Tooth Ablation in Early Neolithic Skeletons from Taiwan

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Tooth Ablation in Indigenous Peoples of Taiwan

Another peculiar custom — the knocking out of two lateral incisor teeth or of the two canine teeth in the upper jaw, or even all four teeth — is practised by the Yagul [Aztec], Bunun, and Tarour [Tivol] men and women. The savages’ idea is that if they knock out these teeth so that the tip of the tongue protrudes in the gap, it will add to their beauty; otherwise their jaw would be similar to those of monkeys and dogs. [Ishii, 1936:8]

Background

Although considerably variable in its expression, the intentional removal of teeth during life has been documented in the living and in the archaeological skeletal record worldwide. Among the reasons attributed to tooth ablation are aged-based achievement, social and cultural identity, trauma, and mourning ritual. Previous studies in bioarchaeology indicate that tooth ablation was relatively common in Taiwan as well as on Mainland China commencing with the Neolithic and continuing into the Iron Age. Tooth ablation has also been reported among Taiwan’s Indigenous peoples, some occurring as late as the early twentieth century.

Research Questions

We describe tooth ablation in some of the earliest Neolithic (ca. 5000 BP) skeletons from Taiwan (map). In addition to describing the pattern of tooth ablation, we examine the frequency of this cultural behavior with respect to sex and age and speculate on the manner of tooth removal. The significance of this ubiquitous form of dental modification observed in the earliest Neolithic skeletons from Taiwan, and in absence at least one Iron Age site from Taiwan, the Shisanhang site, are contextualized through geographical and temporal comparisons. This study contributes to studies in anthropology that attempt to reconstruct past behaviors from archaeological human skeletons.

Nankuanli East Site Sample

• Earliest Neolithic (5000-4500 BP) skeletons from Taiwan (see map)
• Excavations in Tainan Science Park (TSP), southwestern Taiwan from 2002-2003
• Extended spine burials with associated pottery and other funerary objects including domesticated and wild animals
• Subsistence: extensive marine exploitation, hunting, plant collecting, & early farming including the cultivation of foxtail millet

<table>
<thead>
<tr>
<th>Age/Sex</th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adolescent</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Young</td>
<td>9</td>
<td>7</td>
<td>16</td>
</tr>
<tr>
<td>Middle-aged</td>
<td>5</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>8</td>
<td>23</td>
</tr>
</tbody>
</table>

Methods

• While antemortem tooth loss can be attributed to a number of causes (e.g., trauma, congenital absence, accidental trauma, dental pathology etc.), the documentation of the intentional removal of teeth often relies on the recognition of a repetitive pattern of tooth loss in the presence of otherwise good dental health.
• The main criteria for distinguishing antemortem tooth loss in archaeological skeletal remains is the presence or absence of alveolar bone resorption.
• Other criteria include the spacing of teeth, symmetry and non-randomness of loss, the absence of significant dental pathology, presence of roots, fractures of the labial portion of the alveolar bone and ethmographic accounts.

Results

Comparisons

Indigenous People of Taiwan (Nakahashi 2000)
• C2 LPC pattern not observed in 6 Paiwan and 10 Yami crania
• 6/24 (25.0%) of Bunun exhibit C2 LPC pattern
• 9/244 (3.7%) Atayal exhibit C2 LPC pattern
• 42/244 (29.2%) of Atayal exhibit C2 LPC pattern

Prehistoric Skeletons from Mainland China (Tan & Nakahashi 1996)
• The C2 LPC pattern is rare in Neolithic skeletons from China
• The most common pattern of tooth ablation in China is P1
• The C2 LPC pattern is reported in 3 skeletons from two sites in Hubei and Shandong Provinces

Prehistoric Skeletons from Japan (Han & Nakahashi 1996)
• Tooth ablation in Jomon, Yayoi, Kofun, and Ainu highly variable and frequently involving the maxillary and mandibular teeth
• The C2 LPC pattern was observed in 1 P and 2 P from Yayoi site, Daigahama, in Yamaguchi Prefecture of southern Honshu Is. in Japan

Prehistoric Skeletons from Southeast Asia (Dommel et al. 2013; Tayles 1996)
• Although frequencies are generally low (or cannot be determined), the C2 LPC pattern is observed in skeletons from several sites in Thailand (Krub Phnom Dk & Ban Kao), Cambodia (Phnom Suy, Phnom Sopry & Cardamom Mts.), and Island Southeast Asia (Flores, Lomblen, Sumba, W. Timor, and southern Sulawesi)

Discussion/Conclusions

• The most common pattern of tooth ablation observed in the early Neolithic skeletons from the Nankuanli East is the bilateral extraction of the maxillary lateral incisors and canine teeth [C2 LPC]
• The second, much less frequent, pattern in the NKLE skeletons is the bilateral removal of the maxillary lateral incisors [P1]
• The universal practice of tooth ablation in NKLE skeletons suggests widespread cultural and community identity in the earliest Neolithic peoples of Taiwan
• Residual tooth roots suggest tooth removal involved knocking out rather than pulling the teeth being pulled
• Tooth ablation has considerable antiquity in Taiwan extending from the earliest Neolithic to recent Indigenous inhabitants of Taiwan
• The C2 LPC pattern, while relatively infrequent, is more common in skeletons from Southeast Asia than from East Asia
• Studies of tooth ablation in skeletons from Fujian and Guangdong Provinces on the Mainland of China are needed to understand origins of dental modification observed in Taiwan’s earliest Indigenous inhabitants

Works Cited

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