Functional and aesthetic rehabilitation in patient with anterior open bite: a case report

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Abstract: This clinical report presents an oral rehabilitation performed in a patient with anterior open bite, whose main complaint was the fracture in a posterior restoration and aesthetics of the anterior teeth. After detailed examination, an increased vertical dimensional was observed, caused by premature contact of a posterior tooth. Treatment planning was defined to reestablish the vertical dimension by means of occlusal adjustment, which was first performed in dental casts mounted on articulator. Then the same procedure was clinically performed by selective occlusal reshaping and replacement of dental amalgam restorations. Protrusive guidance was achieved by replacing the laminate veneers. The aesthetic and functional features defined during occlusal adjustment and provisional manufacturing were accurately reproduced in the final restorations, allowing a satisfactory result. The establishment of vertical dimension before aesthetic rehabilitation plays a key role in achieving successful treatment outcomes.
Keywords: Vertical dimension. Occlusal adjustment. Dental veneers.

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» Patients displayed in this article previously approved the use of their facial and intraoral photographs.

INTRODUCTION

Restorative procedures may be a reliable alternative for achieving an optimum esthetic rehabilitation.[1,2,3] provided that functional, esthetic and phonetic aspects are taken into consideration.[4] Hence, oral rehabilitation requires proper treatment planning,[2] in which establishing the correct occlusal pattern is considered the key to successful treatment.[5]

Occlusal vertical dimension is one of the most important parameters to determine,[6] since it relates the maxillary and mandibular arches during occlusion,[7,8] and if this is inappropriate, it may lead to prosthetic treatment failure.[9] Increased vertical dimension may occur due to the extrusion of posterior teeth[9] or as a result of an inappropriate prosthetic treatment that may lead to anterior open bite[10] and subsequent esthetic and functional damage.[11] In such cases, restorative procedures must be preceded by adjusting the vertical dimension to provide the patient with stability and comfort.[12]

After the diagnosis of extruded teeth, occlusal adjustment by selective grinding is a reliable treatment to promote occlusal stability. This can be achieved by recovering the disocclusion pattern and decreasing the vertical dimension.[9] Therefore, this case report describes an esthetic rehabilitation preceded by adjusting the vertical dimension of a patient with anterior open bite.

CLINICAL CASE

The patient, a 30-year-old woman, came to the dental office to have tooth #36 restored after the amalgam restoration fractured. The patient reported dissatisfaction with her smile, due to the presence of anterior teeth with unsatisfactory ceramic restorations and discoloration of her natural teeth; the reason for covering the maxillary teeth with laminate veneers.

A thorough history and clinical examination revealed the presence of parafunctional habits, such as abnormal tongue positioning and lip wetting. After an accurate analysis of vertical dimension and excursive movements, an increased vertical dimension and anterior open bite were observed, which resulted from premature contact of molars and inadequate shape of anterior teeth, respectively. As the premature contact of molars was observed in centric occlusion, diagnosis was defined as an adapted dental reverse articulation (Fig 1 and 2).

To confirm the diagnosis and define the treatment plan, dental casts were mounted on a semi - adjustable articulator in centric occlusion. Afterwards, occlusal adjustment by selective grinding was performed in mounted casts to restore the vertical dimension of occlusion. A minimal occlusal reshaping was required, which would not compromise biological structures. However, although the vertical dimension was reestablished, anterior guidance was not achieved due to inadequate shape of laminate veneers, especially considering the height of the patient's anterior teeth (Fig 3).

Hence, treatment plan was defined in order to reestablish occlusal pattern and deliver an esthetic result in a shorter period of time, as desired by the patient. Although an orthodontic solution was considered, occlusal reshaping and restorative procedures were defined as the treatment of choice for this case.

Before the esthetic treatment, an occlusal adjustment was performed as simulated in the casts. Amalgam dental restorations were replaced to reestablish the function of the posterior teeth (Fig 4) and, after occlusal adjustment, laminate veneers on the anterior and premolar teeth were also replaced.

During the procedure, provisional restorations and tooth bleaching treatment allowed us to visualize the final treatment, as shown in Figure 4 B. It must be emphasized that the steps described

Figure 1: A) Initial aspect of patient; **B)** Main complaint: replacement of dental amalgam restorations; **C)** Presence of anterior open bite; and **D)** increased vertical dimension.

Figure 2: Maxillomandibular relationship, with premature contact on posterior teeth 17 and 47 **(A)**, 27 and 37 **(B)**, leading to increase in occlusal vertical dimension.

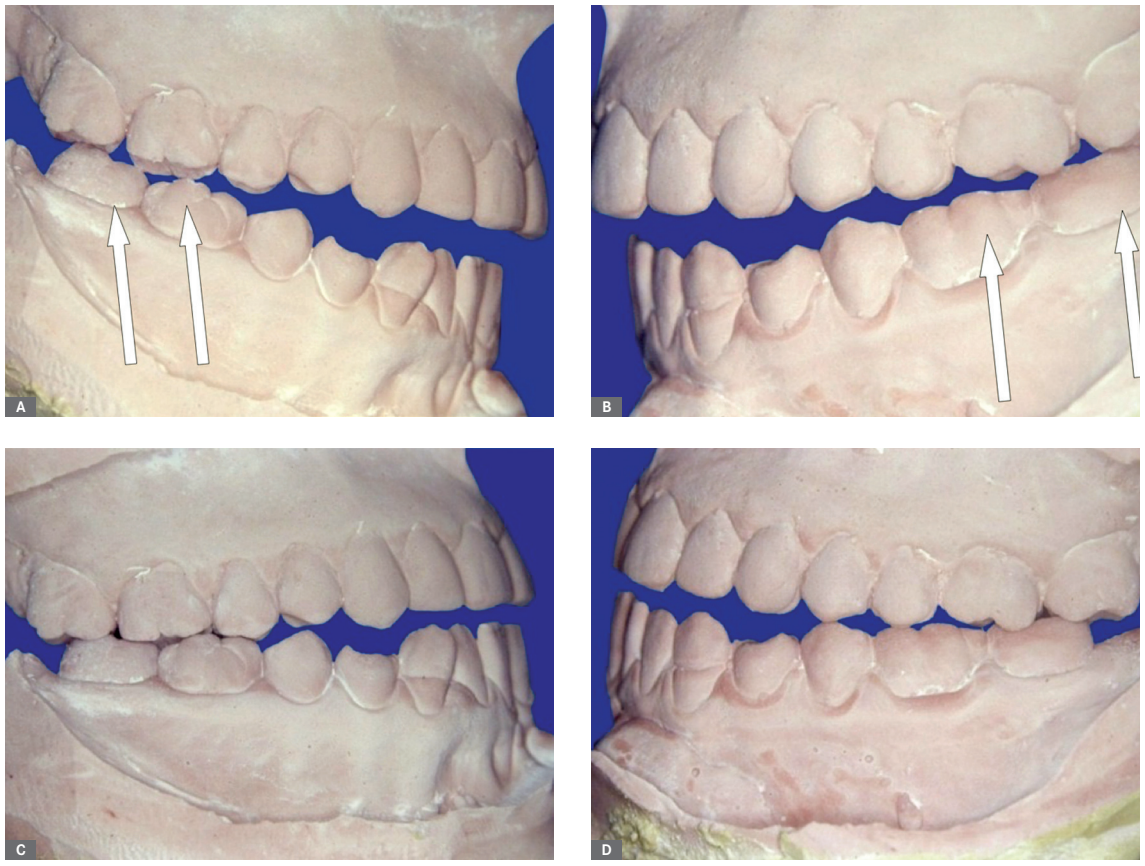

Figure 3: Dental casts mounted in articulator. Habitual occlusion, emphasizing the occlusal contact between teeth 17 and 47 27 and 37, before (**A** and **B**) and after (**C** and **D**) the occlusal adjustment performed in dental casts. It may be seen that there was no contact of anterior teeth when the occlusal vertical dimension was achieved.

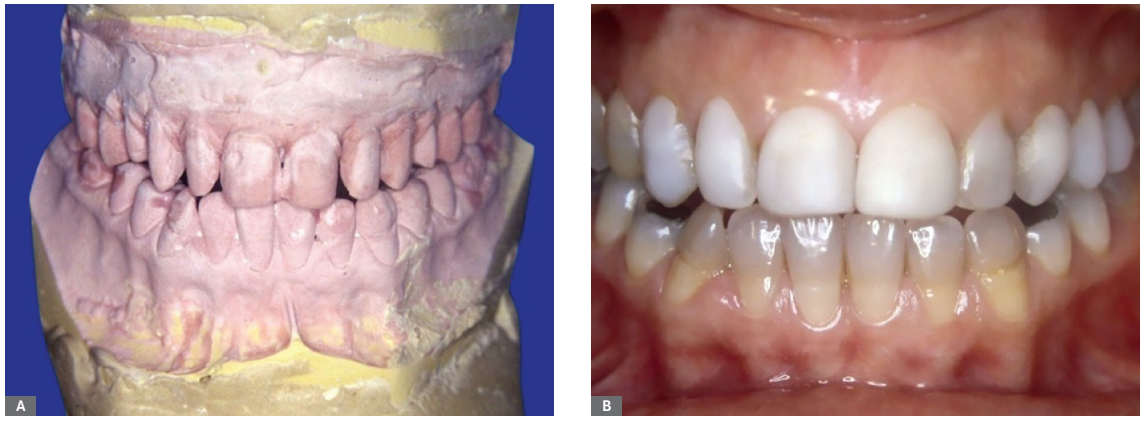

Figure 4: A) Occlusal adjustment performed clinically as simulated in the casts. **(B)**. Composite resin provisional restorations in anterior teeth, providing anterior guidance.

up to this point: from occlusal adjustment to placement of provisional crowns, were considered the most important stages of oral rehabilitation. During this stage, it was possible to see an appropriate esthetic and functional relation between the maxillary and mandibular arches in centric occlusion; from incisal guidance, with disocclusion of the posterior teeth, and lateral movements to the left and right; canine guidance and disocclusion of the teeth on the working and non-working side. The same results were obtained in the final rehabilitation.

After removing the unsatisfactory laminate veneers and preparing the teeth, a dental impression was made and the dental casts were mounted in articulator (Fig 5). New laminate veneers and posterior tooth restorations were manufactured (Fig 6 and 7) and cemented. A predictable result was achieved, which included obtaining anterior guidance, a satisfactory maxillomandibular relationship, and subsequently, an appropriate occlusal vertical dimension (Fig 8). Figure 9 shows the final result, in which the reestablished esthetic and functional aspects may be observed. As the photograph was taken after cementation, soft tissue swelling and redness was expected.

DISCUSSION

The demand for esthetic rehabilitation requires a multidisciplinary approach, during which the shape and function of teeth are reestablished to balance the stomatognathic system. Although esthetic considerations usually define the treatment plan.[13,14] functional aspects must be also carefully evaluated.[15,16] The present case report describes the importance of a detailed clinical exam before defining the treatment plan, considering that the patient's main concern was esthetic rehabilitation. However, since we verified occlusal instability during the clinical exam, the treatment plan was defined to reestablish the functional pattern. Indeed, if occlusion is taken into account, the treatment will result in a satisfactory appearance in the final result.

A diagnosis of increased vertical dimension requires a detailed examination, assessing signs and symptoms, and mounting casts in an articulator.[9] Treatment options will vary according to the etiologic factor, and consist of occlusal adjustment, orthodontic interventions and surgeries.[11]

For many cases, orthodontic therapy is the treatment of choice for occlusal correction. However, if the treatment is not well accepted by the patient, restorative procedures may successfully restore anterior

Figure 5: Dental casts utilized for manufacturing the laminate veneers, in right, anterior and left views.

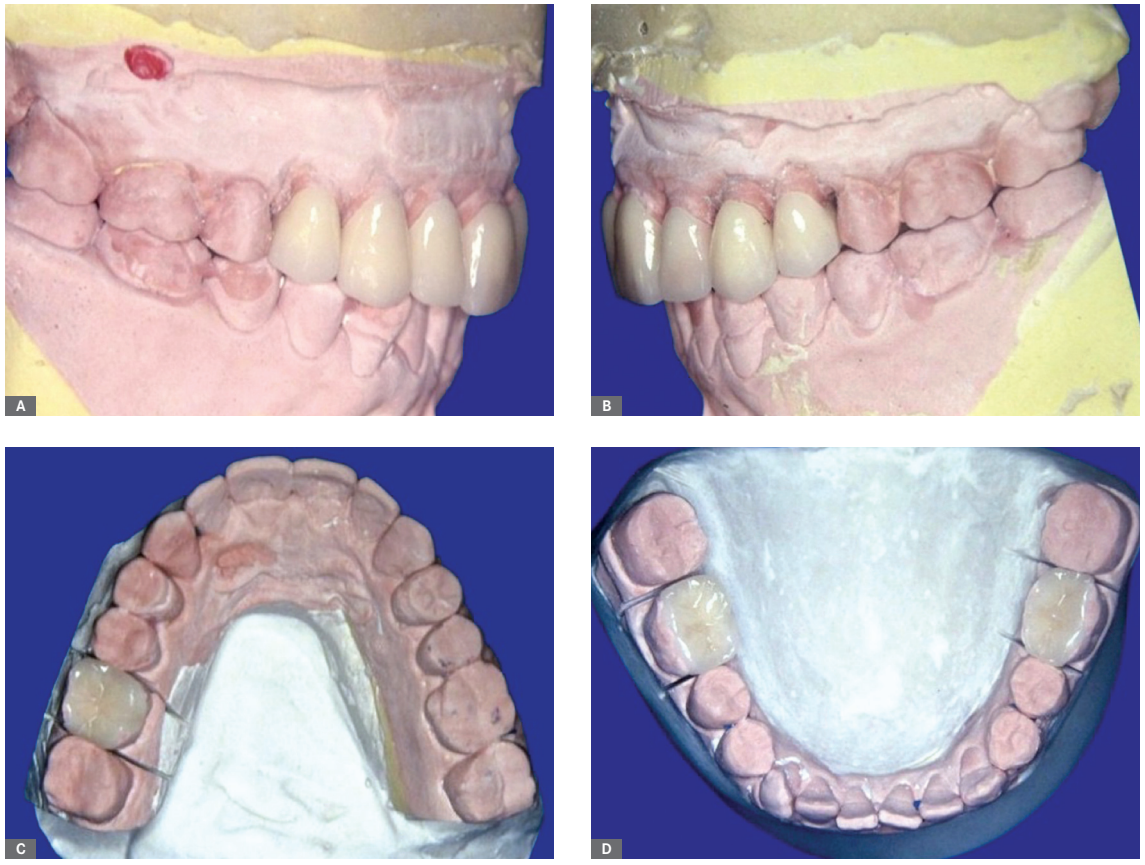

Figure 6: Ceramic restorations reestablishing the shape and function of anterior teeth (**A** and **B**). Ceramic occlusal restorations in posterior teeth (**C** and **D**).

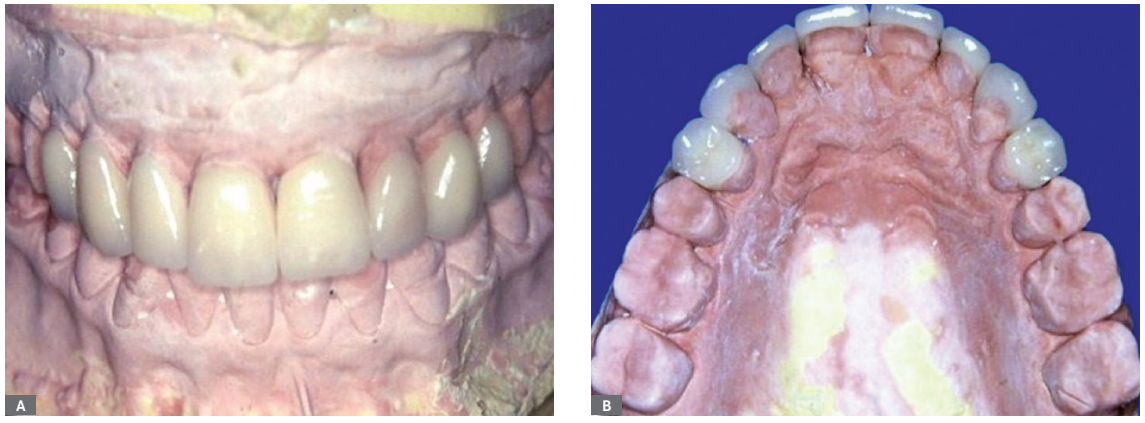

Figure 7: Ceramic restorations in front (**A**) and occlusal (**B**) views.

Figure 8: Placement of ceramic laminate veneers. **A)** Disocclusion of posterior teeth in protrusive movement/ **B**, **C)**. Reestablishment of maxillomandibular relationship.

Figure 9: Final result of treatment. Intra (**A**) and extra (**B**) oral views of treatment.(C).

open bite, provided that shape and size of teeth are taken into consideration.[17] Several factors must be analyzed in order to define the treatment planning. In this case report, concerning the discomfort of patient regarding her appearance, a faster treatment was chosen. Ferreira et al. (2015) presented the selective reshaping as an option for correction of anterior reverse articulation. The authors emphasize the advantages of treatment as a faster and less expensive treatment provided that a proper diagnosis is performed.[18]

The occlusal pattern was reestablished by selectively reshaping the posterior teeth, and reestablishing protrusive guidance by inserting provisional composite resin restorations in the anterior teeth. However, treatment definition was only possible due to an appropriate planning, on which the occlusal adjustment simulated in the casts was essential to verify whether the procedure would effectively reestablish the occlusal vertical dimension.

Hence, the simulation allowed us to determine the most appropriate treatment for the patient. As occlusal reshaping was minimal, the possibility to compromise biological structures was discarded. Ali et al. (2015) presented a similar case report, on which a multidisciplinary approach allowed closing an anterior open bite maintaining an esthetic outcome. However, we emphasize that anterior open bite may be related to complex etiologies that would require more invasive treatment options.[19,20]

Furthermore, we considered it indispensable to replace the previous restorations to suit the restorative procedures to the patient's occlusal pattern. After removal of unsatisfactory restorations, an optimal amount of tooth structure was observed. Hence, a conservative procedure based on replacement of laminate veneers was chosen rather than preparation of teeth for receiving full crowns. Ceramic restorations may promote excellent esthetic and predictability, provided that the occlusal pattern is stabilized.[21] Clinical conditions were considered acceptable to avoid failure of treatment, especially due to the optimal response presented during the provisional treatment. Thus, determining the functional and esthetic aspects of the treatment led to a satisfactory final result.

CONCLUSION

The esthetic and functional aspects defined during occlusal adjustment and provisional manufacturing were accurately reproduced in final restorations, allowing a satisfactory result. An appropriate occlusal pattern must be regarded as a primordial factor in determining the success of an esthetic rehabilitation. If occlusion is taken into consideration, the esthetic appearance is easily reestablished.

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