



Physical Anthropology Section - 2014

H87 New Prospects in Facial Approximation: A Differential Approach in Mouth and Nose Reconstruction in Skeletal Classes

Federica Collini, LABANOF, Milan, 20133, ITALY; Davide Porta, BS, V. Mangiagalli, 37, Milan, ITALY; Alfredo Cigada, BE, Politecnico di Milano, Milano, ITALY; Alberto Amadasi, Via Mangiagalli 37, Milano, ITALY; and Cristina Cattaneo, PhD, Universta Degli Studi Di Milano, Milan, ITALY*

After attending this presentation, attendees will understand some principles of mouth and nose reconstruction in facial approximation, a technique which strives to reproduce facial features and estimate the appearance of the antemortem face from human skeletal remains.

This presentation will impact the forensic science community by providing tools for a more precise reconstruction of nose and mouth from skeletal remains.

Nose: One hundred forty-two radiographs were randomly taken from diagnostic cephalometric X-ray films (lateral view) of Italian dental patients (aged from 14 to 47 years, with a mean age of 25) who consulted the Department of Orthodontics of Milan for dental treatment. Six measurements were taken: height of nasal aperture; nasal depth; nasal angulation; nasal-bone angle; nasal-bone length; and the projection of the previous segment to the line perpendicular to the Frankfurt Horizontal plane, in order to verify which one had the best correlation with nasal depth. For males, the height of nasal aperture had the best correlation with nasal depth; for females, the nasal-bone-projection had the best correlation with the nasal depth. Multiple regression was also conducted showing the need to distinguish the formulas for male and female nasal reconstruction, since they are significantly different. In this sample, the mean of the male nasal depth was 3.83cm (C.I.: 3.72cm–3.93cm); the mean of the female nasal depth was 3.42 (C.I.: 3.37cm–3.47cm). The difference between the two means is extremely significant (p -value = 0.0001), which means that nasal depth is deeply influenced by sex. The difference in nasal angulation between the two genders is significant and a novelty compared to previous studies. Moreover, the nasal depth was statistically different between Class II and III patients.

Mouth: At the present, lip and mouth reconstruction in different skeletal classes has been poorly investigated and this study focuses on emphasizing the importance of using different methods for selective reconstruction according to skeletal class. Sixty latero-lateral radiographs (twenty of each skeletal class) were randomly taken from diagnostic cephalometric X-ray films (lateral view) of the same Italian sample.

The radiographs were divided into the three skeletal classes based on Riedel's ANB-angle, then the profiles were reconstructed with George's method. To evaluate the degree of reliability of George's reconstructions, engineers developed a new software, to assess the difference between the two areas (the real profile and the reconstruction), showing that the reliability of George's method is very low in pathological classes (II and III). To adjust his method to the different classes, seven new reference planes of reconstruction were identified, evaluated by the software and compared both with the real profile and with the classic George method. This comparison led to the evidence that Class III showed a highly statistically significant preferential plane to use for a better mouth reconstruction. Better planes were found also for Class I and II, but were not statistically significant. This work pointed out the basic importance of using different methods for nose and mouth reconstruction by differentiating between males and females and the three skeletal classes.

Facial Reconstruction, Nose, Mouth