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Clinical Case Report of a Class Ll Patient Treated With Pre-Orthodontic Treatment Occlusal Guard

Ayllón Monteón Grelda Berenice, Virgen Santiesteban Gabriel, Hernández Michel, Percevault Manzano Alicia, Cerrillo Lara Daniel, Arellano Cuen Sarahi, Padilla Garcia Kareen Alejandra.

Abstract
Temporomandibular disorders are a group of clinical problems, the origin can be of a muscular nature or by involvement of the joint complex. In some of the cases, the skeletal class ll patients present signs and symptoms in the Temporomandibular Joint, because in this type of patients the condyle presents an advanced position regard to the articular fossa. It is vitally important to correctly diagnose the presented disorder in order to give a correct treatment and end the patient's discomfort. This article shows the clinical case of a patient who was treated with two phases, the first with a dental guard and second with orthodontic treatment.
Key words: *Class ll, occlusal guard, Temporomandibular disorders.*

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I. Introduction

There are different classifications of skeletal biotypes, which are classes l, ll, lll. Each of them has its own structural characteristics as the result of genetic expression [1].

Class I: Exposes a normal relationship between the maxilla and the mandible, regularly has a straight or slightly curved profile.
Class II: Exposes a distal relationship of the mandible with respect to the maxilla, regularly has a convex profile and may or may not present a protruding maxilla with respect to the skull.
Class III: It shows a mesial relationship of the mandible with respect to the maxilla, presents a concave profile and may or may not have a protruding maxilla with respect to the skull.

The classification of malocclusions is different, according to Angle it is also divided into classes I, II and III. Where describes class ll with the lower molar located distally in relation to the upper molar, unspecified occlusion line.

Malocclusions occur due to hereditary or genetic factors, such as the presence of a syndrome and environmental factors such as habits, trauma or diseases [2]. The etiology is difficult to classify, since it is often multifactorial [3].

There are etiological factors that influence one type of malocclusion more than another; those that generate and contribute to class II malocclusion are different from those that cause class III. Therefore, identifying the type of malocclusion and skeletal class that the patient presents is essential to choose the best treatment to follow.

Temporomandibular disorders (TMD) are a set of clinical problems [8] and according to the American Academy of Orofacial Pain they are divided into two: [4]

1. Disorders of Origin (myogenic)

In their pure form they lack destructive TMJ changes and are generally the result of overload, fatigue or muscle tension causing limitation of opening and pain.

2. Joint Disorders (Arthrogenic)

They usually result from inflammation, disease, or degeneration of the soft or hard tissues of the TMJ. The most common disorders are: capsulitis, synovitis, dislocation of the disc and degenerative arthritis.

The patient can refer the disorder of muscular and joint origin separately or together, which makes the treatment more difficult, which can be from drugs, the use of an occlusal guard or splint until reaching the option of a surgical intervention depends on the degree of affection [4].

Temporomandibular disorders (TMD) involve the chewing muscles, TMJ and other structures associated with the oral cavity [7]. The most common symptom of TMD is pain, but also other symptoms and signs are restriction and asymmetry in joint movements, noise, abnormal occlusal wear, hypertrophy of the masticatory muscles and crepitations [7]. Choosing the best treatment requires a good diagnosis based on a detailed anamnesis and physical examination of the patient, including the assessment of etiological factors [9].

A splint or occlusal guard is an alternative to treat TMD, it is an appliance mainly made with acrylic or a thermoformed acetate that covers all the occlusal faces and incisal edges [5] it is generally performed in the upper dental arch.

During the elaboration, it is necessary to mark a precise occlusal contact in the dental guard with the antagonist dental arch since it is preferably required to reach centric relation (CR), the objective is to create a stable, uniform position and distribute the loads as equitably as possible each of the dental organs present in the mouth, in turn, eliminate unstable muscle activity in order to restore functional balance.

The purpose of the dental guard is to create a stable occlusal contact, distributing the loads in each one of the teeth, at the same time that it will break with the unstable muscular activity, wich result in restoring a functional balance to the patient in conjunction with the anatomy [4].

There are different types of occlusal splints: [5]

1. Muscle relaxation or CR plate
2. Anterior repositioning plate
3. Anterior bite plane plate
4. Posterior bite plane plate
5. Pivot plate
6. Soft or elastic plate

According to the 2005 glossary of prosthodontic terms, centric relationship (CR) is defined as "the maxillomandibular relationship in which the condyles articulate with the thinnest and avascular portion of their respective articular discs with the complex in the most anterior position and superior against the walls of the articular eminence. This position is independent of dental contact, clinically understood when the mandible is directed superiorly anteriorly through the horizontal transverse axis [6].

The condylar position of skeletal class II patients according to Ricketts is in a relative forward position in the articular fossa, sustained as this is a way of trying to maintain an adequate airway in these patients [6].

When there is severe crowding, orthodontic treatment becomes complicated, and it is necessary to resort to extractions, mainly of the first premolars, since these are intermediate units between the anterior and posterior sectors.

In the case of class II patients, the extractions are due to the serious discrepancy in the length of the arch, dental biprotrusion or both, and medium or high measurement of the mandibular plane 13. This clinical case report shows how the use of an occlusal guard eliminated TMJ discomfort in a 14-year-old female patient, with a class II skeletal pattern, which is treated with a pre-orthodontic treatment dental guard.

II. Materials and methods

A 14-year-old female patient attended the Orthodontic Clinic of the Universidad Autonoma de Baja California, Tijuana campus. The reason for the consultation "Pain in my joint", which was resolved with a dental guard treatment for 6 months and later an orthodontic treatment with extractions.

Figure 1.- Extraoral photographs

Extraoral analysis: Mesomorphic patient, convex profile, straight nasolabial angle, open mentolabial sulcus, asymmetrical superciliary line, commissural line and bipupillary line, thick lips, middle third increased in relation to the lower one, the dental midline does not coincide with the midline facial, shows 40% of the upper dental clinical crown when smiling (Figure 1)

Intraoral analysis: Bilateral class l molar relationship, right class l and left class ll canine relationship, dental midlines do not coincide with each other, on a 5mm horizontal bite (Figure 2).

Radiographic analysis:

Figure 2.- Intraoral photographs

In orthopantomography revealed 28 permanent dental organs present in the mouth, tooth germ of the 4 third molars, height of the symmetrical branches, displaced right condyle, uniform bone density, root crown ratio 1: 2 (Figure 3).

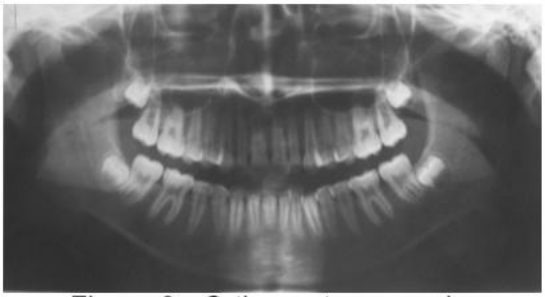

Figure 3.- Orthopantomography

Cephalometric analysis:
Class II skeletal pattern, upper and lower incisors proclined, vertical growth pattern (Figure 4).

Figure 4.- Cephalometric

	NORM	
SNA	82°	82°
SNB	80°	77°
ANB	2°	5°
Angle 1s / SN	104°	118°
1i / Go-Gn	90°	104°
Jaw length	71 mm	71mm
length BCA	71 mm	71mm
Body / BCA	1:1	1:1
Angle Go-Gn / SN	32°	28°

Table 1

Treatment plan:
The treatment plan was divided into 2 phases:
Phase 1:

- Use of a rigid acrylic occlusal guard for 6 months before orthodontic treatment due to the TMJ pain reported by patient. The patient attended an appointment once a week to make adjustments during the first month of use of the guard, from the second month she came every 15 days for review and adjustments. (Figure 5a).

Figure 5 a.- Intraoral photographs during treatment

Phase 2:

- It was started by placing spacers in the upper first molars to later cement a transpalatal arch and refer for extraction of 4 first premolars.
- Upper and lower placement of fixed appliances with Roth slot .018 prescription.
- Upper and lower alignment and leveling with arc sequence.
- Distalization of upper canines with elastic chain.
- Space closure in the inferior arch with loss of posterior anchorage using elastic chain, in the superior arch the closure was with anterior retraction.
- Utilization of class ll elastic mechanics with 3/16 4.5 oz elastics.
- Lower arch advance arch was placed and activated.
- Closure of spaces in the lower arch with loss of anchor.
- Repositioning of brackets to achieve parallelization of roots.
- Detailed and finished
- Upper and lower circumferential retainers (Figure 5 b and c).

Figure 5 b.- Intraoral photographs during treatment

Figure 5 c.- Intraoral photographs during treatment

III. Results:

Figure 6.- Final intraoral photographs

	NORM	
SNA	82°	86°
SNB	80°	80°
ANB	2°	5°
Angle 1s / SN	104°	101°
1i / Go-Gn	90°	100°
Jaw length	71 mm	71mm
length BCA	71 mm	71mm
Body / BCA	1:1	1:1
Angle Go-Gn / SN	32°	36°

Table 2

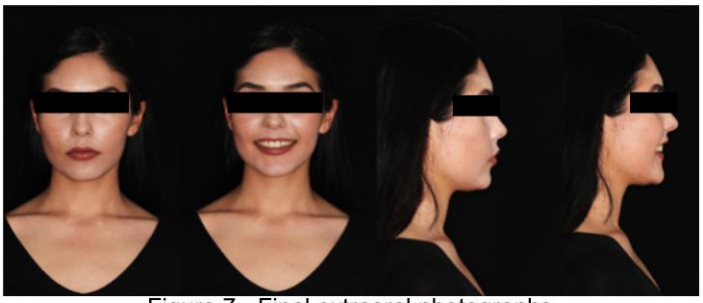

Figure 7.- Final extraoral photographs

With the treatment plan, which consisted of the use of an occlusal guard as the first phase, obtaining as a result a reduction in the joint discomfort that the patient had referred and with the conventional orthodontic treatment with extractions as the second phase, it was possible to obtain a horizontal overbite / ideal vertical, class l canine / molar ratio, adequate occlusal function. (Figure 6, 7 and 8).

IV. Discussion

Figure 8.- Final cephalometric

Temporomandibular disorders have a low prevalence in childhood, increasing in adulthood to decrease again in old age. The prevalence of TMD is in an age range between 30 - 45 years, as well as it increases in women [8], in the clinical case described we observed that despite the young age of the patient she presents TMD, so we suggest performing an adequate TMJ examination regardless of the age range of the patient. We can say that the age range shown in the prevalence is not a determinant for TMD.

Velly et al. conducted a study that indicated that women are three times more likely to have chronic myofascial pain than men [8].

Alterations in muscles and joints, clicking, facial pain, headache and joint pain are signs and symptoms of temporomandibular disorders [4]. The use of the occlusal guard is considered non-invasive and reversible, it can be useful to treat to those with TMD, given its beneficial, restorative and relaxing effects on the structures of the stomatognathic system. In the case of the patient presented in this article, the use of the guard significantly improved her symptoms, for which we agree on the aforementioned.

Ackerman mentions that the soft tissues mark the terms in which the dimensions of the dental arch can be altered by the orthodontist, providing the limits of dental compensation [16].

The upper and lower first premolars are the most frequently extracted teeth, it is believed that this is due to their location in the dental arch, which favors the correction of the deviated midline, space problems in the incisor region or if we have the need of altering the profile but there are other factors, such as ectopic location, absence or agenesis of teeth, abnormal shape, dental caries, endodontic treatments, restorations [15]. In the case of the patient, soft tissues were considered to determine if they were to be harmed by releasing crowding and improving the overbite by means of first premolar extractions, which was considered not to have a negative impact, so the treatment was carry out as mentioned before.

V. Conclusion

Class II malclusion is not a simple clinical entity since there is an imbalance in the structure that will cause some functions to be modified.

The occlusal guard treatment is efficient for the therapy of pain associated with temporomandibular disorders, its use is effective to restore function. It can be a treatment of choice especially in patients with a class II skeletal pattern.

The occlusal guard reduces the clinical manifestations in patients with temporomandibular disorders, improves the position of the condyle and decreases the abnormal activity of the muscles.

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