

**Title:** *Imaging the Left Atrium -Technique*

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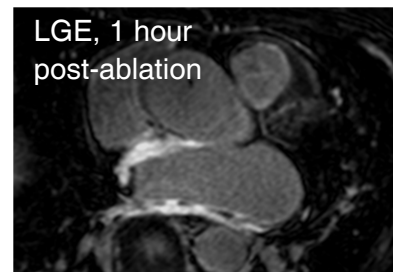
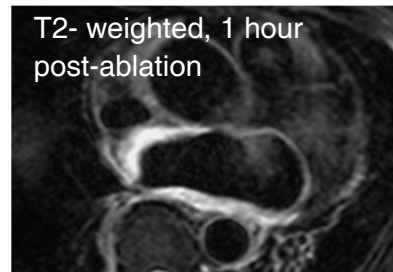
**Highlights**

- Left atrial imaging techniques including MRA, T2 and HASTE, LGE, and 4D flow will be motivated
- Techniques and tips for obtaining high quality images
- Future imaging improvements

**Target audience:** Researchers with interest in atrial fibrillation and other disorders related to the left atrium.

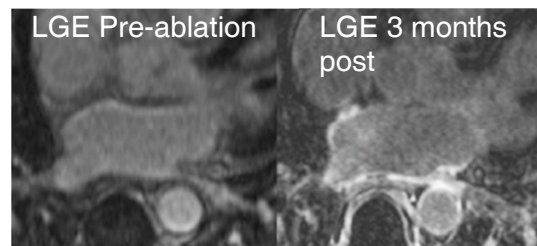
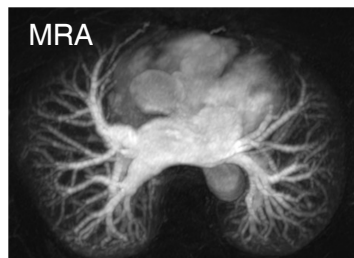
**Objectives:** – After this presentation, one will be able to 1) list the different types of LA images that can be obtained currently in patients, 2) better appreciate the challenges and techniques for obtaining good quality LA images, and 3) better use sequences at their site to obtain LA information.

**PURPOSE:** – To illustrate ways that MRI can improve the assessment and treatment, as well as the understanding of the most common arrhythmia - atrial fibrillation.



**METHODS & RESULTS:** – The CARMA center at Utah, and other groups around the world, have developed advanced MRI methods in order to study the very thin left atrium. Examples of MRA, T2-weighted and LGE images are shown in the figures. The LGE method in particular requires a respiratory navigated 3D acquisition that typically works best with phase encoding right-left rather than the shorter anterior-posterior direction [1], and has timings adjusted depending on heart rate. Functional assessment of the LA will also be discussed, as will 4D phase-contrast flow methods.

Future improvements include gated MRA, T1 mapping, and motion modeling and compressed sensing methods to reduce the acquisition time of the LGE.



**CONCLUSION:** – Advances in LA imaging techniques have made obtaining new types of information possible. Currently, LGE imaging of the LA at our institution helps to guide the selection of patients for ablation treatment [2]. Future clinical impact is likely to include better assessment of ablation lesions and LA remodeling. The methods also are valuable for studying the onset and progression of arrhythmias and other cardiac diseases, in the LV or LA.

**REFERENCES:**

1. Peters DC, Wylie JV, Hauser TH et al. Detection of pulmonary vein and left atrial scar after catheter ablation with three-dimensional navigator-gated delayed enhancement MR imaging: initial experience. *Radiology* 2007;243(3):690-695.
2. Oakes RS, Badger TJ, Kholmovski EG et al. Detection and quantification of left atrial structural remodeling with delayed-enhancement magnetic resonance imaging in patients with atrial fibrillation. *Circulation* 2009;119(13):1758-1767.