

## Foreword

### Elastography as an easier and accurate diagnosis technology

— From a sommelier's knife to an automatic wine opener —



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In the ultrasonic diagnosis of breast cancer, we apply external manual pressure to the breast and observe changes in its shape and movement as an aid to the differential diagnosis of the cancer. The results of this dynamic test were accepted as diagnostic findings by the Terminology and Diagnostic Standards Committee of the Japan Society of Ultrasonics in Medicine.

Since the 1990s, together with Dr. Shiina who, fortunately, is a professor of physics at our university,

we have been conducting research on the development of an imaging diagnosis method that takes into account the hardness of breast cancer. In the beginning, we never imagined that technology would advance to today's level where real-time observation is possible. The significant increase in computation speed provided by the combined autocorrelation method conceived by Dr. Shiina, and, led to the clinical application of Elastography. Since the spatial resolution of an elastogram alone is low, it is superimposed on a B-mode image to enable easier examination. In spite of the extremely simple diagnostic criteria involved when using Elastography for breast cancer diagnosis, the diagnostic performance it provides now rivals that of the ultrasonic diagnoses of breast specialists. Although there may remain some prominent experts who feel that Elastography is not necessary, there are probably many others who believe it to be effective. Drawing an analogy, a top-class sommelier may love using his sommelier knife and think that an automatic wine opener is unnecessary, but with Elastography, we have an automatic wine opener that is easy to use, requires little practice, and opens the bottle every time with few mistakes.

Having been used successfully for breast-related diagnosis, Elastography's scope of application continues to expand as it is adapted for the examination of the thyroid, prostate, intra-abdominal organs and muscle tissue. A method of quantitative assessment similar to that used for the measurement of Strain Ratio (Fat Lesion Ratio) has also been devised, and it is anticipated that this diagnostic method will be further developed in the future.