Accurate, real-time radio-frequency ablation of arrhythmic cardiac tissue

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Technology description

Summary

Radio-frequency ablation is a common technique used to treat atrial fibrillation and other diseases characterized by arrhythmias of the heart. With nearly 2.5 million Americans suffering from cardiac arrhythmias, radio-frequency ablation is indispensible to modern medicine. However, using this technique, it is difficult to identify precise regions of arrhythmic cardiac tissue, which limits the accuracy with which ablation can be performed. This technology enables pinpoint accuracy via real-time monitoring of cardiac structure. Successful application of this technology would not only improve intervention efficiency, but may also improve patient outcomes.

Improved surgical precision enables superior patient outcomes

This technology provides superior real-time mapping of cardiac tissue by generating a live velocity and vector field from a standard electrocardiogram. Software can then transform these data and map out ectopic foci, wave-front collisions, and obstacles to reentrant circuits. The combined result is a precise and real-time understanding of patient's cardiac structure unmatched by conventional technologies. Development of this technology will afford clinicians greater precision in preforming radio-frequency ablation and potentially allow them to improve patient outcomes. This technology has been used successfully to map live human cardiac tissue in vivo.

Publications

Wan E, Grondin J, Biviano A, Whang W, Gambhir A, Konofagou E, Garan H “Novel Method Using Intracardiac Myocardial Elastography Provides Real-time Assessment of Right and Left Atrial Radiofrequency Ablation Lesions in Humans” Circulation. 2014 130.Suppl 2 (2014): A19084-A19084.

Application area

Mapping and evaluation of cardiac tissue
Aid in delivering precise radio-frequency ablation for the treatment of atrial fibrillation and other arrhythmic diseases

Monitoring conduction in other organ systems, potentially the brain or nervous system

Advantages

Precise, real time mapping of cardiac tissue is able to pinpoint areas of arrhythmia
Accurate identification of arrhythmic areas allows for ablation of smaller areas, potentially improving patient outcome
Software focuses on interpreting data from a conventional electrocardiogram, making the technology simple for clinicians to use.

Institution

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