Bioarchaeological research on identity has recently become a topic in the anthropological literature. Skeletal markers of identity relative to social complexity highlight the degree of diversity in the ways past cultures marked identity (see Klaus et al. 2017; Knudson and Stojanowski 2009). Identity is a fluid, multifaceted concept that includes the self-identifying markers of gender, age, religion, disability, social status, and ethnicity (Buikstra and Scott 2009). These aspects of cultural identity can be displayed on parts of the physical body such as the skeleton, dentition, and visage (Joyce 2000; Buikstra and Scott 2009).

This chapter investigates Jomon dental ablation patterns as a means of marking identity and social complexity. Traditionally, Jomon ablation patterns have been assessed skeletally (Harunari 1979; Kusaka et al. 2008, 2009; Temple et al. 2011). Using an artist’s rendition of ancient Jomon individuals, we postulate how visage would have been a permanent and immediate identity marker, highlighting heterogeneity within the Jomon culture. At the same time, dental transfiguration patterns mark internal differentiation of positions within a society of hunter-gatherers.

The Jomon

The Jomon culture of Japan has a deep history. It began around 16,500 BP and lasted until 2300 years BP (Habu 2004). Researchers often lay out six primary Jomon periods: Incipient, Initial, Early, Middle, Late, and Final.
Considering the dates for these periods vary by site and by region, the ranges provided below are general approximations we adopted from tables in Habu (2004).

As the first of six periods, Incipient Jomon was marked by the appearance of cord-marked pottery that is often considered the oldest in the world. Others feel it was derived from or is contemporaneous with early pottery in China and northeast Asia. Extending across the end of the Pleistocene into the early Holocene, the Incipient period (circa 16,500–9500 BP) was a time of dramatic changes in the flora and fauna of the Japanese archipelago, including a shift from coniferous to deciduous forests. Beeches, chestnuts, buckeyes, and oaks provided ample food in the form of acorns and nuts. In coastal regions, huge shell middens attest to the importance of mollusks in the diet. In some areas, salmon was a major resource. Inland groups relied on terrestrial animals, including deer and wild boar. The pottery of the Incipient period, which was relatively small with rounded bases, was possibly used for both cooking and storage. From the beginning to the end of this period, there was a trend toward increased sedentism (Habu 2004).

Even with a hunting-gathering-fishing economy, the abundant resources of Japan resulted in high population densities during the Initial Jomon period (9500–6100 BP). This parallels developments in areas in North America, including California, the northwest coast, and the Aleutian Islands, where non-agricultural Native American populations attained high population densities made possible by rich, predictable, and sustainable resources (Kroeber 1939). A more sedentary lifestyle during Initial Jomon is suggested by an increase in the size of pottery, more substantial houses, and greater use of ground stone implements (Habu 2004).

During the Holocene climatic optimum, the Early (6100–4800 BP) and Middle (4800–4000 BP) Jomon periods were times of more population growth and denser and more numerous settlements. This was accompanied by the development of highly elaborate pottery styles and possibly arboriculture associated with nut- and lacquer-producing trees.

The Late (4000–3000 BP) and Final (3000–2300 BP) Jomon Periods are associated with climatic cooling. During this time, there was a major contraction in the number and size of Jomon settlements and in overall population size. Toward the end of the final period, contacts with the Asian mainland increased, and by 2300 BP, wet rice agriculture began to spread throughout the archipelago. This expansion is associated with the Yayoi culture (2300–1700 BP).
Akazawa (1981) details the contrast in how the eastern and western Jomon adopted wet rice agriculture. In the east, the economy focused on fishing and shellfish collection. In the west, subsistence was based primarily on intensive plant collection. Akazawa (1981) suggests that the transition to agriculture was smoother for the western Jomon because their economy was already focused on plant collection. For the eastern Jomon, who relied on resources from the sea and from beaches, the adoption of agriculture was more difficult. This east-west contrast illustrates the geographic heterogeneity of Jomon culture, which may in turn have played a role in dental ablation patterns.

**Dental Ablation**

In modern western societies, individuals go to great lengths to keep their teeth as long as possible. A huge dental industry has evolved whose primary purpose is to maintain oral health and preserve teeth. In the modern world, removing teeth on purpose, which is often accompanied by great pain, is an alien concept.

However, the intentional removal of perfectly healthy teeth, referred to as ablation, extends back to the late Paleolithic. The practice is evident in far-flung geographic areas, including Africa, Australia, Southeast Asia, China, Japan, Taiwan, the Pacific, and the New World (Campbell 1925; Milner and Larsen 1991; Pietrusewsky and Douglas 1993; Tayles 1996; Jones 2001; Domett et al. 2013). Some of the oldest examples were found in Iberomaurusian skeletons dating between 20,000 and 10,000 BP (Humphrey and Bocaege 2008).

Given that the anterior teeth are often used as a third hand in hunter-gatherer societies, it seems counterintuitive for such populations to practice ablation. Despite that, there are instances of ablation in hunting/gathering societies, including some in Africa and Australia. Based on anterior tooth loss, Hrdlička (1940) suggested that Eskimos practiced ablation, but what he observed is more likely attributable to pronounced occlusal forces leading to shortened roots and incidental tooth loss (Merbs 1968). It is sometimes difficult to distinguish intentional from unintentional tooth loss, but important factors include symmetry, age of individuals, and distinct patterns within a population. Ablation became far more common in agricultural and horticultural groups during the Holocene, when anterior teeth were less often used as tools.
As visibility is key, the most common teeth intentionally extracted are the incisors and canines. More rarely, first premolars are ablated. Some groups focus on the most visible teeth of all, the upper incisors (see Tayles 1996; Humphrey and Bocaege 2008). Lower incisors are the next most common target, followed by upper and lower canines. These teeth are typically single rooted, making extraction easier (but never easy). Whether ablation was traumatic (i.e., the tooth is knocked out) or extractive (i.e., the tooth is coaxed out), the pain associated with the procedure would be intense. Drugs or alcohol may have been used to dull the pain, but oftentimes pain and suffering are important parts of rituals.

Motives for intentional dental modification vary within and between groups. Ablation and other forms of transfigurement can be part of a puberty ritual, indicate marital status, or signify group membership. In some cultures, teeth are knocked out as a sign of mourning following the death of a major figure, such as a chief (cf. Pietrusewsky and Douglas 1993). In Borneo, some hunters had their front teeth extracted to enhance their efficiency with a blowgun (Jones 2001). In some instances, a therapeutic explanation might be appropriate (e.g., to allow individuals with lockjaw to take in liquid nourishment).

Scholars have attempted to interpret the variations in Jomon ritual tooth extraction and link them to other cultural characteristics of this hunter-gatherer society (Harunari 1979, 1986; Takenaka et al. 2001; Kusaka et al. 2008, 2009; Temple et al. 2011). Harunari (1979, 1986) proposed that dental ablation was performed at coming-of-age ceremonies and at marriage. He suggested that different patterns characterized locals and immigrants, proposing that male and female migrants had different ablation patterns to mark their nonlocal social status. Harunari also asserted that ablation types reflected postmarital residency patterns. Funahashi (2003) and Funahashi and Tanaka (2004) further argued that ablation was an age-based event, but it could also represent mourning or childbirth. More recently, Kusaka et al. (2008) postulated that ablation patterns correspond with isotopic dietary data; they link certain patterns to a subsistence-task based identity. These studies have shaped further investigations of Jomon ablation.

To better understand dental ablation patterns, Temple et al. (2011) tested the hypotheses of Harunari (1986), Funahashi (2003), Funahashi and Tanaka (2004), and Kusaka et al. (2008) using dental and cranial metrics, demographic profiles, and carbon and nitrogen isotope analysis. Their results did not support Harunari’s (1979, 1986) idea that patterns demarcated locals from migrants or the assertion of Kusaka et al. (2008) that ablation
was related to task-based identity patterns. In addition, dental morphological studies in western Japan (Tanaka 2001) and strontium isotope analysis (Kusaka et al. 2009) do not support the view that ablation patterns correspond with postmarital residence.

Temple et al. (2011) support the idea of age-based ablation patterns. They discovered that older individuals show a different pattern than younger adults. They also found evidence for kin-based groupings within the patterns. Temple et al. (2011, 330) concluded that Jomon ablation patterns represent “units of familial identity that were achieved at a certain age.”

Our goal is to add to the discussion of Jomon dental ablation. Our primary focus is the Yoshigo Shell Mound site, which yielded a large skeletal series where many individuals exhibit dental ablation. Other Jomon samples studied by C. G. Turner (Tsukumo, Yosekura, Ota, and Hokkaido) provide parallels and contrasts to the observations on the Yoshigo Jomon. After delineating the patterns of Jomon dental ablation spatially and temporally, we “flesh out skulls” and show how specific patterns of ablation might have appeared in the living.

**Materials and Methods**

In 1984, C. G. Turner II made dental observations on antemortem tooth loss, tooth wear, crown and root morphology, disease, and cultural modification for several Jomon series. His data on ablation serve as the core of this chapter. The primary site for dental ablation comes from 101 skeletons from the Yoshigo Shell Mound site on the northern coast of the Atsumi Peninsula in the Aichi Prefecture. The sample consisted of 57 males, 33 females, and 11 individuals of unknown sex. For age groups, the sample size is 87 adults (20+ years), nine adolescents (13–19 years), and five preadolescents (5–12 years). Turner also scored smaller Jomon samples from Tsukumo (n = 26; 12 males, 14 females), Yosekura (n = 22; 14 males, 6 females, 2 unknown sex), Ota (n = 30; 25 males, 3 females, 2 unknown sex), and Hokkaido (n = 56; 36 males, 7 females, 13 unknown sex). Yoshigo, Tsukumo, and Yosekura all date to the Late–Final Jomon period. Ota dates to the Middle Jomon period, while the Hokkaido Jomon run the temporal gamut from Initial to Final Jomon.

To characterize ablation, we focused on total number of teeth affected by tooth district and specific patterns of tooth loss. These are different measures: the first characterization focuses on individual sockets (i.e., number of ablated teeth/all observable sockets) and the second focuses on pattern.
To characterize pattern, both jaws had to be present and all anterior tooth sockets had to be observable.

Although Turner was meticulous about noting which teeth were intentionally removed, he did not distinguish among ablation patterns. Ablation types proposed by previous scholars (Harunari 1979, 1986; Kusaka et al. 2008, 2009; Temple et al. 2011) differ in several regards. For example, Type 2C has been used to represent the extraction of either the lower canines (Temple et al. 2011) or all four canines (Harunari 1979, 1986; Kusaka et al. 2008, 2009). Kusaka et al. (2008, 172; 2009) followed Harunari (1979; 1986, 296) in defining Type O as the ablation of two upper canines, Type 4I as the extraction of both upper canines and all four lower incisors, Type 4I2C as the extraction of all four canines and all four lower incisors, and Type 2I2C as the removal of all four canines and the lower central incisors. From Turner’s observations, nine different pattern types of intentional tooth extraction were distinguished in the Jomon samples. They are named for the exact teeth ablated, with labels by jaw (U, L) and tooth class (I, C, P). Harunari (1979), Kusaka et al. (2008) and Temple et al. (2011) noted the first five patterns, but not those that involved premolars:

- 2UC (both upper canines)
- 2LC (both lower canines)
- 4C (all upper and lower canines)
- 4LI (all lower incisors)
- 4I2UC (all lower incisors and both upper canines)
- 4C2UP (all upper and lower canines, both upper first premolars)
- 4C4P (all upper and lower canines, all upper and lower first premolars)
- 4I2C2UP (all lower incisors, both upper canines, both upper first premolars)
- 4I4C2UP (all lower incisors, all upper and lower canines, both upper first premolars).

**Results**

Table 9.1 shows the variation in ablation by tooth and jaw at the Yoshigo, Tsukumo, and Yosekura sites. For Yoshigo, the number of observable sockets ranged from 115 (upper second premolars) to 174 (lower canines). The total number of observable sockets was smaller for the Tsukumo (35–48) and Yosekura (21–30) samples. Distinctive patterns are evident in the table. First, upper central and lateral incisors were rarely removed (0.0–5.4 per-
<table>
<thead>
<tr>
<th>Site</th>
<th>Tooth</th>
<th>Jaw</th>
<th>N</th>
<th>N Affected</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yoshigo</td>
<td>I1</td>
<td>Upper</td>
<td>150</td>
<td>2</td>
<td>1.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lower</td>
<td>160</td>
<td>84</td>
<td>52.5</td>
</tr>
<tr>
<td></td>
<td>I2</td>
<td>Upper</td>
<td>126</td>
<td>5</td>
<td>4.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lower</td>
<td>172</td>
<td>85</td>
<td>49.4</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>Upper</td>
<td>131</td>
<td>98</td>
<td>74.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lower</td>
<td>174</td>
<td>80</td>
<td>46.0</td>
</tr>
<tr>
<td></td>
<td>P1</td>
<td>Upper</td>
<td>127</td>
<td>32</td>
<td>25.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lower</td>
<td>166</td>
<td>9</td>
<td>5.4</td>
</tr>
<tr>
<td></td>
<td>P2</td>
<td>Upper</td>
<td>115</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lower</td>
<td>168</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Tsukumo</td>
<td>I1</td>
<td>Upper</td>
<td>42</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lower</td>
<td>47</td>
<td>21</td>
<td>44.7</td>
</tr>
<tr>
<td></td>
<td>I2</td>
<td>Upper</td>
<td>37</td>
<td>2</td>
<td>5.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lower</td>
<td>46</td>
<td>19</td>
<td>41.3</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>Upper</td>
<td>37</td>
<td>34</td>
<td>91.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lower</td>
<td>48</td>
<td>25</td>
<td>52.1</td>
</tr>
<tr>
<td></td>
<td>P1</td>
<td>Upper</td>
<td>38</td>
<td>11</td>
<td>31.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lower</td>
<td>48</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td></td>
<td>P2</td>
<td>Upper</td>
<td>35</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lower</td>
<td>48</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Yosekuva</td>
<td>I1</td>
<td>Upper</td>
<td>27</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lower</td>
<td>21</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td></td>
<td>I2</td>
<td>Upper</td>
<td>29</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lower</td>
<td>21</td>
<td>1</td>
<td>4.7</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>Upper</td>
<td>29</td>
<td>29</td>
<td>100.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lower</td>
<td>21</td>
<td>12</td>
<td>57.1</td>
</tr>
<tr>
<td></td>
<td>P1</td>
<td>Upper</td>
<td>30</td>
<td>17</td>
<td>56.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lower</td>
<td>21</td>
<td>4</td>
<td>19.0</td>
</tr>
<tr>
<td></td>
<td>P2</td>
<td>Upper</td>
<td>30</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lower</td>
<td>21</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

This pattern contrasts markedly with the patterns at Yoshigo and Tsukumo, where lower central and lateral incisors were removed in half of the total observable sockets (41.3–52.5 percent). In the small Yosekura sample, the removal of either upper or lower incisors was rare. There are no instances of central incisor ablation from any site.

The treatment of canines contrasted sharply with the treatment of incisors. Both upper and lower canines were commonly removed at all three sites, but upper canines were removed more frequently (74.8–100.0 percent) than lower (46.0–57.1 percent). The frequency of lower canine ablation...
tion is similar to that of lower incisors. It was far less common for premolars to be ablated than incisors and canines. Ablation of upper first premolars was fairly common at Yoshigo (25.2 percent) and Tsukumo (31.4 percent) and was quite high at Yosekura (56.6 percent). While Yoshigo and Tsukumo show almost identical ablation frequencies by socket, Yosekura is something of an outlier with almost no lower incisor ablation and upper first premolar ablation almost twice as frequent. Interestingly, lower first premolars were rarely ablated (0.0–19.0 percent), which may suggest that their removal may had the least impact on visage during life. This is almost certainly the case for second premolars, which were never ablated.

The Jomon from Ota and Hokkaido are not included in Table 9.1 for a significant reason: they showed almost no ablation. Of 500 observable sockets from Ota (I1–P2 of both jaws), there were only two cases of ablation and both were from a single individual who was missing both lower canines (the upper jaw was not observable so the ablation pattern is unknown). For the Hokkaido Jomon, only four of 1,050 sockets, there were only four ablated teeth and all were upper lateral incisors (one symmetrical case and two asymmetrical cases). For these two groups, ablation was not a common practice. The rare instances of ablation may represent immigrants from other areas where ablation was more common.

Although the reasons for the differences are not clear at present, tooth ablation patterns among the Jomon show significant temporal and spatial variation. During the Early and Middle Jomon, when pottery manufacture reached its zenith, ablation frequencies were low. At the Middle Jomon sites of Hokkaido and Ota, only 0.4 percent (4/1050 and 2/500, respectively) of teeth were ablated. The sites from Late and Final Jomon periods have much higher frequencies of ablation. About one-fourth of all incisors, canines, and premolars were ablated at the sites of Yoshigo (395/1489; 26.5 percent), Tsukumo (112/426; 26.3 percent), and Yosekura (63/250; 25.2 percent). Hokkaido is in the northern portion the Japanese archipelago and Ota is in the western/inland area of the Chugoku district, as are Tsukumo and Yosekura. Yoshigo is the only site in the eastern portion of Japan. In terms of geography, then, tooth extraction was commonly practiced in southwest and southeast Japan but was rarely practiced in the north.

While data are available on 101 individuals, only 58 from Yoshigo fulfilled our criteria of having both jaws observable and all anterior sockets visible (Table 9.2). Of these 58, 24.1 percent did not exhibit ablation. Half of those individuals were under 18 years old. The only pattern displayed by those under 18 was 4I2UC, the second most common pattern (17.2 percent
Table 9.2. Patterns of ablation at Yoshigo by gender and age

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Total observed</th>
<th>Male</th>
<th>Female</th>
<th>Under 18</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%  n</td>
<td>%  n</td>
<td>%  n</td>
<td>%  n</td>
</tr>
<tr>
<td>100.0</td>
<td>58</td>
<td>48.3</td>
<td>28</td>
<td>34.5</td>
</tr>
<tr>
<td>2UC</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2LC</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4C</td>
<td>27.6</td>
<td>16</td>
<td>39.3</td>
<td>11</td>
</tr>
<tr>
<td>4LI</td>
<td>8.6</td>
<td>5</td>
<td>14.3</td>
<td>4</td>
</tr>
<tr>
<td>4I2UC</td>
<td>17.2</td>
<td>10</td>
<td>14.3</td>
<td>4</td>
</tr>
<tr>
<td>4C2UP</td>
<td>3.4</td>
<td>2</td>
<td>7.1</td>
<td>2</td>
</tr>
<tr>
<td>4C4P</td>
<td>5.2</td>
<td>3</td>
<td>3.6</td>
<td>1</td>
</tr>
<tr>
<td>4I2UC2UP</td>
<td>6.9</td>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4I4C2UP</td>
<td>6.9</td>
<td>5</td>
<td>7.1</td>
<td>2</td>
</tr>
<tr>
<td>None</td>
<td>24.1</td>
<td>14</td>
<td>14.3</td>
<td>4</td>
</tr>
</tbody>
</table>

of the total sample). Only pattern 4C, where the upper and lower canines were extracted, was more common (circa 28 percent). None of the other patterns have a frequency above 10 percent. The patterns that involved the removal of upper first premolars fall mostly in the 3–7 percent range. No one displayed patterns that involved the removal of only two canines (2UC or 2LC).

Among the 58 individuals with both jaws, 28 were male, 20 were female, and 10 were of unknown sex (< 18 years of age). The pattern types males and females exhibited are very similar (chi-square = 3.46; df = 4; p > 0.05). Males and females show slight differences in the frequency of the aforementioned patterns, but none are statistically significant.

Discussion

Earlier studies focused on a biological construction of Jomon ablation using only the skeleton. In addition to quantifying ablation by socket and pattern type, our goal is to reconstruct the personal and cultural identity of male and female Jomon remains through including the visage. Visage refers to the form, proportions, and expressions of an individual’s face. Artistic renditions of Jomon faces with common ablation patterns create a visual representation that allows for a better understanding of everyday appearance and visual interaction within a community than standard skeletal depictions do. Considering the mouth is a primary social organ, the face is one of the most visible parts of the body that can be treated with some form
of cultural modification (filing, chipping, insets, ablation, etc.) to construct identity in relation to broader social and political networks (White et al. 2009) or as internal differentiation among foragers (Flannery 1972).

Although ritual ablation was a group-wide practice, individual patterns illustrate how visage was a marker of internal differences. Figures 9.1 and 9.2 are artistic renditions of Jomon individuals with specific ablation patterns. Figure 9.1 shows how many young Jomon individuals could have appeared. The pattern displayed in Figure 9.1a, Type 4C, is the most widely expressed pattern at Yoshigo. Figure 9.1b illustrates 4I2UC, the second most common pattern. Together, these two patterns constitute 44.8 percent of the patterns found, and they represent the two most common visages in the Yoshigo Jomon. At some point in their lives, all Jomon individuals had one of both of these visages.

The images in Figure 9.2 show two of the least common patterns, ones that involved the removal of premolars. Figure 9.2a shows the removal of both upper and lower canines and upper and lower first premolars (4C4P), while Figure 9.2b illustrates a pattern that involves the premolars, all of the lower incisors, and all of the canines (4I4C2UP). As these portrayals show, the first premolar is visible when a person is smiling or talking, but the second premolar is not as discernable. This is likely a contributing factor to the preference for extraction of the first premolar over extraction of the second. These two pattern types are observed equally in males and females.

Only one other scholar (Funahashi 2003) reported premolar ablation in the Jomon. She noted that only mature individuals and adults had upper
and lower premolar extraction, which were thought to be a sign of mourning. Interestingly, the Yoshigo and Inariyama samples Funakashi analyzed each have one case of upper second premolar ablation. Turner also observed premolar ablation in three samples. In Yoshigo, Yosekura, and Tsukumo, there are examples of upper and lower first premolar extraction but no second premolar removal. This ablation pattern created a unique visage only shown by a few individuals of both sexes.

Some researchers do not investigate patterns by sex (Matsumura et al. 2001; Mizoguchi and Dodo 2001; Takenaka et al. 2001; Tanaka 2001; Kusaka et al. 2008, 2009; Temple et al. 2011), while others do (Harunari 1986; Funahashi 2003; Funahashi and Tanaka 2004). Funahashi (2003) found that Yoshigo males and females experienced similar rates of ablation. Thirty-two adult females and 47 adult males had at least one tooth removed from the mandible, and the rate of removal of all tooth classes was similar for both males and females with one exception: removal of the central incisor was more common in males. Only 16 adult females displayed tooth extraction in the maxilla, all of which included canines. Among adult males (n = 28), there were examples of ablation in all tooth classes, ranging from the upper lateral incisors to the second premolar. Funahashi and Tanaka (2004, 69), who used a sample (n = 72) from the Doigahama site in the Yamaguchi Prefecture dating to the Early to Middle Yayoi periods, found that females had higher rates of extraction than males, although they did not interpret the significance of this observation. Harunari (1986) did not find a significant sex difference in patterns for the Yoshigo and Inariyama samples. By
contrast, at Tsukumo there was a significant difference in the presence of Type O and Type 4I: males displayed mostly Type O pattern, while females typically exhibited Type 4I (chi-square = 13.21; \( df = 4; p < 0.05 \)). Within our Yoshigo, Tsukumo, and Yosekura samples, there was no distinction. Both males and females had similar visages; the ablation patterns at these three sites created a cohesive external marker.

Body modification, a physical symbol of membership in a social community, creates heterogeneity among members while conveying social information in a permanent manner (McGuire 1983). It is shaped by and contributes to social rapport (Meskell 1998). Changes in a social environment can affect patterns of body modification, in this case dental ablation (Torres-Rouff 2009). The archaeological record only includes what is left behind (i.e., bones, teeth, and aspects of material culture), and it does not incorporate all markers of self. Hence, it limits the understanding of various parts of identity that are self-referential (Barth 1969). By including fleshted body in their studies, bioarchaeologists can create a better understanding of how earlier peoples expressed forms of self-identified social status through body manipulation. Our illustrations show how a crafted visage may have helped people identify as part of a collective.

Explorations of identity should not focus on an etic construction of who people were or where they came from; instead, they should define who they thought they were (Knudson and Stojanowski 2009, 5). Identity relates to larger social phenomena that characterize the existence of an individual in society. Identity is a form of habitus (Bourdieu 1977), the way a culture shapes an individual’s sense of self. For the Jomon, canines and lower central incisors were extracted when a person became an adult (Type 4I2UC; Fig. 9.1b). Other life milestones were commemorated by the extraction of different tooth classes (such as Figs. 9.1a, 9.1b, 9.2a, and 9.2b). All of the common types noted by other scholars (Harunari 1979, 1986; Funahashi 2003; Kusaka et al. 2008, 2009; Temple et al. 2011) were observed in this sample. Ritual ablation created the visage that marked who they thought they were.

Conclusions

Two comments initially shaped how anthropologists wrote about hunter-gatherers: “1) they live in small groups, and 2) they move around a lot” (Lee and DeVore 1968, 11). We now know that hunter-gatherer societies involve a spectrum of qualities. Service (1978, 3) defined greater [social]
complexity as “more parts of the whole” in which parts are differentiated yet are also integrated within the whole. Flannery (1972, 409) defined social complexity in terms of segregation, centralization, and the presence of internal differentiation. McGuire (1983) added heterogeneity, inequality, and the related number of social positions within a society. Hence, hunter-gatherer social complexity encompasses a greater range than was initially perceived (Price and Brown 1985). Hunter-gatherer groups created social distinctions between themselves and other such groups, within their own social framework, and even among family groups. These distinctions are markers of identity.

Patterns of dental ablation offer a further illustration of the social complexity of Jomon hunter-gatherers. The Jomon could have integrated members into their culture through the general practice of dental ablation, yet differentiated among themselves through patterns related to age and family groups. The widespread practice of ablation would have created a visage that marked heterogeneity among group members and notified outsiders of their social affiliation. The various ablation patterns separated people according to social positions within the group. Dental ablation became a constant visual biocultural indicator of Jomon social complexity over time.

Ablation during the Jomon era was limited primarily to the Late and Final periods. The reasons underlying this timing are not fully understood. It is not clear if the practice of ablation dates back to the Incipient/Initial periods of Jomon. The evidence for dental ablation spans the Middle (5000–4000 BP) through the Final (3500–2500 BP) Jomon periods. Ablation reached its zenith during the Late to Final periods, when it attained a frequency of 80–100 percent. Skeletal samples from Ebishima (Mizoguchi and Dodo 2001), Funadomari (Ohnuma et al. 1983; Matsumura et al. 2001), Hokkaido (Dodo and Mitsuhashi 1984), Staohama (Matsumoto 1920), Inariyama (Okura 1939; Funahashi 2003; Kusaka et al. 2008, 2009), Yoshigo (Kiyono and Kintaka 1929; Nakayama 1952; Funahashi 2003; Temple et al. 2011), Tsukumo (Miyamoto 1925; Funahashi 2003), and Yosekura (this study) all display various ablation patterns, but not all Jomon practiced the ritual. There are also examples of ablation from the Protohistoric Kofun period (Watanabe 1966; Harunari 1986) and the Early and Middle Yayoi (Funahashi and Tanaka 2004). Hence, dental ablation seems to have been a practice that is both spatially and temporally bound.

Although we do not conclusively attribute specific ablation patterns to particular life events, it is noteworthy that ablation types do not vary between males and females, suggesting that the motivation for ablation was
not gender specific. This painful action was undertaken to shape an individual's visage. Considering the human face is one of the most interactive parts of the body while smiling, talking, laughing or even resting, patterns of missing teeth would indicate a person's identity or a change in social position within the Jomon community. Thus, given its exceptionally high frequency in Late–Final Jomon samples, dental ablation must have served as an important marker of Jomonese identity after a time when the culture had reached its zenith. The significance of this temporal difference is not altogether clear at this time.

Acknowledgments

We would like to thank Scott E. Burnett and Joel D. Irish for organizing a valuable symposium on purposeful dental modification and for publishing the fruit of our labors in this volume.

References Cited


Funahashi, K. 2003. A study of the timing of ritual tooth ablation and its meaning as rites of passage in Final Jomon period (Jomon jidai no basshi shikou nenreti to gireitekiimi). Quarterly of Archaeological Studies (Kokogaku Kenkyu) 50: 56–76.


