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Case Report

PATHOLOGIC TOOTH MIGRATION AND ATYPICAL SWALLOWING IN PERIODONTAL PATIENTS: A NEW APPROACH WITH ELASTODONTIC THERAPY - CLINICAL SERIES.

G. Iuorio[1], M.T. Iuorio[1], A.M. Iuorio[1], A. Jamilian[2], K. Ferati[3], A. Palermo[4], A. Mancini[5], R.P. Rotolo[6]* and R. Migliaccio[1]

[1]Private practice, Aversa, Italy;
[2]Professor, Module Leader, City of London Dental School, University of Bolton, London, UK;
[3]Faculty of Medicine, University of Tetovo, Tetovo, Macedonia;
[4]College of Medicine and Dentistry, Birmingham, UK;
[5]Interdisciplinary Department of Medicine, University of Bari "Aldo Moro", Bari, Italy;
[6]Multidisciplinary Department of Medical-Surgical and Dental Specialties, University of Campania Luigi Vanvitelli, Naples, Italy

Correspondence to:
Rossana Patricia Rotolo, DDS
Multidisciplinary Department of Medical-Surgical and Dental Specialties,
University of Campania Luigi Vanvitelli,
Naples, Italy

ABSTRACT

Several publications describe the possibility and limits of orthodontic treatment in periodontal patients to achieve good occlusion. Pathologic tooth migration (PTM) is a change in tooth position that occurs when a disruption of forces maintains teeth in a normal relationship. PTM can result in severe dental disfiguration and compromise a patient's self-esteem. In order to correct this pathologic and unaesthetic condition, different orthodontic appliances are described in the literature. Among them, elastodontic devices have been recently proposed with good results in terms of patient compliance and treatment efficacy. The aim of this work is to evaluate the use of elastodontic devices for PTM correction in a series of periodontally compromised patients. The reported cases demonstrated that elastodontic treatment could support and complete periodontal therapy with an occlusal stabilization activity, especially in cases characterized by occlusal trauma. This additional therapy stabilized teeth movement recovery a harmonic occlusion, recovery an acceptable aesthetics, and corrected altered muscle functions such as atypical swallowing. Further studies are needed to investigate these innovative therapeutic procedures better.

KEYWORDS: *periodontitis, malocclusion, tooth, migration, device*

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INTRODUCTION

Periodontitis is an infectious and inflammatory disease that progressively destroys tooth-supporting structures, is one of the most widespread diseases, and is the leading cause of tooth loss in adults (1). Periodontitis is a bacterially induced inflammatory disease linked to the individual's oral microbiota and immune system (2). However, the microbial insult is not enough *per se* to induce the onset of the disease (3, 4).

The development of periodontitis is also due to an individual susceptibility linked to a genetic basis (5) and/or to lifestyles (especially smoking and poor oral hygiene) and/or trauma from occlusion (6), which allows bacteria to express their pathogenic potential (7).

In every patient affected by periodontitis, it is necessary to define and follow a treatment strategy that eliminates the opportunistic infection and prefigures the clinical outcome parameters. The periodontal treatment plan provides for an initial phase of infection and risk factors control, including patient motivation, instrumental (scaling and root planing), and, in selected cases, pharmacological (local or systemic) therapy (named etiologic or causal therapy). This therapy, in most cases, can bring the clinical indices of periodontitis, such as full-mouth bleeding score (FMBS), full-mouth plaque score (FMPS), probing depth (PD), and clinical attachment level (CAL), within physiological limits (8). However, these results may not be achieved in all sites, particularly those with high initial PD and intrabony defects. For these reasons, it is necessary a re-evaluation; when it is positive, the patient will be introduced to a supportive periodontal therapy; otherwise, it will be possible to opt for an additional non-surgical or surgical therapy to eliminate the irritative factors not removed by the etiologic therapy and modify the anatomy of pathologically altered hard and soft tissues. It is also very important to eliminate or to take under control the risk factors for periodontal disease like smoking, stress, anatomic, and trauma of occlusion.

Some authors found that occlusal therapy can reduce the long-term progression of periodontal disease and could be considered an important adjunctive therapy in the treatment of periodontal disease (9, 10).

In order to control trauma of occlusion in periodontal patients, there are more therapeutic options; the best is orthodontic therapy.

The goals of the treatment of occlusal traumatism may be summarized as follows:

elimination or reduction of tooth mobility;

establishment or maintenance of a stable and reproducible maximal intercuspal habitual position;

provision of efficient masticatory function and a comfortable occlusion with acceptable phonation and aesthetics;

elimination of parafunctional habits and pathologic tooth migration (PTM).

PTM is defined as a change in tooth position that occurs when there is disruption of forces that maintain teeth in a normal relationship (11). A recent study demonstrated that most patients with moderate-to-severe periodontitis need or could take advantage of orthodontic therapy because of esthetical and functional changes caused by PTM (12). Another recent retrospective study evaluated the long-term response of periodontal tissues and survival rate of teeth with advanced attachment loss and PTM in 21 periodontitis patients treated with combined periodontal and orthodontic treatment. All anterior migrated teeth functioned at the end of 10 to 15 years of maintenance. Residual probing depths and clinical attachment levels improved after treatment and remained stable through the follow-up. In highly compliant patients, all migrated teeth with an initial unfavourable prognosis showed long-term clinical stability (13). Pathologic tooth migration can result in severe dental disfiguration and devastate a patient's self-esteem. A prevalence in periodontal patients of 55.8% was recently reported (14).

Tooth migration is often the motivation for patients to seek periodontal therapy. According to Brunsvold M.A. (15):

1. most cases of moderate to severe PTM require a team approach to achieve treatment success. Periodontal therapy is followed by orthodontic therapy, which usually involves fixed appliances. Prosthodontic treatment is often required following orthodontic therapy;
2. when PTM is in the early stages, periodontal therapy alone is sometimes effective in producing spontaneous migration correction. This correction has been reported after non-surgical and surgical treatment;
3. light intrusive orthodontic forces are effective in treating extrusion and flaring if inflammation is controlled during all phases of treatment;
4. most patients with PTM have moderate to severe periodontitis. Several studies describe successful orthodontic treatment in these patients if inflammation is controlled.

Many factors influence tooth position; therefore, there are many possible etiologic factors for PTM. The multiple causes of incisor flaring emphasize the complexity of differential diagnosis (6).

The main factors known to influence tooth position are:

tissues of the periodontium;

occlusal factors;

soft tissue pressures of the cheek, tongue, and lips;
a variety of oral habits.

Periodontal inflammation (9) and eruptive forces also influence tooth position (Fig. 1). In order to correct PTM, there are a lot of different techniques described in the literature (16-20). However, some studies (19-20) indicated that conventional orthodontic treatment with light intrusion forces could be a reliable treatment method for PTM if gingival inflammation is controlled before, during, and after orthodontic therapy.

All these studies agree that inflammation associated with periodontitis must be carefully controlled before, during, and after orthodontic therapy. The authors also agree with this therapeutic approach but underline that conventional orthodontic treatment is an option that receives poor compliance from periodontic patients. It is no coincidence that, despite mechanical protocols specifically calibrated on periodontal disease elements and proposed and validated for over 20 years, it is generally not well accepted by the patient. It is one of the therapies considered useful and necessary but not practiced in everyday clinical reality. On the other hand, traditional orthodontics has some important disadvantages in managing adult and periodontal patients, the main of which is that it could have a negative impact on daily hygienic procedures (21-23). Furthermore, recent literature has shown that the maintenance of the activity indices of periodontal disease can be kept under control more predictably through the use of removable rather than traditional fixed orthodontic devices (24). Among the removable devices used for treating PTM, the elastodontic device (and therapy - ET) could be the most useful.

ET is nowadays increasingly used in orthodontic interceptive treatment. It uses removable elastomeric functional appliances that produce neuromuscular, orthopedic, and dental effects. Thus, these devices are useful in the developmental age, when skeletal structures are characterized by important plasticity and adaptation capacity, allowing for removing factors responsible for malocclusions (25). Elastodontic appliances improve orthodontic parameters such as Overjet (OVJ) and Overbite (OVB) and eliminate functional disorders of the stomatognathic system and act in a three-dimensional way within the oral cavity, improving breathing, swallowing, and postural problems, especially if associated with targeted functional exercises. Furthermore, these devices act as rehabilitative therapy for altered muscular functions. The presence of a lingual ramp and a button for the tongue, in addition, allows the restoration of a correct posture and lingual function. Furthermore, elastomeric devices are generally well tolerated by patients requiring simple collaboration and management, and they are both simple to use and comfortable.

The aim of the study is to propose the use of ET in periodontal patients affected by PTM. Four cases of ET in PTM patients with moderate and severe periodontitis are reported.

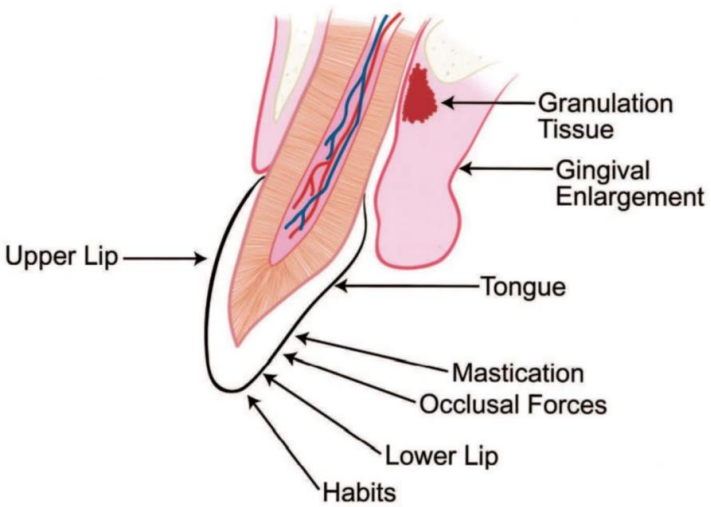

Fig. 1. *Main factors influencing tooth position.*

CASE REPORT

Clinical Case 1

A 40-year-old woman presented to our private practice with the complaint of "poor aesthetics due to periodontitis, pathologic tooth migration, and diastema". The anamnesis resulted in the absence of systemic pathologies, no allergy, no trauma in the orofacial area, no smoking, and familiarity with periodontitis. On enquiring further, she was generally unhappy with the appearance of his front teeth and smile because of her PTM and diastema. Intermittent pain and tooth sensibility episodes would occur, and the patient also complained about bleeding gums associated with periodontitis.

Intraoral examination revealed adequate oral hygiene, moderate periodontitis, with more severe localization on the lower and upper frontal sectors; during clinical exams dentists wear masks to prevent the spread of the virus that causes COVID-19 (26).

Diastema was seen between #12 #11; anterior splaying of the upper and lower incisors; these lower incisors were already splinted previously due to progressive pathological mobility. The presence of anterior splaying and grade 2 mobility on the upper central incisors, associated with widening the periodontal spaces highlights primary occlusal trauma. The examination of swallowing showed the presence of "atypical swallowing" with a low tongue posture and oral breathing. Based on data collection, the problem list is summarised as follows:

periodontitis;
hopeless teeth #42,41,31,32;
PTM #12 ,11,21,22;
diastema #12,11;
reduced overjet and overbite;
trauma of occlusion;
atypical swallowing and mouth breathing.

On the basis of the problem list, the treatment goals for this patient were, at first, to eliminate periodontitis by etiologic periodontal therapy, followed by maintenance therapy by reinforcing meticulous oral hygiene.

Immediately after, it was necessary to face the "extra periodontal" problems already listed: hopeless teeth #42, 41, 31, 32; PTM #12, 11, 21, 22; diastema #12, 11; the trauma of occlusion, and para functions; the latter was responsible for part of the patient's symptoms and represented dangerous "mechanical" risk factors for periodontal tissues already reduced by the disease. To address the extra-periodontal problems, the Authors first acted on the mandible by extracting the irrecoverable incisors and replacing them with a traditional non-removable prosthesis anchored on the two canines # 43 # 33. This has the dual purpose of resolving edentulousness but also of regularizing the (altered) overjet and overbite by acting on the length and inclination of the lower incisors. At the same time, they used an innovative myofunctional trainer; it is a non-traditional nocturnal device, a "three-dimensional byte". Thanks to this particular device, it was first of all intended to reposition the jaw possibly dislocated as a result of the dental migrations resulting from the disease itself; these migrations are, in fact, the cause of and pre-contacts that are very harmful to the residual periodontium and capable of altering the correct mandibular posture.

In the specific case, the jaw was dislocated forward, potentially traumatizing for the periodontium of the upper frontal teeth where the diastema and the PTM were found. The aim was also to obtain a more correct static and dynamic occlusal pattern, in the absence of which a bad work of the periodontium of the most overloaded elements is inevitable, which would consequently be more exposed to the risk of progression or recurrence.

Above all, the para-functions present were addressed: atypical swallowing and oral breathing; in fact, they develop excessive and harmful forces on a periodontium already reduced (although healed) by the disease. Therefore, it was decided to use an innovative myofunctional trainer to solve extra-periodontal problems. This appliance is not a common nocturnal occlusal splint, but it is a "three-dimensional byte" made in elastic medical silicone. The myofunctional trainer consists of a double-track, one for the upper arch and the other for the lower arch, and it is a one-piece device wrapping both arches. A horizontal plane, more rigid, on which the arches lay down, is made to level the dental arches according to a predetermined anatomical plan. Two softer vertical flanges, one internal and one external, can wrap the arches to neutralize abnormal centripetal and/or centrifugal muscle forces that may insist on the arches to obtain more harmonious shaping. The used appliance is shown in Fig. 2.

The device generally follows the shape and diameter of the arches, the anteroposterior relationship of the arches themselves (1, 2, 3 class), and the vertical relationship. This last and very important parameter, managed by providing along the occlusal horizontal plane with differentiated thicknesses, has allowed in this specific case to insert in the device

the intrusive information on the frontal teeth for the precise purpose of obtaining the correction of the PTM of the upper frontal teeth. The patient's maxillary inter-molar diameter (DIM) was 60 mm, and it was set by measuring the distance between the external sides of the distobuccal cusps of the upper first molars.

As mentioned, the appliance has a conformation based on the specific shape of the arches and the intermolar diameter of the upper arch. Device size of 60 mm DIM was deliberately chosen in order to obtain the levelling of the occlusal plane without an expansive effect in the upper alveolar but, on the contrary, with the therapeutic goal of restoring a correct neutron corridor and thus obtaining the re-entry of the two incisors with the relatively recent diastema #12 and #11. The aim was to take advantage of a single therapeutic approach to deal with the alteration of the correct occlusal scheme (PTM and diastema) and the alteration of the correct functional and motor patterns (trauma from occlusion, atypical swallowing, and oral breathing). This combined approach has a double rationale. The first one is the simplification of the treatment and the greater compliance of the patient concerning other differentials, multiple, in more times and more expensive treatments.

Fig. 2. *Detail of the Elastodontic device used in this case report.*

The second one is the clinical experience of the authors, who consider the problems mentioned above interconnected and potentially connected to the contextual problems of the periodontium; the latter, not by chance, was more damaged precisely in the frontal area where the dysfunctions were located. The appliance was initially worn for 30 minutes during the day (for the first 30 days) by practicing some myofunctional exercises explained to the patient to start to correct the functions of swallowing, breathing, and chewing by acting on the internally and externally. Immediately afterward, nocturnal use for 12 months was introduced, allowing these new, more correct motor engrams to become automatic (Fig. 3). The patient was observed monthly.

Fig. 3. *Case 1: Detail of the clinical case at the baseline and after 12 months of treatment.*

Clinical Case 2

A 45-year-old woman presented to our private practice with the complaint of "poor aesthetics due to periodontitis, pathologic tooth migration and diastema #11 #21", loss of interdental papilla #41, #31. The patient revealed the absence of systemic pathologies, no allergy, no trauma in the orofacial area, no smoking, and familiarity with periodontitis. On enquiring further, she was generally unhappy with the appearance of his front teeth and smile because of her PTM and diastema #11 #21.

Intraoral examination revealed sufficient oral hygiene, moderate periodontitis, with more severe localization on the lower and upper frontal sectors. Moreover, it was present a diastema between #11 and #21 and an anterior splaying of the upper incisors.

The presence of anterior splaying and grade 2 mobility on the upper central incisor #11, associated with the widening of the periodontal spaces and other signs and symptoms, highlights primary occlusal trauma. The examination of swallowing showed the presence of "atypical swallowing" with a low tongue posture and oral breathing. The patient reported two previous attempts to close the interincisal diastema using traditional fixed orthodontic therapy, both of which resulted in relapse. Based on data collection, the problem list is summarised as follows:

Periodontitis;
PTM #21;
Diastema #11, #21;
Loss of interdental papilla #41, #31;
reduced overjet and overbite;
Trauma of occlusion;
Atypical swallowing and mouth breathing.

Based on the problem list, the treatment goals for this patient were, at first, to eliminate periodontitis by etiologic periodontal therapy, followed by maintenance therapy by reinforcing meticulous oral hygiene. However, immediately after, it was necessary to face the "extra periodontal" problems already listed (PTM #11, 21, diastema #11, 21, trauma

Fig. 4. *Case 2: Detail of the clinical case at the baseline and after 12 months of treatment.*

of occlusion and parafunction); the latter were certainly responsible for part of the patient's symptoms and represented dangerous "mechanical" risk factors for periodontal tissues already reduced by the disease.

In regard to the extra-periodontal issues, the initial treatment planning provided action on the mandibular arch by applying four metal-free prosthetic crowns on 42,41,31,32 for the dual purpose of eliminating imperfections from the loss of the inter-incisive papilla between 41 and 31 and regularizing the overjet and overbite (altered) by acting on the length and inclination of the lower incisors. At the same time, an innovative myofunctional trainer was used (Fig. 4), with the same modalities, the same clinical procedure, and the same observation time of 12 months as case 1.

Clinical Case 3

A 33-year-old woman presented to our private practice with the complaint of "poor aesthetics due to periodontitis, pathologic tooth migration #11, #21 and diastema #21, #22". The anamnesis showed the absence of systemic pathologies, no allergy, no trauma in the orofacial area, no smoking, and familiarity with periodontitis. On enquiring further, she was generally unhappy with the appearance of his front teeth and smile because of her pathologic tooth migration and diastema #21 and #22.

Intraoral examination revealed sufficient oral hygiene, moderate periodontitis, with more severe localization on the lower and upper frontal sectors: diastema between #21, #22; anterior splaying of the upper incisors. The presence of anterior splaying and grade 2 mobility on the upper central incisors and #22, associated with the widening of the periodontal spaces highlights primary occlusal trauma. The examination of swallowing showed the presence of "atypical swallowing" with a low tongue posture and oral breathing. The patient reported the recent opening of the interincisal diastema between 21 and 22; based on data collection, the problem list is summarised as follows:

periodontitis,
PTM #11 #21,
diastema #21, #22,
trauma of occlusion,
atypical swallowing and mouth breathing.

Based on the problem list, this patient's treatment goals were to eliminate periodontitis by etiologic periodontal therapy

Fig. 5. *Case 3: Detail of the clinical case at the baseline and after 12 months of treatment.*

followed by maintenance therapy by reinforcing meticulous oral hygiene. Immediately after, it was necessary to face the "extra periodontal" problems already listed (PTM #11, 21; diastema #21, 22; trauma of occlusion and para-functions); the latter were undoubtedly responsible for part of the patient's symptoms and represented dangerous "mechanical" risk factors for periodontal tissues already reduced by the disease. To avoid extra-periodontal problems, they applied four metal-free prosthetic crowns on 42, 41, 31, and 32 for the dual purpose of eliminating the imperfection resulting from the loss of the inter-incisive papilla between 41 and 31 and regularizing the overjet and overbite (altered) by acting on the length and inclination of the lower incisors (Fig. 5). At the same time, they used an innovative myofunctional trainer as in clinical case 1 and 2 with the same modalities, the same clinical procedure, and the same observation time of 12 months.

Clinical Case 4

A 50-years old woman presented to our private practice with the complaint of "poor aesthetics due to periodontitis, pathologic tooth migration #11, #21 and diastema #41, #31". The anamnesis resulted in the absence of systemic pathologies, no allergy, no trauma in the orofacial area, soft smoking, and familiarity with periodontitis. The subject was unhappy with the appearance of her aesthetic frontal region due to pathologic tooth migration #11, #21 and diastema #41, #31.

Intraoral examination revealed sufficient oral hygiene, moderate periodontitis, with more severe localization on the lower and upper frontal sectors. In addition, a diastema between #41 #31 and PTM #11, #21 were present.

The presence of grade 2 mobility on the upper central incisors, associated with the widening of the periodontal spaces highlights primary occlusal trauma. The examination of swallowing showed the presence of "atypical swallowing" with a low tongue posture and oral breathing. The patient reported the recent opening of the interincisal diastema between 41 and 31. Based on data collection, the problem list is summarised as follows:

periodontitis,
PTM #11 #21
diastema #41, #31,
trauma of occlusion,
atypical swallowing and mouth breathing.

Based on the problem list, the treatment goals for this patient were, at first, to eliminate periodontitis by etiologic periodontal therapy, followed by maintenance therapy by reinforcing meticulous oral hygiene. However, immediately after, it was necessary to face the "extra periodontal" problems already listed PTM, diastema, dental trauma of occlusion, and para-functions. The latter was responsible for part of the patient's symptoms and represented dangerous "mechanical" risk factors for periodontal tissues already reduced by the disease.

At the same time, they used an innovative myofunctional trainer as in clinical cases 1, 2, and 3 with the same modalities, the same clinical procedure, and the same observation time of 12 months (Fig. 6).

Fig. 6. *Case 4: Detail of the clinical case at the baseline and after 12 months of treatment.*

RESULTS

From a clinical point of view, the consequences of this "integrated" therapeutic approach using the myofunctional trainer were multiple and early. After only 12 months, in all 4 cases presented, the return of the PTM

on the affected incisors was achieved. In addition, diastemas (Fig. 7-10) disappeared.

In cases 1 and 2, the PTM was also accompanied by fanning of the upper incisors supported by an excessive reduction of OVJ e OVB. The anterior splaying was also re-entered in these two cases where the length and shape of the lower incisors were aprosthodontically corrected.

The correct functions in swallowing and breathing have been regularized with the related effects on motor engrams and the harmony of occlusal relationships. A very satisfactory aesthetic appearance of the smile was also obtained, entirely in line with the best expectations of patients and able to improve their self-esteem and social life.

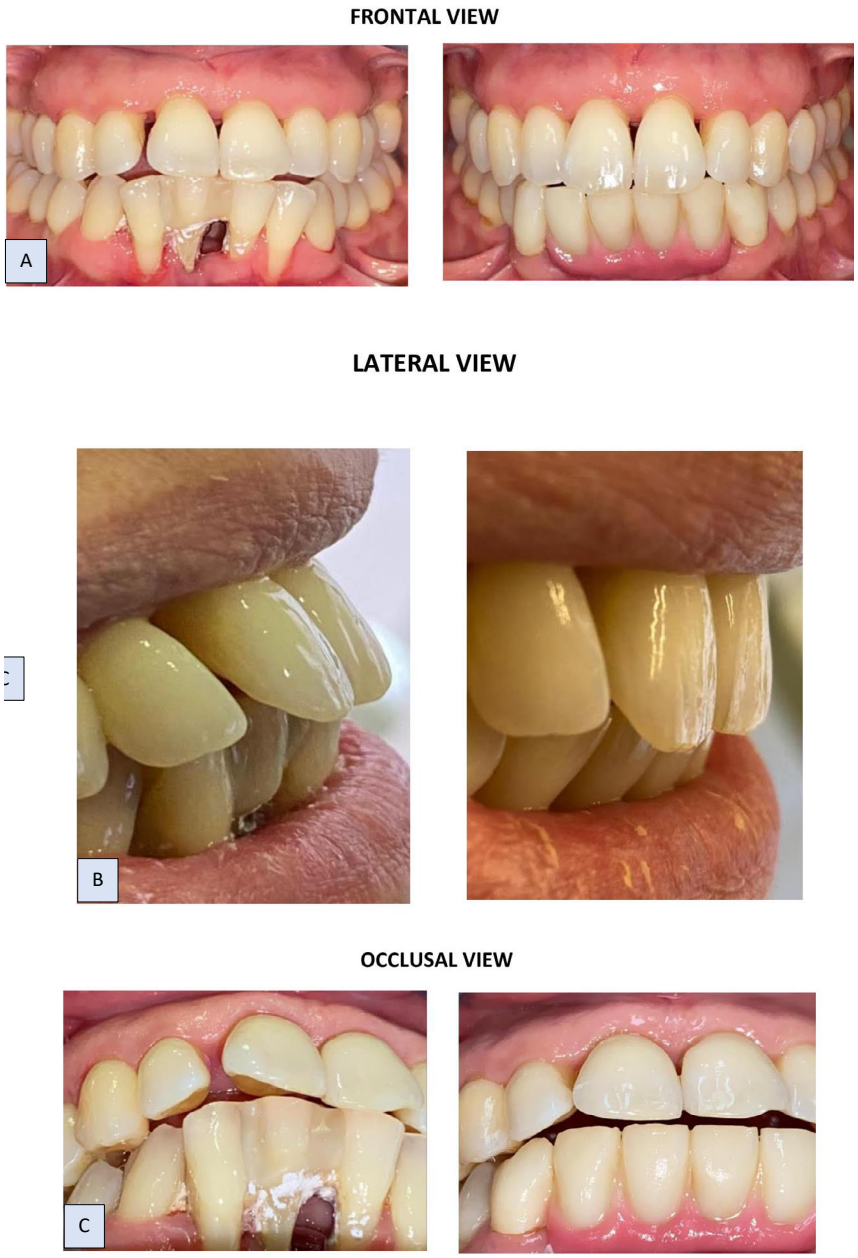

Fig. 7. *A): Case 1: Comparison of the clinical case at the baseline and after 12 months of treatment in frontal view; B): Case 1: Comparison of the clinical case at the baseline and after 12 months of treatment in lateral view; C): Case 1: Comparison of the clinical case at the baseline and after 12 months of treatment in occlusal view. Regularization of the overjet and overbite by acting on the length and inclination of the lower incisors.*

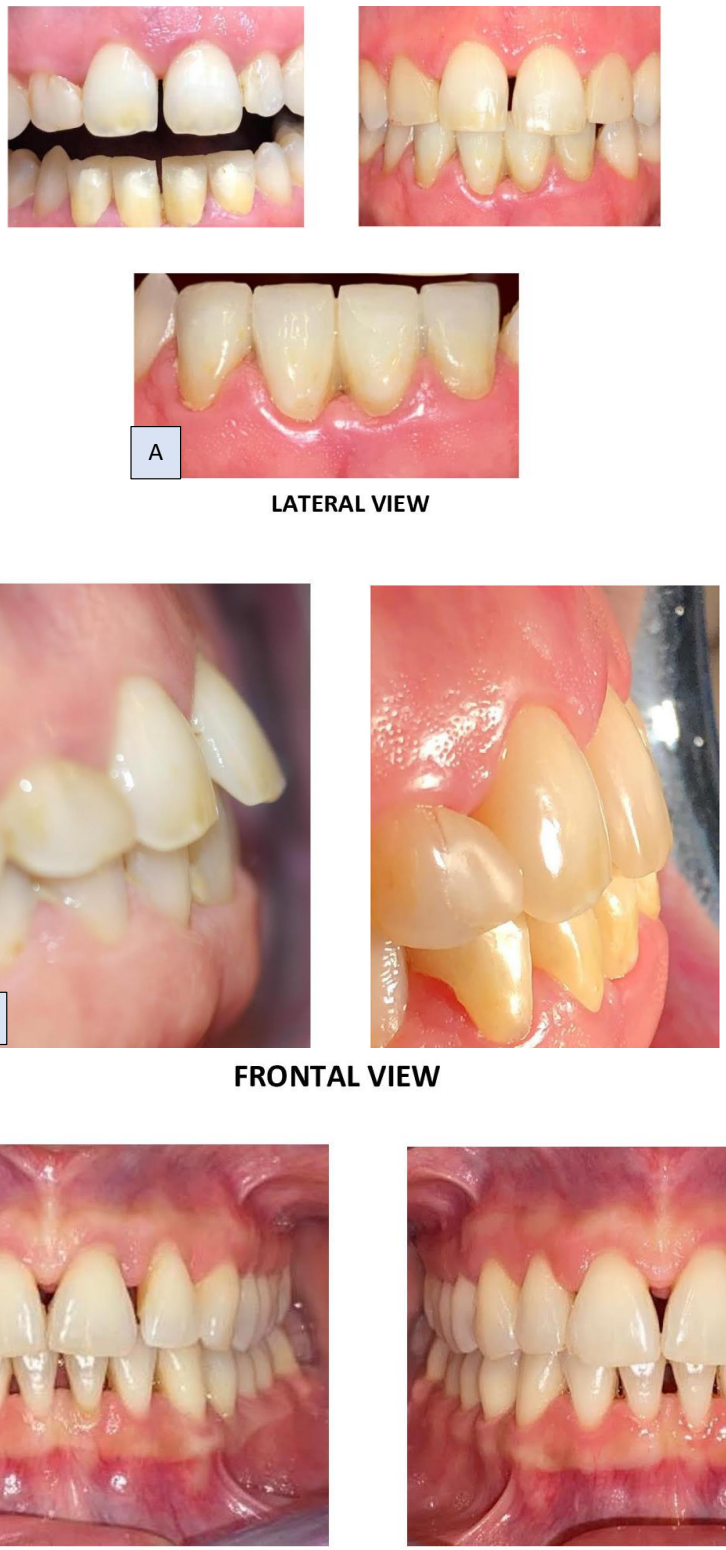

Fig. 8. *A): Case 2: Comparison of the clinical case at the baseline and after 12 months of treatment; B): Case 2: Comparison of the clinical case at the baseline and after 12 months of treatment in lateral view; C): Case 2: Comparison of the clinical case at the baseline and after 12 months of treatment in occlusal view.*

Fig. 9. *A): Case 3: Comparison of the clinical case at the baseline and after 12 months of treatment in frontal view; B): Case 3: Comparison of the clinical case at the baseline and after 12 months of treatment in lateral view; C): Case 3: Comparison of the clinical case at the baseline and after 12 months of treatment in occlusal view.*

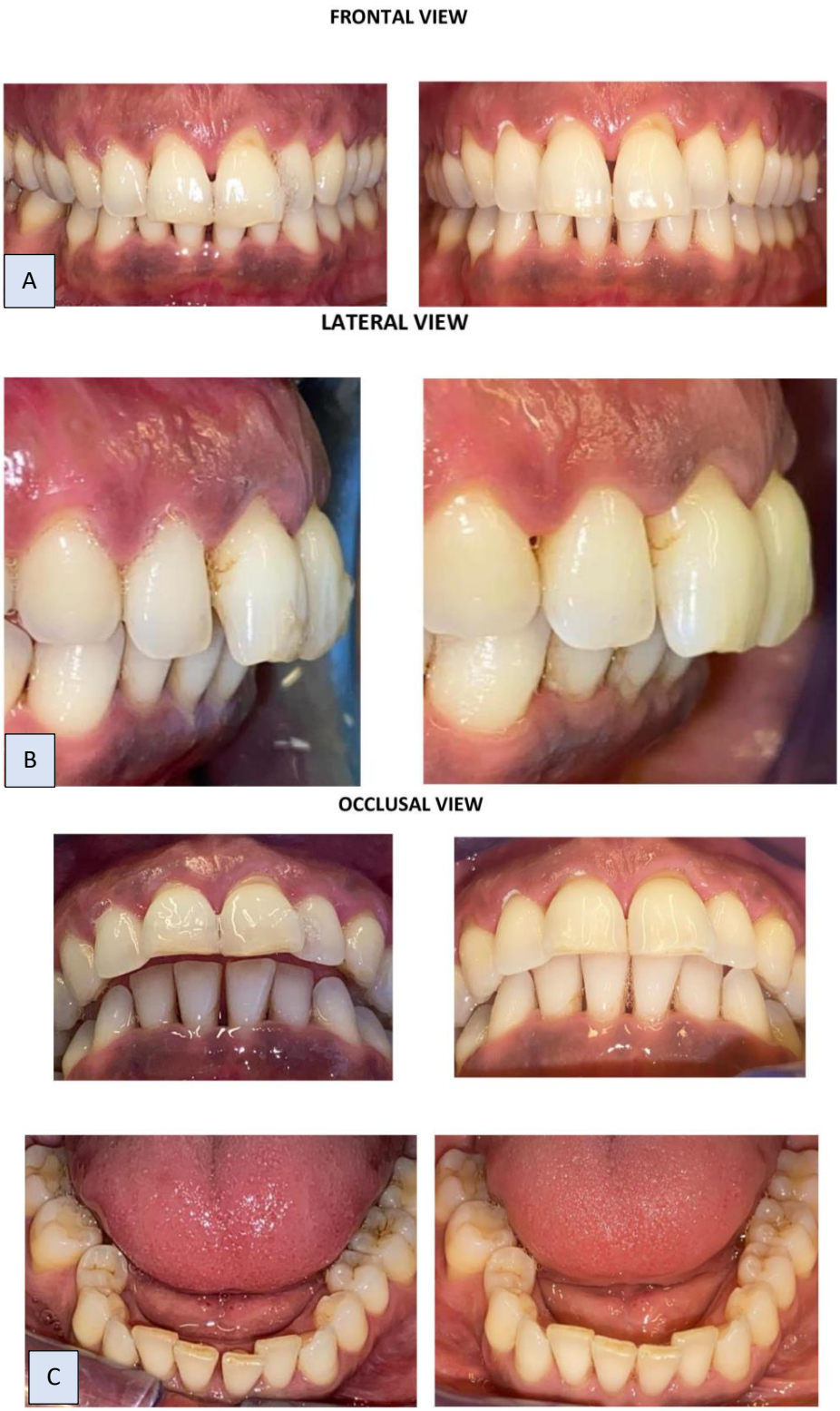

Fig. 10. *A): Case 4: Comparison of the clinical case at the baseline and after 12 months of treatment in frontal view; B): Case 4: Comparison of the case at the baseline and after 12 months in lateral view; C): Case 4: Comparison of the clinical case at the baseline and after 12 months of treatment in occlusal view.*

DISCUSSION

The authors observed improvement in dental and periodontal status in these clinical cases after elastodontic myofunctional therapy. After etiological therapy of periodontitis, it has been decided to implement an innovative myofunctional trainer.

Although more than a century has passed since the first publication of Karolyi, (27) which involved the forces of occlusion in the behavior of periodontal tissues, deep-rooted controversy about the role of occlusion in the development/progression of gingivitis and periodontitis remains. Some studies propose that traumatogenic occlusal forces are related to the initiation and/or progression of periodontal disease (28, 29). Conversely, other studies find no association between trauma from occlusion and periodontal disease (30-32).

During the 1960s and early 1970s, Glickman et al. (33, 34) proposed that occlusal trauma acted as a co-destructive agent, influencing the spread of inflammatory gingival exudate directly to the periodontal ligament, eliciting a combined lesion of trauma from occlusion and periodontitis. Despite extensive research over many decades, such defying question relates to the role of occlusion in the etiology and pathogenesis of periodontitis, is still not completely understood (6). By analyzing data from the literature, we can summarise the following to date:

- there is no definitive scientific evidence that trauma from occlusion causes or accelerates the progression of gingivitis or periodontitis;
- the periodontal ligament physiologically adapts to increased occlusal loading by resorption of the alveolar crestal bone, resulting in increased tooth mobility. This occlusal trauma is reversible;
- occlusal trauma is a cofactor that increases the rate of progression of an existing periodontal disease;
- there is a place for occlusal therapy in the management of periodontitis, especially when related to the patient's comfort and function;
- occlusal therapy is not a substitute for conventional methods of resolving plaque-induced inflammation.

The myofunctional trainer applied provided an effect of oral muscles re-education through a series of myofunctional exercises to start modifying and correcting the functions of swallowing, breathing, and chewing. In addition, it allowed muscular reprogramming and the modification of the previous motor engram (35, 36). The device presented a reference point for the tongue muscles to allow, during daily myofunctional exercises, but even at rest, a correct positioning up and behind the upper incisors (37, 38). The appliance showed its arch reconfiguration and intrusive effect, which have a decisive role in PTM improvement.

The elastic myofunctional trainer has restored a correct "neutral corridor" of the arches allowing the correct positioning of the teeth in a three-dimensional position not to receive oblique and deflecting forces. This result, thanks to the device's elastodontic action, was, in our opinion, due to the combined effect of the intrusive action by the horizontal plane, more rigid, on which the arches lay down, and the retraction action carried out by the vertical flanges.

The most relevant result has been achieved in the frontal sectors where the PTM and diastema disappeared, improving the smile with a very satisfactory aesthetic effect.

We want to point out that this therapeutic approach undoubtedly has advantages over other options (i.e., traditional orthodontics) that may be just as effective; first of all, the mini-invasiveness that, from the periodontal point of view, has no impact on the daily hygienic procedures (39, 40).

As for all medical acts (never 100% predictable), a value is also that of the reversibility of the treatment. Especially in cases like those presented, characterized by parafunctional habits, the action through traditional fixed orthodontic procedures, would certainly be less easily "reversible" than the removable device used at night (41, 42).

From the cost-benefit ratio point of view, which should always be considered in the ethics of our therapeutic choices, the simplified and mini-invasive device used here is undoubtedly brilliant.

CONCLUSION

Based on all the previous considerations, the authors want to focus their attention on the use of these new devices in cases where there is a possible traumatic and/or parafunctional component to support periodontal lesions like PTM and diastema.

"Three-dimensional byte": an elastic medical silicone device consisting of a monobloc that wraps both arches with a horizontal plane (more rigid) on which the two arches are leveled according to a predetermined anatomical plane and two vertical flanges, one internal and one external (softer); aimed at neutralizing the abnormal muscular forces that insist on the arches.

The use of three-dimensional silicone bytes during the night, without any impact on hygiene practice, could support and complete the anti-infective periodontal therapy with an occlusal stabilization activity, especially in occlusal trauma is evident and/or there are dental migrations, i.e., in stage 4 periodontitis.

The effect of this therapy additional is:

- greater stability of the result, the recovery of a harmonic occlusion, the recovery of acceptable aesthetics;
- the correction of long-time altered and never corrected muscle functions such as atypical swallowing and oral breathing that may have been the cause of the early onset and severity of periodontal lesions.

Further studies are needed to better investigate these innovative therapeutic procedures.

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Conflict of Interest

The authors declare no conflict of interest.

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