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Vascular Graft Identifies Endoleaks

Technology No. 20160162

IP Status: Pending US Patent; **Application #:** 15/585,869

Detects arterial pressure changes to diagnose endoleaks

A new vascular graft design may diagnose endoleaks without requiring CT scans or angiography. The technology monitors changes in arterial pressure that may indicate an endoleak. Specifically, the technology coats existing PTFE or Dacron vascular grafts in carbon nanotubes or silver nanoparticles to create a pressure-sensitive membrane. When the sleeves deform due to pressure changes, an electrical signal is created. The signals are transmitted via radiofrequency to a receiver outside of the body. The receiver displays real-time pressure readouts and wall shear stress of both the internal and external surface of the graft. Radiopaque markers provide fluoroscopic visual confirmation of the graft's orientation, so the physician can reliably identify the areas of the graft under excessive stress or exhibiting signs of endoleaks.

Three-dimensional pressure map helps localize graft defects

Current vascular grafts eliminate flow to an aneurysmal space, thereby reducing or eliminating the risk of rupture. However, when a vascular graft fails to completely divert blood flow, an endoleak may result. Endoleaks are difficult to diagnose, and current graft technologies have no way to monitor endoleads or provide feedback. This new technology provides real-time, active sensing of the vascular graft which may be used to diagnose endoleaks. The graft produces a three-dimensional pressure map that spatially localizes differentiations in pressure measurements to assist physicians in localizing graft defects.

Phase of Development

- Concept

Benefits

- Diagnoses endoleaks without CT or diagnostic angiography
- Three-dimensional pressure map identifies areas under excessive stress or exhibiting signs of endoleak

Features

- Monitors changes in arterial pressure that may indicate endoleak
- Real-time pressure readouts
- Notifies healthcare professionals of pressure changes
- Carbon nanotube/silver nanoparticle coatings creates pressure sensitive membrane
- Radiopaque markers provide fluoroscopic visual confirmation of graft orientation

Applications

- Vascular grafts
- Aneurysm
- Abdominal aortic aneurysm repair
- Thoracic aortic aneurysm repair
- Aortic ectasia
- Peripheral vascular atherosclerosis
- Visceral atherosclerosis
- Peripheral vascular aneurysmal repair
- Visceral aneurysmal repair

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