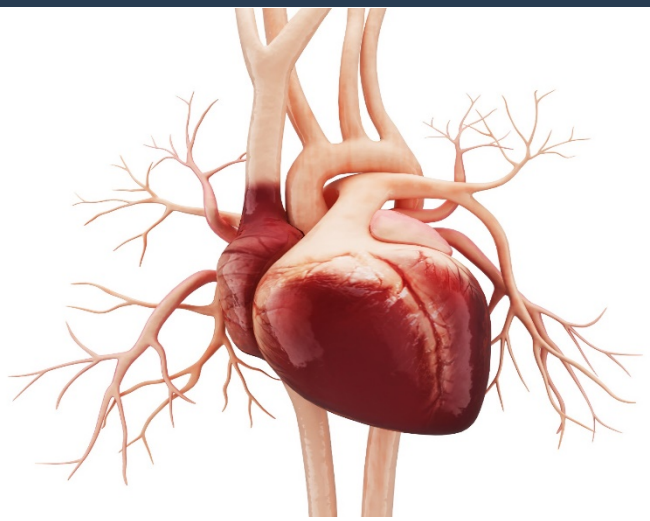
Cardiac Septal Occluder Technology

An implantable cardiac device to facilitate access of therapeutic catheters to the left chambers of the heart

Reference: Septal Occluder

Objective

Seeking co-development or co-investment partners



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Background

Transseptal procedure (TS) is a technique used in cardiology to access the left chambers of the heart percutaneously. This procedure involves puncturing the heart internal wall (atrial septum) to provide access to the therapeutic catheters. TS technique is used to treat Atrial Fibrillation (AF), Heart Failure (HF), and Mitral valve Regurgitation (MR) with the minimally invasive procedure. If not managed post-TS procedure, the punctured wall also known as iatrogenic atrial septal defect (iASD), will create a shunt that allows communication of oxygenated blood between the right and left atrium, leading to severe complications such as stroke and heart dysfunction.

AF is a recurrent disease which coexists with HF and MR, and as such, a patient may require several TS procedures during their lifetime.

Current technologies for sealing the iASD such as "Abbott Amplatzer" and "Gore Cardioform" septal occluders are deployed across the atrial septal shunt at the end of the TS operation.

These devices seal the iASD shunt but also block the access to the heart left chambers permanently. This is problematic as it prevents subsequent septal access and reduces the treatment options available to patients.

Consequently, there is an unmet clinical need to provide a method for sealing the iatrogenic shunt created during TS puncture, while also preserving the ability to re-access the left chambers for future TS interventions.

Tech Overview

Researchers at NUI Galway have developed a NiTi mesh-based occluder device which can be deployed via the percutaneous delivery system following the TS operation to seal the iatrogenic shunt (iASD) created on the septum. While the initial function of the implant is to seal the iASD, its complementary function is to provide an access path for the therapeutic catheter to pass the atrial septum in the subsequent TS procedures. As such, once the occluder is implanted, it provides a repetitive "access-path" and "sealing" feature, therefore allowing the management of iASD, without a need for further intervention at post-TS operation.

Benefits

The occluder implant:

- Provides effective and repetitive sealing of iASD after each TS procedure preventing complication caused by left-right heart atrial shunt
- Provides easy and repetitive subsequent access for the therapeutic catheter in case of a follow-up TS procedure
- Enhances manoeuvrability of therapeutic catheters, in a TS procedure, specifically in the operation for treatment of MR

Applications

The application of the developed occluder implant is for the treatment of AF, HF and MR with TS procedure. These operations involve Transcatheter Mitral Valve Repair/Replacement (TMVR), Electrophysiology (EP) and HF treatments.

The global market size of TMVR was valued at $1.82B in 2019 and is expected to reach $4.67B by 2027, at a CAGR of 14.4%. The market size of EP devices is $4.5B in 2020 and projected to be $5.6B in 2025, with CAGR of 4.1%. Heart failure market size was $3.7B in 2018 and is expected to be $22.1B in 2028, with CAGR of 19.5%.

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