Influence of marker movement errors on measuring 3 dimentional scapular position and orientation

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Abstract:

Introduction: Scapulothoracic muscles weakness or fatigue can result in abnormal scapular positioning and compromising scapulohumeral rhythm and shoulder dysfunction. The scapula moves in a -3 Dimentional fashion so the use of 2-Dimentional Techniques cannot fully capture scapular motion. One of approaches to positioining markers of kinematic systems is to mount each marker directly on the skin generally over a bony anatomical landmarks. However skin movement and Motion of underlying bony structures are not Necessaritly identical and substantial errors may be introduced in the description of bone movement when using skin –mounted markers. Objective: evaluation of Influence of marker movement errors on 3-Dimentional scapular position and orientation

Materials & Methods: 10 Healthy subjects with a mean age 30.50 participated in the study. They were tested in three sessions A 3-dimentiional electro mechanical digitizer was used to measure scapular position and orientation measures were obtained while arm placed at the side of the body and elevated 45 90 120 and full Rang of motion in the scapular plane. At each test positions six bony landmarks were palpated and skin markers were mounted on them.

This procedure repeated in the second test session in third session. Removal of markers was not performed through obtaining entire range of motion after mounting the markers.

findings: The intraclass correlation coefficients (ICC) for scapulor variables were higher (0.92-0.84) when markers were replaced and re-mounted on bony landmarks with Increasing the angle of elevation.

Conclusion: our findings suggested significant markers movement error on measuring the upward Rotation and posterior tilt angle of scapula.

key words: Marker error/3-dimentional scapular kinematics/electromechanical digitizer