

# Electrophysiological imaging of LA – D. Shah

- Stroke in patients with atrial fibrillation can have multiple etiologies. By some estimates (such as the AFFIRM database) only about 55% of ischemic strokes are definitely or possibly cardio-embolic. Thus the AF is not the direct culprit in a significant number of strokes in patients with AF, fitting well with the added role of atherosclerosis promoting risk factors comprising the CHADS and CHADSVASC scores.
- Electrophysiological indicators or risk factors: Even in the absence of known or detected AF, 24 hour Holter based APB counts have been found to be linked to ischemic stroke and implantable loop recordings have found a significant frequency of AF in cryptogenic stroke patients. Interatrial block has been associated with stroke and systemic emboli. And in a large cohort of elderly patients with hypertension, LA enlargement is associated with ischemic stroke. Similarly, LA enlargement reflected in terminal forces in ECG lead V1 have been associated with imaging signs of ischemic stroke in patients without known AF.
- Electrophysiological signs of LA scar including low endocardial voltage zones have been found in patients with AF, associated with echo based speckle tracking signs of dyssynchrony. Other echo based signs of LA dysfunction correlate as well as do multi-detector CT attenuation values and delayed enhancement with gadolinium during MR imaging. One study found a correlation between greater MR delayed enhancement detected LA fibrosis and stroke whereas an older study found a similar correlation between large low voltage LA zones and stroke in patients with AF. In this context, catheter ablation may have bimodal effects on stroke risk by virtue of increasing LA scar area.
- Summary
  - There is likely a significant local LA component contributing to stroke risk in patients with AF. LA dysfunction or remodelling may however contribute to stroke risk even without documented AF and LA electrophysiological parameters may provide an early indication of this remodelling .