G48 Unique Dental Morphology With Concurrent Dental Developmental Anomalies: A Case Study Demonstrating the Utility of a Multidisciplinary Approach

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After attending this presentation, attendees will understand how the medical examiner, the forensic odontologist, and the forensic anthropologist collaborate to analyze a case involving a human calvarium.

This presentation will impact the forensic science community by presenting a case with unique dental morphology and by demonstrating the utility of dental radiography beyond antemortem/postmortem comparisons.

A human skull was discovered when a man was clearing some brush behind trash bins in southwest Florida. The medical examiner assumed jurisdiction of the skull and requested that the forensic odontologist conduct a postmortem dental examination in the absence of antemortem records. The medical examiner also requested that a forensic anthropologist perform an osteological examination to establish a biological profile and record individualizing characteristics that might be useful for personal identification.

Following guidelines and standards established by the American Board of Forensic Odontology, the initial dental examination included dental charting, digital photographs, radiographs, impressions, and a written report.[1] Oral examination revealed significant occlusal wear and the external morphology of the maxillary incisors exhibited shoveling, double shoveling, and lingual pits. Radiographs demonstrated that the maxillary right third molar had closed apices and multiple teeth exhibited developmental anomalies.

The anthropological examination performed at the C.A. Pound Human Identification Laboratory included both non-metric and FORDISC® metric analysis.[2] The remains were classified as an adult, Native American male. This finding and the taphonomic appearance of the remains suggested that the calvarium was that of a prehistoric Native American and, thus, of no medicolegal significance.

Teeth are useful in anthropologic research because of their preservability, observability, variability, and heritability.[3] These traits are also the reasons why teeth are valuable in forensic dental cases; however, anthropologists and odontologists tend to view teeth from different perspectives. Anthropologists focus intently on the surface details of teeth while odontologists look inside the teeth with radiographs. The presence of shoveling, double shoveling, and interruption grooves in the incisors are morphologic patterns present in this case which have been documented by anthropologists to occur at higher frequencies among those of Native American ancestry. Dental radiographs documented that the maxillary right third molar was a taurodont and the maxillary incisors exhibited dens invaginitis with distinctly bifurcated anterior pulp chambers. The use of cone beam computed tomography enabled 3D visualization of the teeth. To determine whether the dental morphology and anomalies in this case represent rare incidental findings or whether there is a correlation between the observed dental morphology and anomalies will require additional scientific research.

This case demonstrates how, under the jurisdiction of the medical examiner, the forensic odontologist and the forensic anthropologist are able to contribute to the disposition of a forensic case. Additionally, this case presentation demonstrates how forensic odontologists use dental radiography beyond forensic identification.

References:

1. American Board of Forensic Odontology. http://www.abfo.org
2. Jantz, RL Ousley, SD. FORDISC® 3: Computerized forensic discriminant functions. Version 3.1. Knoxville, TN: University of Tennessee, 2010.
3. Scott, G. Richard 2008. Dental Morphology. In Biological Anthropology of the Human Skeleton, ed. M. Katzenberg and S. Saunders, 265. New York: Wiley-Liss.

Forensic Odontologist, Forensic Anthropologist, Dental Radiography

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