

Myoton Pro: A Novel Tool for the Assessment of Mechanical Properties of Fascial Tissues

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Background

The digital measurement tools Myoton-2 and Myoton-3 proved to be reliable and useful for assessing biomechanical properties of myofascial tissues (1,2,3). These tools create a constant pre-load of the soft tissue via a movable indentation probe, which is then rapidly released and the tissue response (damping oscillation) of the tissue is measured.

Purpose

To develop an improved version of this tool that includes assessment of two new viscoelastic tissue properties (Fig.1).

Results

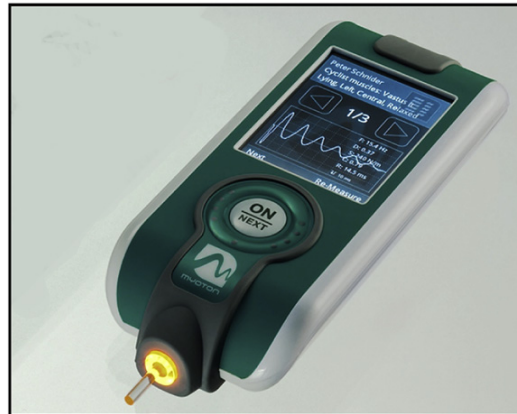
It was possible to maintain the same technology and precision as in the previous version for the assessment of mechanical tissue tension (tone), tissue stiffness, and for logarithmic decrement (elasticity). In addition the measurement capacity for the following two viscoelastic tissue parameters has been added: 1) Creep-ability (Deborah number) at 1.3% precision; 2) Mechanical stress relaxation time (ms) at 1.5% precision.

Preliminary clinical examinations of the authors suggest that these newly added parameters appear responsive for assessment of immediate before-after tissue changes induced by myofascial manipulation. Dense fascial layers positioned close to the skin were found as good targets for application. These include the plantar fascia, achilles aponeurosis, limb retinaculae, tractus iliotibialis, pes anserinus, lumbar fascia, temporal fascia, and galea aponeurotica. Measurements are less satisfactory with adipose patients.

Conclusion

It is recommended to further examine the reliability and validity of fascial tissue measurements with this tool, particularly in regards to the newly added viscoelastic tissue parameters. Comparison with ultrasound elastography could be included to validate the stiffness parameters of specific tissue layers.

A



B

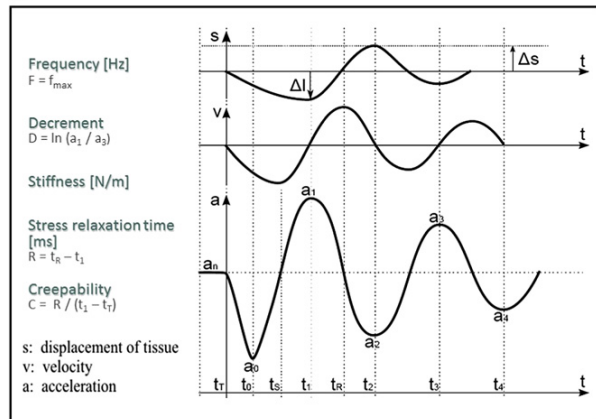


Figure 1 A) The cell phone size of the Myoton Pro plus its automatic illumination of the indentation probe allow for improved precision of the data acquisition. B: The device measures the displacement, velocity and acceleration of the tissue response. From these data five different biomechanical tissue parameters are gained.

References

- Bizzini M., Mannion A.F. Reliability of a new, hand-held device for assessing skeletal muscle stiffness. *Clin Biomech* 18: 459–461, 2003
- Kerpe R., Krisciunas A. How could we explain tissue changes of the plantar muscle tone in the patients with type 1 diabetes mellitus and interpret the findings. In: Huijing P.A, Hollander P., Findley W.F., Robert Schleip. *Fascia Research II – Basic Science and Implications for Conventional and Complementary Health Care*. Elsevier Urban & Fischer, Munich, 2009, p.296-297
- Ditroilo M., Hunter A.M., Haslam S., De Vito G. The effectiveness of two novel techniques in establishing the mechanical and contractile responses of biceps femoris. *Physio Meas* 32: 1315–1326, 2011

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