

Title: Motor firing patterns of Scapulohumeral rhythm

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Introduction: Scapular dysfunction is commonly present in association with glenohumeral pathology. One role of the scapula is to provide a movable base to maintain glenohumeral joint integrity and provide optimal length for function of the rotator cuff musculature. Loss of motor control of scapular rotators hampers rehabilitation of glenohumeral pathologies.

Purpose: To determine if muscle firing pattern abnormalities of scapular musculature exist in individuals with glenohumeral pathology and abnormal scapulohumeral rhythm, as compared to normal subjects.

Subjects: Preliminary N=13 (projected N=30)

Normal subjects are those without history of shoulder pathology and demonstrate full range of motion in their shoulder (present n=7). Abnormal subjects are those with a clinical diagnosis of rotator cuff impingement, glenoid labral tear, or acromioclavicular sprain, and present with abnormal scapulohumeral rhythm (present n=6). Exclusion criteria are: previous fracture in the shoulder girdle; adhesive capsulitis; previous surgery to either shoulder; and bilateral symptoms of shoulder pain.

Methods: Subjects are questioned regarding their history of shoulder injuries and shoulder dominance. The subjects are asked to move their arms through a complete range of motion to insure that they meet the inclusion criteria.

The subjects are instrumented with bipolar surface electrodes placed over their upper trapezius, lower trapezius, and serratus anterior bilaterally. Electrical goniometers are aligned with midline of the humerus and the thorax to monitor shoulder range of motion. Subjects perform maximal voluntary isometric contractions for each muscle group using a standard manual muscle test position. The subjects perform five trials of elevating their arms through a full range of motion in two planes, the frontal and 45° anterior to the frontal plane. The kinematic data from the electrical goniometer and electromyographic data is analyzed over 20° intervals throughout elevation and lowering.

Results:

Results and Conclusions are forthcoming.