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System And Method Of EAT/US-Guided Pulsed Field Ablation For Intracardiac Applications

Tech ID: 34331 / UC Case 2025-817-0

BRIEF DESCRIPTION

A real-time, ultrasound-based imaging modality that improves intracardiac irreversible electroporation accuracy by visualizing electric field distribution during cardiac ablation.

FULL DESCRIPTION

Irreversible electroporation (IRE) is a nonthermal tissue ablation technique that causes cell death in tissue while preserving the extracellular matrix while inducing minimal inflammation, which makes it a promising treatment for intracardiac ablations, however incomplete lesion treatment leaves areas at risk of arrhythmic recurrence. This technology combines electroacoustic tomography (EAT) with intracardiac echocardiography (ICE) catheters to provide real-time imaging of electric field distributions during irreversible electroporation (IRE) cardiac ablation which enables real-time image guidance for cardiac ablation, minimizes collateral tissue damage, and reduces repeat interventions for cardiac arrhythmias.

SUGGESTED USES

- » Cardiac ablation procedures: Guidance and monitoring of pulsed field ablation (PFA) for arrhythmia treatment and intracardiac electroporation therapies requiring precise lesion creation and verification.
- » Clinical applications: Electrophysiology labs seeking improved ablation success rates and reduced complications, particularly for pediatric and fragile patients benefiting from nonthermal, targeted treatments.
- » Advanced interventional solutions: Development of personalized cardiac treatment devices and advanced imaging solutions for interventional cardiology that optimize energy delivery.

ADVANTAGES

- » Real-time precision and safety: Visualizes electric fields and differentiates reversible vs. irreversible zones to ensure accurate lesion formation and minimize collateral damage and also supports personalized protocols and uses non-thermal ablation to avoid heat-sink effects, protecting surrounding tissues and vessels.
- » Reduced complexity: Provides immediate lesion verification and works with standard ICE catheters, reducing repeat ablations.

PATENT STATUS

Patent Pending

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OTHER INFORMATION

CATEGORIZED AS

- » **Medical**
 - » Devices
 - » Disease: Cardiovascular and Circulatory System
 - » Imaging
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- » **Sensors & Instrumentation**
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