Method and Apparatus Providing Improved Ultrasonic Strain Measurements of Soft Tissue

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WARF: P03347US

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a method of modeling the variation in acoustic properties of soft tissues as a function of strain to improve elastographic measurements and to obtain direct measurements of strain.

OVERVIEW

Elastography is an acoustical imaging method used to estimate the elastic properties of soft tissue by assessing the tissue in different states of compression. Tissue that exhibits less strain under compression is assumed to be stiffer than tissue that exhibits more strain.

Although elastography is useful for estimating elastic properties at locations relatively far from the site of stress concentration, some researchers have found that it fails significantly at stress concentrations near stiff inclusions because the force of compression is not uniformly dispersed within the tissue.

THE INVENTION

UW-Madison researchers have developed a method of modeling the variation in acoustic properties of soft tissues as a function of strain to improve elastographic measurements and to obtain direct measurements of strain. In general, this method exploits the recognition that strain in biological tissue fundamentally affects the acoustic properties of the biological tissue.

Typically, strain is deduced by measuring the motion of the tissue under implicit assumptions about constant stress fields and acoustic properties. Using this method, tissue strain is deduced directly from the modification of the ultrasonic signal caused by changes in the acoustic properties of the material.

THE WARF ADVANTAGE

Since its founding in 1925 as the patenting and licensing organization for the University of Wisconsin-Madison, WARF has been working with business and industry to transform university research into products that benefit society. WARF intellectual property managers and licensing staff members are leaders in the field of university-based technology transfer. They are familiar with the intricacies of patenting, have worked with researchers in relevant disciplines, understand industries and markets, and have negotiated innovative licensing strategies to meet the individual needs of business clients.

APPLICATIONS

- Elastography

KEY BENEFITS

- Improves measurements of tissue stiffness by more accurately modeling variation in acoustic properties and variation in the stress field from which such stiffness is computed
- Flexibly incorporates multiple factors that may affect acoustic properties within tissue
- Provides a method of measuring pre-stress of tissue *in vivo*
- Capable of measuring strain lateral to the axis of ultrasound propagation, such as for the measurement of the Achilles tendon where axial propagation of ultrasound would be difficult
- Suitable for correction or production of images
- Works with transmitted ultrasonic signals, which are stronger than reflected signals

ADDITIONAL INFORMATION

Related Technologies

See WARF reference number P06115US for a similar technique used to derive material properties of tissue.

Tech Fields

Medical Imaging - Ultrasound

CONTACT INFORMATION

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