FULL MOUTH REHABILITATION AS AN EFFECTIVE TOOL FOR ANTI-AGING. CASE REPORT

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Abstract
It is a well-known fact that white teeth, harmonically located in the dental rows, with no defects, wear signs and pathology in the periodontium, are a sign of youthfulness and some kind of a mirror of overall body health. Actually, the dentist can be the first one to detect the first manifestations of any somatic diseases or deficiencies during examination of the patient. Modern digital technologies can offer high quality and aesthetics of the dental procedures, that also benefits in the time of dental sessions, which is less stressful for the patient, the dentist and the laboratory. This study presents a clinical case of complex functional and aesthetical dental rehabilitation of a 34-year-old patient. The main complaint of the patient was a change of the face image, tooth wear and unsatisfactory appearance of the teeth, as well as discomfort during the jaw movements and occlusion. Since the patient had clear time limits, namely 3 months, rehabilitation, was carried out according to a fast protocol. It included increase of the vertical dimension, using botulinum therapy of the masticatory muscles, temporary prosthetic crowns and final full zirconia crowns. Also, splint therapy for the treatment of temporomandibular disorder was included to the protocol, as this problem hasn`t been treated in time. During the rehabilitation process, cone-beam computed tomography of the jaws and joints, an intraoral scanner, and the most modern digital workflow for prosthetics were performed.

As a result of the rehabilitation, the lost chewing function and aesthetics of the teeth were restored. The tone of the masticatory muscles and the range of the jaw movements were harmoniously corrected, the cheek pits, the upper and lower lips increased in volume, therefore the shape and size of the lower part of the face increased and the patient`s smile became snow-white. The patient`s general condition and mood improved, he gained a new younger look.

Keywords: full mouth rehabilitation; tooth wear; botulinum toxin; zirconia crowns; digital workflow; occlusal splint; temporomandibular disorder.

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Key Messages for Research and Practice

- The key to the success of aesthetic and functional prosthetics is a complete diagnostic protocol and precise planning of total rehabilitation.

- Botulinum therapy of the masseter muscles is a highly effective method for the tone and size correction of the masticatory muscles and stereotypic clenching of the teeth.

- For high esthetics in the fight against premature aging and abrasion of the hard tissues of the teeth, the use of the protocol of raising the vertical dimension is the clue to success. Most often it includes: botulinum therapy, splint therapy and temporary crowns and final crowns.

- For the positive outcomes of such treatment plan, examination of the temporomandibular joints is obligatory, even if the patient has no complaints.
Introduction

The development and promotion of the beauty industry, especially in social networks, encourages people to rejuvenate their look and, accordingly, to renew the smile. High quality and aesthetics of the dental procedures comes from the everyday improvement in modern digital technologies [1,3]. Sometimes, health problems, related to the loss of occlusal vertical dimension lead young people to look for esthetic and functional rehabilitation of their smile [3]. Severe tooth wear can cause a lot of suffering to the patient, including tooth sensitivity, unsatisfactory changes in face and smile image as well as temporomandibular disorders [2]. Nowadays it can occur in teen age, young adults and also older persons and may be caused by different reasons. Sleep and awake bruxism are among these reasons which may also cause hypertrophy of the masseter muscles. In recent years, we can see a lot of publications about the use of botulinum toxin to regulate the activity of bruxism and reduce masseter size and hypertrophy [4,5].

Clinical case

Patient A., 34 years old. Complained about a change of the face image, an unsatisfactory teeth aesthetics, excessive tooth wear, cracks and chipping of the enamel, a sunken lower lip, a decrease in the lower part of the face, as well clicking in the temporomandibular joints (TMJ) and limitation of jaw movements. Also suffers from emotional exhaustion, sleep and awake bruxism. According to the subjective part of the examination: fear of the dental interventions, which led to avoidance of visits to the dentist, parafunctional habits, sleep and awake bruxism, a chin injury after a motorcycle incident 5 years ago.

Objectively: multiple lesions of the hard tissues of the teeth by the carious process, enamel erosion, attrition, generalized tooth wear up to 50% of the height of the crowns with no pain, diastema, trema and deep bite were detected. The tooth color is heterogeneous in the range A2-A3.5. According to cone-beam computed tomography (CBCT) of the jaws and TMJ, many teeth have signs of periodontitis as a result of poorly sealed root canals, heads of the mandible are of different shapes and sizes, more flattened on the right side, with an uneven contour and clarity of the cortical plate, the bone tissue of the mandibular heads is heterogeneous. This condition of the articular surfaces may occur as the result of an injury 5 years ago, the consequences of which were not assessed in time. Mouth opening 36 mm, jump-like with deviation to the right and clicking in the right TMJ. Hypertrophy of the masseter size, tense and painful on palpation.

Discussion. Thorough clinical examination (Fig. 1 A-D), evaluation of the additional investigations (Fig. 2 A-B), prosthetic rehabilitation plan, using semiadjustable articulator (Amann Girrbach), were performed. The patient was offered a comprehensive step-by-step treatment plan, which included total full mouth rehabilitation with restoration of the occlusal pattern and lost vertical dimension, harmonic change of the shape and color of the teeth. This treatment plan simultaneously provided the treatment of temporomandibular disorder (TMD) with the use of splint therapy. Such a volume of prosthetics required preliminary endodontic treatment and composite build-up of some teeth (Fig. 3).

All diagnostic and planning procedures were carried out with the help of modern digital technologies using the dental intraoral scanner Trios 3 Shape and digital workflow for modeling of the splints and crowns by the dental laboratory in the Exocad system. Prosthetic treatment took place in several stages:

- delivery of occlusal splints for night use for primary adaptation of the TMJ and masticatory muscles;
- primary segmental preparation of the teeth for the production of provisional restorations, after 2 weeks (Fig. 4). Planning and manufacturing of the temporaries was carried out by digital modeling in the Exocad system (Fig. 5). After this clinical stage, the doctor and patient can evaluate the shape, size and color of the future teeth, as well as the quality of chewing food and phonetics after fixing them on temporary cement;
- botulinum therapy of the masticatory muscles using Botox Allergan in the amount of 16 units per each masticatory muscle to correct bruxism, hypertension of the masticatory muscles and to ensure an even distribution of the masticatory overload;
- final in-mouth check of the temporary restorations, correction of the occlusal contacts, marginal fitness and the shape of temporary teeth. Some crowns were reworked according to the conditions of the oral cavity and chewing pattern during the next 2 weeks. Thus, success was achieved in smooth adaptation to the new occlusion. At this stage, an increase in the range and smoothness of the jaw movements, a decrease in TMJ clicking were detected;
Figure 1. A – Intraoral frontal view before treatment, B – Intraoral right view before treatment, C – Intraoral left view before treatment D – Intraoral maxillary occlusal view before treatment.

Figure 2. CBCT of the TMJ (sagittal plane), A – right TMJ, B – left TMJ.

Figure 3. Panoramic view after endodontic treatment and build-up of the teeth.
**Figure 4.** Frontal view of the teeth after primary preparation.

**Figure 5.** Temporary crowns, Exodad view.

**Figure 6.**

A – Final zirconia crowns in Exodad, B – intraoral right side view after final tooth preparation, C – intraoral left side view after final tooth preparation, D – final zirconia crowns on the day of cementation.
- next check session 2 weeks after using the corrected temporary structures. The patient revealed no complaints about the aesthetics or any difficulties in chewing food. So, we started the stage of final preparation of the teeth and manufacturing of permanent zirconia crowns, color B1 (the patient’s choice) (Fig. 6 A-D).

- the final fixation of zirconia crowns on permanent cement was carried out after assessment of the main parameters: absence of patient complaints, symmetric occlusal contacts, degree of mouth opening 43 mm, absence of pain during palpation of masticatory muscles and their uniform tone.

Conclusion

As a result of the complex functional and aesthetical rehabilitation with the increase of vertical dimension, the patient regained even bilateral mastication, the lower part of the face increased, the sagging of the lower lip has been compensated, the degree of the mouth opening and movement range increased, the corners of the mouth rose, the smile became white and harmonious, the patient gained a younger look. All this, in general, had a positive effect on the emotional state, mood and, accordingly, on increasing of the self-esteem of the 34 year-old patient.

REFERENCES


