REAL-TIME ELASTOGRAPHY USING AN EXTERNAL REFERENCE MATERIAL: PRELIMINARY RESULTS OF ACHILLES TENDON ELASTICITY PATTERN

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BACKGROUND AND AIM

Real-time elastography (RTE) is an ultrasound technique to obtain a qualitative assessment of tissue elasticity. It is performed by compressing tissue and then producing a coloured image that reflects the elasticity pattern of the tissue. The principle of RTE is that tissue compression produces displacement within the tissue, which is less pronounced in harder than in softer materials. This technique has previously been shown to be useful in the differential diagnosis between benign and malignant tumours. Recently it has been used also to evaluate the musculoskeletal system, especially in tendon disorders. The aim of this study was to describe elasticity pattern of normal Achilles tendon using real-time elastography (RTE) with an external reference material.

MATERIALS AND METHODS

Thirteen healthy subjects were recruited. Longitudinal RTE ultrasound (MyLab™ ClassC) images of left and right Achilles tendon were acquired. An external reference material (Zerdine®, CIRS, Inc., Norfolk), with known elastic properties (first layer 93 kPa, second layer 10.5 kPa), was placed on the subject’s tendon and included in the b-mode scans (Fig. 1). The reference material was used to normalize colour scale among subjects. Two region of interest (ROI) were drawn in the reference material and in the tendon. The range between soft and hard (from red to blue) (Fig. 1A) was divided in 256 steps (0-255), according to the ultrasound image colour depth. The median and interquartile range of the distribution colors were computed. Index ratio between the reference material and the tendon median values were calculated.

RESULTS

The mean ± (SD) color index for the tendon was 184 ± 8.57 and for the reference material (93kPa) was 104 ± 15.52. The color index ratio between reference and tendon was 0.568 ± 0.09. (Table 1)

CONCLUSIONS

Preliminary results show that healthy subject have similar color index ratios for the Achilles tendon. Color index ratios of pathological Achilles tendon should be investigated in future research.

REFERENCES


ACKNOWLEDGEMENTS: Thim van der Laan Foundation for funding the study.

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