A 5,500-Year-Old Artificial Human Tooth from Egypt: A Historical Note

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Archaeological excavations at a Neolithic cemetery near Gebel Ramlah, Egypt yielded, among other finds, a life-size shell carving of a human tooth. Based on its spatulate crown and large conical root, the tooth most closely emulates a maxillary incisor. The crown's lingual and labial surfaces are suggestive of a left central incisor, whereas the occlusal view is more reminiscent of a left lateral incisor. The present report details the tooth's appearance and provides several interpretations concerning its function, including the possibility that it was intended to be a dental implant. INT J ORAL MAXILLOFAC IMPLANTS 2004;19:645–647

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In January 2003, a carving of a human tooth was recovered during the archaeological excavation of a prehistoric cemetery near Gebel Ramlah, in Egypt's western desert, about 160 miles southwest of Aswan. The cemetery is affiliated with a cultural period termed the Final Neolithic period, between 5,400 and 5,650 years ago.[1,2] Detailed information about the site itself can be found in previous publications.[3,4] An in-depth discussion of the carved tooth's discovery, analysis, and alternate functional interpretations from an anthropological perspective has also been presented elsewhere.[5] The purposes of the present article are to report the find to a clinical audience and to further explore the possibility that the life-size tooth carving was intended as an ancient dental implant.

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DESCRIPTION OF THE CARVED TOOTH

The material from which the tooth was carved is shell (Bobrowski, personal communication, 2003). The species is unknown, but it most likely originated in the Red Sea. Several identifiable shells (eg, cowrie and slipper winkle [*Nerita sp*]) from this water source have been recovered in the cemetery.

Although not a perfect replica, based on its single conical root and skillfully rendered spatulate crown, the carving was clearly modeled after a human maxillary incisor (Fig 1). The lingual and labial aspects of the crown, particularly the labial aspect, are most characteristic of a left central incisor (Figs 1a and 1b). However, the occlusal view is more suggestive of an asymmetric left lateral incisor (Fig 1c). Indeed, mesiodistal and buccolingual crown measurements (made per the technique of Moorrees[6]) of 7.7 and 7.1 mm, respectively, are nearly identical to the mean dimensions of a sample of 6 male lateral incisors (actual teeth, not replicas) from the cemetery. Moreover, although not measured in the latter sample, the carved tooth's crown height (7.2 mm), root length (15.3 mm), and overall length (22.5 mm) are within the range of variation for

Fig 1a Lingual view of the carved shell tooth.

Fig 1b Labial view of the carved shell tooth.

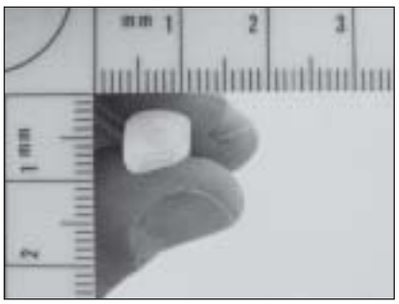

Fig 1c Occlusal view of the carved shell tooth.

maxillary lateral incisors (based on personal observations by the author and other data[7]).

FUNCTIONAL INTERPRETATIONS

One of the main questions surrounding the carved tooth relates to its intended purpose. That is, what was it used for? Regrettably, many burials at the Gebel Ramlah cemetery have been exposed to the surface and damaged over the past 5,500 years, as a result of wind-generated erosion in this barren desert landscape. Such was the case for the tooth, which was not recovered in direct association with human skeletal remains or, for that matter, within a burial pit. Thus, any functional interpretations must be conjectural. However, it seems unlikely that the tooth was an art object or an amulet; nor does it appear to have been worn as jewelry. In the first instance, nothing like it was recovered among grave offerings from intact burials. Secondly, shell and bone jewelry found adorning intact individuals all exhibited finely drilled holes to facilitate attachment with a string. The tooth has no hole. Instead, the attempted morphologic detail, life-size scale, and use of white "toothlike" shell as the material may suggest a more practical purpose, ie, perhaps it was meant to replace an actual human incisor.

As previously documented,[4,5] extreme care was found to have been taken by the Neolithic gravediggers at the Gebel Ramlah cemetery during reinterment of skeletons disturbed by later, intrusive burials. Such care included deliberate repositioning of skeletal elements, including reinsertion of teeth that had fallen from their alveoli during handling.[4,5] Perhaps the carved tooth was intended to take the place of an incisor lost during this mortuary treatment. In other words, it may have been inserted into an alveolus postmortem. In what may be comparable treatment, more recent (ca 2500 BC) remains from Giza and El Qatta, Egypt, exhibit probable insertion of several teeth during the mummification process; however, in these cases actual human teeth, bound with gold wire, were used.[8–11] By way of interpretation, Ring[10] stated that such replacement may have been done to "… inter a corpse in as complete a state as possible, for they [the Egyptians] firmly believed that the body must be kept intact to house the soul in the afterworld" (p 36).

The most interesting possibility regarding the tooth's function, however, and the one that first crossed the author's mind, is that it was intended to be a prosthesis. That could explain why such care was taken to closely emulate the size, shape, and color of an actual human incisor. Of course, if it was meant to replace a tooth in a living individual, it would be categorized as a dental implant, based on its full-sized root. Unfortunately, because the tooth was not found actually implanted within an alveolus, there is no direct confirmation of a clinical function. Still, as previously reported,[5] there may be some support for this possibility. It is known, for example, that the Egyptians practiced basic dentistry by at least 2900 BC.[10,12] Moreover, some believe that they used dental prostheses.[10,11] Subsequent Mediterranean-area Phoenicians and Etruscans definitely did.[10,13–15] And, in what could be interpreted as an analogous (although temporally and spatially divergent) premodern example, Ring, among others, reported that a Mayan mandible (ca AD 600) from the Ulúa Valley, Honduras, contained 3 implanted artificial teeth. Two of these teeth, which were also carved from shell, though more crudely fashioned, are said to show signs of osseointegration in their incisor alveoli.[10]

The case against an implant interpretation is compelling. Beyond the lack of a direct association between the present tooth and skeletal remains, such technology is certainly well beyond the capability of a culture practicing only basic dentistry. Further, Becker,[16] in a wide-ranging review of

purported examples of ancient dentistry, denied that there is evidence that dental prostheses were made before 630 BC and that they did not appear in Egypt until after 400 BC (though see Puech[11] for an opposing view). He additionally noted that prostheses were limited to crowns only; no irrefutable examples of ancient implants have been documented.[16,17] Even the Mayan mandible is suspect; although the actual specimen was not studied, a photograph showing purported bony integration instead appears to identify incorporation of tightly-packed soil between the roots and alveoli (Becker, personal communication, 2003; personal observation by author, 2003). Dental implantation, at least in a clinical setting, was not introduced until 1918.[10]

CONCLUSION

In the end, the actual function of this tooth replica is, of course, unknown. It may have been an implant, but could just as easily (and more likely) have served another purpose. What is known, however, is that it was skillfully carved into a close approximation of a human maxillary incisor. The artisan who created it (and perhaps others in the Gebel Ramlah populace) obviously had a good understanding of dental anatomy. To date, no evidence for a similar level of knowledge or dental craftsmanship has been reported at other contemporary or subsequent regional sites.[18,19] (Kaczmarek, personal communication, 2001; Friedman, personal communication, 2001). This fact, together with documented evidence of tooth replacement and other manipulation in the mortuary process,[4,5] suggests that teeth played an important role for these desert-dwelling Neolithic people.

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