Pediatric Heart Valve Conduit Accomodates Growth

Technology #20170055

PTFE Heart Valve Conduit Grows with Heart

A conduit, which can be used for cardiac repair in children with congenital heart disease, allows future growth/expansion. The conduit, a tubular device, is constructed of stretch PTFE tube and the valve mechanism consists of biologic or synthetic materials. The maximum stretch of the PTFE is oriented radially, and submucosa, thin-walled PTFE or other materials can be used to create a bicuspid (or tricuspid) valve. The conduit spontaneously expands in a radial direction in response to hemodynamic and somatic needs. Because the maximum stretch is radial, using a balloon catheter after implantation can permanently stretch the tube (i.e., as the child grows). The conduit can be deployed in vascular systems to provide a pathway of care as they can be expanded circumferentially to provide a cross-section for blood flow appropriate for the size of the patient. The hemostatic conduit will not calcify, has some regenerative/remodeling capacity and accommodates growth. The conduit is amenable to catheter-based insertion and manipulation without risk of rupture or bleeding.

Fewer Pediatric Heart Surgeries Required

Valve or valved conduit replacement (e.g., with synthetic conduits, biologic or metallic valves, or even donor organs) for children with congenital heart disease is a less than ideal therapy, primarily because the replacement materials cannot grow as the child (and the child’s heart) grows. Therefore, rectifying a congenital heart defect often requires multiple revision surgeries as the patient grows, where a new conduit or portion thereof is inserted in the patient’s heart. These surgeries place the patient at risk of morbidity, bleeding and/or possible death. This new conduit can expand, or “grow,” with a patient’s heart. By orienting the maximum stretch radially, the tube can expand spontaneously or be stretched with a balloon catheter after implantation, thus avoiding multiple high-risk reoperative cardiac surgery.
BENEFITS AND FEATURES

- Conduit expands, or “grows,” with a patient’s heart
- Offers valve pathway of care
- Hemostatic; easy to handle
- Custom sizes
- Some regenerative/remodeling capacity
- Amenable to catheter-based insertion and manipulation after insertion
- Reduces revision surgeries/multiple operations
- Lessens risk of rupture, bleeding and/or death

APPLICATIONS:

- Congenital heart disease
- Pediatric/children’s heart surgery
- Valve replacement
- Pulmonary conduit insertion
- Pulmonary valve disease; pulmonary leakage, stenosis, or atresia
- Tetralogy of Fallot
- Double outlet right ventricle
- Transposition complexes
- Ross procedures (aortic valve disease)
- Fontan operation
- Single ventricle palliation
- Total cavopulmonary connection

Phase of Development - In Vivo/animal studies

Interested in Licensing?
The University relies on industry partners to scale up technologies to large enough production capacity for commercial purposes. The license is available for this technology and would be for the sale, manufacture or use of products claimed by the issued patents. Please contact Kevin Anderson to share your business needs and technical interest in this technology and if you are interested in licensing the technology for further research and development.

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IP: UM Docket 20170055

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