2008-626 A Method to Protect the Esophagus and Other Mediastinal Structures During Cardiac and Thoracic Interventions

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Technology description

BACKGROUND

Atrial fibrillation (AF) is the most common cardiac arrhythmia that is characterized by rapid and irregular beating. The diagnosis of AF is often based on electrocardiogram (ECG) characterized by the absence of discrete P waves and an irregular ventricular rate. Patients diagnosed with AF have increased chances for stroke, heart failure and other heart complications. AF can be treated with medications to slow down the heart rate or to control heart rhythm, and/or by non-surgical procedures, such as cardioversion or ablation.

Catheter ablation is an effective minimally-invasive procedure for treating AF that uses locally-delivered heating or freezing to make small scars in heart tissue to prevent abnormal electrical signals from moving through the heart. During the procedure, a series of catheters are threaded through the blood vessel to the heart to locate the source of abnormal beating, then either radiofrequency waves, extremely cold temperatures, or laser light is generated at the tip of another catheter to create a scar at a small area of the faulty heart tissue. This scar forms a barrier that prevents electrical impulses from crossing between the damaged heart tissue to the surrounding healthy tissue.

A variety of serious complications have been reported with catheter ablation, including pulmonary vein stenosis, cardiac perforation, thromboembolism, vascular complications, and phrenic nerve injury. Atrioesophageal fistula, thought to result from thermal injury of the esophagus due to its close position to the posterior left atrial wall, is a rare but often fatal complication of catheter ablation for AF. Prior methods for avoiding esophageal injury during left atrial catheter ablation usually limit the amount of energy applied to areas of the heart where collateral damages is likely (e.g. near the esophagus). However, limiting energy delivery may not provide proper therapy leaving arrhythmia unsuccessfully treated. Therefore, there exists a need for a device to actively protecting esophagus during catheter ablation.

INNOVATION

Researchers at UCLA have developed a novel device that increases separation between left atrium and esophagus to prevent esophageal injury during catheter ablation of the posterior left atrial wall for atrial fibrillation. This device also avoids injury to surrounding mediastinal structures when access to

specific regions of the heart is needed in the fields of cardiology, radiology, electrophysiology and surgery.

Application area

Catheter ablation for treatment of atrial fibrillation

Advantages

Improves both the safety and efficacy of the catheter ablation procedure
Avoids injury to esophagus and surrounding mediastinal structures

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