

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 (KPa's). 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

	Position	Initial (KPa's)	Post-Tx (KPa's)	% Decrease Fascia Stiffness	% Clinical Imprvmnt
Chronic Meralgia Parasthetica	Left Lower Quadrant	169	62	63%	100%
Chronic Shoulder Impingement Pain at 2 sites	Right supraspinatus	132	47	64%	90%
	Right anterior shoulder	144	19	73%	
Post-op Foot Surgeries and Toe Deformity	2 nd - 3 rd metatarsal	236/191	63/46	75% (avg)	90%

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

[1] Drakonaki EE, Allen GM, Wilson DJ. Ultrasound elastography for musculoskeletal applications. Br J Radiol, 85: 1435-45, 2012.

