Conduit to increase coronary blood flow in heart failure patients

Technology #cu16249

This technology is a pressure-sensitive conduit that improves blood flow in patients with heart failure.

Unmet Need: Device that mitigates need for heart transplantation

Heart failure is a leading cause of death worldwide. However, most pharmaceutical and surgical strategies focus on treating symptoms and maintaining cardiac function, without completely treating the condition. Over time, irreversible damage accumulates, requiring heart transplantation. As transplantation is a complicated procedure that also relies on the availability of donor organs, new therapeutic strategies that address heart failure are needed.

The Technology: Customizable pressure-sensitive conduit to improve coronary blood flow

This technology consists of an implantable device that utilizes a sensory and control unit to open and close a conduit placed between the left ventricle and coronary artery, improving blood flow and oxygen delivery. The sensory unit detects changes in biological signals such as pressure, blood flow, and oxygen that are analyzed by the control unit to control the open/closed state of the conduit. In contrast to complicated heat transplantation, this technology may be surgically implanted using routine techniques used to place stents, grafts, and valves. Additionally, the conduit is 3D printed, ensuring each device is patient-specific. In sum, this technology provides a pressure-sensitive conduit that increases coronary blood flow in heart failure patients, preventing tissue damage and providing an alternative to transplantation.

Applications:

- Increase blood flow and oxygen delivery to cardiac tissue in heart failure patients
- Continuously monitor blood pressure, oxygen and other biological signals to monitor heart condition
- Alternative or precursor to heart transplantation
Advantages:

- Sensory unit may be customized to detect a variety of biological signals
- Automatically controlled based on pre-set, or manually modified, parameters
- 3D printing enables customization to each patient
- Made using existing biocompatible materials
- Implanted using existing surgical techniques

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