A distensible wire mesh for a cardiac sleeve

Tech ID: 32968 / UC Case 2022-714-0

BRIEF DESCRIPTION

Researchers at University of California, Irvine have developed a novel distensible wire mesh that can be used in the heart surround sleeve component of a whole heart assist device. This wire mesh design enables the device to collapse and expand reversibly for a variety of uses, such as during the delivery process of the whole heart assist device as well as for allowing the device to contract and expand to physically pump the heart.

SUGGESTED USES

This distensible wire mesh can be used in any structure or device that needs to be able to reversibly collapse and expand in size, such as in the sleeve structure of a whole heart assist device.

TECHNOLOGY DESCRIPTION

Heart failure affects at least 26 million people worldwide and generates an enormous clinical and economic burden globally. Due to the limited availability of heart donors, heart transplants are not a feasible solution for most people. Many of these individuals instead use ventricular assist devices (VADs). However, VADs are mechanical pumps that are intertwined with ventricles of the heart, making them continually in contact with blood. This mechanism requires patients to take blood-thinners to prevent blood clots from forming. In addressing this problem, researchers at University of California, Irvine previously developed a whole-heart assist device comprised of an implantable sleeve that wraps externally around the in-tact heart (see Tech ID: 30542 & Patent: 11376417). This cardiac sleeve device surrounds a failing heart to assist in pumping and does not directly contact blood, which is critical in mitigating clotting risk.

The team of UCI researchers have now invented a distensible wire mesh for use in this whole heart assist device, as well as in any other structure or device that needs to be able to reversibly collapse and expand in size. This novel design enables the wire mesh to be leveraged in a variety of uses that require dynamic changes in size. For example, the novel wire mesh in the cardiac sleeve allows the device to be compressed into a catheter for delivery to the heart. Additionally, the design enables the whole heart assist device to contract and expand to pump a failing heart externally, and it makes the device easily adjustable to the size of the patient's heart.

STATE OF DEVELOPMENT

Feasibility animal study is in progress.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Published Application	20230256232	08/17/2023	2022-714

CONTACT

Alvin Viray
aviray@uci.edu
tel: 949-824-3104.

INVENTORS

- Kelley, Gregory S.
- Kheradvar, Arash

OTHER INFORMATION

KEYWORDS

Whole heart assist device, Minimally invasive device implantation, Transcatheter delivery, Deployment and implantation

CATEGORIZED AS

- **Medical**
  - Devices
  - Disease: Cardiovascular and Circulatory System

RELATED CASES

2022-714-0

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Percutaneous Heart Valve Delivery System Enabling Implanted Prosthetic Valve Fracture
- Method to Improve the Accuracy of an Independently Acquired Flow Velocity Field Within a Chamber, Such as a Heart Chamber
- Percutaneous Heart Valve Delivery System
- Growth-Accomodating Transcatheter Pulmonary Valve System
- System for Transcatheter Grabbing and Securing the Native Mitral Valve's Leaflet to a Prosthesis
- Real-time 3D Image Processing Platform for Visualizing Blood Flow Dynamics
- Method for Synchronizing a Pulsatile Cardiac Assist Device with the Heart
- Automated Histological Image Processing tool for Identifying and Quantifying Tissue Calcification
- Fully Automated Multi-Organ Segmentation From Medical Imaging
- Simple, User-friendly Irrigator Device for Cleaning the Upper Aerodigestive Tract and Neighboring Areas
- Automated 3D Reconstruction of the Cardiac Chambers From MRI of Ultrasound
- Minimally Invasive Percutaneous Delivery System for a Whole-Heart Assist Device

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5270 California Avenue / Irvine,CA
92697-7700 / Tel: 949.824.2683