

# Sutureless Aortic Bypass Graft System

## Summary

This invention pertains to a new aortic bypass graft system designed to facilitate open surgical treatment of aortic or branch vessel arterial occlusive disease. The system consists of an implant coupler with attached bypass graft, which is intended to be installed in a non-clamp fashion using an over-wire technique. In addition to eliminating the risks inherent with aortic cross clamping, this system expedites the creation of a proximal anastomosis thereby significantly reducing operative time and creating potential for further development of laparoscopic aortic bypass techniques.

### Key Investigator

Jack L. Eidson, MD

### Field

Vascular Surgery

### Technology

New aortic bypass graft system

### Key Features

- Eliminates aortic cross clamping
- Reduces operation time
- Potential for minimally invasive utilization
- Simple design

### Stage of Development

Preclinical, prototype

### Status

Available for licensing

### Patent Status

Provisional

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### Market

Peripheral vascular disease and its associated complications affect 8 to 10 million patients in the United States. Each year, approximately 12 thousand open bypass operations are performed for the treatment of visceral and advanced iliac arterial occlusive disease.

Open surgical bypass for atherosclerosis affecting the aorta, its primary branches, and the iliac arteries is the standard of treatment for life and limb-threatening conditions. Open surgical bypass is unsurpassed in long-term durability and primary patency, when compared to endovascular therapy. A major drawback to open surgical treatment is the need for clamping the aorta, a process that places the patient at risk for aortic dissection, distal embolization, and permanent ischemic organ injury. Additionally, open surgical bypass can be a lengthy operation under general anesthesia, which is followed by extensive recovery and hospitalization.

This device offers the potential to simplify open surgical bypass and will be utilized for several operations, including aorto-visceral, aorto-femoral, and aorto-iliac bypasses. With the increasing interest in aortic debranching operations for repair of aortic aneurysms, and the current limitations to laparoscopic aortic bypass surgery, this invention offers promise to these future fields of aortic surgery.

### Technology

This technology pertains to an implanted graft and attached coupling device that is designed to attach firmly and securely through the aortic wall. The coupler is mounted on a wire-guided dilator, which is simply advanced through a needle puncture, and then used to dilate the aortic opening while the graft coupler is secured, all with minimal blood loss. Once the coupler is seated and secure, the dilator is removed, at which time arterial pressure and flow is introduced into the attached graft. The end of that graft can then be clamped and hand-sewn to the target vessel in a conventional fashion. The invention will be most suitable for graft requirements ranging from 6 mm to 10 mm in diameter.

The low profile and simplicity of such a system would make it suitable for passage through a laparoscopic port, or introduction into the non-diseased portion of a heavily calcified aorta that has limited options for conventional clamp placement.

By eliminating the need for aortic cross-clamping, the use of this device would eliminate many of the associated risks, in addition to eliminating the time-consuming process of hand-sewing a graft to the aorta.

An initial prototype has been designed and was used to evaluate proof of concept in a cadaver model. A second version of the prototype will be available early summer.