Stone-age dental filling identified

6,500-year-old human mandible shows evidence of beeswax used to seal a cracked, upper canine

By Robert Selleck, Managing Editor

A team of Italian and Australian researchers appears to have found physical proof that restorative dentistry dates to the Stone Age.

The researchers identified traces of a dental filling made of beeswax in a Neolithic human tooth discovered in Slovenia — and they are saying it may be the “earliest known direct evidence of a therapeutic-palliative dental filling.”

The research findings were published Sept. 19 in PLoS ONE, the peer-reviewed, open-access journal, accessible at www.plosone.org.

The team acknowledges in its paper that it cannot be absolutely certain that the beeswax filling was placed in the tooth in an effort to address a dental problem the individual was experiencing while alive. But the paper identifies that as being the most likely explanation, that it cannot be absolutely certain.

“The tooth probably became very sensitive, limiting the functionality of the jaw during occlusion. The occlusal surface could have been filled with beeswax in an attempt to reduce the pain [by] sealing exposed dentin tubules and the fracture from changes in osmotic pressure (as occurs on contact with sugar) and temperature (hot or cold relative to the oral cavity),” the team wrote.

The piece of jawbone with five teeth still attached was discovered long before the team’s research was conducted. It was excavated from a cave wall near the village of Loče, Istria, in Slovenia and was initially dated based on associated fauna remains, which traced to the Upper Pleistocene era.

The team reported that the specimen was considered to be “one of the most ancient anthropological remains from the northern-Adriatic area.” But the find had never been subjected to detailed analysis until the researchers secured permission to study the mandible using state-of-the-art scanning technology and radiocarbon dating techniques.

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Permission was granted by Italy’s Natural History Museum of Trieste, to whom the original finders had donated the specimen. The mandible, determined to be from a male who died in his 20s, was described by the team as, “the left portion of an isolated adult mandible bearing a canine, two premolars, and the first two molars.”

The 12-person team of researchers from university and governmental facilities in Italy and Australia used Dental Tribune U.S. Edition | October 2012

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Various views of the mandible discovered in a cave in southern Slovenia. Scale bar, 10 mm.


A) Distal-mesial section of lower left canine. B1) Micro-CT detail of crown showing thickness of beeswax (in yellow). Beeswax exactly fills shallow cavity in exposed dentin and upper part of crack. B2) 3-D reconstruction and B3) microphotograph of crown in occlusal view with indication of surface covered by beeswax (within yellow dotted line). C) Micro-CT based cross-sections showing enamel cracks along labial and lingual aspects. Positions of the cross-sections are shown in B2. Beeswax is shown yellow. Scale bars, 2 mm.

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A dilemma. We now have so many dental groups that we have almost run out of letters of the alphabet. As group after group abbreviates its name, we are at a loss to tell one from another without a scorecard. Either we need a new alphabetical language or more exotic sounding dental organizations with as yet, unused letters.

History relates its alphabet beginnings to Mesopotamia, where early transcribers used grooved lines on a bulla, or gourd-like container. These scratches of lines became the beginnings of written communication.

Flash lighting to mobile communications of today, where time pressures have abbreviated words, and we have a lingo all of its own. Abbreviating is a modern necessity.

To begin with, you cannot tweet — under tweeting rules — over a certain number of characters. Also, texting spohistication requires not only abbreviating, but also doing it creatively, to stumpt the recipient.

Fortunately, having a college-aged daughter has given me a little heads up in this language. For example, CUL means “see you later” and POS means “parent over shoulder.” Everyone is in a rush — but to where? Tired thumbs? And communicating these words with initials not only gives the recipient. It also will satisfy tweeters and texters alike.

The idea of written language is to give unique connotation to words. Abbreviations have become the teratogen of communication.

To help ameliorate this confusion I am proposing a Hoexter’s Index (HI), which will not conflict with the ERA in baseball. By adding an ‘H’ to the first letter in an acronym, we would recognize that an AE (American Academy of Periodontology) meeting would be required to use that color in its initials. When publicizing an AO meeting, we would recognize that an AO meeting was for the Academy of Osteointegration, an implant group, as compared to an AO meeting, which would be for Alph Omega, a dental fraternity group. Also, we would know that AAP represents the American Academy of Periodontics, which would not be confused with the AAP, or the American Association of Prosthodontics. Unfortunately, unless we have a color chart, we will be just as confused, but it will be much more colorful.

This is only a suggestion and any thoughts or other solutions would be received and considered for publication as well. There is an obvious problem. Let us communicate and help correct it.

To conclude, Rodney Dangerfield, the famous comedian, once described his son eating alphabet soup that his wife, a horrible cook, had made. The boy separated letters to spell “HELP.” Let’s help our profession abbreviate with colorful understanding, OK.

By David L Hoexter, DMD, FACOD, FICOI, Editor in Chief

Proposed: colorful communications

At least the GNYDM, representing the largest dental meeting in the U.S., has unique letters in its title and will not be confused with any other dental organizations.

There is also the ERA mini implant, not to conflict with the ERA in baseball. By adding an ‘E’ to the first letter in an acronym, we would recognize that an AO mini meeting would be required to use that color in its initials. When publicizing an AO meeting, we would recognize that an AO meeting was for the Academy of Osteointegration, an implant group, as compared to an AO meeting, which would be for Alph Omega, a dental fraternity group. Also, we would know that AAP represents the American Academy of Periodontics, which would not be confused with the AAP, or the American Association of Prosthodontics. Unfortunately, unless we have a color chart, we will be just as confused, but it will be much more colorful.

The use of beeswax during the Neolithic.

A human partial mandible associated with a possible case of therapeutic palliative substance use of beeswax during the Neolithic.

The research team also referenced documentation on the use of beeswax as a binding agent in antiquity — and explained the substance’s ability to remain preserved for long periods of time because of its “extreme chemical stability.”

The team’s conclusion. “In this emerging framework of ancient dental therapeutic practices, the finding of a human partial mandible associated with contemporary beeswax, covering the occlusal surface of a canine, could represent a possible case of therapeutic use of beeswax during the Neolithic.”

In a note regarding the funding of the research project, the team wrote, “This work is part of the ICT/Elettra EXACT Project (Elemental X-ray Analysis and Computed Tomography) funded by Friuli Venezia Giulia (Italy). The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.”

The team’s paper is titled, “Bee wax as Dental Filling on a Neolithic Human Tooth.”

(Dental Tribune graphic created at www.worldx.net)