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Alternative management of patients with gummy smile due to maxillary growth: Clinical case

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Abstract
The patient's smile plays an important role in his psychology, managing to express joy, confidence, kindness, among other emotions. Gummy smile or subsequently, short tooth syndrome has been defined as a nonpathological condition causing esthetic disharmony in which more than 3 mm of gingival tissue is exposed when smiling. Having various etiologies such as excessive maxillary growth, short upper lip, or abnormal eruption of maxillary anterior teeth, it indicates that the approach to the problem can also be varied. Despite orthognathic surgery being the ideal treatment for some cases, it is important to recognize that there are contraindications and disadvantages of this type of surgery. The lip stabilization technique or LipStaT® is a minimally invasive and novel procedure that seeks to improve the appearance of the smile by repositioning the upper lip and decreasing the amount of gum showed during dynamic smile. In this clinical case, it was detected that the main problem of the patient lies in the excessive maxillary growth, for which the ideal treatment of the patient lies in orthognathic surgery, however, he does not agree to this, for which the approach will focus on something minimally invasive compared to orthognathic surgery, such as crown lengthening elaboration and lip repositioning.

Keywords: Gummy smile, maxillary growth, lip repositioning, altered passive eruption

Introduction
The patient's smile plays an important role in his psychology, managing to express joy, confidence, kindness, among other emotions. Therefore, an affectation of this will have an impact on his self-esteem. One of the most common aesthetic problems and with the greatest impact on patient confidence is the 'Gummy Smile' [1].
Gummy smile or subsequently, short tooth syndrome has been defined as a nonpathological condition causing esthetic disharmony in which more than 3 mm of gingival tissue is exposed when smiling [2].
The etiology of the gummy smile is often multifactorial, so the diagnosis must be accurate in order to obtain the appropriate treatment and the expected results [3].
Having various etiologies such as excessive maxillary growth, short upper lip, or abnormal eruption of maxillary anterior teeth, it indicates that the approach to the problem can also be varied. For the correct diagnosis we will need the evaluation of the following aspects: medical history, facial analysis to find alterations between the facial thirds, such as excessive vertical growth of the maxilla, lip and perioral muscular analysis, dental analysis and periodontal analysis [2].
Orthognathic surgery for the correction of dentofacial deformities has been a standard treatment for more than 20 years. Orthognathic surgery aims to correct the dysmorphisms of the jaws whose origin can come growth disorders of the maxilla and mandible. Both dental function and aesthetic goals should be achieved simultaneously through orthognathic surgery, and doing so requires consideration of both skeletal movement and soft tissue changes. In recent decades, the surgical goals of orthognathic surgery have shifted to become primarily aesthetic [4].

In order to succeed in our treatments and to decide of an orthodontic-surgical, simple orthodontic or interceptive approach, it would be necessary to seek to be individualized as appropriate. This individualization depends on several factors, of which we will retain mainly three: the “timing” of the orthodontic treatment, the cephalometric analysis and the desires of the patient [5].

Despite orthognathic surgery being the ideal treatment for some cases, it is important to recognize that there are contraindications and disadvantages of this type of surgery, such as: planning that takes a long time, high costs that prevent it from being a routine treatment, temporary worsening the appearance of the patient; and psychological problems due to delays in achieving the main demand of the patient, which is usually an aesthetic facial appearance, a technique of high surgical skill since any minor error could affect the treatment result, some patients reject the use of orthodontics altogether with the surgical treatment for which orthodontic stability problems could arise, it can be considered an invasive surgery due to the use of general anesthesia depending on the approach technique of the surgeon [4, 6, 7, 8], some patients cannot undergo surgery when their systemic state is not ideal , or patients with uncontrolled Diabetes Mellitus due to increased probability of tissue necrosis, patients with thalassemia at increased risk of bleeding and infection, bone and joint disease, patients with skeletal immaturity, those with progressive dentofacial disease, vitamin D deficiency, disease Chron's and chronic obstructive pulmonary disorder [9].

Rubenstein and Kostianovsk first described a technique similar to the LipStaT in 1973 called Lip repositioning. The LipStaT is a very versatile technique and can be used in a wide range of clinical situations with gingival display. The lip stabilization technique or LipStaT® is performed by limiting the retractions of the smile muscles, such as zygomaticus, orbicularis labia, elevator of the angle or elevation of the lip. This technique it is a minimally invasive and novel procedure that seeks to improve the appearance of the smile by repositioning the upper lip and decreasing the amount of gum showed during dynamic smile [10].

In this clinical case, it was detected that the main problem of the patient lies in the excessive maxillary growth, for which the ideal treatment of the patient lies in orthognathic surgery, however, he does not agree to this, for which the question arises of how be able to address these cases when our patients do not want the initial treatment plan?

Case report

A 55-year-old patient comes to the consultation because she mentions that "she shows a lot of gums when she smiles", she mentions being very affected because her relatives make fun of her way of smiling, as part of her medical history the patient has pressure problems high and Diabetes Mellitus.

Diagnosis

For the diagnosis of the patient the following parameters were evaluated [3]:

1. Patient medical history.
2. Facial analysis.
3. Lip analysis: static versus dynamic.
4. Rest position analysis.
5. Dental analysis: crown length and incisal margin.
6. Periodontal examination.

When performing the evaluation, it was determined that the patient had a gummy smile due to excessive growth of the maxilla and altered passive eruption. Therefore, orthognathic surgery is chosen as the ideal treatment, however, the patient refuses this plan due to fear of recovery from this type of surgery and because of its economic possibilities. As a second option for her problem, crown lengthening is mentioned, and subsequent evaluation for lip repositioning, to which the patient accepts said option.

Procedure

Scaling is performed one week before surgery

The patient is rinsed with 0.12% chlorhexidine for one minute, before surgery (Fig. 1), anesthetized with Articaine from dental piece 1.6 to 2.6, thus anesthetizing the anterior, middle and posterior nerves of both quadrants, anterior palatal anesthesia is placed and posteriorly, once anesthetized, the SCUs are located for the subsequent performance of the gingivectomy (Fig. 2). Once completed, the full thickness flap is raised (Fig. 3) to proceed to the ostectomy where 3mm of the SCU was left to the bone marginal crest of the parts 1.6 to 2.6. 5-0 nylon Ethicon™ with single suture technique is used to close the flap. The sutures were removed after 4 weeks since the patient did not return until that period (Fig. 4).

Approximately 6 months were expected for reassessment (Fig 5), where the patient wanted to continue with the treatment plan for lip repositioning surgery.

To perform the Lip Repositioning surgery (Fig.6), the area to be affected is marked with Viscot® surgical pen (Fig.7), based on the level of exposure of the gummy smile in which our patient had 6mm of exposure [11], so our vertical incisions will be 12 mm, starting above the mucogingival line, and our horizontal extension will cover the piece from 1.6 to 2.6, the use of surgical pen allows us to make the incisions exactly, since the mucosa, being a mobile structure, makes it difficult to follow a straight cut. Our No. 15c scalpel blade enters a thickness of one millimeter, passing through the previously made marking (Fig.8); at the end of our incisions the marked mucosal tissue is removed with a partial thickness dissection, this will expose the underlying connective tissue, minor salivary glands will also be removed to achieve a uniform connective tissue contour. To make the sutures, Nylon 5-0 Ethicon™ was used, beginning by placing a simple stitch in the center of the area, the following sutures were placed halfway between the midline and the most distal area of the dissection, each suture is placed leaving 3 mm between each. At the end, it is checked that the closure of the edges has a good approximation (Fig. 9). As a medical prescription, analgesics are prescribed (Ibuprofen 600mg every 8 hours for 3 days with margin to suspend or extend as needed for pain) and 0.12% chlorhexidine gluconate (10ml morning and night 30 minutes after brushing for two weeks). The sutures were removed 2 weeks after the procedure, without complications.

The patient was seen one month after the surgical procedure, she mentions being satisfied with the treatment (Fig. 10).

Figure format

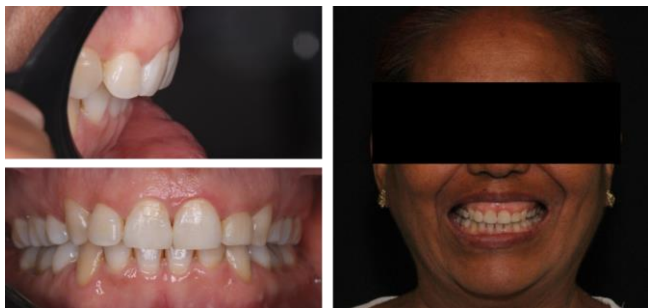

Fig 1: Patient preoperative.

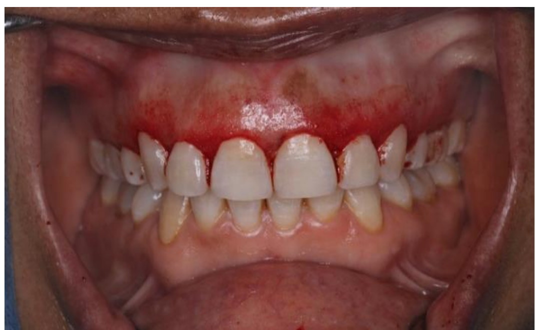

Fig 2: Completed gingivectomy

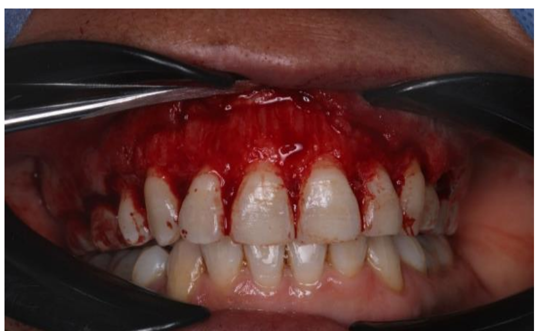

Fig 3: Flap elevation and ostectomy.

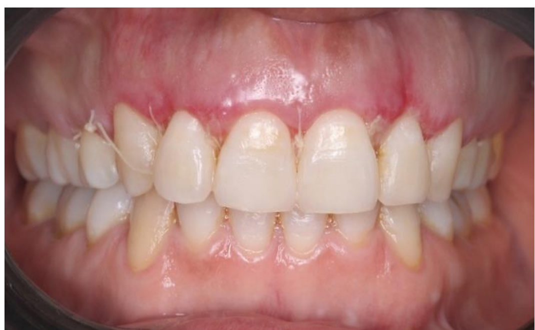

Fig 4: Postoperative period after one month**.**

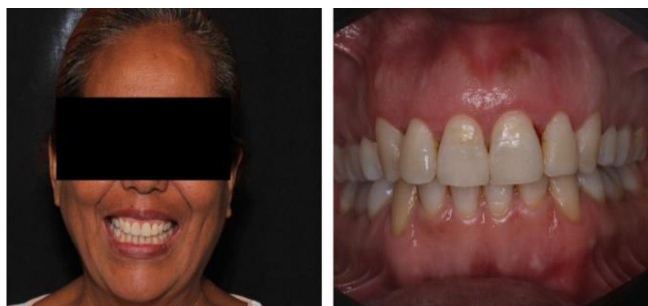

Fig 5: Reassessment at 6 months.

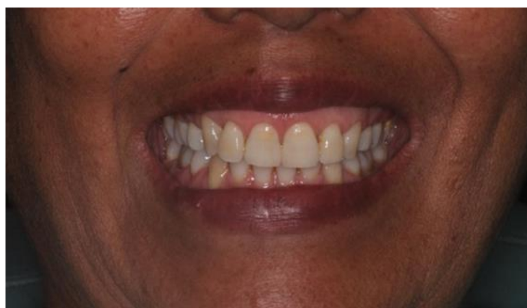

Fig 6: Preoperative before lip repositioning.

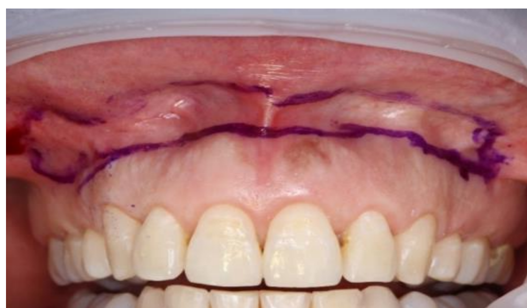

Fig 7: Marking of the area to operate.

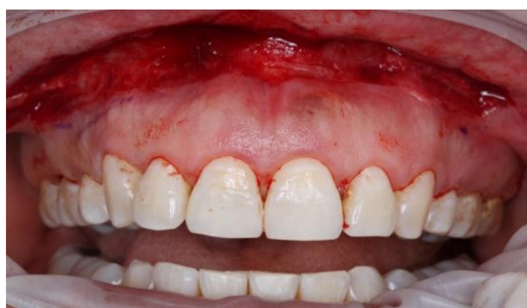

Fig 8: Surgical area after making incisions.

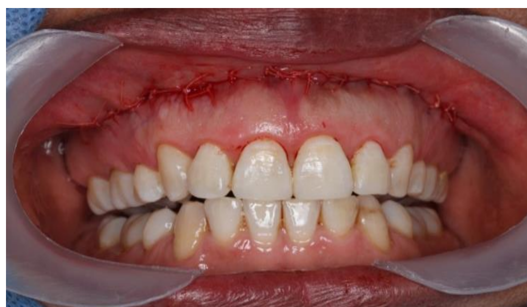

Fig 9: Simple sutures with 5-0 nylon.

Fig 10: Photograph after 1 month of surgery.

Discussion

According to Dr. Peter Brennan (2016) occasionally the uncomplicated maxillary prognathism may be treated with an anterior segmental osteotomy this deformity are usually

severe Class II division 1 cases that have been refused to orthodontics, which in this case, it would've been obligatory. Bad splits can prolong the duration of surgery and impair the recovery and healing process. An incidence of 0.9%-20% of bad splits in BSSO surgery has been reported in the literature. The findings of previews articles for orthognathic surgeries are to be considered highly accurate, the surgical planning should be transferred with the highest precision to the patient during the intraoperative period; otherwise, the achievement of desirable aesthetic and functional results would be impaired. It has been known that the advantages outweigh the disadvantages, although there are situations in which contraindications can play an important role [12].

The literature on lip repositioning since the implementation of this technique in 1973 by Rubenstein and Kostianovsky has emphasized finding the etiological factor first when patients complain that they are not comfortable with their smile, which has demonstrated its importance in the psychology of the patient himself. As there are several causes of the gummy smile problem, the approach also gives us various treatments. A very recurring problem is altered passive eruption, which can be treated with crown lengthening; however, when other factors are related, such as maxillary vertical excess, surgical lengthening of the crown will not resolve the gummy smile, and the patient You may need another optional treatment, such as lip repositioning. Authors such as Bhola and Rosenblantt mention satisfactory results, in most cases when the patient exceeds 8mm of exposure, only being contraindicated when patients have a thin band of keratinized gingiva. The results at terms of 6 months to 4 years have presented good stability of the treatment [10, 11, 13].

Conclusion

The aesthetic problems of the smile become relevant by psychologically affecting patients, the gummy smile has various etiologies, so the approaches can be just as diverse, although each etiological factor has an ideal plan, this cannot always be done. especially when we talk about excessive maxillary growth, which as an ideal approach will be an orthognathic surgery which has various disadvantages and contraindications, for which the set of minimally invasive options such as Crown lengthening and Lip repositioning, the latter being more controversial due to its stability, however, stability has been shown even at 4 years.

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To CONACYT.

The authors report no conflicts of interest related to this study.

Conflict of Interest

Not available

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Not available

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