonary vein isolation: Learning curve, safety and efficacy: The MERLIN registry

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Funding Acknowledgements: Cardiofocus

Background: Radiofrequency (RF) based pulmonary vein isolation (PVI) results in favourable clinical outcome, although its complexity demands a long learning curve. Balloon-based systems, have been developed to possibly solve these limitations. The second-generation laser balloon (LB2) offers optimized features for improved tissue contact and visibility.

Purpose: We determined safety, efficacy and learning curve of the LB2 for PVI.

Method: A total of 45 consecutive patients (89% persistent AF) were prospectively enrolled and divided in three groups (T1, T2, T3) of n = 15 patients per group. All patients underwent PVI using the LB2 by two operators. The operators were experienced in RF and cryothermal procedures, but not in laser ablations.

Results: A total 174/177 PVs (98%) were successfully isolated. The median procedure time significantly declined from 132 (114, 158) to 119 (102, 127) and 91 (86, 105) min in T 1–3, respectively (P = 0.0009). Similarly, the median fluoroscopy time significantly decreased from T1 until T3 (22 (17, 27) vs. 21 (16, 24) vs. 13 (10, 17) min, respectively, P = 0.045. Adverse events occurred in 6.7% with a trend towards a lower complication rate with increasing experience.

Conclusion: The LB2 was safe and effective for PVI even for operators without any previous experience in laser balloon based PVI. Procedure time LA dwelling time and fluoroscopy time decreased after a learning curve of 15 cases.