Magnetically Coupled Ablation Devices

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Technology description

Atrial Fibrillation (AF or AFib) is a medical condition that is a significant cause of stroke, heart failure, disability and death. It is estimated that more than 640,000 people develop AFib each year in the US alone. Currently, up to 5 million people are affected by AFib in the US; that number is expected to reach 12-16M people in the US by 2050. Although several procedures and related devices are available for performing AFib ablation, the least invasive procedure is performed using catheter ablation. Catheter-based ablation of AFib, which delivers ablation to the endocardial tissue (inside the heart) results in 80-85% success following first time ablation surgery, and 95% success with a second ablation. An estimated 110,000 AFib catheter ablation surgeries were performed worldwide in 2010, with an anticipated growth rate of 12 - 15%. This represents only a small fraction of the 35% of AFib patients who meet the criteria for surgical intervention using catheter ablation surgery. With improvements in surgical devices and methods, the potential market is significant. Ablation surgery involves destroying the defective tissue that causes the afibrillation in the heart. Currently, the catheters are moved along manually in a "dot-to-dot" fashion. This runs the risk of missing areas of the tissue and/or over-heating in one area. Over-heating could cause punctures that lead to fusion of the esophagus with the atrium. Holes also provide an environment for microbial infection, and creation of emboli (stroke, heart attack). Three leading cardiologists at Intermountain Healthcare have invented a bipolar magnetically coupled endocardial and epicardial ablation device that will "roll" along the atrium. By including a rolling component of the catheters, the ablation procedure will avoid dot-to-dot complications, and will apply a more consistent current over the atrium creating a full length lesion. This invention also includes a design for a steerable delivery catheter for positioning the ablation. This concept could also potentially be used for ventricular tachycardia, atrial and ventricular extopic foci, atria tachycardia, atrial flutter, and atrioventricular reentrant tachycardia.

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