A129 Deconstructing Non-Carious Cervical Lesions on Teeth in Forensic Contexts

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Learning Overview: After attending this presentation, attendees will have a better understanding of: (1) variability in non-carious cervical lesions, and (2) the use of non-carious cervical lesions at the cementoenamel junction for the purpose of reconstructing biological profiles, which can help to estimate if the remains are modern or ancient and determine if the remains are of legal significance.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by demonstrating the importance of an integrated approach to analyzing non-carious cervical lesions at the cementoenamel junction to obtain a positive identification and medicolegal vs. archaeological importance of skeletal remains.

The causes of the non-carious cervical lesions at the labial surface of the teeth and its medical-legal implications are examined in detail in this presentation. This study used two forensic anthropological cases to illustrate these lesions and their implications for medical-legal research. The presence of cervical lesions can have long-term health consequences, such as hypersensitivity in the dentine, risk of tooth fracture, the potential for dentine and pulp exposure, inflammation of the area, and tooth loss. The lesions are described as hairline crack striations with a wedge shape and sharply delimited borders, triangular, C-shaped lesions with rounded floors, and saucer-shaped. These types of lesions have medical significance and usually are found and treated by dentists and described in antemortem records. However, the etiologies of the lesions are a fairly contested topic and understudied in forensic anthropological investigation.

Lesions observed in these areas are multifactorial and not caused by a single mechanism. They typically relate to a combination of factors, such as abrasive action from the use of toothpaste combined with over-brushing, diseases, the excessive consumption of acidic food, and the use of toothpicks. Non-carious lesions at the cementoenamel junction are rarely found on archaeological material. However, it is commonly found in forensic anthropological cases.

The methods used to analyze the two case studies focus on reconstructing the biological profiles. Preparation of the elements with soft tissue included several hours of soaking in a heated water bath with equal parts detergent and sodium carbonate (Na2CO3). Any adherent soft tissue was then manually removed from the bones, and all the resected elements were allowed to dry. Photographic documentation of selected remains and skeletal features were taken at different times during the examination. Also, a complete set of DEXIS digital dental periapical radiographs were made during the examinations. The individuals were analyzed using the same methods to obtain comparable results. The biological profile includes estimation of the biological sex and age-at-death and documenting pathological conditions, among other variables.

The biological profile data allowed for reconstructing portions of the social life histories of the individuals for subsequent correlation with particular characteristics and ultimately identification. The non-carious lesions at the cementoenamel junction in the two cases presented contribute to the positive identification of the individuals as they provide an additional line of evidence for the dates of the remains and reconstructing the biological profile. It is argued that the presence of non-carious lesions at the cementoenamel junction can help to estimate if the remains are modern or ancient and determine if the remains are of legal significance. Thus, the presence of non-carious lesions on teeth from human remains is an additional line of information that can aid in the reconstruction of the biological profile and ultimately in the positive identification of individuals.

Teeth, Forensic Anthropology, Non-Carious Lesions