Who and when? Dental modification in coastal Ecuador

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Introduction

Dental modification is a signal of social identity and status, documented among many cultures around the globe in the past and present. Here, we investigate the timing, style, and geographic origins of modified teeth from the Museo Arqueológico y Arte Contemporáneo (MAAC) in southern Ecuador (Fig. 1). While dental modification has been previously documented in this region, no examples have been directly dated, and few studies have investigated the geographic origins of this technology. Thus, we present results of radiocarbon dating, and isotopic analyses from four individuals in order to more fully understand dental modification in prehispanic Ecuador.

Materials and Methods

Previous analysis of the MAAC collection revealed Four individuals had dental modification included incised crosshatching, small gold insets, metallic plaques, and gold appliques. One tooth was selected from each individual and assessed for radiocarbon dating, strontium isotopes, and stable carbon and oxygen isotopes. Radiocarbon dating was performed at DirectAMS, strontium isotopes processed at the University of Florida, and carbon apatite and oxygen isotopes at Washington State University, following standard methods and lab protocols.

Results and Discussion

Timing?

The range of dates from 1065-352 BP suggests at least 700 years of practice. The earliest date suggests pre-Manteño technology, while the latest date indicates that dental modification continued even after European colonization, contrary to Christian doctrine and Spanish chronicles. Interestingly, the styles of the earliest and latest modifications appear very similar. This underscores the importance of directly dating examples, rather than relying on stylistic comparisons for cultural affiliation, especially from un-provenienced museum collections.

From where?

Oxygen isotopes reflect some degree of geographic variability, although generally suggest areas of high precipitation and low evaporation, consistent with coastal, humid environments common along the Ecuadorian coast. Strontium data suggest similar origins for I-75-76 and 47-380-77, while 2-2708-84 and 3-3097-92 appear to come from other areas. While baselines samples are currently unavailable, predictive models (Scaffidi and Knudson 2020) suggest that the local signature for southern coastal Ecuador should be between .708 and .709, higher than the values reported here. 3-3097-92 is particularly interesting given their significantly lower value – the closest known area with this value is near modern Trujillo Peru (Fig. 6). 2-2708-84 also appears to come from further away – this individual was previously identified as associated with the Jama-Coaque culture, more common in central and northern Ecuador. While we do not currently have baseline data for those regions, the signature outside of southern Ecuador seems to support that association.

Who?

Based on our data, it appears that dental modification was available to various groups over time, linked to status and culture but not limited by sex, age, or circumscribed to one region. The diverse styles documented here (insets of different designs and cross-hatching) suggest that dental modification did indeed reflect social identity, as access to the technology and resources necessary to perform these elective surgeries varied over time. Males and females presented with dental modification and while all individuals here were adults, two were young adults, suggesting dental modification wasn’t limited to the older age ranges. Carbon apatite data suggests that diets ranged from very heavily seafood and C4 based, to significantly less so. We would expect all coastal denizens to consume a large amount of sea resources; however the variation in diet is interesting, particularly as it reflects access to C4 and, potentially, maize, a crop associated with ritual and elite status in coastal Ecuador. While not reflective of the whole diet, carbon apatite provides insight into changing diets over time and between these individuals.

References

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