



# Bitemarks analysis of orthodontically treated suspects – an identification approach

T. Nunes, S. Alves, J. Saraiva, J. Coelho, C. Caetano & A. Corte-Real

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of *E. faecalis* phages in the saliva of healthy individuals suggests that they may play a role in the control of this bacterium in the oral cavity.

CONTACT Teresa Nascimento ✉ [tnascimento@egasmoniz.edu.pt](mailto:tnascimento@egasmoniz.edu.pt)

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## Bitemarks analysis of orthodontically treated suspects – an identification approach

T. Nunes<sup>a</sup>, S. Alves<sup>b</sup>, J. Saraiva<sup>b</sup>, J. Coelho<sup>b,c</sup>, C. Caetano<sup>b,c</sup> and A. Corte-Real<sup>b,c</sup>

<sup>a</sup>Fifth-year student of Integrated Master in Dentistry, Faculty of Medicine, University of Coimbra, Coimbra, Portugal; <sup>b</sup>Faculty of Medicine, University of Coimbra, Coimbra, Portugal; <sup>c</sup>Forensic Dentistry Laboratory, Faculty of Medicine, University of Coimbra, Coimbra, Portugal

### ABSTRACT

**Introduction:** The advent of tridimensional (3D) technologies brings new and more reliable tools for bitemark analysis [1–7]. This experimental study intends to assess, in a forensic scenario, an identification approach for orthodontically treated suspects.

**Materials and methods:** 13 Cone Beam Computed Tomographic (CBCT) cranium files were selected from the clinical database of Coimbra Hospital and University Center/Faculty of Medicine of the University of Coimbra. The volunteer patients were recalled to bite an apple (golden delicious 75/80) which was immediately subjected to a CBCT scan. The 3D rendering of every bitemark was compared with the 3D upper dental arches obtained from the CBCT cranium scans of the simulated “suspects”. The research team was composed by 5 elements. The matching process consisted on corresponding landmark points in the bitemark and in the subjects’ dentition (upper dental arch). 169 comparisons were obtained between the 13 subjects and the 13 apples bitten. The kappa statistics analysis was performed. The study was approved by the Ethics Committee of Medicine’s Faculty of the University of Coimbra (CE-048/2017).

**Results:** Cohen’s kappa values varied between 0.834 and 0.882. Fleiss kappa obtained a value of 0.604. The Friedman’s test was performed and the normality assumption was not verified ( $p > .05$ ).

**Discussion and conclusions:** The statistical analysis supports the accuracy and reliability of the methodology and the moderated agreement in classification, for the subject group. The post orthodontic treatment group can be included in bitemark sample in an identification scenario. It should not be an exclusion criteria for sample selection as it is usually performed. This experimental study opens up to new opportunities in forensic sciences regarding post orthodontic patients.

CONTACT T. Nunes ✉ [tacntiago@gmail.com](mailto:tacntiago@gmail.com)

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## Determination of the vertical dimension occlusion – case report

S. Félix<sup>a</sup>, M. João Barreto<sup>a</sup>, A. Mariz de Almeida<sup>a,b</sup>, A. Alves<sup>a</sup>, P. Cebola<sup>a</sup> and P. Maurício<sup>a,b</sup>

<sup>a</sup>Instituto Universitário Egas Moniz (IUEM), Caparica, Portugal; <sup>b</sup>Centro de Investigação Interdisciplinar Egas Moniz (CiiEM), Egas Moniz Cooperativa de Ensino Superior, Caparica, Portugal

### ABSTRACT

**Introduction:** Despite the improvement in oral health care, tooth loss, for reasons associated with caries or periodontal disease, continues to be a reality in our population [1]. The planning of a total or a partial dental prosthesis is the key for the creation of a harmonious and natural relationship between the prosthetic structures, the tissues and the face, combining functional rehabilitation with aesthetics. The correct Vertical Dimension of Occlusion (VDO) is a key aspect in oral Rehabilitation [2].

**Materials and methods:** A 49-year-old female patient attended the Oral Rehabilitation consultation with complaints about the aesthetic viability of her partial upper prosthesis with decreased VDO, which she had been using for about 20 years. The patient was advised to make a new prosthesis, not only to improve the aesthetics but also to increase the VDO to restore harmony at the soft tissue level. Clinically we started the usual protocol oral rehabilitation procedure: 1. Clinical History, Preliminary Impressions, Profile teleradiography with the old prosthesis; 2. Definitive Impressions; 3. Intermaxillary recording, VDO recording using the Willis method; 4. Wax try in with phonetic and aesthetic test; cephalometric analysis; 5. Prosthesis delivery;

**Results:** Our main objective was to measure and to establish a functional and ideal VDO. Considering the Willis Method, the 2/3 anterior facial height (AFH) was 67 mm, the patient prosthesis was 60 mm and the wax try in was 67 mm. In terms of cephalometry the angles related to VDO were lower compared the wax in and with the mean values in the prosthesis (i.e. Jaraback Analysis – Anterior Facial Height – 102° prosthesis 117°, wax in and mean value of 113°). We were able to safely assure the VDO not only from a soft tissue point of view, as well as phonetically, aesthetically and with cephalometry.

**Discussion and conclusions:** The establishment of a correct VDO using different methods is crucial in the construction of the dental prosthesis, allowing a stable, comfortable and functional rehabilitation for the patient [1]. The Willis method, soft tissue and phonetics analysis, as well as cephalometric analysis, obtained good clinical results, similar to those achieved by other authors [1–3]. Orthlieb et al. [3] also confirmed that cephalometric measurements are important references in the measurement of VDO in partial and total edentulous patients. Total / Partial prosthesis continue to be a valid solution for the rehabilitation of partial edentulous patient both functionally as aesthetically. It is possible to determine the VDO, in a simple and scientifically correct manner, using if possible, a combination of the available techniques, in a partially edentulous patient.

CONTACT S. Félix  samuelfelixmem@hotmail.com

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