



## Case Report

## Orthognathic surgery in a precocious edentulous patient

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## المخلص

تهدف هذه الورقة إلى مناقشة دور جراحة تقويم الفك كعلاج بديل قابل للتطبيق في مريض مصاب بانعدام الأسنان المبكر. يقدم تقرير الحالة الحالي مريضاً عمره ٣٢ عاماً مصاباً بانعدام الأسنان المبكر مع طقم أسنان مزدوج وتشوه سني وجهي. وساءت الحالة بسبب فقدان لأسنانه في وقت مبكر. جراحة تقويم الفك هي الإجراء الذي اكتسب شعبية في جراحة الوجه والفكين كما هو في الوقت الراهن أكثر سهولة للمرضى. حيث يقلل من تكاليف الجراحة مع تزايد عدد الجراحين لهذا النوع من الجراحة. الغالبية العظمى من المرضى الذين يخضعون لهذه الجراحة هم من البالغين الشباب؛ على الرغم من أن العمر ليس عائقاً أمام الأداء التقويمي. لكن يفضل المرضى الأكبر سناً أنواعاً أخرى من العلاج بسبب مرضته. جراحة تقويم الفك هي علاج قابل للتطبيق ويمكن التنبؤ بنتائجه لإعادة التأهيل بعد الجراحة التعويضية لمرضى انعدام الأسنان الكلي.

**الكلمات المفتاحية:** جراحة تقويم الفك؛ طقم أسنان؛ كاملة؛ طب الشيخوخة؛ فقم

## Abstract

This paper aims to discuss orthognathic surgery in a precocious edentulous patient as a viable alternative treatment. The present article is a case report of a total edentulous patient 32 years ago, with a double denture and dentofacial deformity, aggravated due to the early loss of teeth. Orthognathic surgery is a procedure that has been gaining more and more space in the specialty of maxillofacial surgery and traumatology because it is currently more accessible to patients due to the reduction in surgery costs and the greater number of surgeons who

perform it, among others. The vast majority of patients who undergo this surgery are young adults. However, age does not impede orthognathic performance, older patients prefer other types of treatment due to its morbidity. Orthognathic surgery is a viable and highly predictable treatment in cases of prosthetic rehabilitation of totally edentulous patients.

**Keywords:** Complete; Denture; Geriatrics; Orthognathic surgery; Prognathism

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## Introduction

Brazil is a country with a large number of toothless people.<sup>11</sup> Although there are several types of prostheses that could be used to restore function and aesthetics, rehabilitation is challenging in some cases, such as in patients who were toothless at a young age with dentofacial deformities.

Patients with dentofacial deformities tend to undergo multiple confections and replacement of prostheses due to difficulty or impossibility of the procedure, depending on the degree of deformity. This is because the prostheses cause great discomfort to the patient and/or have an extremely short life; they often fracture because of the occlusion that can happen due to the manufacture of unstable prostheses. There is an aggravating factor in edentulous patients from a young age, with exaggerated bone resorption. This fact reduces the area of support of the prostheses and hinders their retention.

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One factor that can also make it difficult to manufacture dentures in patients who have been toothless from a young age is bone resorption, which mostly occurs through the vestibular in the maxilla and the lingual in the mandible.<sup>1</sup> This can lead to a misperception that the patient has dentofacial deformity, in addition to an increase in the inter-arch space.<sup>2</sup>

This article reports the first step of prosthetic-surgical rehabilitation of a patient who had a dentofacial deformity and was completely toothless from a young age.

## Materials and Methods

We report a complex case of a patient with dentofacial deformity and early tooth loss with a literature review to discuss a viable, predictable, and stable alternative in the case of patients who need major advances for dental-facial corrections and prosthetic rehabilitation. This study followed the principles of the Helsinki statement on health in all the policies. Written voluntary and informed consent for the surgery and verbal consent were obtained from the patient for publishing this report.

## Case report

### *Diagnosis and aetiology*

A 56-year-old female patient with leukoderma presented to a private clinic in the city of São Paulo on August 13, 2015 complaining of masticatory difficulty. She reported that all of her prostheses were very painful and had an extremely reduced durability. She had also lost all her teeth at a very young age, 32 years ago.

The patient was edentulous in the initial physical examination, and presented a mandibular advancement and maxillary setback, making it challenging to manufacture prostheses with adequate shape and function.

The patient arrived at the clinic and was ready to undergo orthognathic surgery, but questioned whether she would fit the profile of a surgical patient. The answer was positive, and cephalometric documentation was requested for a better assessment of the case.

## Results

### *Treatment proposal*

When evaluating the documentation, especially the face radiographs (lateral and frontal norms), we verified that the patient had a 9-mm mandibular advancement and a 3-mm maxillary setback. The patient had already consulted other surgeons, and the initial plan was to perform surgery to restore the mandible without repositioning the maxilla.

When analysing the documentation combined with the clinical examination, it could be seen that the patient had a more deficient maxillary relationship than a mandibular protrusion. Therefore, it was decided not to change the mandibular position, but to perform a maxillary advance to avoid a long advance that could generate a biprotrusion. In the prosthesis, it was decided to slightly compensate (less



**Figure 1:** Frontal view, pre-surgery.

than 5°) the inclination of the patient's teeth; therefore, the total maxillary advance was reduced to 12 mm. We also decided not to perform bimaxillary surgery because of the risk of paraesthesia and/or some unwanted sagittal fracture due to moderate mandibular atresia, in addition to the risk that a mandibular setback could alter the patient's breathing for worse, especially during sleep, even causing apnoea.

Intraoral access was performed by Le Fort I osteotomy. The prostheses were fixed after detachment and bone exposure. Both prostheses received holes through which the



**Figure 2:** Immediately post-surgery, frontal view.



**Figure 3:** Profile view, pre- and post-surgery.

locking screws were inserted to save time during the surgery. Bilateral osteotomy and maxillary movements were performed. Intermaxillary block and fixation of advanced maxillary segment. Due to the extensive and early bone loss, it was challenging to fix the screws due to the extremely papyraceous bone; however, no plate was left out because of this. A Lindorf-type plate and two 'L' plates were used on each side of the maxilla. Screws with a length of 5 mm were used. The papyraceous bone of the region made it difficult to fix the plates, but no change in their position or shape was necessary. No graft was performed on the patient (see [Figures 1 and 2](#))

In the profile image ([Figure 3](#)), it is possible to notice the alteration of the maxillary region and nasal positioning, giving the patient a more youthful appearance.

The patient was satisfied with the result, not only because of the aesthetics, but also because she had been able to regain the functions she had lost many years ago, mainly chewing and speech. Presently, the patient uses the same prostheses installed during surgery and is in the planning stage for prosthetic rehabilitation using implants. There was no negative impact on the breathing, and the osteotomies were consolidated, with no signs or symptoms of pseudoarthrosis and/or bone malformation.

### Discussion

The importance of orthognathic surgery for patients, with effects that tend to increase people's self-esteem and quality of life, has been demonstrated by several authors,<sup>3</sup> not only because of the aesthetic benefits, but also for the functional changes, especially in Class III facial pattern individuals.<sup>4,5</sup>

There is no protocol regarding the sequence of treatments: orthognathic surgery, grafts, and rehabilitation using implants for edentulous patients<sup>6</sup>; it can vary according to the

patient's profile and even according to the team's experience. Several studies recommend that the best sequence would be to start by performing orthognathic surgery combined with the installation of implants in just one surgical time.<sup>1,7,8</sup> However, this reference has many variables, such as the availability of certain materials and the patient's financial condition. Thus, there is no fixed rehabilitation sequence; however, it is important that the steps are carried out within an acceptable period of time, such that the result is not compromised.

Intrasurgical navigation is a promising technique in these specific cases with the installation of implants assisted by a browser simultaneously as orthognathic surgery. However, it is still a recent technique and requires more foundation and consistent results in the long run.<sup>9</sup> Osteogenic distraction can also be used with relative success, according to some authors.<sup>10</sup>

### Conclusion

Orthognathic surgery in total edentulous patients and those with prostheses is a promising therapeutic alternative, since it allows prosthetic rehabilitation, whether through implanted or mucosal-supported prostheses. It is a more stable procedure that does not require excessive dental inclinations, which can reduce the life of the prostheses and cause discomfort to the patient. The change in planning from bimaxillary surgery to mandibular advancement proved to be viable and stable, and did not have any adverse effects on the patient.

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### Conflict of interest

The authors have no conflict of interest to declare.

### Ethical approval

We confirm that this manuscript followed all ethical protocols, including the Helsinki protocol. No patient has been submitted to unethical procedures, experimental procedures, or anything considered unusual to any health and ethical protocols around the world.

All the Helsinki protocol items were followed. This case was operated under private practice; therefore, there is no ethical committee involved. I, the corresponding author was the surgeon of this case and would like to publish it through my university, but the university was not responsible for the patient or the case.

### Authors contributions

RG conceived and designed the study, was the main surgeon of the case, and provided logistic support. CRPJ and MOCDL conducted the research, provided research materials, and collected and organised the data. RGT wrote the initial and final drafts of this article. All authors critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

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