

Non-invasive Evaluation of Liver Disease Using MR Elastography

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A passive driver is placed conveniently above the liver during patient setup to generate gentle vibrations. The MR-Touch scan is synchronized with vibrations to capture the shear waves to reconstruct MR Elastogram images for stiffness assessment.

Patient history

Patient with Crohn's disease and autoimmune hepatitis with rising liver function tests.



Discovery⁺ MR450



The MR-Touch application utilizes an active driver (above) to generate shear waves that are propagated to the abdominal cavity via the passive driver.

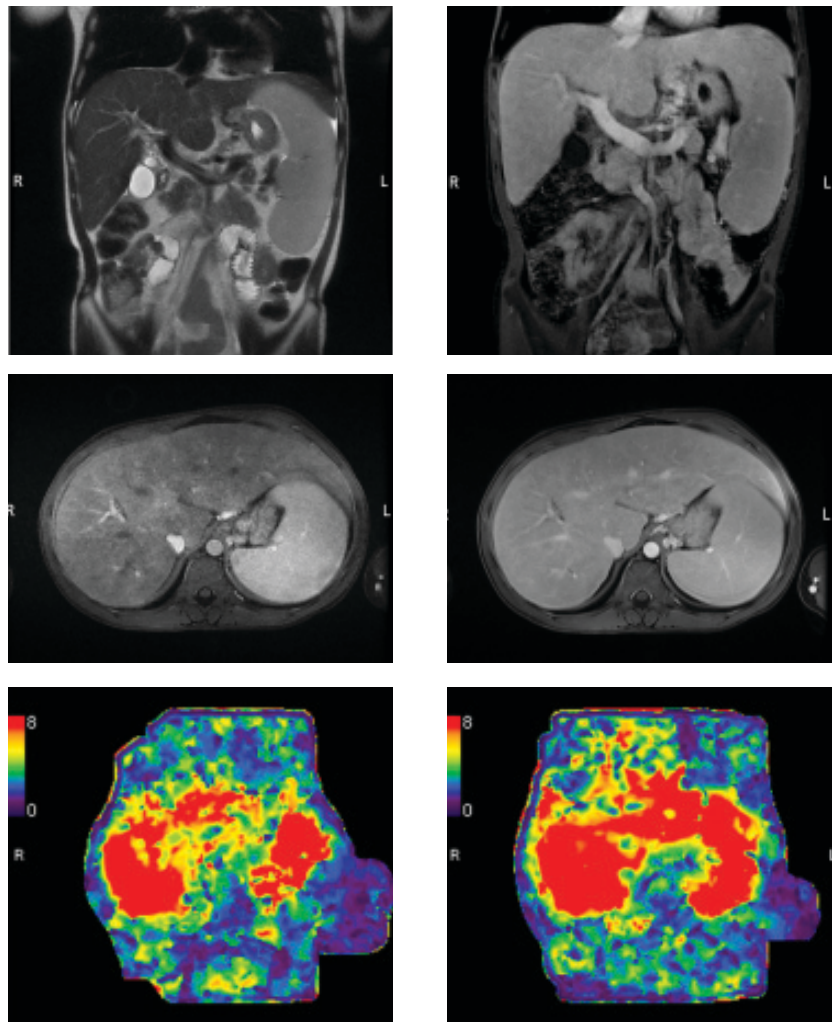


Figure 1. Abdominal MR exam included coronal SSFSE and LAVA Flex (top row), dynamic LAVA Flex imaging (middle row) and MR elastogram (bottom row).



Dr. Russell N. Low

Russell N. Low, MD, is Medical Director at Sharp and Children's MRI Center in San Diego and since 1991 has practiced with San Diego Imaging Medical Group. He received his medical degree from the University of California, San Diego, with honors and participated in the NIH Research Training Program. Dr. Low interned at St. Mary's Hospital and Medical Center in San Francisco and completed his residency in diagnostic radiology at the University of California, San Francisco and his fellowship in MRI/CT/Ultrasound at Stanford University Medical Center. He has authored over 60 articles and five book chapters, and is a frequent speaker at symposiums and conferences, including RSNA and ISMRM.



Dr. Tarek Hassanein

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MR technique

Abdominal MRI was performed using the 12 channel torso surface coil. Four axial MRE slices were obtained, each requiring a single 20-second breath-hold. Conventional abdominal and pelvic MRI was also performed with 3D dual echo, FRFSE T2, DWI b500, and dynamic LAVA Flex imaging.

MR finding

Anatomic images show hepatosplenomegaly. The liver contour is smooth and there are no morphologic changes of overt liver fibrosis. MRE shows marked increase in liver stiffness indicating marked liver fibrosis confirmed by biopsy.

Histopathology: Marked liver fibrosis.

Discussion

MR Elastography adds a whole new dimension to liver imaging. The MR-Touch application provides vitally important and sometimes unexpected clinical information that can alter and improve patient management.

MR-Touch parameters	
TR	50 ms
TE	24.6 ms
Bandwidth	+31.25 kHz
Flip angle	30 degrees
Matrix size	256 x 64
Slice thickness	10 mm
Gap	1 mm