The researchers listed several previously known examples of ancient dentistry but said there was no known published documentation of the use of "therapeutic palliative substance in prehistoric dentistry." 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.”

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 of the possible scenarios that would explain the presence of the substance on a worn-down tooth that otherwise would have had exposed dentin.

“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 Loche, Istria, in Slovenia and was initially dated to an age range of 6,655–6,400 years Before Present and the filling, 6,045–6,440 years BP.

Based on the radiocarbon analysis, the mandible was dated to an age range of 6,055–6,800 years Before Present and the filling, 6,045–6,440 years BP.

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

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In a note regarding the funding of the research project, the team wrote, “This work is part of the ICTP/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, “Beeswax as Dental Filling on a Neolithic Human Tooth.”