Growing up between wars and epidemics: teeth alterations in an individual from the S. Francisco Convent of Coimbra (19th century, Portugal)

Ana Isabel RUFINO*, Maria Teresa FERREIRA, Sofía N. WASTERLAIN

Laboratory of Forensic Anthropology, Centre for Functional Ecology, Department of Life Sciences, University of Coimbra, Portugal
Centro de Investigação em Antropologia e Saúde, Department of Life Sciences, University of Coimbra, Portugal
* ana.isabel.rufino@gmail.com

Introduction
An excavation conducted in 2011 in the surroundings of the Convent of São Francisco (Coimbra, Portugal) allowed the recovery of 601 skeletons of adults and non-adults of both sexes. These probably belong to individuals that died during the first decades of the 19th century, a period of intense mortality in the region due to several wars (Napoleonic invasions and Portuguese civil war) and epidemics (such as cholera morbus and typhus). This presentation describes and makes the differential diagnosis of the unusual dental alterations observed in a young adult male.

The SF4/11 I59, young adult male
Deposition: S-N, dorsal decubitus
Preservation: well preserved, almost complete

Twenty-four teeth (13 upper, 11 lower) are present and observable. The left lower central incisor was absent possibly due to agenesis. Two first molars (FDI: 26, 46) were lost ante-mortem. Upper lateral incisors presented shortened roots. Marked hypoplastic lesions were recorded in the occlusal surface of the first molars (FDI: 16, 36) (Fig. 1 and 2). Incisal notches were found in the two upper central incisors (Fig. 3). Linear enamel hypoplasia were recorded in all anterior teeth. Periapical x-rays revealed normal pulp chambers both in incisors (Fig. 4) and molars (Fig. 5). However, bulbous roots were radiologically observed in the left lower first molar. The short roots of the lateral incisors were confirmed radiologically.

Differential Diagnosis

Amelogenesis imperfecta
Congenital defects that primarily affect enamel formation, most likely due to mutations of the genes involved in amelogenesis. The defects can be classified as hypoplastic, hypomaturation and hypocalcified, with variable degrees of severity (Witkop, 1989). Although it can occur with anterior open bite, this was not observed in this individual. Nevertheless, both incisor and molar lesions suggest an hypoplastic defect of the enamel formation.

Dentinogenesis imperfecta
Hereditary developmental condition that affects the structure and composition of dentine (Wasterlain and Dias, 2009). Clinical appearance is soft brown translucent teeth with obliterated pulp chambers, which can occur with or without osteogenesis imperfecta (Witkop, 1989). Since no abnormalities in the pulp chambers or skeletal lesions were observed, dentinogenesis imperfecta is not a probable diagnosis.

Enamel Hypoplasia due to metabolic or systemic disorders
Defects of enamel tissue resulting from an injury to the ameloblasts due to metabolic or systemic disorders, such as vitamin D deficiency, hypoparathyroidism, hypocalcemia, among others (Nikiforuk and Fraser, 1981). Although no skeletal alterations typical of metabolic or systemic disorders were identified in this individual, such diagnosis cannot be excluded. Given that linear enamel hypoplasia were recorded in the dentition, the above described alterations could also represent a moment of deprivation or disease.

Molar lesions Hypomineralization (MIH)
Condition related with environmental changes, breast feeding, respiratory diseases, oxygen shortage of the ameloblasts, and high-fever diseases. The produced defects range from white-yellow or yellow-brown demarcated opacities to severely hypomineralised, broken enamel (Weerheijm et al., 2001). Concomitantly with the lesions in the permanent first molars, alterations can often be detected in the upper incisors and, more rarely, the lower incisors. This is a possible diagnosis for the individual under study since only first molars and upper incisors are affected, representing a more severe case involving enamel loss.

Conclusion
Since no abnormalities in the pulp chambers or skeletal lesions were observed, a diagnosis of dentinogenesis imperfecta is not favoured. The remaining hypotheses can be considered for this individual: either a genetic or a metabolic/systemic origin may explain the observed teeth alterations. This case study highlights the complexity of studying human remains from archaeological contexts, since no clinical records are available and post-mortem alterations can impair a correct observation of the pathology.

References