

COMPLEX ORAL REHABILITATION IN PSEUDO ANGLE CLASS III: A CASE REPORT**Andressa Serafini¹, Suleima Alves¹, Patrícia Curylofo¹, Priscilla Raile¹, Dr. Renata Rodrigues²,
Dr. Osvaldo Bezzon² and Dr. Valéria Pagnano*²**

¹Postgraduated Student, Postgraduate Program in Oral Rehabilitation, Department of Dental Materials and Prosthetics, School of Dentistry of Ribeirão Preto, University of São Paulo, Ribeirão Preto, SP, Brazil.

²Professor of Department of Dental Materials and Prosthetics, School of Dentistry of Ribeirão Preto, University of São Paulo, Ribeirão Preto, SP, Brazil.

Corresponding Author: Dr. Valéria Pagnano

Professor of Department of Dental Materials and Prosthetics, School of Dentistry of Ribeirão Preto, University of São Paulo, Ribeirão Preto, SP, Brazil.

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ABSTRACT

Oral Rehabilitation consists in a treatment with prosthetic solutions aimed at improving the oral health of the patient. The objective of this study is to report a case of a 45-year-old male showing poor esthetics and great difficulty in mastication. After a complete exam, it was found that the patient had pseudo Angle Class III malocclusion, ie, anterior crossbite, fully toothed maxillary arch, and Kennedy Class I on lower arch. However, when assessed in the position of Centric Relation, he showed an incisal edge position, suggesting that part of the crossbite was caused by mandibular protrusion. Through the restoration of Vertical Dimension of Occlusion with conventional prostheses, it was possible to correct the underbite. Oral rehabilitation with different types of prostheses can bring comfort and satisfaction to the patient, even not using more invasive approaches, as orthognathic surgery.

KEYWORDS: Oral Rehabilitation, Pseudo class III malocclusion, Centric Relation, Vertical Dimension of Occlusion, Removable Partial Denture, Fixed Partial Denture.

INTRODUCTION

The positioning of the jaw is driven by periodontal pulses through mechanoreceptors. Therefore, when there is loss of natural teeth, many receptors are lost or destroyed. Thus, a partial or totally edentulous patient may not be able to control jaw movement or to prevent deflective occlusal contacts when in centric relation (CR), as a toothed patient would do by often changing the mandibular postural rest position.^[1] For this reason, the importance and necessity of intermaxillary registration and models assembling in the CR position lie with the fact that it is a reference position for the development of an occlusion that is harmonious with all the stomatognathic system^[2], which is the key to the comfort and proper functioning of the patient.

In order to develop a healthy, harmonic and balanced operational occlusion in relation to the stomatognathic system, it is necessary to record the condylar guidance through some intra or extraoral method to adjust the orientation of the condyle^[3,4], so as to allow the centric occlusion of artificial teeth to coincide with the more reproducible possible position of the jaw closing or centric relation.^[1] There are two types of intermaxillary manipulation techniques. Chin point guidance^[5] and bilateral mandibular manipulation.^[6,7] Both techniques

are efficient and reproducible, however, some studies show that the most accurate method compared to the reproducibility of the CR is the bilateral mandibular manipulation^[8,9,10], advocated by Dawson.^[1]

In any dental treatment, diagnosis and treatment plan should be specific, that is, the treatment must have an individualized approach by obtaining as much information as possible: complete history; functional analysis; models mounted on articulator and radiographs.^[11,12,13,14] Multidisciplinary interaction is often required to conduct the clinical case.

A major challenge to the dentist in the clinic is to make the diagnosis of a patient presenting bad intermaxillary positioning of Angle Class III malocclusion. The causes of this type of malocclusion can be hereditary^[15,16]; congenital^[17] or acquired.^[18] Moyers (1988)^[19] reported that a patient with pseudo-Class III malocclusion has intermaxillary disproportion associated with acquired neuromuscular reflex, ie, there is anterior mandible displacement in the closing of the jaws, depicting a typical patient showing class III skeletal and dental patterns when in Maximum Intercuspatation (MI).^[20] The occlusal analysis during the clinical examination becomes the primary factor for diagnosis. The

malocclusion of a pseudo class III can be diagnosed by a cephalometric analysis; family history; canine and molar relations in both MI as well as in CR, and dento-skeletal morphology.^[21]

When the jaw is moved to the CR position, it presents a Class I skeletal pattern, a normal facial profile, and a Class I molar ratio. By keeping the jaw in this position, the front teeth may have both horizontal and vertical overlap, without contact, or an incisal edge position. This mandible manipulation shows that an increase in the vertical dimension of occlusion (VDO) is required, making the rehabilitation treatment challenging.^[22]

Patients are increasingly aware of the high quality present in the dental field, thus requiring greater longevity and less invasive treatments for their dental therapies. Due to increased awareness; access to oral health professionals and improvements in dental materials and technological advances, several options have been created and, therefore, the dental community needs to have a new look over proper diagnosis and planning techniques aimed at less invasive dental treatment with confidence to provide great therapeutic benefits to patients.^[23]

The objective of this work is to report a case of oral rehabilitation of a pseudo-class III patient in which, through correct diagnosis, it was possible to recover the patient's VDO by using mounting articulator; diagnostic wax up and making fixed prostheses associated with Removable Partial Denture (RPD), thus avoiding more invasive treatment such as orthognathic surgery.

CASE REPORT

A male patient, 45 years old, attended the Clinic of Specialization of Course of Dental Prosthesis of the

School of Dentistry of Ribeirão Preto, University of São Paulo, showing lack of lower posterior teeth and significant occlusal imbalance.

During anamnesis, he reported to have never used prostheses; lack of pain or any other signs and symptoms of temporomandibular joint disorders (TMD). Investigations confirmed mild bone resorption in both dental arches and satisfactory periodontal and systemic conditions. There were previous endodontic treatment in teeth 12, 13 and 22, but the restorations made after the endodontics fractured in a short time, which motivated him to seek rehabilitation treatment.

Clinical examination revealed a Angle Class III maxillomandibular relation with anterior crossbite in Maximum Intercuspatation (MI) (Figures 1a and b). The facial contour showed a greater growth of the mandible in relation to the maxilla; however, when guiding the patient's mandible towards centric relation (CR), an incisal edge position was obtained (Figure 2), suggesting that the anterior crossbite could be caused by mandibular protrusion.

The presence of bilateral angular cheilitis at the beginning of the treatment was an indicative of loss of VDO, due to the loss of the lower posterior elements.

The Vertical Dimension at Rest (VDR) calculated by Willis Compass was 51 mm. The VDO that the patient presented in MI was 44 mm. Thus, the ideal VDO was calculated according to the following formula: Ideal VDO = VDR - freeway space. The freeway space calculated was 4 mm. Thus, the ideal VDO would be 51 mm - 4 mm = 47 mm. It was concluded that it would be necessary to recover the VDO in 3 mm (47 mm - 44 mm).



Figure 1. Initial photograph of the patient. Front view (a). Patient in MI (b).



Figure 2. Intraoral examination, patient in CR.

Aiming at the correct planning of the case, the study models were mounted on a semi-adjustable articulator (articulator 4000, BIOART, São Carlos, Brazil) in CR based on the interocclusal record obtained through the use of a Jig, made with acrylic resin (Duralay, Reliance Dental MFG Company, Worth- IL, USA) and recording bases of acrylic resin (Jet, Articles Dental Classic Ltda., Campo Limpo Paulista, Brazil) and dental wax rolls (Wilson, Polidental, Cotia, Brazil) (Figure 3). In Figure 4 (a and b) it is possible to see the positioning of the teeth in MI after the removal of the interocclusal record.



Figure 3. Installation of CR models.

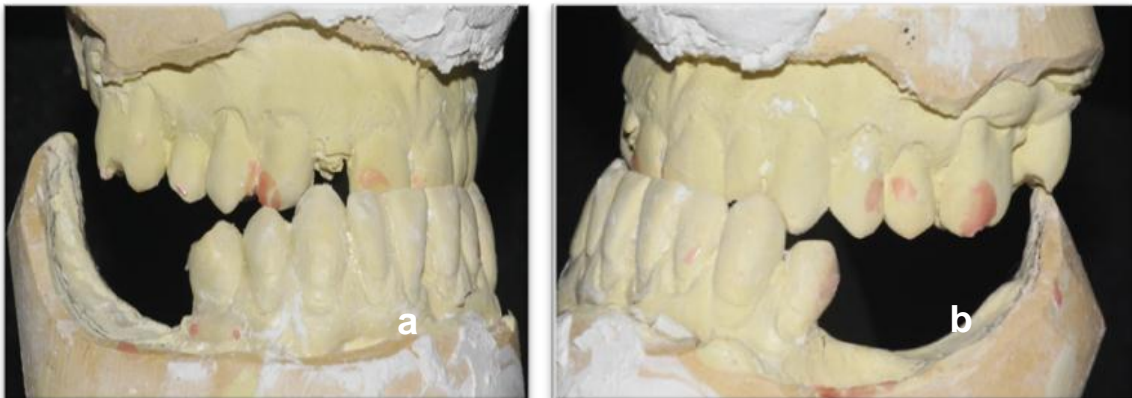


Figure 4. Right Side View of MI (a). Left side view of MI (b).

Dental preparations for metal-ceramic crowns were planned for the following elements - 15;14; 13; 12; 11; 21; 22 and 23; 34 and 45, also the selective grinding of the incisal edges of the lower anterior teeth and lower Removable Partial Denture (RPD) to replace posterior elements. Through the diagnostic wax up (Figure 5) we could obtain predictability of the treatment and patient compliance. Replicas of the models were obtained for the preservation of the diagnostic wax up models and later selective grinding on the incisal edges of the duplicate model.



Figure 5. Diagnostic Wax up.

Temporary crowns were obtained (Figure 6) from silicon condensation impression (Speedex, Coltene, Altstätten, Switzerland) directly on the models mounted on articulator which had its teeth previously selectively ground. The selective grinding made on the mandibular study model was transferred to the mouth with the help of a dry-point compass (Jon, São Paulo, Brazil) (Figure 7).



Figure 6. Temporary prosthesis obtained.

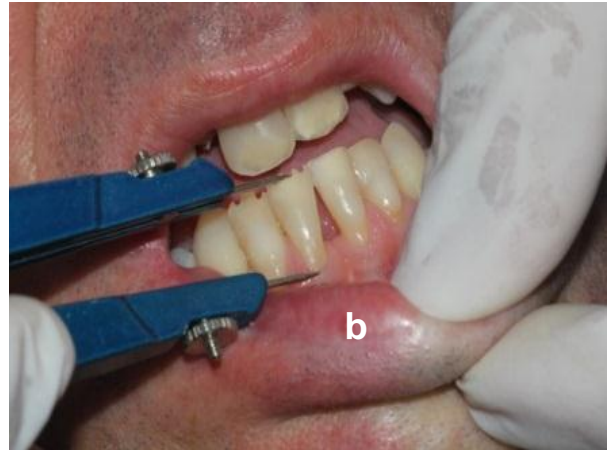


Figure 7. Transferring the selective grinding performed on the model (a) to the oral cavity (b).

Following to that, the preparations on the upper teeth were performed, being it necessary to prepare the root canal for the confection of molten metal core for teeth 13 and 12 and, later, temporary crowns were cemented over them (Figure 8).



Figure: 8 Temporary prosthesis installed.

New impression was performed with all temporary prosthesis in position for reassessment of the reestablished VDO, making sure that 47 mm were suitable for the restoration of the VDO. The patient reported to be comfortable and the bilateral angular cheilitis disappeared.

The final rehabilitation of the mandibular arch was performed through the cementation of the metal-ceramic crowns on elements 34 and 45, and the installation of RPD (Figure 9). Sixty days after the use of temporary upper crowns, the final rehabilitation of the maxillary arch was performed through the cementation of metal-ceramic crowns and the case was finalized (Figure 10).



Figure: 9 Maxillary arch with temporary prosthesis and mandibular with metal-ceramic and RPD.



Figure: 10. Final view of the clinical case.

DISCUSSION

For an accurate diagnosis, complete extra and intraoral assessments are mandatory.^[24] Radiographs (intra- and extra-oral); examination of the oral tissue; periodontal evaluation and occlusal analysis using study models are fundamental tools for diagnostic evaluation.^[25,26] Through these resources it was possible to find out that the patient had pseudo-class III malocclusion, added to poor occlusion.

The resolution to this case would be Orthodontic^[27,28] and also the possibility of a surgical association to it.^[29] However, the most important factors to be considered in the diagnostic and planning process are basically the patient and their expectations. In this case, this type of treatment was discarded by the patient due to socio economic issues; age; treatment duration and for being a more invasive and painful rehabilitation.

During the diagnosis, the models were mounted on an articulator having as a treatment strategy the rearranging of his occlusion and the establishment of a new occlusal scheme around a suitable condylar position, as the CR^[30], which is considered to be comfortable and reproducible.^[1]

In the study of Lila-Krasniqi *et al.* (2015)^[31] when individuals having fixed prostheses were evaluated for the discrepancy between MI and CR, no relationship with Temporomandibular dysfunction was detected, thus the authors concluded that what matters in an oral rehabilitation is to position the temporomandibular joint focusing on occlusal, muscle and joint balances. In this case study, positioning the joint in CR was the way to establish the balance among these factors by establishing a standard incisal edge position in accordance with Cardoso *et al.* (2014)^[32], who rated the record in CR as simple, fast and free of charge, thus playing a decisive role in the differential diagnosis for patients with pseudo-Class III profile.

Furthermore, through the evaluation of the patient's facial appearance and by using the method of Willis, the loss of VDO was observed, which can be attributed to the lack of the lower posterior teeth, considered by

Abduo and Lyons (2012)^[24] one of the main causes to it. Complete dentures related studies have reported that the loss of VDO can compromise aesthetics; promote temporomandibular disorders; lower facial height and rotate the jaw forward and down^[33,34,35], which is probably associated with the pseudo-class III of the patient. Thus, it was necessary to recover the lost VDO in 3mm, which was considered to be a feasible increase^[36,37] that enabled the construction of a new occlusal plane.

Through diagnostic wax up, temporary crowns were made for the evaluation of the established VDO, which provided increased overall comfort; acceptance and adherence to treatment.^[24] According to Seol *et al.* (2010)^[37] waxing is essential to provide a previous analysis of the final treatment for both, the patient and the dentist.

After the installation of temporary crowns, there was a 2-month waiting period to, only then, perform possible changes on the established VDO, because when erroneously decreasing vertical dimension, the occlusal force is also decreased; and, on the other hand, increased vertical dimension can cause psychological stress to the patient.^[38] After reassessing the VDO and finding the appropriate height, the metal-ceramic crowns and lower RPD were installed.

In the present case, the restoration of condylar position in CR, and the increased VDO allowed comfort and aesthetics to the patient eliminating the need for more invasive treatments with orthognathic surgery. However, such behavior was only possible due to the previously established, correct diagnosis and planning of the case.

CONCLUSION

Through a correct mandibular manipulation it was possible to restore the Vertical Dimension of Occlusion and to correct the underbite with conventional prostheses. Oral rehabilitation with different types of prostheses can bring comfort and satisfaction to the patient, even not using more invasive approaches as orthognathic surgery.

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