SHOULDER POSITIONING AND RELATIVE IMPINGEMENT RISK DURING ULTRASONIC SCALING: ASSESSMENT OF DENTAL HYGIENE STUDENTS

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Abstract (Limited to 300 Words):

BACKGROUND AND PURPOSE: A high incidence of shoulder pain has been reported in dental hygienists. The purpose of this study was to model the proximity of rotator cuff tendon insertions to the coracoacromial arch in order to identify relative impingement risk in occupational tasks of dental hygienists.

SUBJECTS: Nine second-year female dental hygiene students. Average age 23.44 ± 2.79 years, height (cm) 166.37 ± 9.96, weight (kg) 58.59 ± 9.20, average weekly hours in clinic 13.5 ± 1.78, and two subjects were left hand dominant.

METHODS AND MATERIALS: Subjects filled out a modified Nordic Questionnaire for symptom reports and performed ultrasonic scaling techniques while being monitored for neck and shoulder positions with surface electromagnetic sensors. Data were analyzed using Matlab coding software & 3-D bone models were reconstructed allowing rotator cuff tendon proximities to be calculated relative to the coracoacromial arch. Exposure variation analyses (EVAs) were calculated based on subject's humeral elevation angles.

ANALYSES: Modes of cervical and humeral angular positions and tendon proximity data were compared among sextants (areas) of the mouth and sides of the teeth being cleaned using two-way ANOVAs. Dental hygienist trunk orientations relative to the patient (clock positions) were also analyzed using one-way ANOVA. Data was analyzed with SAS software and significance set at $p < 0.05$.

RESULTS: The proximity of the infraspinatus and supraspinatus tendons to potential impinging structures depended on both the sextant and side of the tooth (significant interaction). There were also differences across sextants for subscapularis and supraspinatus tendons relative to the coracoacromial ligament. Clock position affected the proximity of both infraspinatus and supraspinatus tendons to the acromion, with the shortest distances noted at 8 o'clock.

CONCLUSIONS: Results demonstrate differences in impingement risks related to positioning of dental hygienists during occupational tasks.

IMPLICATIONS: Ergonomic intervention has potential to reduce shoulder impingement risk in dental hygienists.