Use of High Frequency Shear Wave™ Elastography (HFSWE) to Identify and Evaluate Treatment of Fascial Adhesions

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BACKGROUND HFSWE is a noninvasive diagnostic method with applications in the field of internal medicine, clinical dermatology and more recently physical therapy. HFSWE quantifies tissue stiffness using color images through echogenicity of Ultrafast™ ultrasound. Results include a colorized map and a quantification of tissue stiffness in kilopascals (KPAs). High frequency ultrasound can evaluate the effectiveness of altering tissue stiffness in tendons and myofascial tissue with dry needling and other manual therapies [1]. We believe HFSWE has broader applications in the evaluation of treatment effectiveness in reducing fascial stiffness. We present three cases using HFSWE representing a range of musculoskeletal problems: chronic meralgia parasthetica, chronic shoulder impingement pain and post-operative pain following five foot surgeries.

METHODS HFSWE was used with a SL15-4 transducer to quantify tissue condition at the beginning, middle and end of therapy. Markings were used to precisely identify anatomical positioning. HFSWE identified areas of increased tissue stiffness with widespread fascial adhesions. Results guided manual treatment to reduce both tissue stiffness and pain. Outcomes also included improved elasticity and functionality. HFSWE provided feedback for monitoring treatment effectiveness.

RESULTS

<table>
<thead>
<tr>
<th>Position Description</th>
<th>Initial (KPAs)</th>
<th>Post-Tx (KPAs)</th>
<th>% Decrease Fascia Stiffness</th>
<th>% Clinical Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic Meralgia Parasthetica - Left Lower Quadrant</td>
<td>169</td>
<td>62</td>
<td>63%</td>
<td>100%</td>
</tr>
<tr>
<td>Chronic Shoulder Impingement Pain at 2 sites - Right supraspinatus</td>
<td>132</td>
<td>47</td>
<td>64%</td>
<td>90%</td>
</tr>
<tr>
<td></td>
<td>144</td>
<td>19</td>
<td>73%</td>
<td></td>
</tr>
<tr>
<td>Post-op Foot Surgeries and Toe Deformity - 2nd to 3rd metatarsal</td>
<td>236/191</td>
<td>63/46</td>
<td>75% (avg)</td>
<td>90%</td>
</tr>
</tbody>
</table>

CONCLUSIONS Inflammation can lead to adhesion formation in the myofascia. HFSWE can demonstrate the central role of fascial stiffness in musculoskeletal problems. HFSWE also introduces a method to visualize fascial adhesions in real time. Therapists can improve their effectiveness using objective tools to measure treatment outcomes which offer qualitative and quantitative monitoring of tissue stiffness following therapy or surgery.

REFERENCES