Improved Transcatheter Aortic Valve for Valve-in-Valve Implantation

Tech ID: 20981 / UC Case 2010-010-0

BRIEF DESCRIPTION

UCSF investigators have developed a new percutaneous prosthetic aortic valve that can be used for valve-in-valve replacement of either native or prosthetic aortic valves. The design allows for supravalvular placement of the prosthetic valve. Advantages include reduced paravalvular leak, reduced energy loss and improved hemodynamics regardless of the calcification level of the diseased valve.

FULL DESCRIPTION

Background

Minimally invasive transcatheter aortic valve implantation (TAVI) has been expected to replace open heart surgical valve replacement with a less painful, less invasive, and less traumatic procedure. In the elderly population especially, TAVI offers hope for patients too frail for open heart procedures. However, the performance and longevity of transcatheter valves has been questioned. A study by Zegdi et al. (2010) demonstrated that the native calcified and stenotic aortic valves cause distortions in leaflet geometry and non-circular deployment of transcatheter stents. Distortions in aortic valves result in leaks, suboptimal hemodynamics (which can result in symptoms such as fainting, weakness, chest pain and chronic heart failure), and early valve failure. A new transcatheter valve design that could overcome the geometrical challenges of inserting a transcatheter valve inside a calcified and stenosed valve would facilitate broad adoption of TAVI for both replacement of diseased valves and replacement of deteriorated earlier valve prostheses without open heart surgery.

Description

UCSF investigators have developed a new design for a percutaneous valve that can be used for valve-in-valve replacement of either native or prosthetic aortic valves. The design allows for the valve to sit above the native valve position so that the size and shape of the new valve are not constrained by the size or calcification of the valve to be replaced. The new valve design has significant hemodynamic advantages over that of the first generation percutaneous valves. Efficacy of this design was tested in an in vitro pulse duplicator system and transvalvular gradients obtained with the new valve-in-valve design were comparable with standard surgical valve replacement of equivalent size.

SUGGESTED USES

▶ Treatment of native aortic stenosis by replacement valve

▶ Replacement of degenerated bioprosthetic aortic valve

ADVANTAGES

▶ Improved hemodynamics over other transcatheter valves

▶ Less invasive than surgical valve replacement

OTHER INFORMATION

CONTACT

Shikha Sharma
shikha.sharma@ucsf.edu
tel: View Phone Number.

CATEGORIZED AS

▶ Medical
▶ Devices
▶ Disease: Cardiovascular and Circulatory System

RELATED CASES

2010-010-0
A patent application has been filed. Worldwide rights are available.

The investigators welcome the opportunity to work with industry partners to further validate the device in in vivo models.

**PUBLICATIONS**


**PATENT STATUS**

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Additional Patent Pending

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**ADDRESS**

UCSF Innovation Ventures
600 16th St, Genentech Hall, S-272,
San Francisco, CA 94158

**CONTACT**

Tel: innovation@ucsf.edu

https://innovation.ucsf.edu

Fax:

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