

CFAO Graduate Student Posterboard Abstracts

University of Toronto

PERCEPTIONS OF PLASTIC SURGEONS, ORTHODONTISTS AND LAYPERSONS TO ALTERED FACIAL BALANCE

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Background: It is well established that mild facial asymmetry is considered normal, and it is thought that a few millimeters or degrees of difference between left and right sides of the face is not clinically appreciated.

Objective: To quantify in precise physical units the acceptability of facial asymmetry to plastic surgeons, orthodontists and the lay population.

Methods: Stereophotogrammetric images were animated with one of six facial asymmetries, including: jaw and nasal deviation, interocular distance, ocular height, angulation, and shape. Twelve animations were randomly presented, and 60 evaluators were asked to judge the faces based on their visual acceptability using an interactive flash application.

Results: The results demonstrated threshold levels of acceptability for each regional facial asymmetry. Mandibular deviation of approximately 4 mm was necessary to be judged as unacceptable. Nearly 3 degrees of nasal deviation was considered unacceptable. Approximately 9% rounder and 18% flatter eye was considered unacceptable. Hypertelorism was unacceptable after an increase of approximately 2 mm and hypotelorism unacceptable after a decrease of approximately 2.5 mm. Vertical ocular dystopia was unacceptable after superior positioning of approximately 2.5 mm and inferior positioning of approximately 2 mm. Threshold levels for unacceptable ocular angulation were approximately 5.5 degrees superiorly and 3.5 degrees inferiorly.

Conclusions: The results of this study show that plastic surgeons, orthodontists, and lay people find specific facial asymmetries to be unacceptable at similar levels of deviation. The quantification of asymmetric thresholds may aid the clinician in diagnosis and the evaluation of treatment results.

NEUROPLASTICITY OF THE FACE MOTOR CORTEX (FACE-M1) ASSOCIATED WITH ORTHODONTIC TOOTH MOVEMENT OF THE RAT TEETH

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The aim was to determine if altering the rat's dental occlusion with an orthodontic appliance produces changes in the features of the ICMS-defined face-M1. Sprague-Dawley rats had a closed-coil spring placed to mesialize the right upper molars. Pairs of stainless-steel EMG electrodes were implanted in the left and right anterior digastric (AD – jaw-opening), masseter (jaw-closing) and genioglossus (GG – tongue-protrusion) muscles. Intracortical micro-stimulation (ICMS - 20, 40, 60 μ A; each of 5 trains at 1 Hz.) was applied through transdural tracks to the right and left face-M1 in rats on days 1 (n=5), 7 (n=5), and 28 (n=5) after the active spring was attached to the teeth. The control group was the naïve group (n=5) and sham groups with springs with no activation for days 1 (n=3), 7 (n=4), and 28 (n=5). Intracortical microelectrode penetrations had a horizontal spatial resolution of 0.5 mm, and at each anteroposterior plane (AP) a series of mediolateral (ML) penetrations were made with each penetration being 0.2 mm increments in depth. A significant reduction in the total number of AD and GG positive sites occurred on day 1, which recovered to naïve level by day 7, followed by another significant reduction that was evident at day 28. Supported by CIHR grant MOP-4918.