Dynamic Chiropractic

Soft Tissue Sampler #2

Warren Hammer, MS, DC, DABCO

I received some enlightening mail last month about the article, "Soft Tissue Sampler" (Dynamic Chiropractic, 10/18/96 issue). It seems that many readers enjoyed it since instead of a long article which may at times appear tedious, they enjoyed short bursts of information. Well, here we go again.

Supraspinatus Muscle Testing: In a recent article from the American Journal of Sports Medicine (which everyone interested in soft tissue should subscribe to) Kelly BT, et al. did another electromyographic investigation of cuff muscles.[1] They changed the usual accepted position of this test as described by Jobe and Moynes[2] in which the straight arm was elevated 90° in the scapular plane (30° to 45° anterior to the coronal plane) with the arm internally rotated, i.e., thumb down. Kelly, et al.[1] state that their EMG findings showed slightly increased EMG activity when the thumb is pointed up, i.e., the arm is externally rotated. They did state that there was no significant difference between the two positions, but the position of thumb down caused a positional pain provocation since this position tended to create impingement. They felt that any positional pain may decrease the reliability and accuracy of the manual muscle testing of this muscle.

Infraspinatus Muscle Testing: Kelly, et al.[1] state that the best position for testing this muscle with maximal activation with associated minimal activation of the supraspinatus and posterior deltoid was with arm at the side of the patient (0° elevation), elbow flexed 90° and the shoulder internally rotated 45° from the sagittal plane. They state that there was minimal pain provocation with this position and optimum test-retest reliability as was also demonstrated with the supraspinatus above.

Subscapularis Muscle Testing: Kelly, et al.[1] recommended the Gerber and Krushell lift off test[3] which was originally used to determine if there was a rupture of the subscapularis. For this test the patient places his/her arm behind the back with the dorsum of the hand resting on the midlumbar spine and pushes backward against resistance. To use this test the patient must have full passive internal rotation and no pain in positioning themselves.[4] According to Kelly et al.[1] this test maximizes subscapularis activation and minimizes activation of the pectoralis and latissimus muscles. They felt that this position test avoids the impingement position associated with internal rotation at 90° of scapular elevation.

Intracell Technology: I have recently been using a very effective instrument for detecting and treating trigger points plus releasing potential adhesions all over the body. It's a specially constructed nonmotorized device composed of a semi-rigid core around which 14 independent, one inch spindles freely revolve. Patients usually end up taking one home with them. It was developed by a fellow DC, Dr. Pat E. Belcher of Atlanta.[5]

Use of EMG Activity for Muscle Testing: While muscle firing patterns and muscle activity has been analyzed with important information from EMG testing. "The amount of recorded

electromyographic activity is only an indicator of muscular activity level and is not a direct indicator of the force produced by the muscle."[6] Many other variables which produce motion in a joint must be considered, such as the moment of force (torque) about a particular motion axis (fulcrum), the cross-sectional area of the muscle, and its line of action.[7]

References

1. Kelly BT, Kadrmas WR, Speer KP. The manual muscle examination for rotator cuff strength. An electromyographic investigation. Am J Sports Med, 24 (5):581-593, 1996.

2. Jobe FW, Moynes DR. Delineation of diagnostic criteria and a rehabilitation program for rotator cuff injuries. Am J Sports Med 10:336-339, 1982.

3. Gerber C, Krushell RJ. Isolated rupture of the tendon the subscapularis muscle. J Bone Joint Surg 73B:389-394, 1991.

4. Greis PE, Kuhn JE, Schultheis et al. Validation of the lift-off test and analysis of subscapularis activity during maximal internal rotation. Am J Sports Med, 24 (5):589-593, 1996.

5. RPI of Atlanta, 120 Interstate North Pwy East, Suite 424, Atlanta, GA 30330. (800-554-1501).

6. Basmajian JV, Deluca CJ. Muscles Alive: Their Functions Revealed by Electromyography. Baltimore, Williams & Wilkins 22-43, 1985.

7. Hancock RE, Hawkins RJ. Applications of electromyography in the throwing shoulder. Clin Orth Rel Res. 330,84-97, 1996.

Warren Hammer, MS, DC, DABCO
Norwalk, Connecticut

NOVEMBER 1996