

Measurement of the Effects of ‘Kinesio-Taping’ in Vivo Thoracolumbar Fascia Movement Using Ultrasound: Method Development and Observational Study

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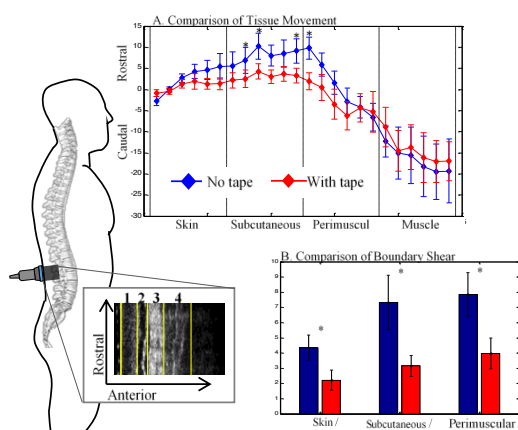
BACKGROUND Changes in thoracolumbar fascial thickness, structure and shear strain are associated with low back pain (LBP) [1, 2], and therapeutic taping techniques, such as Kinesio-Taping (KT), are increasingly used to treat LBP [3, 4], albeit with variable effects and unclear mechanisms. Evidences for quantifying the treatment effects in vivo fascia properties are inadequate. We therefore aimed to develop a reliable in vivo measurement technique to enable exploration of taping mechanisms.

METHODS Thoracolumbar ultrasound videos of known orientation and position were taken from 12 normal participants (male and female, aged 22.9 ± 3.59) while performing velocity-guided lumbar flexion with and without KT. An automated algorithm using cross-correlation to track contiguous tissue layers across sequential frames, in sagittal plane, was developed and applied to two movements of each subject in each taping condition. Differences of tissue movements and shear movements in tissue boundaries were tested with paired t-test.

RESULTS significant differences in mean movements of subcutaneous tissue during lumbar flexion before and after taping were found (figure A). No difference in other observed tissue layers. Shear movements in three boundaries (skin-subcutaneous tissue, subcutaneous-perimuscular tissue, and perimuscular-muscle) were significant reduced during lumbar flexion when KT was applied.

CONCLUSIONS Preliminary results suggest that KT may reduce tissue movements and share during lumbar flexion, however what direction of change in tissue movement may represents a beneficial result after applied KT is uncertain. Combine these results with kinematics and muscle activation data may be useful to fully discover the effects mechanisms of therapeutic taping in patient with LBP.

CAPTION Comparison of tissue movements and tissue boundary shear before and after KT applied. Red lines and bars represent data when KT was applied, while blue represents data without tape application. Error bars are standard error across 12 subjects. Scale unit: pixels. * Significant difference ($p < .05$).



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