Wirelessly Tracking Interventional Medical Device with MRI System

Published date: March 14, 2017

Technology description

Interventional medical procedures can be performed less invasively, and more safely, when guided by magnetic resonance imaging (MRI). Placing devices like catheters, guidewires and stents using MRI guidance has great clinical potential.

One particular challenge in the field, however, has been the development of safe and reliable means for tracking such devices as they are manipulated within vessels or organs. Every previous approach has drawbacks. Attaching and tracking X-ray markers requires radiation, for example, while incorporating paramagnetic material into devices degrades image quality.

Another approach is to connect the devices with special coils that give feedback in real time. But blurry imaging is a problem. Also, cables have to extend from the tip of the device, out of the patient, and into an external connection. A new MRI tracking system needs to be more workable, clear and accurate. UW–Madison researchers have developed a method for driving and amplifying MR signals using an imaging coil that is coupled to a medical device and inserted into a subject. The position-tracking coil uses the MR system’ s external radiofrequency pulses as a power source.

The coil switches between two duties: receiving and storing energy, and acquiring imaging data. Its signals can be wirelessly transmitted to the external MRI system using an amplifier and booster stages. The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a method to transmit tracking and imaging signals from inside a patient using an internal coil powered by radiofrequency pulses.

Additional Information

For more information about MR-guided devices for tracking and imaging in 3-D, see WARF reference number P06222US.
http://www.warf.org/technologies/summary/P06222US.cmsx

Application area

MR-guided interventional procedures

Advantages

No cumbersome power source
Reduces the number of cables running to MRI scanner
Less radiation exposure to patient than in X-ray applications
Fewer adverse effects to patient from contrast agents than in X-ray applications

Institution

Wisconsin Alumni Research Foundation

Inventors

Krishna Kurpad
Madhav Venkateswaran

邮 箱：yeyingsheng@zf-ym.com