

CAO 61st Annual Scientific Session



September 10-12, 2009

Delta Grand Okanagan Resort and Conference Centre, Kelowna, BC



CFAO Graduate Student Posterboard Abstracts – Sponsored by



University of Toronto

INTERCENTER COMPARISON OF TREATMENT OUTCOME IN PATIENTS WITH COMPLETE UNILATERAL AND BILATERAL CLEFT LIP AND PALATE: ANALYSIS OF CRANIOFACIAL FORM

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Background: Several different surgical treatment protocols have been advocated for the management of patients with complete unilateral cleft lip and palate (CUCLP) and complete bilateral cleft lip and palate (CBCLP), and little evidence exists on comparison of the outcomes of each protocol.

Objectives: 1) To compare craniofacial morphology among individuals with repaired CUCLP treated at four North American centers, through cephalometric analysis. 2) To compare craniofacial morphology among individuals with repaired CBCLP treated at three North American centers, through cephalometric analysis. This is meant to serve as a means of treatment outcome assessment, as well as an effort to provide cleft lip and palate (CLP) teams with a basis from which to perform clinical audits.

Methods: A retrospective study was conducted examining the lateral cephalometric radiographs of 148 individuals with repaired CUCLP (average age = 8y 8m, M/F = 99/49, cleft L/R = 106/42) as well as the lateral cephalometric radiographs of 93 individuals with repaired CBCLP (average age = 8y 10m, M/F = 61/32). Main outcome measures included 16 angular, 7 linear and 2 ratio cephalometric parameters. The group means for the different centers per cephalometric measurement were compared using analysis of variance to assess statistical significance. Specifically, pairwise comparisons of means were performed using the Tukey-Kramer method.

Results: For the CUCLP sample, significant differences were found in the sagittal maxillary prominence among the four centers. The most significant differences were seen between centers 1 (largest maxillary prominence) and 3 (lowest maxillary prominence). The differences between the two centers in the mean SNA and ANB angles were highly statistically significant ($p < 0.001$); whereas for the mean Ba-N-ANS', and ANS'-N-Pg angles the differences were significant at the $p < 0.01$ and $p < 0.05$ level, respectively.

Similarly, for the CBCLP sample, the most significant differences were observed between center 1 (largest maxillary prominence), and center 3 group A (lowest maxillary prominence), and center 4. The differences between the three centers in the mean SNA and Ba-N-ANS' angles were highly statistically significant ($p < 0.001$); whereas for the mean ANB and ANS'-N-Pg angles and WITS appraisal the differences between center 1 and center 3 group A, and center 1 and center 4 were significant at the $p < 0.001$ and $p < 0.01$ level, respectively.

Conclusions: 1) Significant differences in craniofacial morphology, specifically hard and soft tissue maxillary prominence, exist among patients with CUCLP treated according to different surgical protocols at the centers investigated in this study; 2) Significant differences in craniofacial morphology, specifically hard and soft tissue maxillary prominence, exist among patients with CBCLP treated according to different surgical protocols at the centers investigated in this study; 3) For both the CUCLP and CBCLP groups, center 1 patients had the greatest hard-tissue maxillary prominence and soft-tissue convexity; 4) Patients from center 3 and center 3 group A, the only center to perform primary alveolar bone grafting, had the least prominent maxilla and straightest soft-tissue profile for both the CUCLP and CBCLP groups, respectively.