



Compliant Aortic Stent Graft

IP Status: Pending US Patent; **Application #:** 16/609,148

Double-walled design mimics compliance of healthy aorta

A double-walled aortic stent graft is compliant to luminal pressure in the aorta. The outer layer of this new design is rigid, similar to current stent grafts, and the inner layer is comprised of a compliant, flexible material that exhibits elastic properties similar to a healthy aorta. The space between the inner and outer layers can be filled (i.e., with sterile saline) to create a volume buffer between the layers so the stent graft becomes compliant to luminal pressure. When blood flows through the lumen of the inner layer, the flexible walls can deform in a similar manner of a healthy vessel. This technology could decrease pressure-induced stresses on the residual native aorta, reduce risk of Stent graft Induced New Entry (SINE) dissections, and potentially result in better systemic hypertension management dissections.

Improves peak systolic pressure, leads to better patient outcomes

Existing aortic endografts offer some flexibility along their length but are rigid across their diameters. Because they press outward against the aortic wall and do not expand during systole, they require greater energy from the native aorta to dissipate the systolic pressure wave. While these stent grafts may protect an acutely injured aorta from an aneurysm, they could also damage the native aorta and require aggressive blood pressure management. This new double-walled, compliant design provides flexibility across the stent graft diameter. When the flexible wall of the inner layer deforms, it behaves more like a healthy vessel. Increasing the compliance can improve peak systolic pressure and lead to better patient outcomes.

Phase of Development

- Proof of concept

Benefits

- Exhibits elastic properties similar to healthy aorta
- Mimics compliance of native tissue
- Could decrease pressure-induced stresses, reduce risk of Stent graft Induced New Entry (SINE) dissections

Features

- Double-walled aortic stent graft
- Rigid outer layer; compliant, flexible inner layer
- Compliant to luminal pressure in the aorta

Applications

- Thoracic and abdominal aortic aneurysm
- Aortic repair surgeries
- Peripheral vascular repair with stent graft
- Aortic dissection

Technology ID

20160398

Category

Life Sciences/Human Health
Life Sciences/Medical Devices

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