MRI-GUIDED APPROACH TO LOCALIZE AND ABLATE GAPS IN REPEATED ATRIAL FIBRILLATION ABLATION PROCEDURE: A PILOT STUDY

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**Background:** The presence of gaps in prior pulmonary vein (PV) isolation (PVI) ablation lesions may be the cause of procedural failure. Delayed-enhanced (DE) cardiac magnetic resonance (CMR) allows the identification of radiofrequency (RF) lesions and gaps (CMR gaps). The present study aimed to test the usefulness of a new DE-CMR guided approach to ablate gaps in repeat procedures.

**Methods:** A 3D DE-CMR volume-rendered left atrial reconstruction (3D model) was created after manually segmenting endocardium and epicardium. The pixel signal intensity map was projected on the 3D model and color-coded. The 3D model was then imported into the navigation system. RF was delivered targeting the CMR gaps, blinded to electrical data.

**Results:** A series of 6 patients were included (61±7 years, 50% with paroxysmal AF, mean time from prior PVI of 17±7 months). 3 patients had additional roof line. In total, 37 CMR gaps were identified around 22 PVs and 7 at the roof line, with a mean of 7.3 gaps/patient and a mean gap length of 6.3 mm. 18/22 PVs were electrically reconnected (mean of 3/patient). All reconnected PVs presented CMR gaps, with electrical-CMR concordance of 94%. Guided by the 3D model, isolation of all PVs was achieved after a mean of 2.8±1.8 RF applications/gap (18.2±10.5/patient) and 124±86 seconds/gap (869±730 seconds/patient).

**Conclusion:** DE-CMR is a useful tool to guide the repeat PVI procedure by accurately identifying and locating the gaps, with the potential of reducing procedure duration and RF application time.