

Title: Ultrasound Elastography

Sonographic elastography is a type of imaging that can be used in conjunction with traditional B-Mode sonography to improve diagnostic techniques. There are many clinical applications including breast, prostate, liver, thyroid and cardiac. Elastography produces images called elastograms that use transducer compression with real-time visualization. High-speed algorithms calculate the tissue strain distributions for the elastogram.

Soft tissues are easily compressed while stiff tissues are more solid-like and do not compress. Elastography is used to distinguish between benign and malignant lesions because malignant lesions are harder than benign lesions. When tumors grow in tissues, they change the stiffness of the tissue they infiltrate. This change in homogeneity is displayed with elasticity imaging. The elastogram is color coded and superimposed onto the ultrasound B-mode image for evaluation.

Of the estimated 1.6 million breast biopsies performed annually in the United States, 80% are benign. To reduce biopsy rates, comparison classifications are used to differentiate between benign and malignant breast lesions. The Tsukuba elasticity scoring system uses 5 scores that correlate to the BI-RADS (Breast Imaging Recording and Data System) categories. This classification system allows for more sensitive, specific and repeatable ultrasound evaluation and minimizes the need of biopsies. Elastography imaging is a non-invasive, cost-effective, real-time modality with growing diagnostic value.

Keywords: ultrasound elastography biopsy breast lesions