

A Guiding Indication System for Monitoring Vascular Flow and Patency under Ultrasound

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Technology description

Ultrasound-Based Anastomosis Detection and Assessment Tool

Novelty:

An implantable, resorbable marker and associated detection software to improve effectiveness of postoperative ultrasound-based detection of vascular complications following reconstructive surgery.

Value Proposition:

Thousands of patients undergo cancer- and trauma-related reconstructive surgery annually; however, many procedures fail due to inadequate revascularization of implanted tissue. This is generally in the location of the surgical connection between existing blood vessels and the ones in the implanted tissue, known as the anastomosis site. Unfortunately, devices currently used to assess vascular complications in the postoperative period have high false positive rates and low sensitivity, causing hospitals to pay thousands of dollars per patient due to inadequate monitoring technology. This technology can indicate the location of the anastomosis, and associated software provides quantitative analysis of the patency and volumetric flow rate of the anastomosis. Additional advantages of this system include:

Technical Details:

Johns Hopkins researchers have developed an ultrasound-based detection system for the identification and assessment of anastomosis sites in reconstructive surgery patients. The resorbable polymer marker is placed underneath or adjacent to an anastomosis site during reconstructive surgery. Postoperatively, providers identify the anastomosis site with ultrasound using the marker geometry and/or software-based feedback for guidance. Once the system detects the correct position and orientation of the ultrasound probe with respect to the marker, axial and longitudinal ultrasound images of the anastomosis site and blood flow rate through the vessel are captured. Quantitative analysis of images and collected data is completed in the associated software to provide users with feedback regarding vascular health and vessel patency at the anastomosis site; specifically, this technology enables detection of clots upon formation, well before occlusion occurs.

Advantages

- Displays vasculature ultrasound to determine patency
- Provides quantitative analysis of vascular flow to monitor vascular health
- Guides users to the desired probe orientation and view for effective analysis
- Can also be used in transplant and vascular surgeries
- Reduces hospital costs and improve patient outcomes

Institution

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