ARTIFICIAL BORING ON THE INCISOR ROOT AT THE LATE JOHMON PERIOD

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Abstract: A single hole penetrating tangentially through the middle of the dental root was found in a right central incisor of the mandible. The tooth was excavated from the bottom layer of the late Johmon and early Yayoi periods under the shell mound of Mitani ruin, Tokushima city. The hole is roundly polished to make a cone-like shape on both the mesial and distal sides without crack. There is neither pathological injury nor trace of living response on microscopy and X-ray test. It is strongly suggested that the hole was simply made on the tooth after extraction from the human mandible.

Index Terms

boring of tooth, dental extraction, dental decoration, Johmon tooth, Johmon period, archeology

INTRODUCTION

On special reference to the decorations of Johmon teeth, tri-dental processing[1] and others[2] have been found on incisors, but they are unusual at the period, because most Johmon people had no artificial deformations on the teeth. The extraction of teeth, mainly of canines or incisors, is found occasionally during the period. It is, however, unknown whether the incisor was artificially processed after extraction. We found the boring made through the root of an incisor at the excavation from the Mitani shell mound of the late Johmon period.

MATERIALS

The ruin was first found in the process of construction at the water supply center, Minami Sako-Rokuban-cho, Tokushima city, in 1922. It was named the "Mitani shell mound". In the course of the present excavation since 1990, Mr. Yoshihiko Takashima discovered the rudiments in the 4th layer of black soil, 3-5 cm thick, in which 5 teeth were found at the bottom with ceramic pieces as found to be the late Johmon or early Yayoi periods. The layer consists of remains of the shell mound at that period. Accordingly, those teeth were identified as being the same age as the mound. The teeth were preserved at the Prefectural Museum of Tokushima and then at the Tokushima University Medical School.

FINDINGS

The 5 teeth were diagnosed as $\underline{6|}$, $\underline{6|}$, $\underline{3|}$, $\overline{|3}$ and $\overline{1|}$, in number, respectively. There are one pair of the same number as $\underline{6|}$. It means that the teeth did not belong to the same individual. Thus, the teeth, not derived from a single person, were excavated in mixing together with the other ones located at different sites.

Measurements of the teeth, shown in Table 1, show that the values obtained are as usual and not peculiar. The attrition is generally proceeded into the dentine, especially deeper in both the $\underline{6|}$s, but not proceeded only in the $\overline{1|}$. A lack of the crown margin made it difficult to measure the diameter. Among these teeth, the $\overline{1|}$ is the only tooth with slight attrition limited to the enamel. The sizes of 23.2 mm in whole length and 14.0 mm in root length were quite peculiar, because it seems possible that it was extracted from a young adult.

Table 1. Measurements on teeth excavated from the Mitani shell mound (mm in length)

Tooth No. & Locality	$\underline{6\|}$	$\underline{6\|}$	$\underline{3\|}$	$\overline{\|3}$	$\overline{1\|}$
Crown length	5.0	1.9	9.0	11.4	9.2
Crown diameters					
proximal to distal	9.2	9.4	7.0	8.6	6.4
buccal to lingual	10.5	—	9.0	—	6.4
Whole length	19.3	16.6	27.0	19.7	23.2
Root lengths			18.0	—	14.0
palatine root length	13.5	11.4			
buccal distal root	11.1	11.7			
buccal proximal root	—	11.6			

Moreover, a small hole was bored through the middle root at the distance of 17.0 mm from the crown edge. The hole is round with a diameter of 1.0 mm on both the mesial and distal faces of the root (Figs. 1a, b). The margin looks like a cone with smooth surface from the lingual and labial views (Figs. 1c, d). There is no sign of rough surface indicating a pathological defect such as caries of the dentine. Further details of the tooth are shown on the X-ray test (Fig. 2). The hole penetrates into the dental cavity (Fig. 2a) by forming a cone-like lumen from the mesial and distal faces of the root (Fig. 2b). From the narrow cavity continues a crack line into the enamel from the labial view (Fig. 2a). This crack may have occurred after extraction of the tooth. No sign of living dentine is detectable in the contour of the hole. Therefore, the boring was possibly made by grinding after extraction of the intact tooth.

DISCUSSION

The custom of extracting teeth has been known from the early Johmon period[3)4)] to the late Johmon period. Both upper and lower canines were extracted from males but lower incisors were extracted instead of canines from females (see the examples of the Tsugumo shell mound[3)]). This habit is said to symbolize adulthood. The extractions were found widely in Aichi[1)], Chiba[3)], Okayama[3)], Yamaguchi[5)] etc. Canines or incisors may have been extracted in the Mitani of Tokushima as well.

In addition, a hole was made in the horn or bone of animals[6)7)] and 10 tusks of the wild boar,

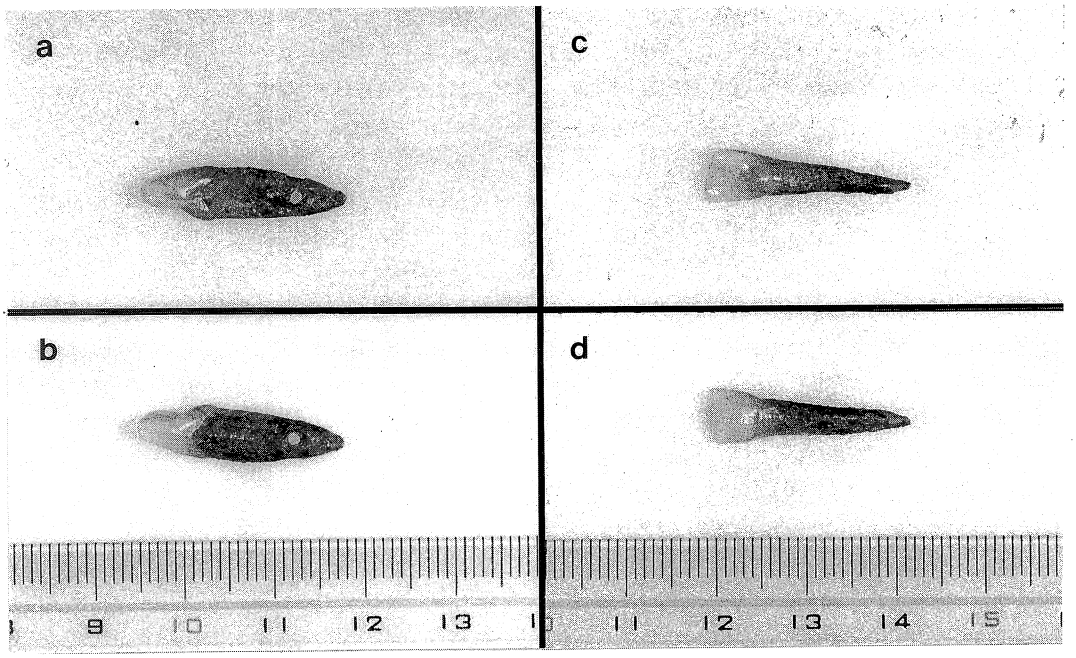

Fig. 1. The right central incisor of mandible with the artificial hole.
a : distal view
b : mesial view
c : lingual view
d : labial view

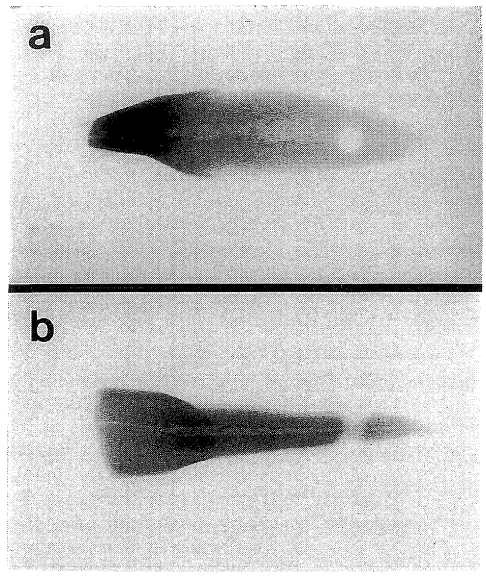

Fig. 2. Roentogenograph of the incisor with the artificial hole.
a : distal view identical to Fig. 1a
b : labial view identical to Fig. 1d

wolf or bear were arranged and bound to make a necklace at the late Johmon period[8)9)].

In the previous excavations especially in Shikoku[10)11)], the present finding of artificial boring has never been found on teeth. Even in whole Johmon humans a tri-dental processing was found only on the upper incisors[1)] and a horizontal processing of the lower incisors[2)] in the living.

In this study, a single hole of 1 mm in diameter is found in the tangential direction through the right central incisor of the mandible. Therefore, the boring must have been done on the incisor after extraction from the mandible. It is also shown that the margin of the hole is smooth without any living response. In addition, the dental attrition is slight and limited to the enamel edge. So, it appears to have been extracted from a young adult. We have no base to discuss the usage, nevertheless, this kind of processing is suggestive of binding by thread, possibly to suspend for serving or enshrining to play an ancient convention as supposed in the example[8)]. Thus, this may give evidence for the conventional extraction of teeth at the late Johmon and early Yayoi periods.

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REFERENCES

1) **Collections from Ikawatsu shell mound, Atsumi-cho, Aichi-Ken** : Skull with tri-dental teeth of late Johmon period, State Museum of Japanese Sciences.
2) **Kanasaki, T.** : A horizontal polishment of mandibular incisors found in the human bones excavated from the Nagasakibana ruin, Tanegashima (translated by the authors) in Kyushu Kōko-gaku No. 3-4, 1958. (in Japanese)
3) **Suzuki, H.** : Johmon men reviewed from bones (translated by the authors), Johmon period I, in Nippon no Bijutsu No. 189, Shibundo, Tokyo p 87-98, 1982. (in Japanese)
4) **Suzuki, H.** : in Japanese roots as reviewed from bones (translated by the authors). Iwanami Book, Tokyo, 1983. (in Japanese)
5) **Kinoshita, M.** : Yayoi period, in Nippon no Bijutsu No. 192, Shibundo, Tokyo, p 23, 1982. (in Japanese)
6) **Collections from Natsushima shell mound** : bony goods and ceramics with pattern twisted threads, Collections of Archeology, Meiji University, Tokyo.
7) **Collections from Torihama shell mound** : bony goods for fishing, Committee of Education, Kohama-shi, Fukui-ken.
8) **Collections from Miyano shell mound** : Human bones decorated by a necklace hanging canines of wild boar, Committee of Education, Sanriku-cho, Iwate-ken.
9) **Esaka, T.** and **Watanabe, M.** : Knowledge on trinkets and bony instruments for fishing, *in* Acheology series 13, Tokyo Bijutsu, p6-26, 1988. (in Japanese)
10) **Miyai, M., Shinomiya, T.** and **Yamada, M. -o.** : Graphic analysis of relationship between the maxillar and mandibular alveolar arches of human bones excavated in Shikoku. Ehime Med. J. **2** : 47-76, 1984.
11) **Yamada, M.** : Paleoanthropological studies on skulls excavated from Shikoku. J. Nara Med. Ass. **44** : 168-184, 1993. (in Japanese)