LV, LA and LAA Dynamics

Left Atrial Appendage Flow Velocity does NOT correlate with LAA Ejection Fraction

Modeling LA and LAA flow with CFD

Normal

4D Flow Assessment of CHD

Ventricular Volume Quantification


4D Phase-Contrast MRI

Ventricular Volume Quantification


4D Phase-Contrast MRI of LAA flow

Calculation of LV strain from SQUEEZ

Pourmortez et al. Circ Imaging xxx, McVeigh et al. JCT xxx
Tendyne Trans-apical Mitral Valve Device

**Ac:** Anterior Cuff, **T:** Tether, **EP:** Epicardial Pad

Visualizing LV Function with the TMVR device

Mapping LV Strain During Systole with SQUEEZ

Gabrielle Cobert, E. McVeigh, J. Leipsic et al. (unpublished)
Comparing SQUEEZ pre and post implant

Comparing SQUEEZ vs time pre and post

Evaluating LV viability with Extracellular Volume (ECV)
4D Flow Assessment of CHD
Diagnostic Visualization

Hsiao, et al. Radiology. 2012; 265(1), 87-95

Dynamic CT of Normal Valves
Dynamic CT of abnormal Ao Valve

Elliot McVeigh, 2017

CT for 3D planning of interventional procedures

Mitul Patel, Elliot McVeigh, Ryan Reeser, Andrew Schlachter, Davis Vigneault, et. al. 2018
Conclusion

“New generation” 4DCT and 4D MR imaging will yield:

- Accurate modeling of dynamic chambers of the heart
- Accurate measurement of regional cardiac function over the whole heart
Biventricular Function Imaging with CT

**Approach:**
- Low radiation dose
- Mean dose < 1 mSv
- Contrast-enhanced
- Retrospectively gated
  - Tube Current modulation

**Result:** Effectively evaluated global biventricular function in 30 consecutive patients

Purpose of the Left Atrial Appendage?