

# Ancient teeth offer evidence of Ice Age dentistry

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A scan of the two teeth with bitumen filling. Credit: *American Journal of Physical Anthropology* (2017). DOI: 10.1002/ajpa.23216

(Phys.org)—An international team of researchers has found evidence of dental work done during the Ice Age that included using a sharp object to remove diseased cavity tissue and fillings with a tar-like substance. In

their paper published in the *American Journal of Physical Anthropology*, the team describes the condition of the teeth, where they were found, and what they revealed about dental technology during the Ice Age.

In studying the [teeth](#) (which were found in a mountainous part of Tuscany, Italy, approximately 20 years ago), two upper incisors (the ones next to the pointy canines), the team found that holes had been "drilled" into them, likely by using a sharp stone, all the way down into the pulp chamber—a procedure that would have almost certainly been very painful. They report scratches and other marks on the inside walls of the teeth, clearly indicating something other than chewing had occurred. Closer examination indicated that the holes had once been filled with bitumen—a tar like substance early people normally used for binding tools together—and bits of straw and what might turn out to be hair. The researchers dated the teeth to a time between 13,000 and 12,740 years ago, placing them in in the Upper Paleolithic. It is not clear what purpose the straw and hair might have served in the procedure, though they note it is possible they were used as an antiseptic or provided some degree of numbness.

The researchers note that it is possible that the holes were drilled for others reasons—to insert jewelry, for example—but the presence of bitumen suggests the purpose was to clean decayed matter from the teeth and to replace it with something meant to slow tooth loss. They also note that the time period during which the older male lived was prior to the widespread use of agriculture—which meant he lived before the time when people began eating foods high in carbohydrates made from grains. The introduction of such foods to the human diet led to widespread dental problems, most specifically tooth decay.

The researchers acknowledge that two teeth from one person is a small sample size, but due to the evidence of an advance in dental care, it is likely the practice of drilling and filling teeth was widespread.

**More information:** Gregorio Oxilia et al. The dawn of dentistry in the late upper Paleolithic: An early case of pathological intervention at Riparo Fredian, *American Journal of Physical Anthropology* (2017).  
[DOI: 10.1002/ajpa.23216](https://doi.org/10.1002/ajpa.23216)

## Abstract

### Objectives

Early evidence for the treatment of dental pathology is found primarily among food-producing societies associated with high levels of oral pathology. However, some Late Pleistocene hunter-gatherers show extensive oral pathology, suggesting that experimentation with therapeutic dental interventions may have greater antiquity. Here, we report the second earliest probable evidence for dentistry in a Late Upper Paleolithic hunter-gatherer recovered from Riparo Fredian (Tuscany, Italy).

### Materials and Methods

The Fredian 5 human consists of an associated maxillary anterior dentition with antemortem exposure of both upper first incisor (I1) pulp chambers. The pulp chambers present probable antemortem modifications that warrant in-depth analyses and direct dating. Scanning electron microscopy, microCT and residue analyses were used to investigate the purported modifications of external and internal surfaces of each I1.

### Results

The direct date places Fredian 5 between 13,000 and 12,740 calendar years ago. Both pulp chambers were circumferentially enlarged prior to the death of this individual. Occlusal dentine flaking on the margin of the cavities and striations on their internal aspects suggest anthropic manipulation. Residue analyses revealed a conglomerate of bitumen, vegetal fibers, and probable hairs adherent to the internal walls of the

cavities.

## Discussion

The results are consistent with tool-assisted manipulation to remove necrotic or infected pulp in vivo and the subsequent use of a composite, organic filling. Fredian 5 confirms the practice of dentistry—specifically, a pathology-induced intervention—among Late Pleistocene hunter-gatherers. As such, it appears that fundamental perceptions of biomedical knowledge and practice were in place long before the socioeconomic changes associated with the transition to food production in the Neolithic.

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