Time-Resolved 3-D Angiography Captures Blood Flow, Vessel Dynamics

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Technology description

Since the introduction of angiography there have been many attempts to develop techniques that provide diagnostic images of the vasculature while reducing invasiveness.

A technique called 4-D DSA (digital subtraction angiography) has been developed for generating a time-resolved series of detailed 3-D images with excellent temporal and spatial resolution. Several modifications to the process have been advanced over the years (see WARF reference numbers P110289US01 and P06088US).

These improvements have helped clinicians more clearly visualize the anatomy of vessels. By extension, the deductions that can be made about vessel dynamics and function have improved also. Yet even the best deductions are hindered by imaging limitations. UW–Madison researchers have developed a system and method for integrating 4-D DSA with physiological information (blood flow, velocity) derived via MRI or ultrasound. More specifically, the image processing system receives angiographic data and flow data to generate a combined data set. The resulting images display time-resolved, color-coded flow information.

The new process can be referred to as 7-D DSA.
The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a method that combines 4-D DSA with other imaging modalities such as MRI or ultrasound to provide physiological information.

Application area

Angiographic imaging
Studying aneurysm, vascular malformation, nidus AVMs, velocity changes following stenosis, etc.
Can be implemented using separate MRI and rotational DSA systems, or combined systems

Advantages

Combines high-quality angiography with useful physiological data

Provides blood flow and velocity information

Empowers clinicians to make better deductions about vessel function and dynamic performance

Institution

Wisconsin Alumni Research Foundation

Inventors

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