

## Early results for iCMR in atrial flutter

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**Background:** As a standard of care, ablation of typical atrial flutter involves performing cardiac catheterization under x-ray fluoroscopy. The unique ability of magnetic resonance (MR) to provide real-time functional imaging in multiple views without ionizing radiation exposure has the potential to be a powerful tool for diagnostic and interventional procedures. Real-time MR imaging-guided radiofrequency (RF) ablation has been used as a part of clinical trials.

**Objective:** To implement the MR imaging-guided RF ablation of typical atrial flutter in the clinical routine.

**Methods:** From January to July 2020, 15 consecutive patients with typical atrial flutter have been referred for ablation. Patient preparation, conscious sedation and groin puncture took place inside the 1.5 Tesla MR scanner as a part of an MR-only workflow. The catheter advancement as well as the RF ablation procedure have been performed under direct visualisation of catheters with integrated micro-coils using an interactive sequence with active tip tracking and automatic slice positioning in the plane where the catheter tip has been detected. During catheter advancement a single frontal plane has been used to visualize the passage of the catheter through femoral veins and inferior vena cava. With both diagnostic and ablation catheters in the right atrium, an axial stack of balanced steady-state free precession acquisitions has been acquired and used to reconstruct planes in the short- and long cardiac axis. These have been used to provide a "left- and right anterior oblique" view familiar to an interventional electrophysiologist. The subsequent catheter placement and ablation have been performed under direct visualisation in these two planes (see figure).

**Results:** The ablation was successful in 14 patients, one patient had to undergo a conventional procedure on the following day. The mean time to reach right atrium and coronary sinus was 4 [3,5] and 7 [6,10] minutes, respectively. The mean total ablation duration and procedure time was 18 [12,26] and 43 [33,58] minutes, respectively. There were no adverse events.

**Conclusion:** The implementation of the MR imaging-guided RF ablation of typical atrial flutter in the clinical routine is feasible and leads to similar success rates and procedure times as the conventional fluoroscopy-based ablation.

Abstract Figure.

