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## A Two Year Multidisciplinary Treatment for Malocclusion Caused by Generalized Aggressive Periodontitis

Margarita Vasilievna Poliakova<sup>1\*</sup>, Victoria Yurievna Danilova<sup>2</sup>

## Abstract

This report is presented multidisciplinary treatment for malocclusion due to generalized aggressive periodontitis and emphasized the importance of perfect retention with both ways of retainers (plastic and metal) for two years period. This clinical case demonstrates a relapse, which is the return of some teeth to their original position after a year and a half due to the non-use of plastic retainers on the upper jaw, despite the presence of a fixed wire retainer.

The patient was a 49-year-old woman who turned to the clinic with the chief complaint of displacement in the anterior tooth. An oral examination revealed pathological tooth mobility throughout the entire oral cavity due to severe loss of periodontal support. Crowding in the mandibular anterior teeth were also observed. The goal of <sup>1</sup>Prosthodontist, Ph.D. in Medicine, The Central Research Institute of Dentistry and Maxillofacial surgery, Moscow, Russia

<sup>2</sup>Orthodontist, The Central Research Institute of Dentistry and Maxillofacial surgery, Timura Frunze Street, 16, Moscow, Russia

\*Corresponding Author: Margarita Vasilievna Poliakova, Prosthodontist, Ph.D. in Medicine, The Central Research Institute of Dentistry and Maxillofacial surgery, Moscow, Russia.

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subsequent treatment was to enhance aesthetics while preserving most of the natural teeth and to achieve ideal inclination by aligning the teeth.

**Keywords:** Generalized aggressive periodontitis; Non-extraction; Orthodontic treatment; Periodontal destruction; Multidisciplinary treatment.

## Introduction

The number of adult patients affected by the consequences of periodontal diseases who are seeking orthodontic treatment to enhance their occlusion and overall quality of life is steadily increasing. However, it is crucial to emphasize that patients experiencing vertical bone loss have distinct requirements due to the frequent occurrence of associated pathological shifts. As a result, these patients necessitate personalized orthodontic treatment that considers factors such as anchorage, biomechanics, and combined therapy. This complexity can lead to uncertainties in determining the order of priorities and organizing the treatment plan [1,2].

The patient turned to the clinic with the goal of restoring the aesthetics of the smile. For many years, the patient has been suffering from periodontal disease and has repeatedly visited clinics to address gum

bleeding issues. She regularly visited a dental hygienist for professional hygiene. Closed curettage of periodontal pockets has been performed multiple times (according to the patient) (Fig. 1, 1a).



**Figure 1:** The initial situation.



**Figure 1a:** The initial situation.

Poliakova MV | Volume 4; Issue 1 (2023) | Mapsci-JDR-4(1)-032 | Case Report **Citation:** Poliakova MV, Danilova VY. A Two Year Multidisciplinary Treatment for Malocclusion Caused by Generalized Aggressive Periodontitis. J Dent Rep. 2023;4(1):43-51. **DOI:** <u>https://doi.org/10.37191/Mapsci-2583-2255-4(1)-032</u> To restore the aesthetics of the smile, the patient was previously advised at another medical-preventive institution to have all the teeth extracted followed by dental implant placement and complete dentures.

The patient was not prepared for such a radical treatment option, both financially and psychologically, due to the relatively young age.

After discussing the clinical situation with a team of specialists consisting of a prosthodontic dentist, an orthodontist, and an implantologist surgeon, it was decided to adopt a combined approach to address the existing problems.

Unfavorable periodontal status often becomes a contraindication for orthodontic treatment. In this case, based on the satisfactory individual hygiene of the patient, the absence of systemic somatic diseases, as well as regular monitoring and observation by a periodontal specialist, we deemed it possible to use this treatment method to achieve aesthetic results, preserve most of the teeth, and improve hygiene.

## **Clinical presentation**

An informed consent was obtained from the patient for publication of the case and accompanying images.

The patient was a 49-year-old woman who presented with the chief complaint of displacement in the anterior teeth. In medical history, there is regular gum bleeding during tooth brushing, gradual protrusion of the upper central incisor from the dental arch, professional hygiene, and periodontal pocket curettage. The harmful habit includes occasional shisha smoking. The patient feels self-conscious while speaking and avoids smiling. Objective findings. No asymmetry in the lower third of the face, no enlarged regional lymph nodes, normal skin color, painless palpation of the masticatory muscles and temporomandibular joint. The height of the lower third of the face is harmonious.

## Local status

Pigmented dense plaque present on all teeth. Soft dental plaque is present in areas of tooth crowding and opposite to the ducts of the sublingual and parotid glands.

## Orthodontic status

Constricted dental arches in the upper and lower jaws, crowded position of the lower teeth, deep overbite, dental arch relationship classified as Class I according to Angle's classification.

The mobility of most teeth is grade 1-2, pocket depth up to 3 mm, no suppuration.

**Tooth 1.1**: Extrusion, root exposure halfway, grade 3 mobility, marginal gingiva is cyanotic, swollen, bleeds upon probing, periodontal pockets on all sides up to 6 mm.

**Teeth 2.6, 3.7, 3.6:** Intact, grade 3 mobility, periodontal pockets up to 10 mm.

**Tooth 4.2:** Grade 3 mobility, periodontal pocket of 4 mm, lingual position.

## Diagnosis

- Chronic generalized moderate periodontitis-K 05.31
- Abnormalities in dental arch relationship and tooth position-K 07.2

## Treatment plan

- Professional hygiene.
- Extraction of teeth 1.1, 2.6, 3.7, 4.7.
- Placement of braces and initiation of orthodontic treatment.

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- Implant placement in positions 1.1 and 2.6 after 3-4 months of bone tissue healing.
- Provisional prosthetic crowns on the implants after 3-4 months of osseointegration.
- Definitive prosthetic restoration on the implants after completing orthodontic treatment.

## Materials and methods

Cone beam computed tomography (CBCT) before treatment, intraoral radiographs during implant placement, and post-treatment control orthopantomograms.

Use of Implantium SuperLine implants (Dentium, South Korea).

Two-stage delayed implantation, with soft tissue augmentation performed during the removal of tooth 1.1.

Analog impressions taken using Silagum impression material (DMG, Germany).

Temporary crown provision using acrylic resin on standard titanium temporary abutments.

Definitive crowns made of zirconia on individual zirconia abutments (1.1) and metal-ceramic crowns on individual milled titanium abutments (3.6), cemented with glass ionomer cement Fuji 1 (GC).

## Damon Q bracket system

Retainers placed on the anterior teeth of the upper and lower dental arches from canine to canine after completing orthodontic treatment. Additionally, the use of retention caps is recommended for at least two years. The periodontal disease was managed by a periodontist who provided guidance on oral hygiene and periodontal disease control throughout the course of treatment. orthodontic Appropriate occlusion and a good oral environment were achieved. The condition of the periodontal tissue stabilized during and after favorable orthodontic treatment, and occlusal stability was observed at the 2-year follow-up examination.

## The medical records

## December 2020

Professional hygiene performed before the placement of braces. Extraction of teeth 1.1 and 2.6. Socket preservation was done in tooth 1.1 using a bone substitute (BioOss) and a connective tissue graft. The wounds were sutured with Vicryl sutures (Figure 2). After a week braces system installed, and the crown portion of tooth 1.1 was used to replace the missing tooth, fixed to the orthodontic arch. Cone beam computed tomography (CBCT) was done at the orthodontic treatment stage before implant placement (Figure 2a).

## January 2021

Super Line implants (Dentium) were placed in positions 1.1 (size 3.6) and 2.6 (size 4.0). A closed sinus lift was performed in the 2.6 position. Gingival formers were placed.

## October 2021

Temporary crowns were placed on the implants in positions 1.1 and 2.6 during the orthodontic treatment stage.

#### December 2021

Braces system removed, retainers placed, and impressions taken for the fabrication of retention caps (Figures 3-5).



Figure 2: Installed braces system with the crown portion of tooth 1.1 fixed to the orthodontic arch.



**Figure 2a:** Cone beam computed tomography was done at the orthodontic treatment stage before implant placement.



**Figure 3:** Lower jew with retainer.



Figure 4: Upper jew with retainer. 2.6.-temporary crown on implant.



Figure 5: 1.1 - Temporary crown on implant.

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## April 2022

Implants in positions 1.1 and 2.6 were restored with permanent crowns (Figure 6).



**Figure 6:** Final restoration.

#### June 2023

The check-up revealed a slight displacement of the front teeth in the upper jaw. The patient admitted that she stopped wearing the upper jaw night splint because she experiences psychological discomfort and inconvenience during sleep (Figures 7).



Figure 7: A follow-up examination one and a half years after the completion of the treatment.

#### Discussion

The success of orthodontic treatment lies not only in whether we were able to move the teeth in the desired direction and achieve the desired functionality and aesthetics but also in the stabilization of the obtained result. Stable occlusion and the absence of relapse, both in the early stages after orthodontic treatment and in the long term, are an integral part of successful treatment and recovery. We cannot speak of achieving success in rehabilitation if, after a short period following the completion of treatment, we observe a change in the position of the teeth, their movement back to the original position, and, as a result, a deterioration in aesthetic and functional outcomes.

Stabilization of the achieved result is accomplished with the help of retention devices. In the case of patients with generalized periodontitis, the risk of relapse after orthodontic treatment is significantly higher than in situations with a healthy periodontium. As a result, attention to retention should be doubled [4].

It is extremely important to use both types of retainers: fixed wire retainers and removable aligners. The patient should be warned about the risk of relapse if the patient refuses to use at least one type of retainer. In the case of nighttime wear appliances, it is important to emphasize to the patient the need for daily use of the appliance, and the patient should be informed about this even before the start of treatment, including informed written consent. It is also necessary to conduct regular follow-up examinations as often as possible, especially during the first two years after treatment completion, to timely identify any patient non-compliance with wearing aligners. The optimal frequency of check-ups can vary from 3 to 6 months. In later stages, up to 5 years, this frequency may be adjusted to longer intervals between examinations with consistently positive progress.

## Conclusion

The collaborative effort of multiple specialists allowed for the preservation of most of the teeth and the restoration of smile aesthetics. Correcting tooth crowding significantly improved the quality of individual hygiene. The change in tooth inclination achieved through orthodontic treatment facilitated the establishment of axial loading on the tooth's periodontium, thus contributing to its strengthening. The patient is very pleased with the aesthetic outcome, which has enhanced the social confidence. In conclusion, it is important to emphasize once again the importance of patient-doctor collaboration in achieving and maintaining a stable treatment result. The patient must be well motivated to follow the doctor's recommendations strictly and faithfully.

The authors have declared that no competing interests exist.

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