



JOURNAL of FORENSIC ODONTO- STOMATOLOGY

VOLUME 31 Supplement 1 October 2013
Abstract book IOFOS Conference 2013 Firenze

SUPERIMPOSITION OF FRONTAL SINUS 3D VOLUMES

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The authors declare that they have no conflict of interest.

Background: *In body identification exams the available antemortem data can determine the postmortem analysis. Recently, an increasing number of individuals have few or no dental treatments, and unique anatomical features gain importance. In the literature, there have been reports of identification through comparison of the frontal sinus contour in Postero-anterior radiograph. The objective of this study is to develop and test a three-dimensional technique for frontal sinus comparative analysis. Method: Twenty Cone-Beam Computer Tomography (CBCT) exams (10 males, 10 Females) were selected of individuals between 20 and 40yo. A numerical list containing the names of the patients was created and then blindly randomized in the random.org website by two observers. Each one segmented and exported frontal sinus volumes in the open-source software InVesallius® and in MeshLab®, also open-source, the observers were able to superimpose the 3D models to connect the two randomized lists. A third observer received the individual results and assessed the level of correct matches. Results: Both observers reached an outstanding 100% accuracy. The software Meshlab was capable of superimposing the matching volumes while it placed models side by side if a negative comparison was detected, a characteristic that facilitated the analysis. Great deal of topographic unique features was noticeable in the volumes and, never the less, the compatibility was clear. Conclusion: The technique developed increases the usage of the Frontal Sinus identification method in new forms of three-dimensional exams such as CBCT, improving the results and the confiability of the forensic analysis.*

KEYWORDS: Forensic Odontology, Identification, Frontal sinus