# HFUS Images Illustrate Reduced Dermal and Myofascial Stiffness/Densification and May Be Useful Biomarker

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**BACKGROUND** Pain originating from muscles and/or associated soft tissues such, as skin and fascia, are likely an important component of many severe and chronic pain conditions. Patients persistent pain may be due to ineffective treatment of the dermal and myofascial component of their pain. Identifying and developing quantitative biomarkers involving dermal and myofascial tissues are critical for effective pain management. No biomarkers have been available either to study dermal and myofascial tissue pathophysiology or to test the effects of treatments.

**METHOD** Structural imaging using high frequency ultrasound (HFUS) to visualize micro-structures of the dermal and myofascial tissue of patient who had 6 months central quadricep aching pain and stiffness/densification. Functional tissue assessments are illustrated using before and after still pictures and real-time passive bidirectional tensioned skin HFUS video to quantify soft tissue mobility and biomechanical properties (e.g., stiffness, viscosity, shear plane mobility) before treatment, after 3 treatments in one week, and no additional treatments at 6 weeks.

**RESULTS** HFUS images, Fig. 1, illustrate reduced dermal and myofascial stiffness. Rejuvenated myofascial tissue appears replacing the myofascial densification. HFUS video illustrates real time dynamic structural viscoelastic myofascial movement improving from 2 cm. to 2.3 cm. in depth with passive bidirectional tensioned skin.

**HFUS Bidirectional Tensioned Skin** **Central Quad Dermal-Myofascial Densification**

**Figure 1.** **Pre-Treat** **1 Wk. Post 3 Treat** **6 Wk. Post 3 Treat**

**CONCLUSION** HFUS can illustrate dermal and myofascial stiffness and help objectify biomarkers that would appear to be useful in the identification and clinical evaluation of dermal and myofascial stiffness/densification. Precise quantification of tissue stiffness/densification pre and post intervention could not be made without High Frequency ShearWave Elastography.

**Category.** Biomechanical

**Keywords.** High Frequency US