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Programme Book

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#13 Sunday Poster Session

Shear Wave Elastography for Assessing Achilles Tendon Overload in Standing Posture and Its Normalization via Ultrasound-Guided Dry Needling

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Background: Tendinopathy is often the result of chronic overload, frequently driven by altered posture and compensatory muscle activity. In patients with low back pain (LBP) and leg pain, evaluating postural influence on distal tendons can aid in targeted treatment. Shear Wave Elastography (SWE) offers a real-time, non-invasive method to quantify tendon stiffness and monitor therapeutic outcomes.

Methods: Twenty subjects were studied: 10 healthy volunteers and 10 patients with chronic LBP and leg pain. SWE was performed on the Achilles tendon in relaxed (supine) and standing positions, simulating mid-stance gait. Both linear and convex ultrasound probes were used; moderate-frequency convex probes provided superior penetration and visualization for deeper structures. Active myofascial trigger points and sacroiliac joint (SIJ) dysfunction were identified. Ultrasound-guided dry needling (US-DN) targeted gluteal and lumbar (L-level) multifidus trigger points.

Results

- **Relaxed (supine)** condition: Achilles tendon SWE values ranged from 0.8–1.4 m/s.
- **Standing**: Values increased to 2.2–3.0 m/s in healthy volunteers and 2.5–4.0 m/s in patients, indicating overload.
- After US-DN, SWE values returned to baseline (1–2.0 m/s), correlating with reduced overload and clinical improvement.
- Post-intervention, posture improved significantly, particularly in pelvic alignment and lumbar multifidus activation, suggesting partial correction of SIJ and lumbar segmental dysfunction.

Conclusion: Achilles tendon overload in standing posture is more pronounced in patients with LBP, likely due to proximal instability and compensatory mechanics. SWE is a sensitive tool for detecting tendon stress and evaluating treatment effects. Ultrasound-guided dry needling effectively reduces stiffness and facilitates postural correction, especially at the SIJ and lumbar multifidus level. Convex probes proved advantageous for deeper muscle and joint visualization.

Keywords:Shear Wave Elastography, Achilles Tendon, Tendinopathy, Posture, Low Back Pain, Sacroiliac Joint, Multifidus, Trigger Points, Dry Needling, Ultrasound-Guided Therapy

Figure 1. Achilles tendon SWE: Relaxed (supine) condition (left); standing position (right)

#11 Monday Poster Session

BIOMECHANICAL CONSEQUENCES OF GIGANTOMASTIA: SHOULDER DYSKINESIA, NEUROVASCULAR COMPRESSION, AND FUNCTIONAL RECOVERY WITH TARGETED INTERVENTIONS

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A 37-year-old female presented with right-sided scapular and neck pain, radiating to the fifth digit, accompanied by paresthesia, heaviness, and restricted right shoulder flexion (limited to ~100°). Symptoms began spontaneously in November 2024 and intensified following an allergic reaction to ibuprofen. Notably, passive elevation to 180° became possible when the right breast was manually lifted. MRI showed no pathology, but thoracic outlet syndrome (TOS) tests were positive. High-resolution ultrasound revealed myoaponeurotic tears and fascia bands in the infraspinatus.
Kinematic analysis using Showmotion (Figure 1) showed significantly reduced scapular upward and posterior rotation on the right side, altered scapulohumeral rhythm, and diminished elevation capacity (HumMax 103.62°; NormZoneA 70.19 vs. 100 on the left). These findings suggest impaired early-phase motion and mechanical dysfunction.
Gigantomastia was identified as the primary biomechanical driver of dysfunction via: (1) scapular loading with abnormal anterior tilt and limited upward mobility, (2) neurovascular compression aggravating TOS symptoms, and (3) pain-induced neuromuscular inhibition. Symptom resolution following breast lifting and significant improvement after scapular prolotherapy and nerve-targeted injections support the mechanical and neurogenic etiology.
Conclusion: Gigantomastia causes significant shoulder dysfunction through combined kinematic and neurovascular mechanisms. Breast reduction should be considered alongside ongoing scapular stabilization and neuromuscular therapy.

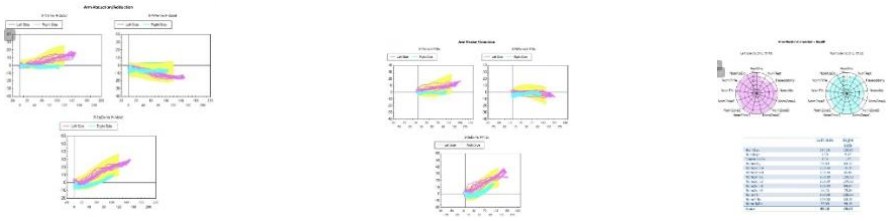

Figure 1: Kinematic and biomechanical assessment using Showmotion reveals right-sided scapular dyskinesia, reduced upward/posterior rotation, and impaired glenohumeral elevation (HumMax 103.62°) associated with gigantomastia. Functional improvement was observed following targeted interventions including prolotherapy and brachial plexus injections. Graphs illustrate motion asymmetry and reduced NormZoneA on the affected side.