

ABSTRACT

Title: Viscous and elastic properties of soft tissue "in situ"

Goals and methods: The aim of this thesis is to measure the viscoelastic properties of human soleus muscle and Achilles tendon in vivo and post mortem in situ. It is a pilot study that uses myotonometry as the method of measurement. Based on the response of connective tissues on deformation made by tip of myotonometer, resp. its viscoelastic properties, curves in graphs are created. Three main described parameters of the curve are steepness, deflection and its surface area. Main goal of the experiment is to compare properties of different types of tissue and their potential differences while denervated or innervated. Results of this study may help with better understanding of the soft tissues behavior in response to manual therapeutic contact. The study also describes the differences between in vivo and post mortem tissue properties that may be help further studies which use post mortem tissues to predict in vivo behavior.

Results: Soft tissues in vivo have higher viscosity. In comparison, post mortem tissues have significantly higher stiffness and energy dissipation than in vivo. Elastic properties of denervated soft tissue manifest with approx. 7 seconds delay. Viscoelastic properties of muscle tissue show changes depending on deeper deformation.

Key words: Soleus muscle, Achilles tendon, myotendinous junction, stiffness, elasticity, energy dissipation, myotonometry