

Lingual Orthodontics as an Aesthetic Resource in the Preparation of Orthodontic / Surgical Treatment

By Silvana Allegrini Kairalla, MD; Aluísio Galiano, MD; Luiz Renato Paranhos PhD

Abstract: The lingual technique was introduced in the late '70s and, just like orthodontics, it has developed significantly in the past few years. Adult and young adult have been attracted to such alternative aesthetic treatment. Despite their need of orthodontic treatment, they want to have an aesthetic alternative, as "invisible" as possible - something that can be achieved with the lingual technique. Nevertheless, many treatment or retreatment cases also demand correction through orthognathic surgery, a process which is nowadays much simpler and considered an effective auxiliary method for the malocclusion correction. Having posed that, this study aims to show correction of malocclusion and discrepancy between dental arches through lingual orthodontic technique associated to orthognathic surgery. This study shows that it is possible to provide the patient who suffers from malocclusion with proper correction, achieving the desired aesthetics by using lingual braces and performing lingual orthognathic surgery.

Keywords: Malocclusion. Corrective Orthodontics. Orthognathic Surgery.

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Introduction

In recent times, patients, mostly adults, have increasingly demanded dental malocclusion correction. Several reasons lead to such fact;

however, the aesthetic factor is the major one – whereas the need for correction of anterior crowding is the main complaint.¹ Such small dental crowding is generally related to the terminal growth of the jaw.

However, when patients are evaluated, it becomes clear that, in most cases, it is not enough to correct the aesthetic problem, as the supporting part of the teeth, in other words, the bone part, is often compromised. In some cases, especially in adults, one can search orthodontic correction through dental compensation. Nevertheless, such kind of treatment is not always possible, and then an additional orthognathic surgery will be necessary.²⁻³

Adults and young adults have increasingly sought more aesthetic⁴ treatments, and the field of orthodontics has developed a lot in that sense, especially with the introduction of ceramic brackets in the 80's.⁵ After the lingual technique appeared, the field stagnated in the USA.⁶⁻⁷ However, the technique continued to be developed in Asia and Europe and is currently used worldwide.⁸

Since orthodontic patients are increasingly more demanding, the search for treatments which are as aesthetic as possible, or even almost invisible ones, like the lingual technique,⁹ has increased considerably. The method is suitable for all kinds of orthodontic treatment that may be executed in the buccal technique.¹⁰ Therefore, this study aims to report, explain and exemplify, by reporting a clinical case, the possibility of performing a surgical orthodontic treatment with the use of lingual braces.



Figure 1a: Initial frontal photograph.

Figure 1b: Photo of profile, showing the patient's pattern II.

Case Report

Patient M.H., 29-years-old, leucoderma, Pattern facial II, dolichofacial (Figures 1a-b) looked for an oral and maxillofacial surgeon complaining of frequent and severe pain in the temporomandibular joint on both sides.

She had already undergone a compensatory orthodontic treatment in her adolescence, in an attempt to correct the dental Class II and the anterior overjet. The patient reported dissatisfaction with the results obtained with the compensatory orthodontic treatment with the severe painful symptoms she started to present after the compensatory orthodontics. The patient reported pains on the right and left sides of the mandibular joints.

After clinical and imaging evaluation, the conclusion was that a surgical treatment of the TMJ and the repositioning of the maxillo mandibular complex would be the most appropriate option to solve the case, once palliative types of treatment

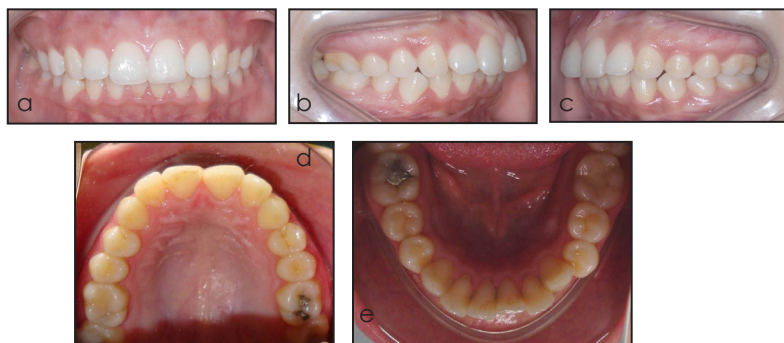


Figure 2a: Intra oral frontal initial photograph.
 Figure 2b: Intra oral initial photograph of the right side.
 Figure 2c: Intra oral left initial photograph of the left side.
 Figure 2d: Intra oral initial photograph of the occlusal view of the maxilla.
 Figure 2e: Intra oral initial photograph of the occlusal view of the mandible.

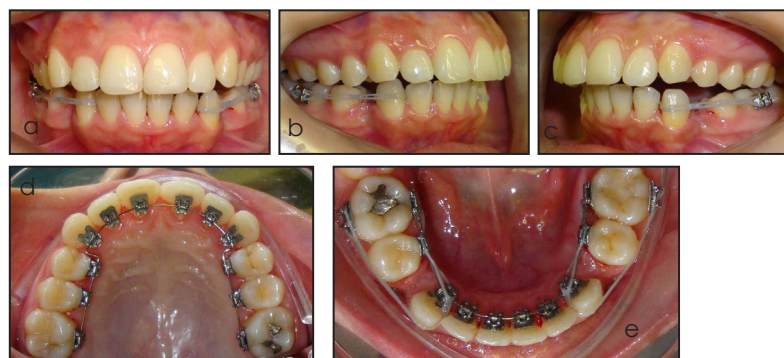


Figure 3a: Retraction phase with lingual self-ligating braces Innovation L.™
 Figure 3b: Retraction phase overlooking the right side with lingual braces.
 Figure 3c: Retraction phase overlooking the left side with lingual braces.
 Figure 3d: Occlusal view of the maxilla with lingual braces.
 Figure 3e: Occlusal view of mandible with lingual braces.

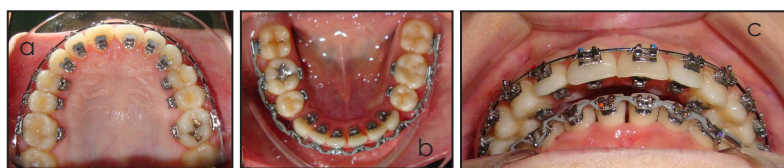


Figure 4a: Occlusal view with lingual braces during the leveling phase in the maxillary dental arch.
 Figure 4b: Occlusal view with lingual braces during the final in the maxillary dental arch.
 Figure 4c: View of the overjet between the maxilla and the mandible.

to cure the painful symptoms and had no positive effect in the past. Therefore, a surgical treatment of the right and left temporomandibular joints (repositioning the articular disc by using mini-anchor), and the repositioning of the maxilla, mandible and chin were planned.

The patient had an Angle's Class II malocclusion, crowding in the maxilla and mandible, with accentuated proclination of lower incisors as shown in Figures 2a-e.

As a result, the orthodontic plan was implemented, which consisted extracting the first premolars in order both to improve the inclination of the lower incisors which were very proclinated and achieve an ideal overjet, in order to allow the required surgical advancement of the mandible, and, in this way, harmonize the facial profile.

As the patient had undergone a previous orthodontic treatment with vestibular metal brackets, she preferred this new treatment to be done in the most aesthetic way as possible. The plan was to start with a treatment with Innovation L™ (GAC) lingual self-ligating braces, and then to start the anterior inferior retraction and the leveling of the maxillary dental arch, as shown in Figures 3a-e.

About a year after the beginning of the treatment with lingual braces, the space of the extractions had been practically closed and the leveling of the teeth had been completed, in order to allow the surgery to take place.

A week before the surgery the patient received vestibular conventional metal braces and the passive rectangular surgery arch, in order to enable the surgeon to stabilize the adequate mandibular maxillo relation in the trans-operative period. Such stabilization could be accomplished with skeletal anchorage, through the placement of orthodontic micro-screws, but because it the case involved advance and a quite meaningful counterclockwise rotation of the maxillomandibular complex, the surgeon opted for the use of vestibular brackets, which ensure a safer and more appropriate surgical manipulation, also allowing a greater stability and the maintenance of the post-operative occlusion with light force elastic - if necessary (Figures 4a-c). The surgery was executed sequentially from left and right joints in succession as shown in Figures 5a-f. Then there was a bilateral sagittal split osteotomy of the mandible, the placement of the intermediate surgical guide and the fixation with mini-plates and micro-titanium screws (Figures 6a-c).

When the mandibular positioning was ready, a Lefort type I maxillary osteotomy was performed, and the final positioning of the occlusal adjust was done after installation of maxillary palatal retention and the maxillo-mandibular fixation. The fixation with titanium mini and micro-plate screws was then performed on the jaw in order to stabilize it in its pre-drawn position, as planned (Figures 7 a-e). Finally, chin surgery was performed so as to achieve the final harmony of the face (Figure 8).

The treatment was over after sixteen months (Figures 9 a-e) and the aesthetic result can be verified by comparing the photographs before and after the surgery, with the frontal (Figures 10a and b), profile (Figures 11a and b) and smiling photos (Figures 12a-c).

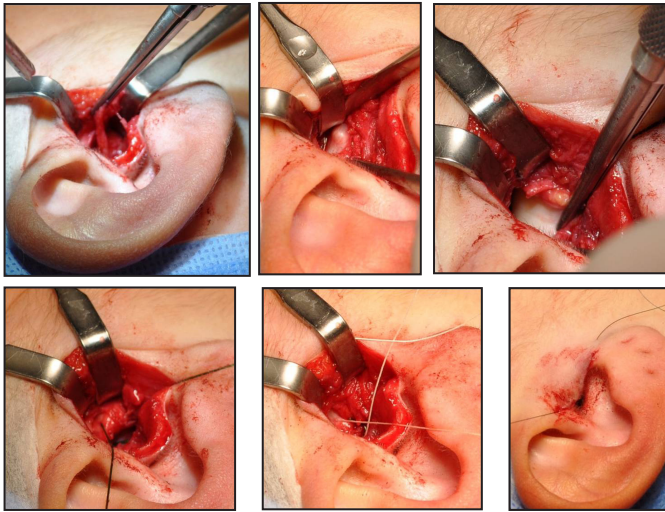


Figure 5a: Excising bilaminar tissues.
 Figure 5b: Intact condylar fibrocartilage.
 Figure 5c: Disc pulled back in place after freeing anterior disc attachment.
 Figure 5d: Placing sutures through disc.
 Figure 5e: Placing sutures to close bilaminar tissue.
 Figure 5f: Intradermic suture.

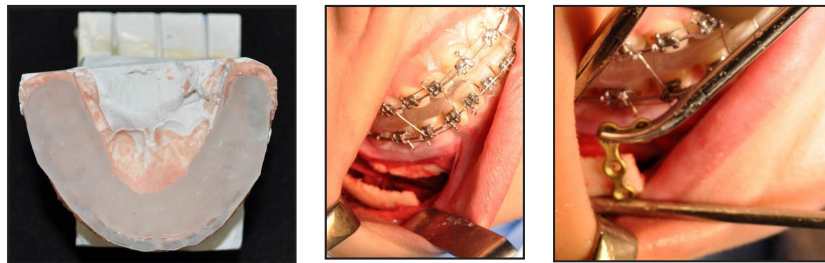


Figure 6a: Mandibular splint.
 Figure 6b: Right mandibular sagittal split osteotomy.
 Figure 6c: Placing rigid fixation on right mandibular sagittal split osteotomy.

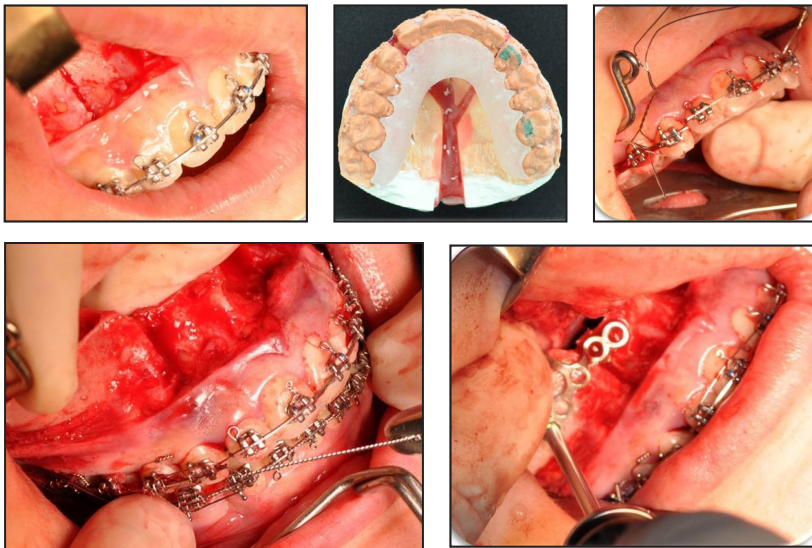


Figure 7a: Interdental maxillary osteotomy
 Figure 7b: Maxillary splint
 Figure 7c: Placing wires on first pre molars and first molars to stabilize the maxillary splint
 Figure 7d: Placing final occlusion
 Figure 7e: Placing rigid fixation on the maxillary osteotomies

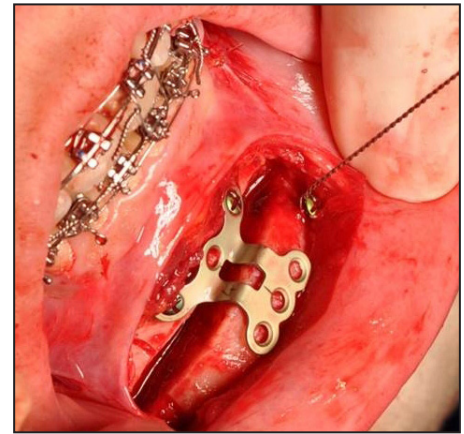


Figure 8 - Placing rigid fixation on the chin osteotomy.



Figure 9 - Intra Oral Photograph front end.
 Figure 9 b - Photograph of the intra oral end of the right side.
 Figure 9 c - Photograph of the intra oral end of the left side.
 Figure 9 d - Photograph of the intra final oral occlusal view of the maxilla.
 Figure 9 e - Photograph of the intra final oral occlusal view of the mandible.

Discussion

Convincing a patient who presents facial and occlusal disharmony that the best treatment for him/her implies surgery is not an easy task, and the arguments are based primarily on the functional improvement that it will be achieved the end of the treatment, as well as the facial balance and harmony that s/he will acquire with the whole procedure and treatment. In the case described above, the task has become less arduous, because the patient had already undergone a compensatory orthodontic treatment and the result was not as expected.

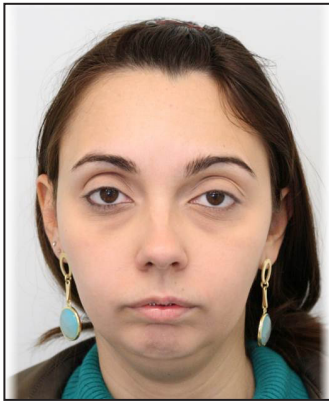


Figure 10 - Pre-surgery frontal photograph
Figure 10 b - Post-surgery frontal photograph

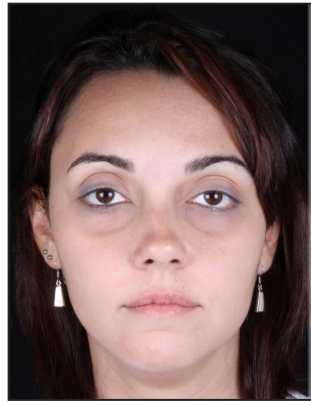


Figure 11 a - Pre-surgery profile photograph
Figure 11 b - Post-surgery profile photograph

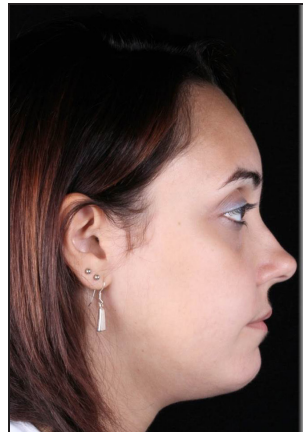


Figure 12 - Pre-surgery Smile photograph
Figure 12 b - Post-surgery smile photograph

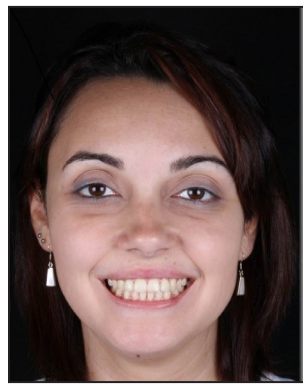


Figure 12 c - Patient smiling

In what concerns the dental esthetics, the patient had reported no complaints, but the existence of continuous pain (head and neck), as well as the limitation of mouth opening - led the patient to accept a faster surgical treatment.

Another important factor that should be taken into consideration concerns the need for wearing braces before the surgery, once the teeth have to be aligned and leveled. Therefore, in many cases, an ortho/surgical treatment has to be done, including extractions prior to the surgery.²⁻³ In the case above, the necessary extractions were the first pre-molars, in order to solve the lower crowding and improve the position or compensation of the lower incisors which were not very proclinated and did not allow the necessary corrections to advance the mandible. The purpose of the mandibular extractions was to increase the intermaxilar discrepancy. Thus, the surgical movement was maximized, obtaining the desired facial harmony even with the occlusion finalized with class I canines and molars in Class II.^{11,12}

It is important to mention that the patient had undergone orthodontic treatment and did not want to use vestibular brackets again, and this was precisely the greatest barrier to the surgery.

Therefore, he was offered an aesthetic and invisible treatment,⁹ during the active phase of treatment where the brackets were bonded on the lingual surface of the teeth^{6,8,10} and, only a little before the surgery is that the buccal braces were placed, so that the bindings during surgery could be done, as suggested by some authors.^{13,14} The braces were removed 45 days after the surgery, that is, when the patient was discharged by the surgeon, so that she could complete the orthodontic treatment - which occurred two and a half months later.

Conclusion

When the patient strongly desires an aesthetic look, especially during the long period of orthodontic treatment before the surgery, the lingual braces treatment can be used with a subsequent orthognathic surgery.

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