



Case Study

A probable case of congenital syphilis from 18th century Vienna

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ABSTRACT

Archaeological excavation of a historic cemetery in Vienna, Austria, dating to the Josephinian period (CE 1765–1790) yielded a likely case of congenital syphilis. The individual displays intensive alteration of the permanent and deciduous dentition such as the mulberry molar and a tapered, fang-like canine. Traits rarely documented in paleopathological literature such as unnotched Hutchinson's incisors or pitting on the base of the cusps of deciduous second molars complement the finding. The present contribution describes this first probable case of congenital syphilis from Central Europe based on dental morphology. Beyond this documentation the specimen is compared to previous cases reported elsewhere.

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1. Introduction

Physical evidence of congenital syphilis is predominantly clinically documented by cranial or postcranial bones. Skeletal, unlike dental symptoms, however, are too unspecific from a differential diagnostic point of view to diagnose paleopathological cases of congenital syphilis (Rothschild and Rothschild, 1997; Ortner, 2003). Identifying teeth altered by the causative agent of congenital syphilis *Treponema pallidum* subsp. *pallidum* heavily depends upon paleopathological reference material. Concerning syphilis, there are four widely acknowledged dental expressions, of which two are believed to have diagnostic value (Hillson et al., 1998):

1. The Hutchinson's incisor comprising permanent upper central incisors with converging mesial and distal margins, a central notch at the incisal edge and labio-lingual flattening (Hutchinson, 1857);
2. The Moon molar or bud molar of the permanent upper or lower first molars with a dome-shaped appearance and multiple crowded cusps (Moon, 1877);
3. The Fournier molar or mulberry molar affecting permanent upper and lower first molars by hypoplasia of the occlusal third of the crown, reducing the cusps (Fournier, 1884, pp. 19–20);
4. And a fang-like permanent canine displaying a circumferential groove in the occlusal third of the crown (Fournier, 1884, p. 20; Bradlaw, 1953).

These are clinically affirmed malformations (Nabarro, 1932; Horne, 1954; Leão et al., 2006; Freiman et al., 2009; Pessoa and Galvão, 2011) that have also been archaeologically identified (Jacobi et al., 1992; Hillson et al., 1998; Erdal, 2006; Mendonça de Souza et al., 2006; Mayes et al., 2009; Nystrom, 2011). Karnosh (1926), however, emphasizes that many congenitally syphilitic children also suffer from nutritional deficiencies producing generalized defects on the dentition – a circumstance that complicates diagnosis difficult in a historic context (Condon et al., 1994 in: Hillson, 1996).

In the present case, an individual is presented whose patterns of dental malformation is the first archaeological evidence of possible congenital syphilis in Central Europe. The analysis is restricted to the teeth because of the sparse postcranial material. Dental traits distinctive or suggestive of the disease are elaborated here and compared to previous studies. The importance of the specimen lies within the excellent state of dental preservation and the multitude of alterations displayed.

As Rothschild and Rothschild (1997) and Harper et al. (2011) argue, lesions of congenital syphilis have to be further analyzed to acquire more diagnostic specificity and this case might be a contribution to this claim. According to Harper et al. (2011), former pre-Columbian case studies of congenital syphilis lack photographic documentation (Sidell et al., 2007; Lelong, 2003) or peer-reviewing (Henneberg et al., 1992; Henneberg and Henneberg, 1994, 1998; Blondiaux and Alduc-Le Bagousse, 1994; Blondiaux, 2008). An 18-month-old girl from 18th century Lisbon, Portugal presents with lesions consistent with but not specific to congenital syphilis: periostitis, osteitis and osteochondritis (Mendonça de Souza et al., 2006). Further post-Columbian

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evidence of congenital syphilis from Southern Europe is presented by Montiel et al. (2011) via aDNA detection of *T. pallidum pallidum* in postcranial material of two individuals dating back to 16th or 17th century Spain. Archaeological evidence of adult treponemal disease from 16th to 18th century Austria has been published at the national level (Bauer et al., 1983; Müller and Winkler, 1985). Clinical reports testify that congenital syphilis is still present in Central Europe today (Vécsei et al., 1999; Fehlow, 2002; Liwén and Owczarek, 2012). To the best of our knowledge, this study presents the first archaeological case highly suggestive of congenital syphilis from post-Columbian Central Europe.

2. Materials and methods

The subadult (burial nr. FH-206) examined in this study was recovered from an ancient cemetery known as 'Neuer Schottenfriedhof' in Vienna, Austria. Opened in 1765 CE, it was closed in 1784 CE, when Emperor Joseph II prohibited burials inside the city limits of Vienna (Mück, 1978). From 2005 to 2006 the burials of 400 individuals ($n=303$ adults, $n=97$ subadults) were unearthed. This cemetery was used for the deceased of the 'Schotten' parish belonging to the inner district of Vienna and for patients of the General Hospital (Bauer, 2004). The archaeological findings show that some of the individuals were autopsied. The simple grave goods (Litschauer and Pototschnig, 2009) and the overall poor physical constitution indicate that the buried belonged to a poor, hardworking class (Gebetsroither and Grossschmidt, 2009).

About three quarters of the excavated individuals revealed pathological changes of the skeleton and two-thirds had dental enamel defects. Important for the interpretive context of the case described here, 24 individuals from this excavation exhibited reactive skeletal changes suggestive of treponemal disease such as metaphysitis of the ulna and saber shin deformity of the tibia (Gaul and Grossschmidt, study in progress).

3. Results

Burial nr. FH-206 is a subadult almost exclusively represented by dental remains. The only reliably associated postcrania are the calcanei. Although the mandible is missing the condyles, coronoid processes and parts of the rami, it contains a complete set of deciduous dentition as well as partially erupted permanent first molars and unerupted permanent incisors, canines, premolars and second molars (Fig. 1). The maxilla is very fragmentary but there are three deciduous and three permanent teeth in situ. There are



Fig. 1. Superior-frontal view of the mandible.



Fig. 2. Labial view of the Ldc₁.



Fig. 3. Lingual view of Rdm₂ and RM₁.

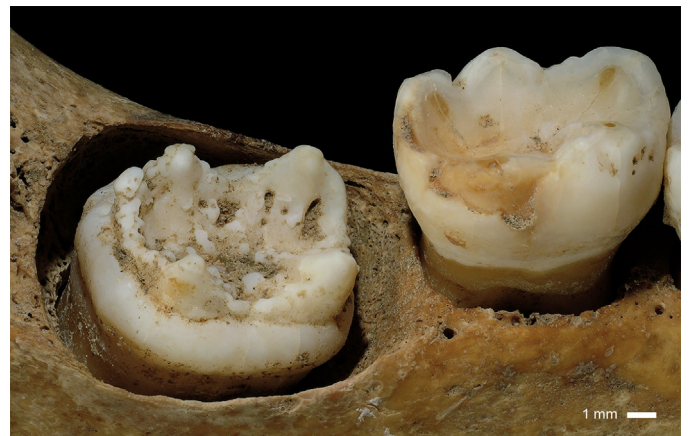


Fig. 4. Lingual-occlusal view of LM₁ and Ldm₂.

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