

Periapical lesions and intentional dental modifications in a skeletal sample of enslaved Africans (Lagos, Portugal)

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Introduction

Intentional dental modifications (IDM) are alterations of teeth usually performed as a ritual for aesthetic or identity purposes. However, the execution of the technique is not exempt from risk and can be related to a higher prevalence of dental pathology, more specifically through the exposure of the dental pulp and consequent periapical inflammation.

This investigation discusses the possible relationship between IDM and periapical lesions (PL) in a sample of enslaved Africans from Lagos, Portugal (15th-17th centuries) (Rufino et al., 2016).

Material and Methods

The sample is part of a collection excavated at Valle da Gafaria site in Lagos. It was located outside the medieval walls, in an urban discard deposit dated from the 15th to 17th centuries. The morphometric analysis of the individuals, context of inhumation and archaeological artefacts led us to attribute them an African origin, probably from the beginnings of the transatlantic slave trade. A total of 81 adult individuals (49 females, 19 males, and 13 individuals of unknown sex) were evaluated. IDM were considered when there was loss of dental structure not attributed to accidental trauma, functional wear, or post-mortem fracture. PL were differentially diagnosed following Dias and Tayles (1997), and Hillson (2001). The statistical significance of the recorded values was tested with independent samples chi-square.

Results

In all, 2285 sockets and 2063 permanent fully erupted teeth (757 anterior, 1306 posterior; 1027 upper, 1036 lower) were analysed. In this sample, 50 individuals (61.7%) had IDM, in a total of 203 modified teeth. Both women (61.2%) and men (63.2%) presented such alterations. Only anterior teeth were culturally modified. Anterior upper teeth were more modified (39.6%) than lower ones (15.5%) (chi-square = 54.602, df = 1, p<0.000).

Twenty five (30.9%) of the 81 individuals presented macroscopic cavities in the alveolar bone compatible with periapical inflammation. In all, 54 PL were found. Most osteolytic lesions (77.8%) were consistent with a diagnosis of granuloma or cyst. Seven (13.0%) were diagnosed as periapical abscesses, and only five (9.3%) were considered residual lesions as they were remodelling as a result of the loss of the corresponding tooth. Concerning the aetiology of the periapical lesions, 24 (44.4%) were related to decayed teeth, and 17 (31.5%) were associated with modified teeth. When this pathological condition was exclusively observed in the anterior dentition of the Lagos's individuals, it was confirmed that anterior modified teeth were significantly more affected by PL (9.3%) than unmodified teeth (0.4%) (chi-square = 39.466, df =1, p<0.000). Figure 1 presents the maxilla of the individual no.120 with all upper incisors intentionally modified and PL related to both upper central incisors. In the corresponding X-ray (Figure 2), there are oval radiolucent areas related to the apices of the modified teeth.



Figure 1. Maxilla (anterior view) of individual no.120 with all upper incisors intentionally modified and periapical lesions related to both upper central incisors.

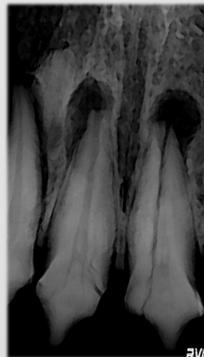


Figure 2. Radiological image of the upper central incisors of individual no.120 where oval radiolucent areas related to the apices of the modified teeth can be observed.



Figure 3. Upper right central incisor (anterior view) of individual no.44 with the mesial incisal angle removed.



Figure 4. Radiological image of the upper right central incisor of individual no. 44 where an alteration of the dental pulp morphology on the mesial pulp horn can be observed.

Discussion

Given that an important archaeological assemblage of African individuals recovered from Lagos had IDM, it was important to assess the relationship between this cultural practice and PL, to better understand the impact of such lesions on the quality of their lives.

IDMs were almost equally recorded in women and men, and the upper anterior teeth were more modified than the lower anterior. All IDM are consistent with filing. The same trend was observed by Wasterlain et al. (2016) with the entire collection. This specific practice may be quite harmful by exposing the pulp to a broad spectrum of microorganisms, and therefore, leading to the pulp necrosis or other consequences (Goose, 1963; Martins & Martins, 1986). Although there are several publications describing IDM in present day and past populations, almost none discusses the complications of post-modification procedures. In an ethnographic study conducted in Angola several decades ago, Almeida (1937) reported dental caries, gingivitis, pyorrhoea, and jaw lesions as common long-term consequences. Nevertheless, it has also been suggested that many teeth suffering violent trauma (accidental or wilful) may not develop periapical abscesses as a result of defence mechanisms, which limits the exposure of the pulp and the consequent periapical infection (Goose, 1963; Dias & Tayles, 1997; Hillson, 2001, 2008; Roseiro, 2013). In the present sample, there were cases where this could have happened. Figure 3 shows the right upper central incisor of individual no. 44, with the mesial incisal angle removed. This tooth was not associated with any PL. The analysis of the periapical X-ray image (Figure 4) shows an alteration of the dental pulp morphology on the mesial pulp horn, probably a result of the deposition of irregular secondary dentine in response to the aggression, thus leading to the modification of the normal contour of the pulp chamber, allowing the pulp to remain vital.

Conclusions

The association between IDM and the presence of PL was found in both jaws of the enslaved individuals from Lagos. The present results support the hypothesis that this cultural practice predisposes teeth to periapical inflammation. Since this pathological condition may cause pain and sensitiveness to cold, heat and pressure, one can propose that they probably had an adverse impact in the quality of life of these individuals.

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