GEORGE MASON UNIVERSITY
COLLEGE OF SCIENCE
DEPARTMENT OF BIOLOGY SEMINAR

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"Ultrasound Imaging of Myofascial Trigger Points in Chronic Myofascial Pain"

The etiology and pathophysiological mechanisms of chronic myofascial pain syndrome (MPS) are not well understood. Recent surveys of health care providers identify a lack of consensus among clinicians and investigators about criteria for diagnosis of MPS, appropriate treatment targets, and clinical research outcome measures. Many, but not all, agree that an MPS diagnosis must include the presence of an myofascial trigger point (MTrP), but there is controversy regarding the role of MTrPs in the pain syndrome. The current diagnostic standard for MTrPs is based on palpation for the presence of tender nodules in a taut band of skeletal muscle and an associated cluster of symptoms including certain pain patterns, but there is significant variability in the diagnostic criteria in practice, and some studies have shown poor reproducibility for palpation of MTrPs, due in part to a lack of evidence-based objective criteria.

In this talk, I will describe our research group's work using ultrasound imaging and elastography, to demonstrate for the first time that there are abnormalities in the milieu of the muscle containing palpable MTrPs. We found nodular regions of hypoechogenicity on sonography. Quantitative measures derived from imaging, such as size, entropy and elastic modulus can be used to differentiate between normal asymptomatic muscle, and muscle containing latent and active MTrPs. These regions have diminished vibration amplitude on external vibration consistent with local regions of increased mechanical stiffness. We also observed that the neighborhood of MTrPs shows evidence of vascular remodeling that is especially pronounced in patients with acute neck pain. Our results indicate that in subjects with chronic neck pain and active MTrPs, the abnormalities are not confined to discrete isolated nodules but instead affect muscle surrounding palpable MTrPs. We observe that active MTrPs most frequently localized near the distal fascial border of the muscle and have an irregular shape. These shapes can be characterized in 3D to reveal the complex heterogeneous nature of the muscle. This lends further evidence towards an understanding of this phenomenon not just as an isolated abnormality, but rather a more pervasive process that impacts the neighborhood of the muscle and fascia. The imaging measures are sensitive to detect changes in the milieu of the muscle after dry needling intervention, and show persistent changes 6 weeks after dry needling, that are associated with corresponding improvements in pain and symptoms.

TUESDAY September 19, 2017
3:00-4:15 PM
Innovation Hall Room 207