Dental restorations and prostheses in two Portuguese identified skeletal collections (Lisbon and Coimbra, 19th–20th centuries)

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Introduction

Teeth play an important biological role (e.g., in feeding, speech) but also have local relevance as they are related to health status, hygiene and the ideal of beauty (Barnett, 2017). Since ancient times, dentistry is concerned with dental treatments and embellishment. However, little is known about the techniques and materials used in each time period and region in Portugal. The aim of this study is to compare the dental procedures performed in individuals belonging to the Identified Osteological Collections of Lisbon (Cardoso, 2006) and Coimbra (Cunha and Wasterlain, 2007; Wasterlain, 2006), who lived in the late 19th and early to late 20th centuries, in order to make a contribution to the history of Dentistry in Portugal.

Materials and Methods

The dentitions of 1476 adult individuals of both sexes from the Lisbon (n=876) and Coimbra (n=600) collections were observed. The age-at-death, sex, place of birth, occupation, and cause of death are known for each individual. All medical treatments/procedures, namely dental fillings and prostheses, were identified and carefully described. Statistical analysis was performed with the IBM SPSS statistics® software version 22.0. Chi-square test was used to compare the data obtained for Lisbon and Coimbra collections. The significance level was set at a probability P<0.05.

Results

Dental fillings were identified in both samples although more frequently in the Lisbon collection (11.2%, 94/875) in comparison to Coimbra (2.3%, 12/514), but the difference is not significant (X² = 2,000, g.l. = 1, p = 0.157). The most common restorative material was the amalgam (low copper alloy), although other types of materials were identified (e.g., silicate cement, gold) particularly in the anterior dentition (Figures 1, 3, 4 and 5). In Coimbra, most restorations were performed according to the Black’s principle “extension for prevention”, bringing the margins of the filling out to the point where they could be readily reached by a toothbrush and trying to prevent relapses of caries. In the Lisbon collection, the restorations were more variable (Figure 3, 4, 5 and 6). Several types of dental prostheses were identified in individuals on both collections (Coimbra, 0.4%; Lisbon, 1.9%) namely complete/partial removable prostheses and dental crowns (Figures 2, 4 and 8). Vulcanite, a material used in the production of dentures since the late 19th century until the 130s, was identified in six individuals (one from Coimbra and five from Lisbon). Acrylics material was only found in the Lisbon collection (58.32%, 10/17 of the total individuals with removable prostheses) (Figures 2, 4). Some of these dentures suffered fractures and had been repaired which shows some maintenance by the dentist (Figures 4 and 7). The greater presence of dental procedures in the Lisbon collection can be related to a higher socioeconomic status of some of these individuals and/or a greater availability of dental care services in the Portuguese capital city at that time. It should also be highlighted that the Lisbon collection includes individuals that died in later decades of the 20th century.

Conclusions

The present study adds valuable information on dental procedures performed in Coimbra and Lisbon, obtained directly from the individuals that lived and died in the late 19th and 20th centuries. The cases described here testify the use of dental materials that were otherwise only known through historical and/or medical documents. The relatively large amount of dental procedures found in Lisbon collection suggests that at least some individuals were not of low socioeconomic status, and indicate a social gradient that is still largely unknown for this collection. On the other hand, the differences found between the two assemblages make evident a dissimilar access to dental treatment by individuals that died in Lisbon or Coimbra, and in distinct decades. Finally, this study makes evident the great value of skeletal collections and paleopathology to the field of history of dentistry in Portugal.

Bibliography


Figure 1. Dental inlay in gold (Male, year of death: 1951), Luís Lopes Anthropological Collection, MUHNC. MB61-00175 (Photograph by L. Carvalho © ULisboa-MUHNC).

Figure 3. Amalgam filling (69 year-old male, year of death: 1932, postal worker), Luís Lopes Anthropological Collection, MUHNC. MB61-01128 (Photograph by L. Carvalho © ULisboa-MUHNC).

Figure 5. Silicate cement filling in the upper left canine and first pre-molar (Ind. 388), Coimbra Collection, 39 year-old male.

Figure 6. Amalgam filling in the lower right first molar made with the "extension for prevention" technique (female, year of death: 1932), Luís Lopes Anthropological Collection, MUHNC. MB61-01873 (Photograph by L. Carvalho © ULisboa-MUHNC).

Figure 2. Mandibular partial denture (Male, year of death: 1976), Luís Lopes Anthropological Collection, MUHNC. MB61-00593 (Photograph by L. Carvalho © ULisboa-MUHNC).

Figure 4. a) Partial denture in vulcanite; b) Upper jaw denture. A region of fracture that was later repaired is noticeable; c) Attachment system of the denture to the upper right first molar; d) Same individual presents an amalgam dental filling on the same tooth (Male, year of death: 1955, public security guard - retired), Luís Lopes Anthropological Collection, MUHNC. MB61-01375 (Photograph by L. Carvalho © ULisboa-MUHNC).

Figure 7 a) Complete upper denture in acrylics; b) Lower view of the denture. A repaired fracture in the palate can be observed; c) Upper view of the same denture/ repaired fracture (80 year-old male, year of death: 1938, discharged assistant), Luís Lopes Anthropological Collection, MUHNC. MB61-01368 (Photograph by L. Carvalho © ULisboa-MUHNC).

Figure 8. a) Removable partial denture that replaces the left lateral incisor and canine; b) Removable partial denture that replaces the right upper lateral incisor. In the upper canine, the root was removed to support a "pivô" for a dental crown (Ind. 1026 T), Coimbra Collection, 31 year-old female.

Figure 3. Prosthetic crown on the upper molar (male, year of death: 1941), Luís Lopes Anthropological Collection, MUHNC. MB61-00087 (Photograph by L. Carvalho © ULisboa-MUHNC).

Figure 4. a) Partial denture in vulcanite; b) Upper jaw denture. A region of fracture that was later repaired is noticeable; c) Attachment system of the denture to the upper right first molar; d) Same individual presents an amalgam dental filling on the same tooth (Male, year of death: 1955, public security guard - retired), Luís Lopes Anthropological Collection, MUHNC. MB61-01375 (Photograph by L. Carvalho © ULisboa-MUHNC).

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