New insight into the origins and motivations for ritual tooth removal in ancient Taiwan

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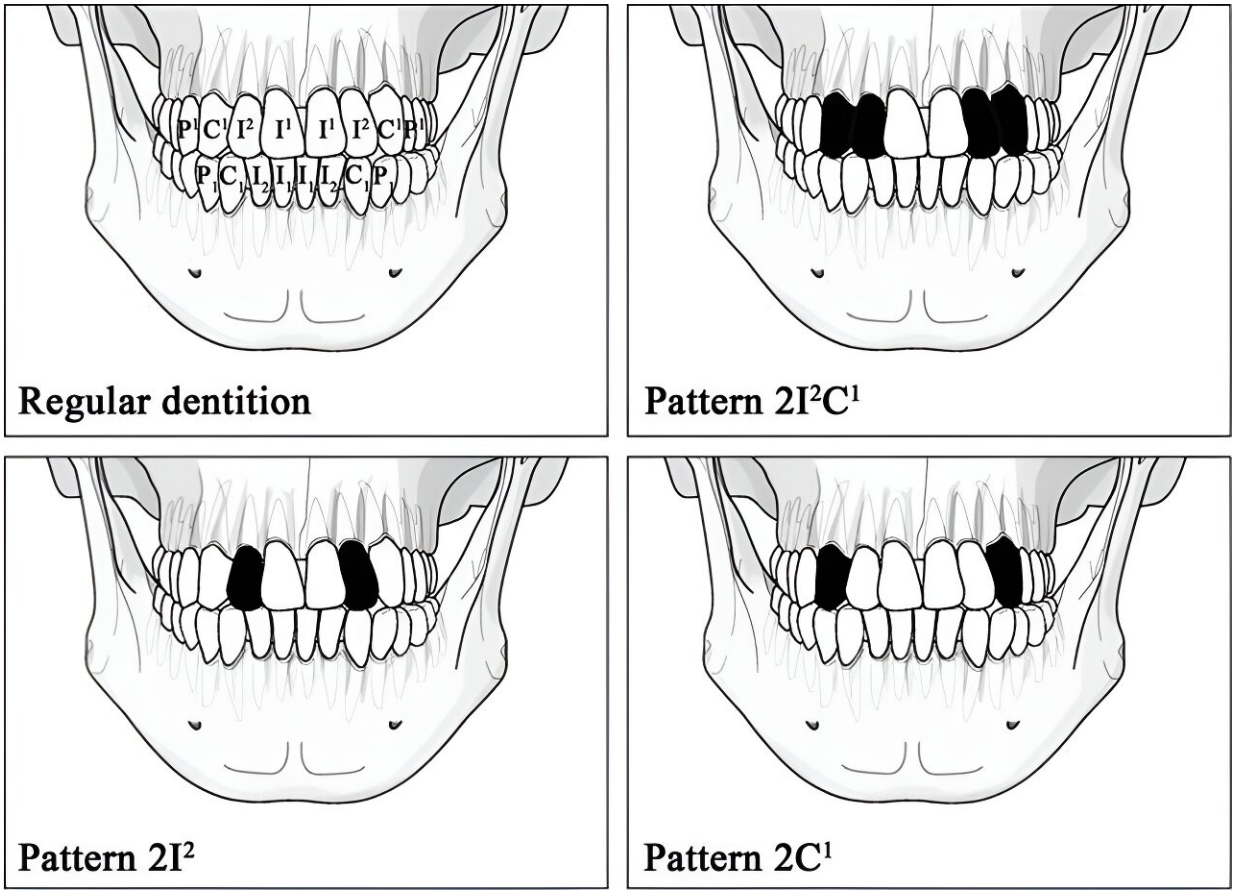

Illustration of regular dentition and tooth ablation patterns recorded in ancient and contemporary populations in Taiwan. Black teeth indicate removal. Credit: *Archaeological Research in Asia* (2024). DOI: 10.1016/j.ara.2024.100543

A recent study published by archaeologist Yue Zhang and her colleagues in *Archaeological Research in Asia* has provided detailed insights into the practice of tooth ablation in Taiwan from the Neolithic through to the modern era.

Tooth ablation is the practice of removing otherwise healthy teeth. In ancient Taiwan, this manifested in the form of removing some of the upper front teeth, usually incisors (I) and/or canines (C). The tradition is associated with the first Austronesian (AN) communities, who subsequently spread across the Asia-Pacific region.

However, until recently, a comprehensive archaeological and ethnographic overview of the practice has been lacking, leading to a significant knowledge gap in terms of how the practice developed, why it persisted, and the social and cultural norms that surrounded it.

The practice was first observed in Taiwan about 4800 BP during the Neolithic (4800–2400BP). It coincided with the transformation of local hunter–gatherer societies into more sedentary societies. These settled societies introduced a new pottery horizon, domesticated plants (rice and millet), animals and the earliest known instance of tooth ablation.

The most common patterns of tooth ablation recorded were $2I^2C^1$ and $2I^2$ (where 2 indicates bilateral removal and the superscript indicates the upper tooth and position). The skeletal remains indicated that tooth ablation was practiced equally between the sexes. From its origins along the coast, the practice of tooth ablation, burial, and agricultural norms spread and proliferated, even into surrounding Asian-Pacific regions.

"The development of the tooth ablation custom in ancient Taiwan aligns with the broader understanding of its Neolithic culture. The consistent pattern of tooth ablation ($2I^2C^1$) observed in Taiwan's early Austronesian population is also comparable to patterns found in Austronesian-related

cultures across Island Southeast Asia. Therefore, the $2I^2C^1$ ablation could reasonably be considered a characteristic of ancient Austronesians," Zhang said.

However, during the late Neolithic, a new trend emerged, whereby males stopped practicing tooth ablation as frequently. By 1900BP, during the Iron Age, the practice of tooth ablation had become almost exclusively female.

The reasons for this change are enigmatic. However, Zhang provided a possible explanation for the change, saying, "The decline of tooth ablation among males might reflect broader cultural and social changes. As the Neolithic material and culture were fully adapted and evolved to more local expressions in this phase, tooth ablation might have been reinterpreted differently."

While archaeology can provide some insights, others are gleaned from ethnographic accounts. Some of the earliest documents that discuss tooth ablation come from the Chinese Three Kingdoms period (220CE), others from the 17th century Dutch journals.

However, the most comprehensive ethnographic accounts were collected during the Japanese Rule period (1895–1945CE), during which aborigines' surveys were conducted (1901–1909). After this, armed suppression during the 1910s eradicated many local traditions, including tooth ablation, although some communities still practiced it until the mid-20th century.

These ethnographic accounts detail some of the reasons behind tooth ablation. The reasons were varied and could be different from one group to another. One of the motivations for tooth ablation was for aesthetic reasons. Practitioners believed normal dentition similar to dogs, pigs and monkeys was unattractive and instead sought to have teeth more akin to

mice.

Other motivations included memorial reasons; tooth ablations were seen as a test of courage or a way to memorialize an ancestor's bravery. Some saw it as a right of passage into adulthood, while others believed it to be a group identifier. Finally, some motivations for tooth ablation were practical, such as facilitating the ingestion of medicine by individuals who suffered from lock-jaw (due to tetanus). Although other practical reasons may not have been as useful as believed.

"Local testimonies (from Bunun) suggest that tooth ablation can improve pronunciation. However, the scholar who recorded these testimonies expressed doubt as well, noting that people without tooth ablation also have good pronunciation. From a functional perspective, removing the front teeth could affect eating, as these teeth help in cutting food, although the (usually) remaining central incisors might compensate somewhat."

Not only the motivation but also the method and age at which tooth ablation was practiced varied. Broadly speaking, northern regions of Taiwan preferred to hammer out the tooth by striking it with a metal, wood, or stone tool. Meanwhile, southern regions preferred to pull out the teeth, usually facilitated by one or two wooden or bamboo sticks attached to some thread bundled tightly around the tooth.

Once extracted, the cavity would be filled with salt or ash from a Miscanthus floridulus sedge to stop the bleeding and prevent inflammation.

These methods of extraction, sans anesthesia, were endured by children as young as 6 or 8 and adults as old as 20.

Interestingly, modern ethnographic accounts also revealed that tooth

ablation, unlike during the late Neolithic and Iron Age, was not as female-centric. According to Zhang, "Modern ethnographic records suggest that both sexes practiced tooth ablation, although detailed frequency for each sex was not noted."

While the research by Zhang and colleagues is comprehensive, more research is planned. "Since our study primarily relies on available skeletal evidence from the Neolithic Age, a crucial period for the ancient Austronesian-related populations migrated to vast areas.

"Current findings are sparse and sometimes geographically concentrated due to the conservation conditions and local archaeological work. More skeletal samples are needed to better understand the origins and evolution of tooth ablation, as well as how this practice was carried by Austronesians as they explored and settled new regions."

Furthermore, Zhang adds, "The conflict in gender distribution observed in archaeological and historical records versus modern ethnographic accounts raises intriguing questions for further research as well."

More information: Yue Zhang et al, Ritual tooth ablation in ancient Taiwan and the Austronesian expansion, *Archaeological Research in Asia* (2024). DOI: 10.1016/j.ara.2024.100543

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