Dental Health in Viking Age Icelanders

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Bull Int Assoc Paleodont. 2008;2(2):14-20.

Abstract

The purpose of the study was to evaluate dental health in Iceland 1000 years ago. Fifty-one skulls were available for research. There were 1001 teeth present in the 51 available skeletons. There was significantly more tooth wear in the age group 36 years and older ($p<0.05$), than in the 18-to-35-year-old age group but no significant difference between sexes. The highest rate of tooth wear was found in first molars, and the lowest in third molars. Heavy tooth wear can be explained by consumption of acidic drinks and food in addition to coarse diet. The main cause of the wear was most likely coarse and rough diet, dried fish and meat.

Keywords: Paleodontology; Skeljastadir; Iceland

Introduction

The Skeljastadir farm is located in Thjorsardalur valley in the south part of Iceland, about 15 km northwest of the volcano Hekla. Sixty-six skeletons were excavated from the Skeljastadir site in 1939, and it is thought to be an old gravesite (1). The dating of occupation is based on volcanic ash chronology from the eruption of Hekla in 1104, which devastated the whole Thjorsardalur valley settlement (2-6) (Figure 1). The purpose of the study was to evaluate dental health in Iceland 1000 years ago.

Materials and methods

Fifty-one skulls were available for research. Five methods used for age estimation were based on developmental stages of teeth (7-11), one on tooth wear (12) and one of ectocranial suture closure (13). The adult skeletons were sexed using morphological characteristics from the skull, mandible and in a few instances, from the pelvis (14). The Brothwell classification was used to register dental wear

(15). Distance from cemento-enamel junction to alveolar bone crest (CEJ-ABC) (six measurements per tooth), tori of the jaw skeleton according to location and size (16), abscesses and other pathological conditions were recorded. Teeth and jaws were radiographed and photographed.

Results

There were 1001 teeth present in the 51 available skeletons were 1001. Teeth missed ante mortem were 95 (1 - 13 teeth). According to the age estimations used, 78.5% were between 26 and 45 years old, 11.8% were older and 9.8% younger. The sex distribution was equal, 25 female, 24 male and 2 of unknown sex. There was significantly more tooth wear in the age group of 36 years and older ($p<0.05$), than in the age group of 18-35 years but no significant difference between sexes. The highest rate of tooth wear was found in first molars, whereas the lowest was in third molars (Figures 2 and 3). The prevalence of torus palatinus was 39.5%, more common among males, mostly in the category of small or medium in size. The prevalence of torus mandibularis was 50%, with no sex difference and most often found bilaterally (Figure 4). There was significantly greater CEJ-ABC distance in the older age group (_36 years of age) than in the younger age group (18-36) and significantly more CEJ-ABC distance in males than females (Figure 5). Root abscesses were found in 45% of the skeletons, and were significantly more frequent in the age group of 36 years and older than in the age group of 35 years and younger. Abscesses were significantly more frequent in males than in females (Figure 6). Only a few cases of caries or caries like lesions were found (figure 7).

Discussion

Heavy tooth wear can be explained by consumption of acidic drinks and food in addition to coarse diet. The main cause of the wear was most likely coarse and rough diet, dried fish and meat. Ground grain was of minor importance (17). Mixture of acidic whey and water, named “Mysa”, was a daily thirst quencher in Iceland until the mid 20th century (18, 19). In addition, traditional Icelandic food was preserved in acidic whey - and still is (20). Teeth were covered with calculus. Scurvy was a common disease. The Sagas describe people with blood at the corners of the mouth, probably from bleeding gums (21). Prevalence of tori was much higher than in our modern population (22-24), of which 39,5 % comprised torus palatinus and 50% torus mandibularis. One criteria of periodontal condition is to rate the loss of alveolar bone i.e. the CEJ-ABC distance. The cause of a long CEJ-ABC distance is not always a periodontal disease. Part of the explanation is eruption of teeth to compensate the tooth wear (25, 26) (Figure 4). Root abscesses were most common in first molars which are also the teeth with highest rate of dental wear. The prevalence of caries was much lower than in the southern part of the continent at that time, were there was more access to sugar through vegetable and fruits (27). The steep rise in prevalence of caries in Western countries around the year1000 AD is due to the sudden access to sugarcane (28) (figure 8). A change in diet arose after the middle of the 19th century, and probably correlated with the introduction of more refined sugars and flours (29, 30), making tooth decay a common disease in Iceland. The ground tooth 21 in skeleton ÞSK 17, a female aged between 36 and 45 years, is probably the first case in cosmetic dentistry in Icelandic history (figures 9-12).

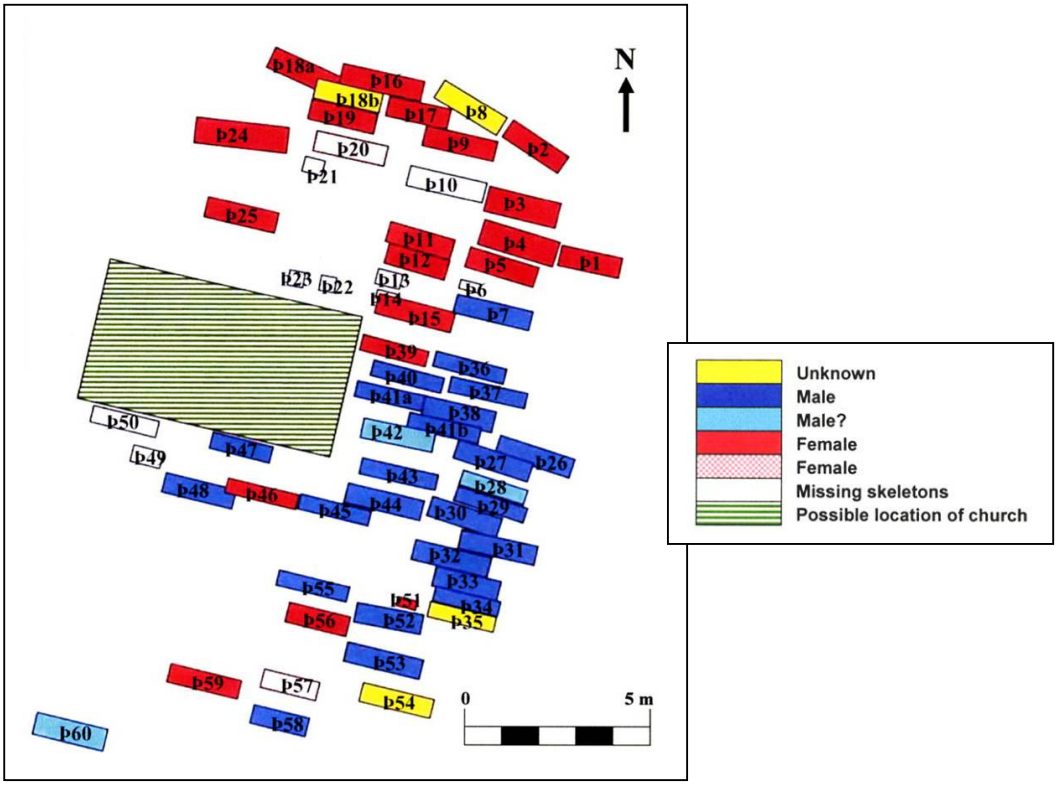

Figure 1. The gravesite.

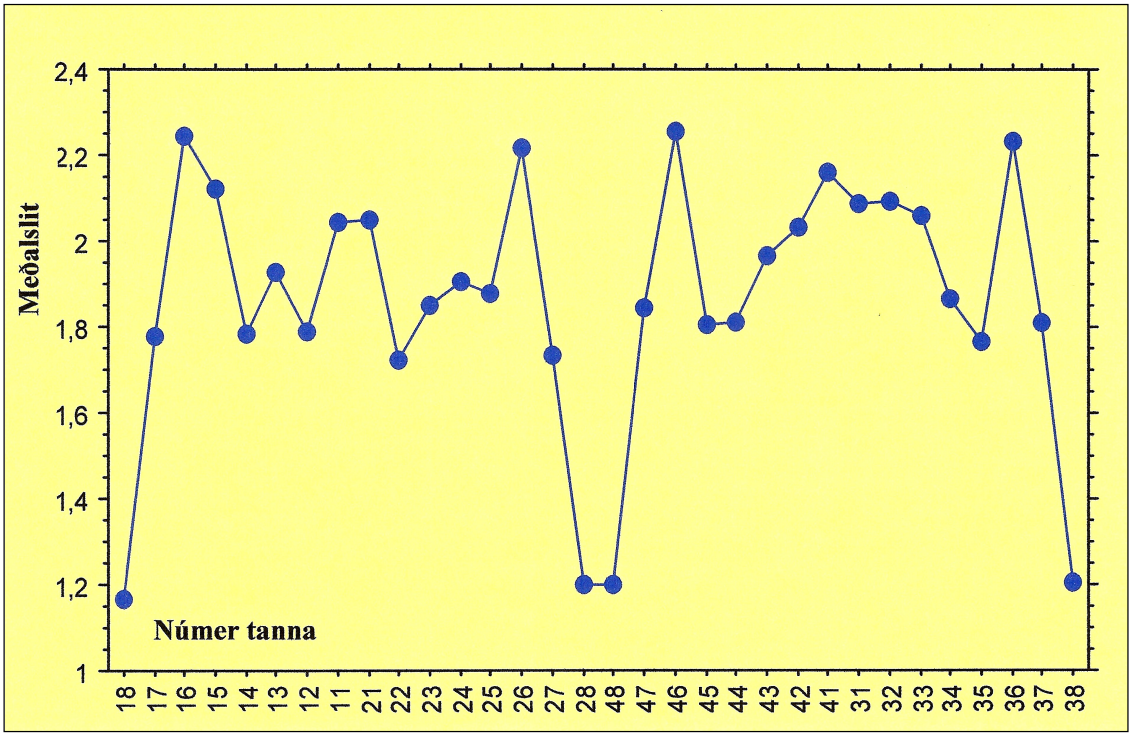

Figure 2. Different mean tooth wear among teeth.

Figure 3. Different tooth wear of the threee molars.

Figure 4. Torus mandibularis.

Figure 5. Cemento-enamel junction-alveolar bone crest.

Figure 6. Abscess formation due to heavy wear.

Figure 7. A caries lesion in tooth 23

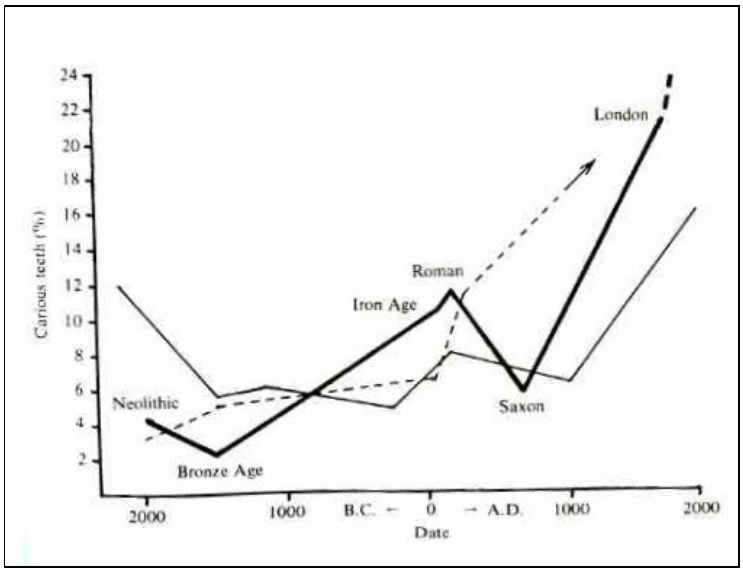

Figure 8 . Caries frequencies through time in three areas. Mainly of young adults, members of both sexes. Britain: —— Greece: - France: ---. (Source: Brothwell. Digging up bones.1981).

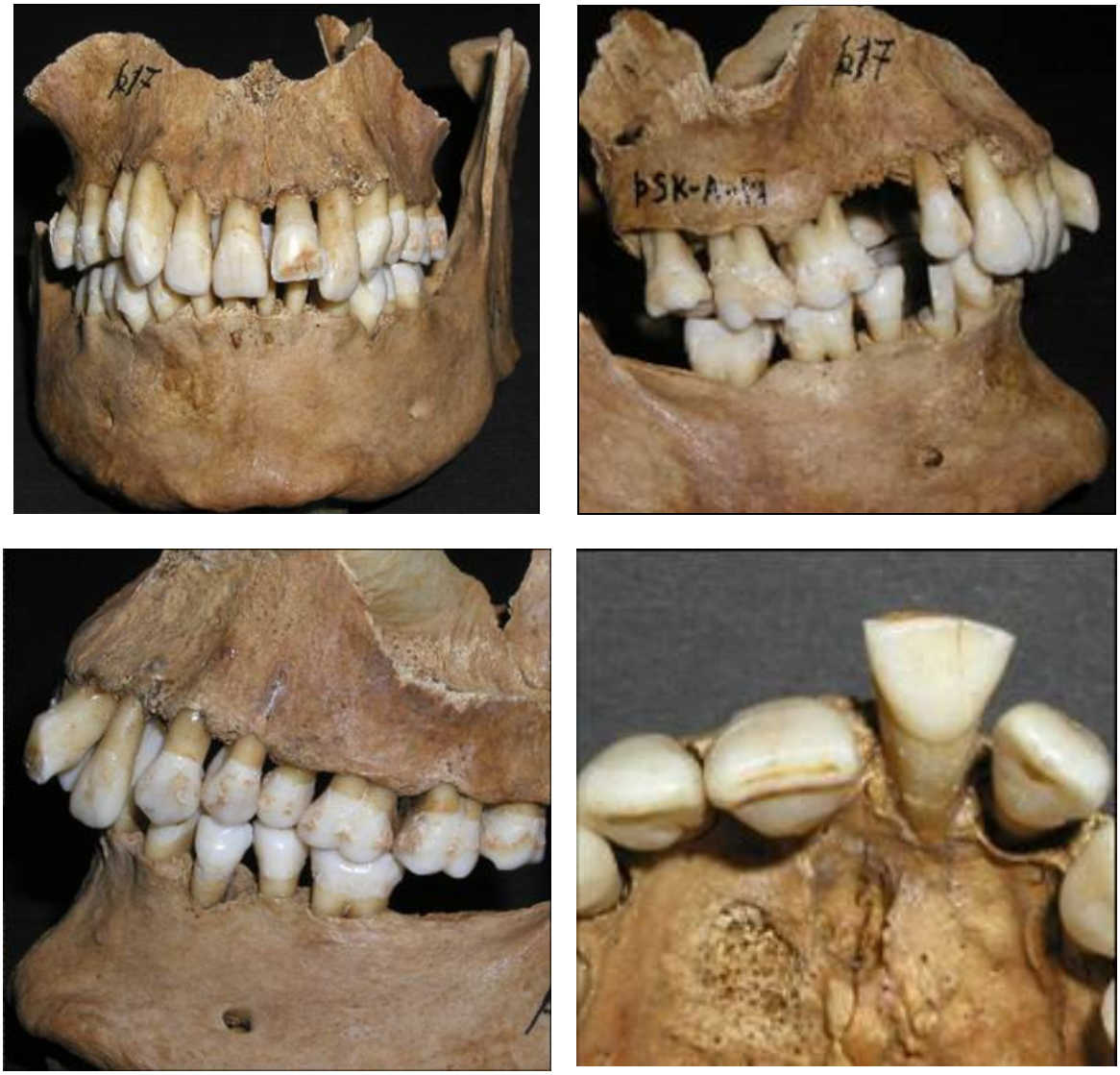

Figure 9-12. Female 26-45 years of age with ground tooth 21

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