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Case Report

Dental and Implantoprosthetic Rehabilitation of the Vertical Dimension in an Elderly Patient with Severe Parafunction

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Abstract

Tooth wear can have several etiological factors. When they occur in combination, the clinical result can be quite devastating, with severe tooth destruction. The purpose of this article is to present the case of a elderly patient with severe tooth wear caused by parafunctional habits (bruxism), with a marked reduction in the vertical dimension of the lower third of the face. Dental and implantoprosthetic rehabilitation was carried out, restoring the vertical dimension.

***Keywords:** Tooth Wear; Bruxism; Oral Rehabilitation; Dental Implants; Aged.*

Introduction

In the dental clinic, tooth wear is frequently observed. There can be several etiological factors, as well as an association between them. Parafunctional habits are the main factors, particularly bruxism and clenching. Clinically, attrition is characterized by variable wear of the incisial and occlusal surfaces of the anterior and posterior teeth, respectively, of both the maxilla and mandible. Advanced dental loss can cause a reduction in the vertical dimension of the lower third of the face, leading to the appearance of facial ageing [1-7].

Bruxism and clenching, the main parafunctional habits, occur relatively frequently, especially after the start of the COVID-19 pandemic. Emotional stress is the main etiological factor behind these changes [6,8-11]. Episodes of bruxism can have up to 6 times more forces generated compared to normal chewing [2].

Depending on the signs and symptoms, various rehabilitation and therapeutic modalities may be necessary. Sometimes, in addition to rehabilitative treatment, the use of occlusal splints and the application of botulinum toxin are necessary, especially in symptomatic cases [2,9,10,12]. However, in more advanced cases, where there is severe tooth wear, dental rehabilitation should also prioritise the recovery of the vertical dimension, established by the intermaxillary relationship [1-4].

The purpose of this article is to present the case of a patient with severe tooth wear caused by parafunctional habits (bruxism), with a marked reduction in the vertical dimension of the lower third of the face. Dental and implantoprosthetic rehabilitation was carried out, restoring the vertical dimension.

Case Report

Caucasian male patient, 72-years-old, came to the dental clinic complaining of tooth loss.

In the clinical extraoral examination, during the smile, tooth loss, a reduction in the vertical dimension of the lower third of the face and consequent facial ageing were evident (Figure 1).

Clinical intraoral examination revealed tooth loss and generalized and severe destruction of the coronary portion of the teeth due to bruxism (Figure 2).

Panoramic radiography revealed tooth losses, loss of tooth substance due to attrition, bone loss caused by periodontal disease, endodontic treatments carried out on some teeth, periapical lesions and carious lesions (Figure 3).

No relevant systemic alterations were reported in the medical history.

Considering the initial planning, periodontal treatment was carried out with oral hygiene guidance and sessions of scaling root planing. The left lower third molar was extracted. After endodontic treatment of all the remaining upper and lower teeth (Figure 4), the jig was installed to re-establish and determine the vertical dimension lost due to advanced tooth wear (Figure 5).

Internal hexagon osseointegrated implants (Implacil™, São Paulo, Brazil) were installed in the edentulous areas: right maxillary first and second premolars; left maxillary canine and second premolar; left mandibular first and second molars; and right mandibular first molar. Cast metal cores were made and cemented on the teeth. Radiographs were taken 6 months after installation (Figure 6).

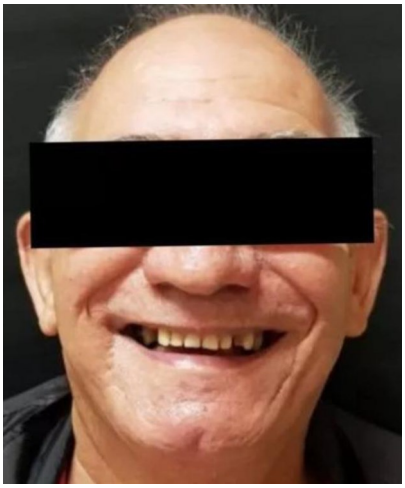

Figure 1: *Clinical extraoral examination: tooth loss, a reduction in the vertical dimension of the lower third of the face and consequent facial ageing.*

Figure 2: *Clinical intraoral examination: tooth loss and generalized and severe destruction of the coronary portion of the teeth due to bruxism.*

Figure 3: *Panoramic radiography: tooth losses, loss of tooth substance due to attrition and caries, bone loss caused by periodontal disease, endodontic treatments carried out on some teeth and periapical lesions.*

Figure 4: *Endodontic treatment of all the remaining upper and lower teeth (occlusal views: A: maxila; B: mandible).*

Figure 5: *Jig installed to re-establish and determine the vertical dimension lost due to advanced tooth wear.*

Figure 6: *Control panoramic radiograph - 6 months: Implants installed and cast metal cores cemented on the teeth.*

Once the cast metal cores were in place and the implants installed, the lithium disilicate single crowns (E-max™, Ivoclar Vivadent, Schaan, Liechtenstein) were made (Figure 7). After making the necessary adjustments, the crowns were cemented and screwed in place (Figures 8 and 9).

After installation, the ageing appearance of the lower third of the face was minimized by the increase in vertical dimension (Figure 10).

The patient has been followed up clinically and radiographically (Figure 11) for 2 years.

Figure 7: *Lithium disilicate single crowns.*

Figure 8: *Single crowns cemented and screwed in place (occlusal views: A: maxila; B: mandible).*

Figure 9: *Single crowns cemented and screwed in place (frontal view).*

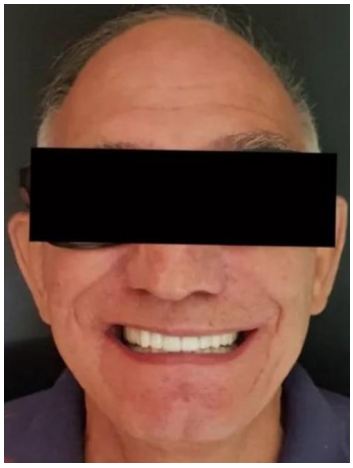

Figure 10: *Clinical extraoral examination: Increase in vertical dimension and minimizing the aspect of ageing in the lower third of the face after the prostheses have been installed.*

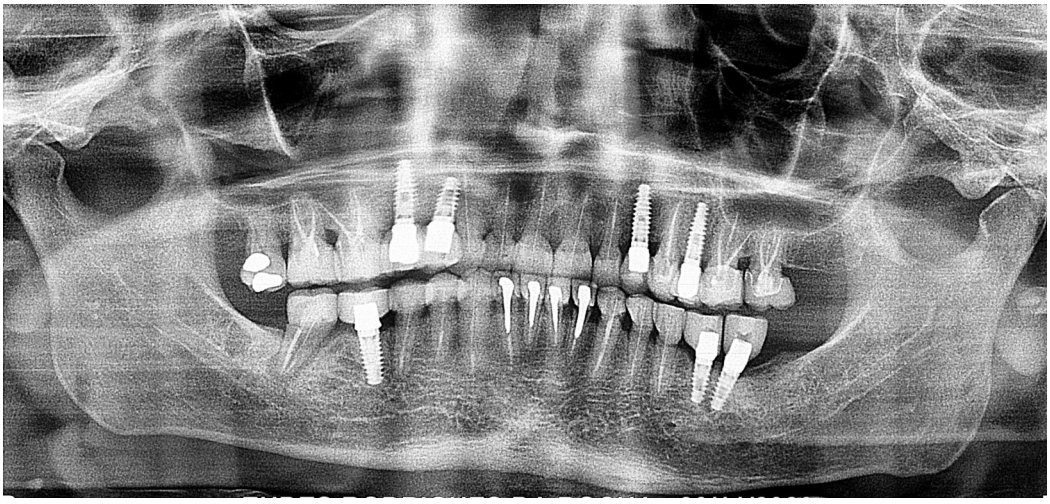

Figure 11: *Follow-up panoramic radiograph - 24 months.*

Discussion

Several means can be used to diagnose tooth wear: calipers; Willis rulers; phonetic assessment; lip and facial soft tissue assessment; contour analysis; mandibular movements. Clinical intraoral parameters include intercuspation; centric occlusion; overjet; overbite; muscle deprogrammers (Lucia jig). Imaging examinations, study models, mounting in semi-adjustable articulators, diagnostic wax-ups and making mock-ups can help in the diagnostic process [2-7,13].

Depending on each case, parafunctional habits - bruxism and clenching - can cause both functional and aesthetic alterations. Functionally, there can be a reduction in the vertical dimension of occlusion, with a subsequent increase in the interocclusal rest space or dentoalveolar compensation; tooth sensitivity; pulp complications; fractures of restorations; cheek and tongue biting; loss of masticatory efficiency. Tooth fractures and discolouration can occur as dental aesthetic alterations. Reduction of the lower third of the face and inverted lip profile with subsequent ageing as facial possible aesthetic alterations [1,3,5-7,13].

Several types of rehabilitation and therapeutic treatments may be necessary in complex cases, as observed in this report. Treatments range from the simplest, starting with more conservative restorative procedures based on adhesive techniques, to the most complex, in which occlusal repositioning, vertical dimension increase and total patient rehabilitation are required. Sometimes primary treatments are required, such as endodontics, periodontics and surgery (extractions) [1-3,5-7], which we have also carried out.

In more complex cases, raising the bite (increasing the vertical dimension) is a fundamental clinical step, as can be seen in this report. Depending on the height to be achieved, removable appliances or fixed prostheses can be made. Subsequently, fixed prostheses or overlays can be made in various materials, such as direct or indirect composite resin, metal-plastic or metal-ceramic crowns, or more modern materials such as zirconia or lithium disilicate [1,2,5-7]. The latter was used in the present case.

Our study group has reported on rehabilitation and therapeutic treatments for patients with variable tooth wear, also resulting from the association between parafunctional habits (bruxism and clenching) and gastro-oesophageal reflux disease [15,16]. In these cases, the association between the etiological factors - bruxism and gastroesophageal reflux disease - seems to present more severe tooth wear, with more complex therapeutic modalities [6,7].

Considering the multifactorial etiology of tooth wear, it is necessary to understand it in order to determine the diagnosis, planning and management of each case. Guidance on diet, oral hygiene and deleterious habits should be provided by the dental surgeon or other health professionals [3,6,7,13].

Conclusions

Parafunctional habits - bruxism and clenching - can cause various disorders in the oral cavity, especially in the teeth. Excessive tooth wear is the main one, from which other deleterious consequences for the stomatognathic system follow. Depending on each case, various therapeutic and rehabilitation modalities may become necessary. It is up to the dental surgeon to diagnose, plan and carry out the treatment indicated.

Conflict of Interest

The authors declare no conflict of interest.

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