



Multi-Mode Medical Tracking and Visualizing System for MR Guided Interventional Procedures

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a multi-mode medical device system and method capable of tracking and visualizing a medical device and its surroundings using magnetic resonance (MR) guidance for interventional endovascular therapy.

Overview

Magnetic resonance (MR) has been utilized largely for medical diagnostic applications, but recent advancements have allowed it to replace many previously performed X-ray examinations. Even more recently, advances have started to permit the use of MR for monitoring and control of therapeutic endovascular interventions. Endovascular therapy is a minimally invasive surgical technique that uses a medical device such as a catheter in the vascular system to access and treat a range of diseases such as vascular disease and tumors.

Visualization for MR-guided endovascular therapy is achieved by tightly wrapping coils at the tip of the device to track it, or by wrapping the entire device in a coil to image the surrounding area with high resolution. These coils are attached to the MR scanner via a coaxial cable. A coil for tracking and a coil for internal imaging can be combined but requires two coil connections, which reduces the flexibility of the device.

The Invention

UW-Madison researchers have developed a multi-mode MR system that incorporates imaging and tracking coils into one device for therapeutic endovascular interventions. The device includes two coils, one for tracking and one for imaging. A switch connecting the two allows use of the tracking coil to move the device to the area of interest and then use of the imaging coil to acquire high resolution images of the area. Only one coil connection to the MR scanner is needed because of the switch.

Applications

- Monitoring and control of endovascular therapy
- General interventional MR applications including monitoring ultrasound and laser ablations of tumors, guiding the placement of biopsy needles, and monitoring the operative removal of tumors
- Monitoring 3-D vascular abnormalities such as arterial-venous malformations (AVMs) and aneurysms

Key Benefits

- Only one coil connection to the scanner
- Less radiation exposure to the patient and the operator
- Less adverse effects to patient from contrast agents than in X-ray applications

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- Able to acquire 3-D images unlike most X-ray applications
- Able to acquire more data with MR, as compared to X-ray, such as temperature, blood flow, tissue perfusion and diffusion, brain activity, and glomerular filtration rate (GFR)

Tech Fields

- [Medical Imaging : MRI](#)

For current licensing status, please contact Jeanine Burmania at jeanine@warf.org or 608-960-9846

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