

IMPROVED ULTRASOUND IMAGE CHARACTERIZATION OF FIBROADENOMAS BY USE OF A TUNABLE RECEIVER IN COMBINATION WITH HIGH FREQUENCY SCANNING.

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The objective of these investigations is to make use of the varying ultrasound frequency dependence of scattering for different types of soft tissue as a means to improve contrast resolution and image characterizations of the internal structure of solid breast masses. In this presentation, the effectiveness of this approach, primarily in respect to image characterization of fibroadenomas, is discussed.

In ongoing clinical research studies with an automated breast scanner, it was found that most fibroadenomas are essentially non-attenuating for examination frequencies as high as 11 MHz. Also, use of these frequencies in conjunction with a sharply focused transducer provides improved visualization of both the wall structure and fine tissue components within fibroadenomas. As a further extension of these investigations, a tunable receiver which allows precise control of bandwidth was incorporated into the automated breast scanner. When this receiver was used as a narrow band filter, the system yielded images with excellent spatial and contrast resolution. More important, when compared to standard images obtained with wide bandwidth receiver systems, these fibroadenomas images are significantly improved in terms of image characterization of internal structure components. These high frequency, tunable receiver images of fibroadenomas are distinctly different from those of malignant masses obtained under the same circumstances.

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