E-Poster

EP-412

S Hear Wave Elastography in the Assessment of Gastrocnemius Spastic Muscle Elasticity: Influences of Ankle Position and Muscle Contraction

Topic: Diagnosis

Marine Devis

Physical and Rehabilitation Medicine, Université Catholique De Louvain, Brussels, Belgium

BACKGROUND

Following upper motor neuron syndromes (UMNS), intrinsic viscoelastic muscle properties such as elastic stiffness may be altered, which leads to muscle hyper-resistance to passive mobilization. So far, no gold standard assessment of hyper-resistance, whether clinical or instrumental, is available. Shear wave elastography (SWE) has been increasingly used for non-invasive evaluation of elastic stiffness of skeletal muscles in people with hyper-resistance.

Our study aimed to evaluate the validity of SWE at ankle neutral resting position (ANRP) in 30 hemiparetic patients following UMNS with hyper-resistance in gastrocnemii muscles. Additional objectives included assessing the influence of ankle position, muscle contraction, and laterality on elastic stiffness, and evaluating the reproducibility and responsiveness of SWE.

METHODS

Elastic stiffness was quantified by shear wave velocity (SWV) measurements of gastrocnemii muscles. A higher SWV corresponds to a higher elastic stiffness. Measurements were performed on the affected and less-affected limbs in ANRP, in passive dorsiflexion and during isometric contraction. Assessments were performed three times. Criterion validity, reproducibility, and responsiveness were evaluated. A linear mixed model was used to study position and laterality effect.

RESULTS

In ANRP, reproducibility was excellent and SWV was significantly higher in the affected limb than in the less-affected limb. This laterality effect disappeared in passive dorsiflexion and was even reversed during isometric contraction. SWV was significantly higher on both sides in passive dorsiflexion and during contraction than in ANRP.

CONCLUSION

Shear wave elastography is a useful tool as an extension of the physical exam for longitudinal monitoring of muscle elasticity, to guide treatment, and assess the therapeutic effect of procedures to reduce muscle overactivity. A standardized protocol is essential with ANRP being the most valid position for assessing gastrocnemius elasticity following UMNS.

Statement of Disclosures

None

Doi: 10.5606/archisprm.2026.EP-412

Corresponding Author:
Marine Devis
Physical and Rehabilitation Medicine, Université Catholique De Louvain, Brussels, Belgium
Email: marine.devis@saintluc.uclouvain.be