

The Icelandic Medieval Diet and Masticatory Stressors



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Harðfiskur: A Coarse Staple

- Harðfiskur; dried cod, haddock, and wolf fish, was replacement for bread in a country where grain was mostly imported.
- Along with harðfiskur, a number of dried and smoked meats and fish were large contributors to the daily repast, including ‘veggja’ whale (wall whale), *riklingur* (dried strips of flounder), and perhaps seal, cod heads and fins.



Dental wear:

- Attritional (Physical)**: wear generated between the lower and upper jaws.
- Abrasive (Physical)**: involves extra-oral material such as food and non-food items introduced into the oral cavity.

-Erosive (Chemical):

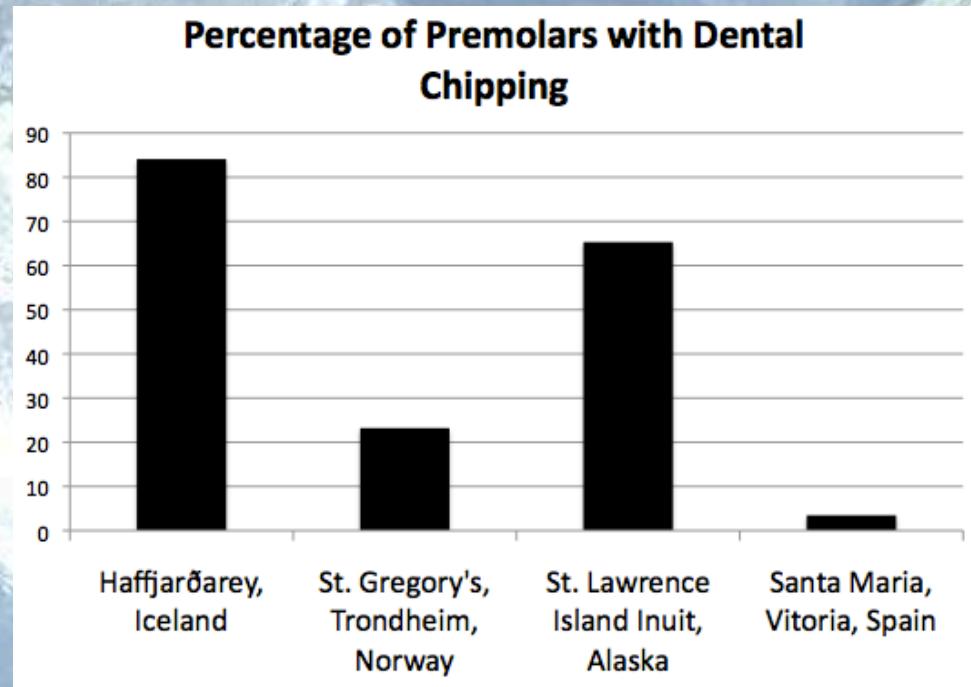
Intrinsic: from acids originating in the stomach.

Extrinsic: acids from food, pharmaceutical, and occupational sources.



Dental Chipping:

- “Dental chipping occurs when the strength of enamel is surpassed by bite force pressure exerted between the opponents in the two jaws. The resultant fracture is usually precipitated by the presence of a foreign element between two occluding teeth.” (Scott and Winn, 2010).



Data adapted from Scott and Winn (2010).

-Multiple dental chips along the buccal borders of the right maxillary premolars (HFE-A-022, Male, 36-45).

Dental Fracture:

-A number of premolars had damage consistent with dental fractures, representing of 9.5% of available premolars, the highest being in the UR4s ($n = 3$). Three lower molars also had dental fractures.



-Dental fracture of the upper right third premolar, and 'planar' microfractures in the corresponding left canines in HFE-A-014e (Male, 36-45).



Oral tori and exostoses:

-Oral tori and exostoses are benign expansile protuberances of normal osseous tissues, which are defined based on their location. The aetiology of these nodular exostoses is ultimately unknown, but almost certainly reflects a complex interplay of genetic, environmental, and functional factors.



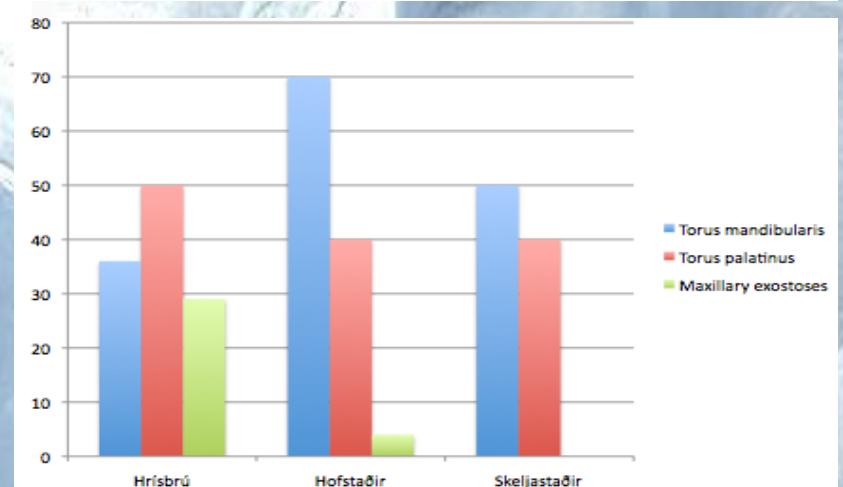
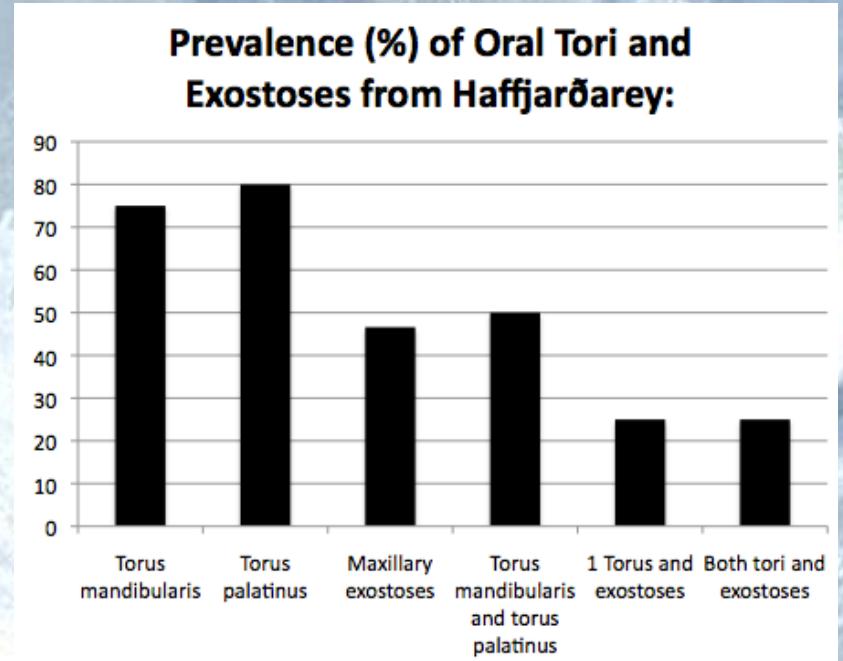
-Extreme mandibular tori in HSM-A-015 (Female, 45+), and large palatine tori and a unilateral lingual exostosis (right) (HFE-A-020, Female, 36-45).

Oral tori and exostoses:



-Large buccal maxillary exostosis with additional evidence of malocclusion from Hrísbru 8830 (Female, 26-35).

-In comparison with other other broadly contemporary Icelandic assemblages, Haffjarðarey has a higher prevalence of oral tori and exostoses; however, populations like Hofstaðir have greater degrees of expression.



Osteoarthritis of the Temporomandibular Joint:

-The diagnosis of osteoarthritis in the skeleton is dependent on at least two of the following criteria:

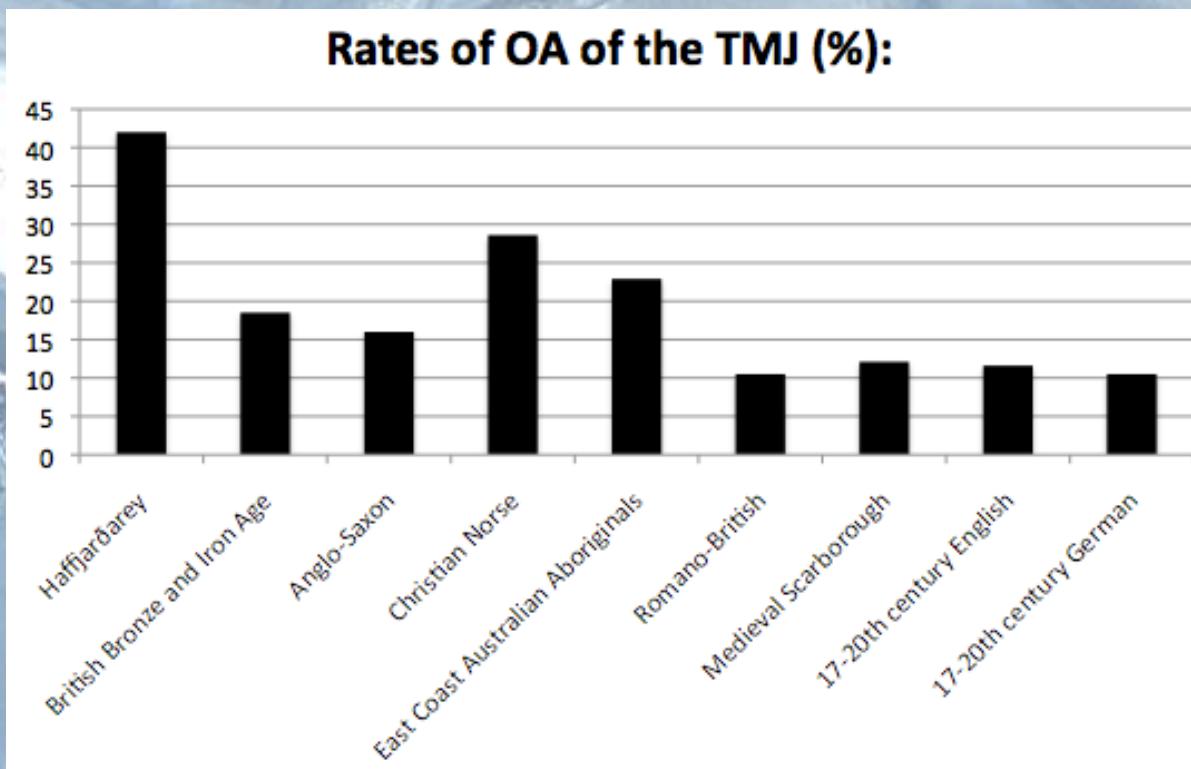
1. New bone on the joint surface
 2. Marginal osteophytes
 3. Pitting or porosity of the joint surface
 4. Or alteration of normal morphology
- OR
5. Eburnation (pathognomonic)

Top: pitting, eburnation, and deformation of the right mandibular condyle (HFE-A-14f, Female, 26-35).

Bottom: pitting and eburnation of the right mandibular fossa (HFE-A-022, Male, 36-45).



Osteoarthritis of the Temporomandibular Joint:



-All the cases of osteoarthritis of the TMJ were of “minimum” expression under the classification of Rando and Waldron (2012). However the prevalence was quite high, with as much as 40% of the individuals presenting with bilateral osteoarthritic changes.

Conclusions:

Although the Haffjarðarey adult assemblage is small, preliminary research and hypothesis testing has revealed some interesting results. The high instances of accidental dental mutilation are suggestive of parafunctional habits that may relate to the eating of harðfiskur and other coarse foodstuffs. The prevalence of oral tori, exostoses, and OA of the TMJ is high, but the level of expression is lower than for some of the comparative material discussed.



Acknowledgements:

This research was possible due to the financial assistance of Gary Ardelant: a thank you is also extended to Hildur Gestsdóttir, Dennis Lanigan, Cecilia Collins, Þjóðminjasafn Íslands, and NABO.

References:

- Halfman CM, Scott GR, and Pedersen PO. 1992. Palatine Torus in the Greenlandic Norse. *American Journal of Physical Anthropology* 88: 145-161.
- Gestsdóttir H. 2004. The Palaeopathology of Iceland: Preliminary report 2003: Haffjarðarey, Neðranes & Viðey. Reykjavík: Fornleifastofnun Íslands FS225-99192.
- Griffin CJ, Powers R, and Kruszynski R. 1979. The Incidence of Osteo-arthritis of the Temporomandibular Joint in Various Cultures. *Australian Dental Journal* 24(2): 94-106.
- Jainkittivong A and Langlais RP. 2000. Buccal and Palatal Exostoses: Prevalence and concurrence with tori. *Oral Surgery, Oral Medicine, and Oral Pathology* 90(1): 48-53.
- Johnsen B. 1978. Eleven Centuries of Food and Health in Iceland with Special Reference to Caries Dentii (A Survey). Reykjavík: The Icelandic Nutrition Council.
- Molnar P. 2008. Dental Wear and Oral Pathology: Possible Evidence and Consequences of Habitual Use of Teeth in a Swedish Neolithic Sample. *American Journal of Physical Anthropology* 136: 423-431.
- Rando C and Waldron T. 2012. TMJ Osteoarthritis: A New Approach to Diagnosis. *American Journal of Physical Anthropology* 148(1): 45-53.
- Richter S and Eliasson ST. 2008. Dental Health in Viking Age Icelanders. *Bulletin of the International Association of Paleodontontology* 2: 14-20.
- Scott GR and Winn GR. 2010. Dental Chipping: Contrasting Patterns of Microtrauma in Inuit and European Populations. *International Journal of Osteoarchaeology* 21(6): 723-731.