

Interventional Cardiac MRI (iCMR) Procedural Workflow

Typical procedure for index arrhythmia: atrial flutter

1. iCMR scanner room setup
 - a. Placement of equipment
 - i. In room monitors
 - ii. Electrophysiology (EP) recording system
 - iii. Ablation generator
 - iv. Irrigation pump and tubing
 - v. Patient monitoring system
 - vi. Anesthesia/infusion pumps
 - vii. Communication system
 - viii. External defibrillator/cardiac stimulator
 - ix. Additional equipment for in-room treatment of adverse events
 - b. Access to required disposable devices for use during the procedure
 - i. Catheter kit
 - ii. Sterile cabling
 - iii. Devices and materials needed for treatment of complications in the iCMR scanner room
2. Patient Preparation
 - a. Sedation/ General anesthesia
 - b. Cardioversion (if required)
 - c. Sterile preparation and draping
 - d. Vascular access
3. Patient Transfer
 - a. Cover/protect sterile access site
 - b. Identification and Removal of all Magnetic Resonance (MR) Unsafe equipment and material
 - c. Physical transfer to iCMR scanner room
4. Patient preparation inside iCMR scanner room
 - a. Introduction into the MRI scanner
 - b. Configure equipment
 - i. Place imaging coils
 - c. Final draping/protection of the sterile field
 - d. Landmark and advance patient
 - e. Transfer of catheters
 - f. Transfer of sterile cables
 - g. Connection of 1st catheter
 - i. Catheter cable
 - h. Connection of 2nd catheter
 - i. Catheter cable
 - ii. Irrigation tubing (final sterile connection)
5. MR imaging pre-ablation
 - a. 3D cardiac imaging: to create 3D shell for catheter navigation.
 - b. Planning of imaging planes (LAO + RAO + transversal plane): to locate cavo-tricuspid isthmus (CTI)
 - c. *Baseline MR imaging: for tissue characterization at the target ablation location (optional)*

6. Procedure
 - a. Maintain anesthesia throughout procedure
 - b. Introduction of CS catheter
 - c. Placement of CS catheter
 - d. Introduction of ablation catheter
 - e. Create electroanatomical map (EAM) with catheter
 - f. Create 'design ablation line'
 - g. *MR imaging: confirm catheter location at target location between EAM and MRI (optional)*
 - h. CTI ablation**
 - i. Create EAM post ablation to detect activation times
 - j. Electrical confirmation of conduction block
 - k. MR imaging post ablation
 - i. Exclude complications (e.g. pericardial effusion)
 - ii. *Tissue characterization at the ablation location (optional)*
 - l. Removal of catheters
7. Removal From iCMR scanner room
 - a. Retract patient table
 - b. Cover sterile access site
 - c. Disconnect cabling and remove components
 - i. Advantage-MR
 - ii. In vivo patient monitor
 - d. Remove MR imaging coil
 - e. Disconnect patient table
 - f. Transfer patient outside MRI room
 - g. Detubate patient and remove vascular access sheaths
 - h. Transfer patient to recovery
 - i. Reconfigure laboratory for diagnostic use

Potential Complications (follow site specific protocols)

1. Treatment in the MR scanner (zone 4)
 - a. Retract patient table while maintaining patient position and MR landmark
 - b. Follow treatment protocol
 - c. Return patient to landmark and proceed with procedure
2. Treatment in the radiology department outside the MRI scanner (zone 3)
 - a. Follow evacuation protocol to remove patient from MRI
 - b. Transfer patient beyond 5Gauss line
 - c. Follow treatment protocol
 - d. Return patient to the MR or transfer to EP fluoroscopy lab / operating room (OR) when indicated
3. Treatment outside of the radiology department (i.e. EP lab or OR)
 - a. Follow evacuation protocol (with emergency pacing protocol, if required)
 - b. Transfer patient to catheterization lab or operating room