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RESEARCH REPORT: A REVIEW OF PRE-HISPANIC DENTAL DECORATION IN ECUADOR AND REPORT OF A NEW CASE

ABSTRACT: A review of the subject in Ecuador and a new case is reported for this country. A comparison is made of the cases found in Ecuador with others of the E4 and E5 types in Mesoamerica in times close to Classic Period. The origin of this cultural practice in the region is discussed and it is concluded as a result of contacts with groups from the near Atlantic and Pacific coasts in earlier times.

KEY WORDS: Dental anthropology - Dental decoration - Latin America - Ecuador

INTRODUCTION

For more than 150 years, the phenomenon of pre-Hispanic dental decoration has been extensively documented and referenced in studies encompassing dentistry, archaeology, and biological anthropology across the Americas (Rodriguez Florez 2023a). Researchers worldwide have extensively investigated the deliberate modification of teeth, which is a prominent topic within the field of American archaeological literature (see Alt, Pichler 1998, Milner, Larsen 1991). Taking into account factors such as the abundance, context, timeframe, and intricate nature of these discoveries, scholars have proposed classification

systems and typologies to identify stylistic patterns (Magitot 1885, Saville 1913, van Rippen 1917, Montadon 1934, Dembo, Imbelloni 1938, de la Borbolla 1940, Delfino 1947, Romero 1952, Marcellino 1972). Certain instances have demonstrated successful associations between stylistic patterns of intentional dental modification and specific periods, cultural development zones, and chronological contexts. These connections have enabled researchers to establish correlations between the practice and the historical and cultural dynamics of different societies (Romero 1960, 1965, 1970, 1986). These endeavors have proven valuable in addressing local issues related to intergroup interactions and deciphering the symbolic significance associated

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with intentional dental modification. Through the exploration of the meanings attributed to power, status, trophies, divinity, and sacrifices connected with this practice, researchers have gained valuable insights into the dynamics of various societies and their cultural beliefs (Alt, Pichler 1998, Romero 1960, 1965, 1970, 1986, Magitot 1885, Saville 1913, van Rippen 1917, Montadon 1934, Dembo, Imbelloni 1938, de la Borbolla 1940, Delfino 1947, Romero 1952, Marcellino 1972). Moreover, additional forms of evidence have illuminated the existence of this practice in various contexts. For example, pottery has been recognized as a medium that depicts the practice of intentional dental modification (Núñez, Barzuna 2017). Furthermore, ritual necklaces have been discovered to incorporate elements associated with dental modification, offering additional insights into its cultural significance (Talavera *et al.* 1997). Although these additional sources of evidence have undoubtedly enhanced our understanding of the extensive prevalence and varied expressions of intentional dental modification, it is important to acknowledge that this field of research still remains relatively understudied. Especially within the context of Northern Andes Archaeology, the investigation of this topic remains confined to a limited number of cases (Saville 1913, Zevallos 1982). Nevertheless, the intriguing nature of this subject presents an excellent opportunity for further investigation, potentially leading to valuable insights into the cultural dynamics and practices of ancient Andean and coastal societies. The objective of this research is to present a new case of intentional dental modification discovered in a pre-Hispanic sample originating from Ecuador. By documenting and analyzing this new case, the study aims to contribute to the current understanding of dental modification practices within the region. The findings

of this research will offer insights into the cultural and historical significance of intentional dental modification in pre-Hispanic Ecuadorian societies.

MATERIALS

The skeletal remains observed come from the archaeological intervention project "Monitoreo arqueológico al interior del Terminal Marítimo de Balao" carried out in 2002 in the Province of Esmeraldas. During the year 2003 the authors carried out an osteological study on the samples of five individuals collected in the aforementioned archaeological works. The final report was called "Análisis bioarqueológicos de los restos óseos humanos del Proyecto de Monitoreo y Rescate Arqueológico del Oleoducto de Crudos Pesados (OCP) en las Provincias de Esmeraldas y Pichincha" (Rodríguez Flórez, Rodríguez 2003). Five individuals represented in bone fragments and loose teeth in a very poor state of conservation were analyzed (*Table 1*). The cultural assignment was Tumaco-La Tolita and the approximate chronology of 2000 to 1500 years BP parallel to the Regional Development Period (2200–1300 BP).

METHODS

A visual examination was conducted on the teeth displaying intentional modification, and the observed dental forms were subsequently compared to the typologies proposed by Romero (1986). In addition, inquiries were made regarding references to other cases of intentional dental modification in the field of Ecuadorian archaeology. This comprehensive analysis

TABLE 1: Human remains from Terminal Marítimo de Balao, Esmeraldas. TMB = Terminal Marítimo de Balao, INPC = Instituto Nacional de Patrimonio Cultural.

Catalogue	Location	Provenance	Conservation Place	Number	Sex / Age	Teeth
218	TMB	Disinterment	TMB / INPC	Individual	Female / 35	27
439	TMB	Disinterment	TMB / INPC	Individual	Indet. / 5	24
534	TMB	Monitoring	TMB / INPC	Grouping	Male / 45	28
559a	TMB	Monitoring	TMB / INPC	Grouping	Female / 25	11
559b	TMB	Monitoring	TMB / INPC	Grouping	Female / 45	28
584	TMB	Disinterment	TMB / INPC	Individual	Indet. / 35	19

aims to contextualize the findings within the broader archaeological record of intentional dental modification in Ecuador, thereby further enriching our understanding of this cultural practice in the region.

RESULTS

The individual 559b, a female adult estimated to be between 35–45 years old, exhibited intentional modification of the upper central incisors. The modification involved filing and possibly the application of some material (which was lost during the excavation). The dental morphology closely resembles the E4 and E5 types as proposed by Romero (1970, 1986) or type A according to Saville (1913). Despite this similarity, it is possible that this case belongs to a previously undocumented type or represents a combination of the

E4 and E5 types. The E4 type is characterized by the removal of enamel from the labial surface of the anterior teeth, resulting in narrow bands of enamel remaining on the incisal portion and near the gingival border (Saville 1913). This configuration allows for the creation of a channel, exposing the dentin, which can serve as a guide to adjust a gold plate covering the entire surface of the anterior teeth. The plate is secured by hooks on the mesial and distal ends to prevent it from falling off. In contrast, the E5 type (referred to as F by Saville 1913) is characterized by the reduction of enamel on the labial surface of the anterior teeth through chiseling and filing, ultimately exposing the dentin. The filing process involves moving from the incisal to the gingival border in a closed angle, resulting in a sharp or thin incisal surface. This filing technique creates an arched appearance of the enamel, with exposed dentin (Vignati 1947, Delfino 1947). The case presented here, belonging to the Tumaco La Tolita culture, appears to be a combination of the E4 and E5 types. The maxillary right central incisor (*Figure 1a*) displays a chiseled enamel fracture on the labial surface and filing on the incisal edge. However, it does not exhibit the characteristic enamel margins in the incisal area associated with the E4 type. Conversely, the upper left central incisor (*Figure 1b*) demonstrates a chiseled fracture in the mesial and distal portions of the crown on the labial surface. The filing procedure appears to have been performed from the distal to the mesial surface, resulting in the exposure of dentin. In both teeth, the incisal portion has been thinned through filing, but there are no signs of deterioration or fractures in the dentin, indicating regeneration during the individual's lifetime. It seems that a lamina, potentially following an anteroposterior direction, covered the dentin of these teeth. *Figure 1* displays the case.

DISCUSSION AND CONCLUSIONS

From a local perspective, there have been at least 18 reported cases of dental modification found in various archaeological sites and occasional discoveries in Ecuador. It is noteworthy that a majority of the reports mention the presence of gold incrustations. Additionally, it is interesting to observe that all the documented cases do not exceed 2000 years before present (BP). Most of these cases belong to the Late Period, known as the Integration Period in Ecuadorian archaeology, which spans from 1500 to 500 BP. The oldest reported case of dental decoration comes from

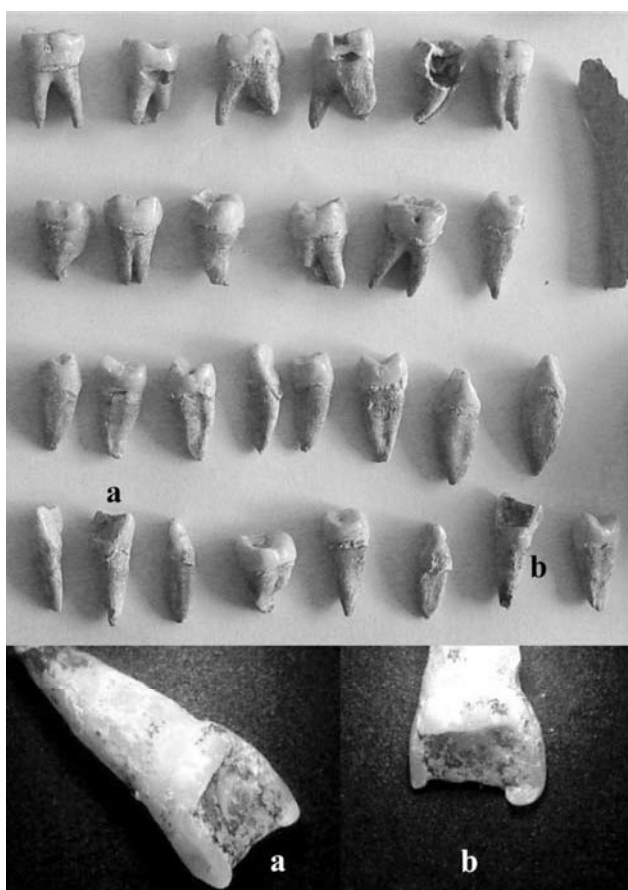


FIGURE 1: Upper central incisors with decoration type E4/E5. TMB, TMB = Terminal Marítimo de Balao.

the Colonche Valley and is attributed to the Guangala culture, as documented by Zevallos (1982). Currently, it is not possible to establish a correlation between these cases and gender due to limited available data, as only seven cases have information regarding the individual's sex in the analysis. Recent studies have managed to obtain radiocarbon (C14) dates for some of the previously described cases with dental decorations, indicating an age of at least 1000 years BP in Ecuador (Juengst *et al.* 2021).

Regarding the age of death, it seems that all the reported cases in Ecuador involved adult individuals. Thus far, all the documented cases of dental decoration in Ecuador have been found in the upper dentition, except for the mandible of an individual from Loma de Cangrejitos, attributed to the Huancavilca culture, as reported by Zevallos (1982).

Regarding type E4, there are records of at least four additional cases apart from the one mentioned in this report, all reported by Saville (1913). Three cases are from the Province of Esmeraldas, and one more is from the Province of Manabí. These cases are notable for the presence of gold inlays. It is worth noting that type E4 is exceptionally rare in the Americas and may serve as a distinctive cultural feature of Ecuador. An examination of the database from the project "Construction of a dental database of American indigenous human groups for continental consultation and comparisons" (Rodríguez Florez 2023a) reveals that type E4 incrustations are found only in an isolated sample from outside of Ecuador. The database consists of 1055 cases of dental decoration from 308 samples. *Table 2* provides an overview of samples with type E4

across America, while *Figure 2* illustrates samples with type E4 specifically in Ecuador.

In the field of Ecuadorian traditional archaeology, certain interpretations have been established regarding the potential relationships between local groups and other regions. During the Regional Developments Period, the cultural evidence is interpreted as reflecting more complex social structures of the chieftain type, characterized by high population density and a highly stratified social hierarchy (Jijon 1997). Various forms of evidence, including ceramics (Valdez 1987, Jijon 1997, Olay, Reyes 2001, Jara 2010), lithics (Jijon 1997), art and iconography (Bernal *et al.* 1993, Rodríguez 2013), funerary patterns (Cabrero, Lopez 1997), and ancient DNA (Gonzalez-Martin *et al.* 2008, Di Corcia *et al.* 2021, Nagar *et al.* 2021), collectively demonstrate similarities and cultural and biological parallels between coastal groups in Ecuador and groups from the western coast of Mesoamerica.

The origin of the Tumaco-La Tolita societies is a subject of extensive discussion due to several factors, including the presence of rare alleles (Mezzavilla *et al.* 2014) and a higher prevalence of certain diseases (Paz, Miño *et al.* 2016) compared to other groups. The presence of such evidences suggests that the Pacific coast of Colombia and Ecuador served as a region of ongoing contact and biocultural exchange among diverse societies (Rodríguez Florez 2021). It is highly likely that a significant relationship existed between the people inhabiting this region and the western coasts of Mesoamerica. A recent report on dental decorations in Colombia highlights how this cultural practice can serve

TABLE 2: American samples with type E4 and E5 reported. Unk = Unknown, Fem. = Female. * The same case described in Pinzon, Hedian 1909 (in Saville, 1913: 384), Joyce 1912 (in Saville, 1913: 383, Fig. 33), Cevallos 1836 (in Saville, 1913: 380). ** The same case described in Jijon 1952. *** The same case described in Bollaert 1860. **** The same case described in Niendorf 1907 (in Saville, 1913: 386)

Country	Sample	Period	Culture	Type	Sex / Age	Reference
Ecuador	La Piedra, Esmeraldas	Integration Period	Manteño	E4	Fem. / Adult	Saville 1913*
Ecuador	Esmeraldas 1	Integration Period	Manteño	E4	Unk. / Adult	Saville 1913**
Ecuador	Esmeraldas 2	Integration Period	Manteño	E4	Male / Adult	Saville 1913***
Ecuador	Tonchigue, Manabí	Integration Period	Manabí	E4	Unk. / Adult	Saville 1913****
Ecuador	TMB, Esmeraldas	Reg. Dev. Period	Tumaco-La Tolita	E4	Fem. / Adult	This research
Argentina	Trelew, Chubut	Post-Hispanic	Unknown	E5	Unk / Adult	Vignati 1947
Mexico	Templo Quetzacoatl	Classic	Teotihuacan	E5	Male / Adult	Serrano <i>et al.</i> 1997
Mexico	Isla de Jaina	Classic	Maya	E5	Male / Adult	Romero 1965



FIGURE 2: Distribution of archaeological samples with type E4 in Ecuador. 1, La Piedra; 2, Esmeraldas 1; 3, Esmeraldas 2; 4, Tonchigue; 5, Esmeraldas, Ecuador.

as an indicator of Mesoamerican beliefs, as reflected in dental decoration, but with adaptations to local metalworking techniques. These findings provide similar evidence of social representation, albeit executed with different materials and techniques (Rodríguez Florez 2023b).

In Mesoamerica, only two cases have been reported with the E5 type: The first one reported as individual 190P from the Temple of Quetzalcoatl, Teotihuacan, with a chronology between 1800 to 1600 years before the present (BP). The other case comes from the Island de Jaina in Campeche reported as individual from Section A.13, between 1100 to 1000 years BP. Both cases belong to the Classical Period and are chronologically close to the Ecuadorian samples.

Based on the data provided in this research, it can be deduced that during the late pre-Hispanic period, ideas and cultural practices were not geographically restricted but instead traveled across extensive areas of the region, including the Pacific and Atlantic coasts. These ideas were materialized by skilled individuals and took on varied meanings within local groups. The evidence presented on dental decoration partially supports this theory already been proposed by previous

researchers in their time (van Rippen 1917, Saville 1913, Dembo 1937, Linee 1940, Romero 1952).

The database used in this study is available by contacting the main author. The distribution maps presented here may vary with time and the inclusion of new finds. You can visit these maps at the following link:

Samples (<https://bit.ly/SamplesDentalDecoration>)
Cases (<https://bit.ly/SamplesDentalMutilation>)

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