CorAccess: Tissue Strengthening and Port Access System for Transapical Cardiac Surgery

Published date: June 8, 2012

Technology description

Market Summary

This device can be used in the placement of a number of cardiac medical devices including the ventricular assist device, transapical aortic valve implant, and transapical mitral valve implant. The market size for these three cardiovascular devices is projected to reach a combined total of approximately $8.5 billion by 2015.

Technical Summary

Purely mechanical devices for percutaneous apical access often have to be used with tissue that is mechanically fragile, especially in cardiac chambers and structures with systemic pressures within the cavity. Tissue fragility and cardiac and/or respiratory motion may lead to covert, overt, or catastrophic hemorrhage at the apex access site in the heart. Researchers at Emory have developed a novel device that directly addresses the weaknesses of other devices by strengthening the tissue (particularly around the ventricular apex) to allow mechanical stability, preventing leakage while an access port is in place, and providing a mechanically sound channel that can be securely closed using a hydrophilic plug following the completion of the procedure. The tissue strength is first enhanced via controlled delivery of energy to the tissue in the heart apex. After the tissue strength has been enhanced, a port can be anchored firmly in the access channel. When the access port is no longer needed for intracavitary procedures, it can be closed with a short plug that will promote rapid recovery and endothelial coverage. The entire plug may be biodegradable or the access channel could be marked to facilitate future access either by plug penetration or removal.

Application area

Device that enhances the tissue mechanical strength of the heart apex allowing access to the cardiac chambers.

Advantages

Reduces procedural time and risks such as apical rupture and bleeding for transapical heart surgery. Improves tissue mechanical stability by enhancing tissue strength, particularly apex tissue which may be weakened in some patients.

Facilitates easier and safer access to the interior structures of the heart during surgical procedures involving repair and replacement.
Less risk of bleed complications compared to conventional suturing of the access site.
Closure of the access site is accomplished with a biocompatible plug thereby eliminating the need for extensive suturing and reducing trauma to the surrounding tissue.

Institution

Emory University

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