Effects of foam rolling with additional vibration stimulation on the characteristics of the thoracolumbar fascia

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Introduction:
The Foam Roll treatment was developed to increase range of motion or to reduce pain. Likewise, it can be stated that a vibration stimulation of the tissue leads to improved movement ability of joints. This study investigates whether the combination of foam rolling and vibrations (12 Hz) can influence the characteristics of the TLF more effectively than the normal foam rolling.

Background:
45 subjects participated in the study (age: 26.31±3.92 years, height: 1.77±0.09m, weight: 74.7±10.17kg, sport-activity: 284.44±131.28 min/week). These were divided into a foam-roll-group+vibration (FRV), a foam-roll-group (FR) and a control-group (CG).
Performing a passive trunk flexion (30°) on a motorized table, a video was taken of the movement of the TLF by a sonographic-probe. Subsequently, the analysis performed according to the Cross- Correlation-Software. This allowed to measure the fascia-movement and to calculate the shear strain mobility (SSM). Further measurements were taken for the thickness, lumbar mobility (goniometry), stiffness (indentometry), mechanosensitivity (algometry) and heat development (thermal camera). For statistical analysis, a two-timed mixed repeated ANOVA was used for the pre-post comparison and an ANOVA was calculated with the pre-post differences.

Results:
The mobility of the FTL improved significantly within the FRV by 2.83mm (p<.001) and also in the FR by 0.96mm (p<.001). The group comparison showed that the mobility of the TLF increased significantly in the FRV. The comparison of the mobility improvement within the two intervention groups showed that there is a statistically significant difference. The FRV differs with a p-value of p<.001 from the FR. The fascia/fascia SSM increased in the FRV by 22.61% and showed a p-value of p<.001. In the FR the fascia/fascia SSM increased by 11.41%. This effect in the FR is not statistically relevant with p=.056.

Conclusion:
The results show that the TLF movement improves with the normal use of a foam roll and with the combined vibration application. The results also show that the group receiving the vibration application caused an increase in movement and in SSM compared to the FR and CG. This suggests that the presence of the Pacini and Ruffini bodies which are known to respond to vibratory may indirectly influence the elasticity of the fascia.