Docket #: S22-120

Anatomically conforming device for tricuspid valve annuloplasty

Stanford researchers have designed a novel tricuspid annuloplasty ring that minimizes the risk of interrupting cardiac conduction during implantation.

Tricuspid regurgitation is a prevalent heart condition in which the tricuspid valve fails to close completely during ventricular contraction. The disrupted unidirectional blood flow could lead to abnormal pressure or volume overload. Patients with moderate to severe cases may require annuloplasty, where a ring device is implanted over the annulus around the tricuspid valve to support valve leaflets. While securing the device, sutures often inadvertently cross the bundle of His in the septum, disrupting heart conduction. To avoid this complication, there is a critical need for alternate annuloplasty devices.

Researchers in the Woo Lab at Stanford have created a modular annuloplasty device that avoids suture placement in conduction tissue. Its most basic form is a C-shaped band with a wide gap between the two ends to avoid traversing over the septal leaflet. The device can be further secured by adding a flexible polymer that joins the ends of the device. Alternatively, the ends can be conjoined with a bridge-like structure that bends away from the valve. The bridge is angled to conform to the septal wall and aorta, improving retention.

Figure

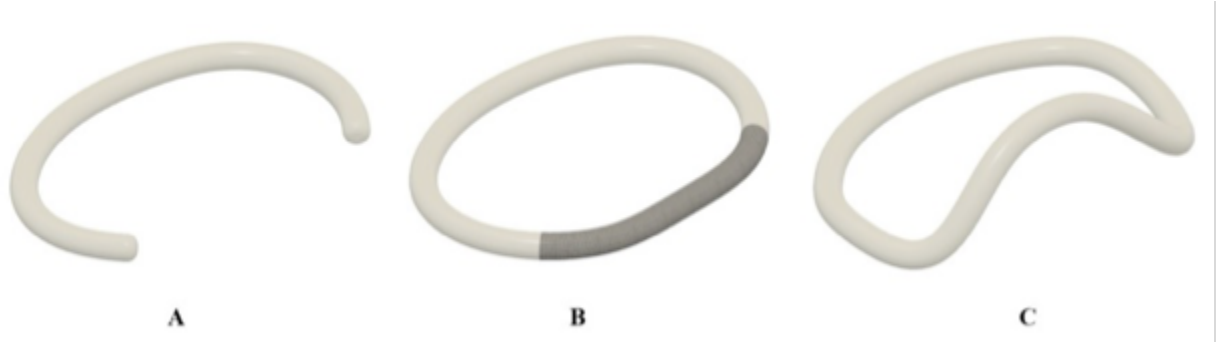


Figure Description: Annuloplasty device in three different configurations (Image credit: the inventors)

Stage of Development
Prototype, *ex vivo* proof of concept

Applications

- Tricuspid valve annuloplasty

Advantages

- No suture placement in conduction tissue
- Reduced need for pacemakers
- Improved retention strength
- Reduced recurrent regurgitation

Patents

- Published Application: WO2024026049
- Published Application: 20250169952

Innovators

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