Linear ablation of left atrial roof is possible with second-generation cryoballoon to treat persistent atrial fibrillation.

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Introduction: Although creation of linear lesions by ablation improves success rates in patients with persistent atrial fibrillation (AF), the procedure has been considered unsuitable for cryoballoon technologies. We developed a technique for linear ablations, using second-generation cryoballoon technology.

Methods: This was a single-arm, retrospective study in 11 patients with persistent AF treated at our center. Cryoablation was performed using a 28 mm second-generation cryoballoon. Sequential overlapping freezes were applied along the left atrial (LA) roof by slight clockwise rotation of the sheath in combination with slight retraction of the sheath and incremental advancement of the cryoballoon, until reaching the original position of right superior pulmonary vein (PV) isolation. The acute endpoint was the creation of a roofline.

Result: Acute success in roofline generation was achieved in 100% of patients, applying on average 5.3 freezes with nadir temperature of -47.8°C (-45 to -50.5°C). No phrenic nerve injuries or cardiac tamponade occurred during or after the procedure. Complete conduction block was confirmed by activation mapping under left atrial appendage pacing in all cases.

Conclusion: Generation of linear roofline lesions is possible with second-generation cryoballoon. The technique can be used in combination with PV isolation to treat persistent AF with high acute success rate, short procedural times, and acceptable safety profile.