Introduction

Contact electrograms are the diagnostic norm. AcQMap (Acutus Medical, San Diego, CA) derives the local charge-sources (dipole density from noncontact voltage and displays them as a color map on a 3D ultrasound reconstructed anatomy.

Methods

Patients scheduled for AF ablation were consented and mapped using a basket catheter with 48 ultrasound transducers and 48 electrodes. Dipole density is inversely calculated to subtract the effect of distant sources and display a more localized map of activation. Conduction is displayed as a retrospective moving color-map. Red is the present location of the leading-edge, while other color-bands represent earlier locations in time. Historical persistence of the leading edge enables visualization of complex conduction patterns. Ultrasound anatomies and pre-/post-ablation maps were obtained.

Results

N: 12 subjects
Mean Age: 58 years (45-74)
BMI: 29 (25-39)
AF Duration: 4.6 years (2-10)

• A total of 112 sec of left atrial AF was mapped (42 maps: 1 to 3 seconds of AF per map)
• Multiple waves spread out from focal sites and short-lasting zones of rotation
• Higher complexity was observed in the septum and region between the antral junctions of the pulmonary veins, including irregular short-radius reentry and patient specific central paths of rotation

Conclusions

• Ultrasound-based imaging and dipole density mapping is feasible in persistent AF.
• It may enable more detailed visualization of propagation patterns and potential therapeutic targets.
• Further clinical studies are needed to determine clinical benefit