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High-resolution imaging of left atrial anatomy using a novel wide-band dielectric mapping system:
first-in-man clinical experience

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Introduction: Recently, the wide-band dielectric mapping system Kodex was introduced. This study presents
the first report of high-resolution imaging of cardiac anatomy using this novel system.

Methods: The study included 20 consecutive patients with symptomatic atrial fibrillation or left atrial tachycardia
who were scheduled for an ablation procedure and underwent simultaneous left atrial mapping using the Kodex
and Carto 3 systems. Pulmonary vein (PV) angiograms served as a reference to compare the cranio-caudal
dimensions of the PV ostia as depicted by either of the two mapping systems.

Results: Complete left atrial imaging was achieved within a median of 9.7 [1st; 3rd quartile, 7.5; 12.8] min.
Median procedure time was 97.5 [90; 112.5] min and median total fluoroscopy time was 8.2 [5.7, 10.6] min,
of which a median of 1.4 [1.1; 2.3] min was used during the creation of the left atrial map. High-resolution
representations of left atrial anatomy were successfully created in all patients. Kodex offers two distinct options
for visualizing the cardiac anatomy (Figure 1). Left-hand panel, a conventional 3D image of the heart chamber
shows a detailed depiction of the atrial surface (posterior-anterior and slightly superior view of left atrium).
Right-hand panel, a novel panoramic view supplies the operator with a unique endocardial perspective of the
left atrium, revealing anatomical features previously obscure to the clinical electrophysiologist. Both Kodex and
Carto measurements correlated well with fluoroscopy measurements, as reflected by Pearson’s correlation
coefficients (r) of 0.91 and 0.95, respectively. Bland-Altman plots revealed that, on average, Kodex
measurements underestimated fluoroscopy measurements by 0.04 mm (95% limits of agreement of -5.72 and
+5.64 mm) and Carto measurements underestimated fluoroscopy measurements by 0.02 mm (95% limits of
agreement -3.61 and +3.57 mm).

Conclusion: Anatomical mapping of the left atrium using Kodex bears the potential to create computed
tomography-like images without the need for additional periprocedural imaging.
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