# RESPONSIVENESS OF THE PLANTAR FASCIA TO VIBRATION AND/OR STRETCH

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PURPOSE An increase in flexibility has been described when bending forward after a treatment of the plantar side of the foot. This increase in flexibility is frequently measured by finger-ground-distance (FGD). Our study seeks to determine viscoelastic changes in the plantar structures and the tension of the Achilles tendon in addition to FGD. It also aims at documenting possible fluctuations in the amount of liquids within the tissue.
METHODS A total of 61 volunteers with informed consent were enrolled and allocated to control (n=35) and treatment groups (n=26). Here the plantar fascia was challenged using two distinct methods: on one foot a vibration of 8-10 Hz was brought passively into the tissue with a Matrix Rhythmus® device. On the other foot the subjects were instructed to apply an active treatment using MELT® balls. Before and after these treatments biomechanical tissue properties were measured via myometry (MyotonPro®) at the two following points: point 1 in front of the heel pad, point 2 at the center of the sole. In addition FGD, electrical bioimpedance as well as the angle between the foot and the longitudinal axis of the fibula were measured before and after treatment (Fig.1).
RESULTS Plantar stretching resulted in a significant reduction of in stiffness parameters at both measuring points and a concomitant increase in impedance. Similar but additionally including viscoelastic parameter changes were observed with vibration, reaching statistical significance only at point 1. The ankle joint angle was decreased in both applications suggesting a relaxation effect on the Achilles tendon. The FGD decreased significantly in both the treatment and the control group, but the differences between the two groups are not significant.
CONCLUSION We conclude that plantar stretching and vibration are effective tools for reduction of the plantar stiffness. The observation of an increased impedance after stretching suggests a potential role of hydration and/or blood perfusion effects.
DISCLOSURES The author has no personal financial or institutional interest in any of the materials or devices described in this article.

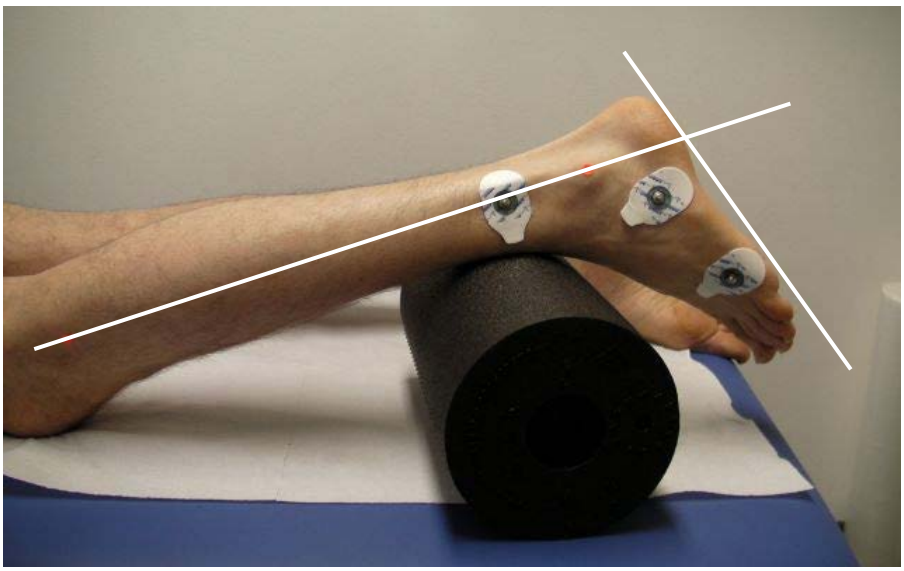

Fig.1: Measurement of the ankle joint angle. Electrodes for impedance measurements are shown.