

Original Contributions

Multistage implantology-orthodontic-prosthetic treatment

A case report

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Supplemental material
is available online.

ABSTRACT

Background and Overview. Patients increasingly expect esthetic and comfortable fixed restorations on implants, are aware how important it is to maintain healthy tooth tissue, and draw attention to the final result of treatment.

Case Description. In this case report, the authors describe implantology-orthodontic-prosthetic treatment provided on a patient who reported symptoms of head, back, and neck pain and had an impaired prosthetic plane, lack of space for prosthetic crowns after the introduction of the implants and no good treatment plan, and broken tooth roots of the mandibular anterior teeth. In addition, the patient wanted to correct the shape and color of the rest of her teeth. The authors present the different stages of the implantology-orthodontic-prosthetic treatment and the final result after treatment. The patient was satisfied with the achieved results of the treatment in terms of functionality and esthetics. She felt a significant reduction in pain in the temporal, masseter, and sternocleidomastoid muscles. The clenching of teeth at night decreased, and she began to sleep better. Her well-being improved.

Conclusions and Practical Implications. Before the beginning of the treatment, dentists should make an accurate diagnosis and determine if patients qualify for the treatment and the appropriate materials are selected. Achieving the desired functional and esthetic effect often requires cooperation with physicians in various specialties and multistage treatment.

Key Words. Multistage treatment; implantology; esthetic expectations.

JADA 2018; ■(■):■-■

<https://doi.org/10.1016/j.adaj.2018.04.028>

In modern dental prosthodontics, the lack of teeth is increasingly supplemented by functional and comfortable prosthetic constructions supported on dental implants.¹⁻⁶ Such reconstruction does not require grinding the hard tissue of teeth and their irretrievable loss (up to 72%).⁷ In the case of missing posterior teeth, these reconstructions make it possible to replace uncomfortable removable partial dentures with fixed restorations, through which better stabilization and retention and good esthetic and positive psychological effects are possible to achieve. Before placing the implants, it is essential for the clinician to take into account the eligibility of the patient for surgery. This assessment should include the patient's general state of health and the local conditions (quantity and quality of bone and the type of occlusion). Dentists should plan the optimal prosthetic structures from the point of view of biomechanics, which will ensure a balanced occlusion in the area of dental arches reconstructed on the basis of implants.⁸

Before providing the patient with an implant-supported restoration, the clinician should obtain an exact history from the patient and conduct a local examination along with radiographic analysis. The patient should be given information regarding methods, the treatment plan, what the surgery involves, costs, possible complications, postoperative hygiene, and the need for follow-up visits. In addition, the clinician must prepare the patient for prosthetic restorations, which involve sanitizing the oral cavity, obtaining impressions and creating diagnostic models, analyzing occlusion and bite registration, defining the type and location of the implants on the models, and drawing up a plan for early and final prosthetic restorations. The last point involves determining the type of construction for immediate implant-supported prostheses and final solutions, preparation of a radiographic template with reference points and templates with preset artificial teeth, execution of

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the necessary models and photographic documentation, and preparation of temporary prostheses that serve also as a model for planning the location of the implants.

In any case, the preliminary prosthetic analysis takes into account factors associated with the correction of occlusion through elimination of premature contacts and corrective treatments in the field of occlusion-articulation surface with the elimination of occlusal interferences. This is done by using selective grinding treatment or orthodontic treatment. In difficult cases with severe occlusion-articulation complications and functional disorders associated with the permanent change of the spatial position of the mandible, malocclusions, the loss of support zones, generalized pathologic tooth wear, and large tissue defects, it is necessary to conduct a multistage treatment. The aim of the first stage is a gradual change in the spatial position of the mandible, taking into consideration the target reconstruction and functional remodeling of the stomatognathic system. This can be achieved using orthopedic treatment methods.

After positive results of the first stage and the patient's adaptation to new occlusal conditions, the second stage of treatment starts. The aim of this stage is the permanent reconstruction of dental arches based on the final restorations already integrated into the newly adopted functional situation of the stomatognathic system.⁸

Before esthetic treatment, the diagnostic wax-up must be made, which involves modeling in wax the shape of future dental restorations.⁹⁻¹¹ On acceptance of the shape of the teeth by the patient, a silicone index must be made from the first elastomeric layer, which will help provide the patient with temporaries (mock-ups) made of composite resin. After the polymerization, an analysis of the length of the teeth with reference to the upper and lower lips needs to be made, paying attention to the function and phonetics and checking the final effect.¹¹⁻¹³ The patient can give an opinion on the new smile, and the dentist should consider the kind of restorations needed.

Accurate diagnosis before esthetic treatment is of particular importance because, on the one hand, it avoids false or exaggerated expectations on the part of the patient, and, on the other hand, it anticipates technical issues and enables them to be solved appropriately.

CASE REPORT

A 38-year-old woman came to the dental office to continue implant treatment (eFigure 1). The patient had undergone the implantation stage in positions nos. 18, 30, and 31 in another dental office. The previous dentist refused to proceed with further prosthetic treatment owing to the lack of vertical space. The main problem was the lack of space for prosthetic crowns in the area of tooth no. 15, which was in contact with the mucous membrane of the mandible. Tooth no. 15, having no contact, elongated from the alveolus. It also became a point of traumatic premature contact. The patient felt pain on the part of the stomatognathic system mainly from the temporal, masseter, and sternocleidomastoid muscles. She reported symptoms of headaches, teeth clenching at night, and trouble sleeping, as well as of back and neck pain. Ultimately, she was interested in esthetic treatment (that is, changing the shape and color of the teeth).

Both the shape of the occlusion and the results of a clinical examination indicated dysfunction of the chewing system: swallowing with the tongue between the teeth and mouth breathing. We heard and felt clicking in the joints on palpation during a temporomandibular joint examination. We observed reduction in the lower facial height, together with slight asymmetry and a retruded chin (Figure 1).

The clinical examination revealed missing teeth nos. 13, 18, 30 and 31. The gingival margin in the area of teeth nos. 24 and 25 was inflamed. Although teeth nos. 24 and 25 had been restored with porcelain-fused-to-metal (PFM) crowns, they showed grade II pathologic mobility, according to the Kantorowicz scale. The other anterior teeth were worn and shortened, with cracks in the enamel parallel to the long axes. We noted a deep overbite and retrusion of the maxillary incisors in the anterior segment.

The posterior teeth had been restored incorrectly with composite resin. A temporary restoration had been placed on tooth no. 19. Tooth no. 14 inclined mesially into the space created by missing tooth no. 13, and tooth no. 32 inclined into the space vacated by missing tooth no. 31.

Missing teeth nos. 13 and 31 and incorrect restoration of tooth no. 19 resulted in the loss of position of adjacent teeth and therefore in a distorted prosthetic plane. The occlusion was diagnosed as class II, division 2, subdivision 2, according to the Angle classification.

After obtaining the patient's medical history and conducting a physical examination, we evaluated the patient's previous panoramic radiograph (eFigure 2) and obtained a computed

ABBREVIATION KEY

- CT:** Computed tomographic.
PFM: Porcelain-fused-to-metal.
TMJ: Temporomandibular joints.

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