M-Reference E Compare Demo Guide

Multi-parametric assessment with Dual Elastography

Wang Feng (wangfeng@mindray.com), Ultrasound Upstream Marketing Department,

[Technical Principle]

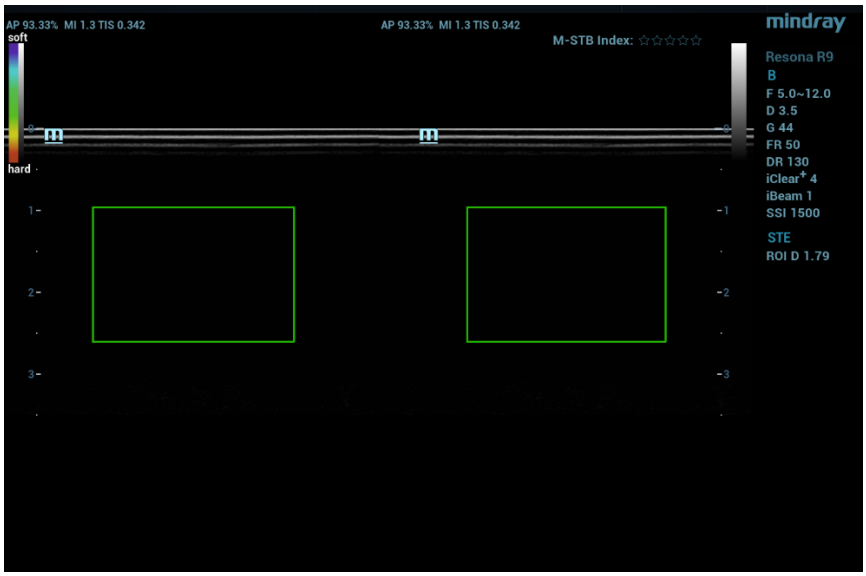
Based on the perfect combination of the high-sensitivity strain elasticity (NTE) generated by the patient's spontaneous breathing, cardiac impulse or large-vessel pulsation, or very slight active compression with the real-time shear wave elasticity (STE), real-time dynamic observation of NTE and STE imaging under the same probe in the same plane is realized to accurately and efficiently assess the softness and hardness of the lesion and provide more diagnostic information.

[Advantages and Features]

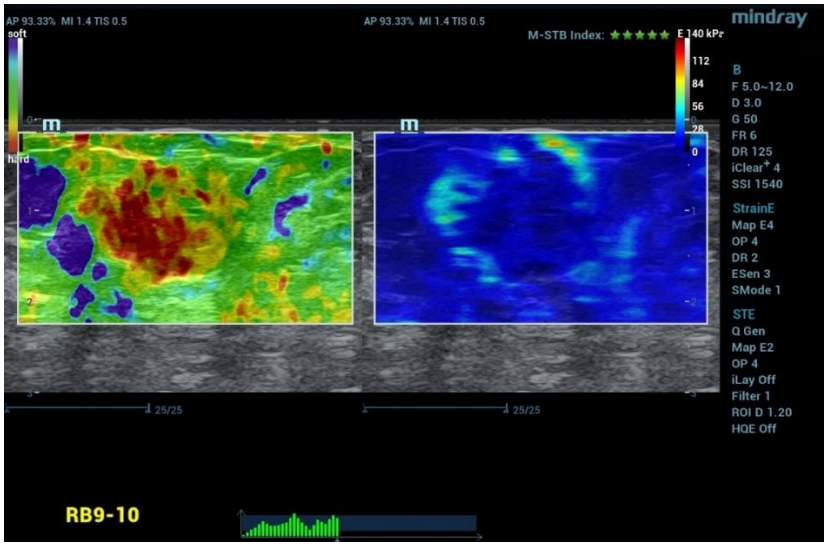
1. Real-time observation of NTE and STE in the same plane is convenient for comparative observation and analysis;
2. Reduction of operation steps improves the work efficiency;

[Demonstration Points]

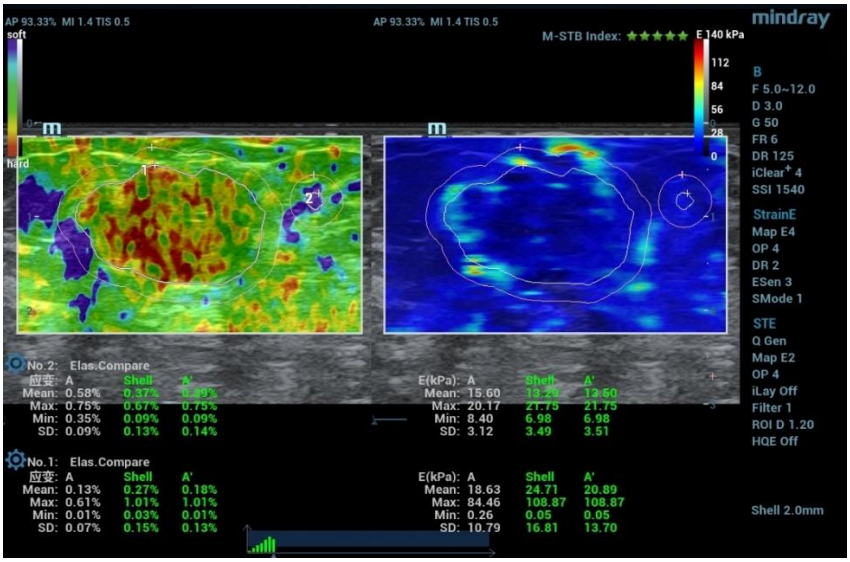
1. Select L15-3WU, L14-3WU, breast, thyroid or musculoskeletal examination mode;
2. Perform a thorough scan of the breast or thyroid to detect suspicious nodules. After the 2D and CDFI evaluation, press the **Elasto** button on the keyboard to activate the elastography function. Select **E Compare Live** on the touchscreen interface and enter the real-time dual elastography acquisition preparation state. The left side is NTE and the right side is STE;



3. Press the left or right button of the trackball to adjust the size and location of the ROI area. It is recommended that the ROI size includes the entire lesion and part of the surrounding tissues as much as possible. After the adjustment, press **UPDATE** to enter the real-time dual elastography acquisition state;
4. Note that during the acquisition of dual elastography, do not press the probe heavily and observe whether the strain elastography BAR is in the normal range and whether the motion stability is more than 4 green stars. You can also press **Display B** on the touchscreen to enter quad display mode, which are B/STE and B/NTE respectively; Press RLB on the touchscreen to start STE quality map (RLB) and confirm that the RLB is above 90%;



5. After confirming that the STE/NTE imaging quality is good, freeze the image;
6. Press **Caliper** for integrated dual elastography measurement, and the STE/NTE and STE/NTE ratio measurement can be supported;



[Precautions]

1. The acquisition of dual elastography can be slightly different from STE alone. The strain elastography can be obtained by breathing or cardiac impulse or large-vessel pulsation, or by very slight active compression to obtain better strain elastography, but never press heavily to avoid affecting the stability and quality of STE.
2. When freezing the dual elastography image and using SHELL to trace and make drawing during measurement, you can press **Display B** on the touchscreen and it will switch to B/STE, B/NTE Quad display to trace the lesion on B image; After the trace is completed, you can turn off **Display B** and switch to dual elastography.
3. The principles of NTE and STE imaging techniques are different. In most cases, the results of NTE and STE are the same: both are hard or soft, but in some cases, the results are inconsistent. According to the research, this is related to the histological classification and grade of breast tumor and the breast thickness[1].

[References]

1. Woo Kyung Moon, et, Comparison of Shear-Wave and Strain Ultrasound Elastography in the Differentiation of Benign and Malignant Breast Lesions, Women's Imaging • Original Research, AJR:201, August 2013