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A Combination of Internal and External Connection Screw-Retained Implant Restorations in Esthetic Zone Rehabilitation: A Case Report

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ABSTRACT

This case report describes the rehabilitation of the Esthetic-Zone of the maxillary jaw of a 70-year-old female patient by using 4 implants (BEGO Semados® RS/RSX) with the challenging position of her implants due to her age and channel access of the Fixtures and also the Difficulty in supplying desired prosthetic parts due to existing problems. In the beginning, the treatment plan was to reconstruct the mouth using conventional restoration with UCLA abutments, but due to the unavailability of non-hex abutments As well as the failure to achieve the desired Esthetic demands of the patient by using this treatment plan, especially in the anterior implant area of the jaw, it Innovatively was decided to use a combination of cylindrical abutments (BEGO MultiPlus system) and UCLA abutments to Design and fabrication of the Final restoration.

Keywords: Dental implant; Dental prosthesis; Static zone; Internal and external connection; Challenging case.

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Introduction

Nowadays implant-based treatments are one of the common and reliable treatments all over the world due to the popularity of these treatments and also the variety of the patients who receive these treatments. The high survival rates reported for single and multiple missing tooth replacements have demonstrated the effectiveness of implant-supported restorations as an approach for oral rehabilitation [1]. So the practitioner should be ready for any challenges that can happen during the process of this treatment (both surgical and prosthetic parts). One of the most challenging steps of this treatment is the prosthetic stage. Usually, it is recommended to start the treatment plan with the overall participation of the patient, the treatment team (consisting of a dental surgeon, prosthodontist, and laboratory technician) and especially with a prosthetics attitude, and even the brand and type of implant is also decided after these consultation sessions and on Based on the final results of the treatment plan [2], but in some cases, due to problems in communication and also the condition of the patient, the plan changes between these steps, which can lead to many problems. One of the complications that is generally encountered in the prosthetic stage is the lack of access to the appropriate prosthetic parts and even in some cases, the lack of parts with the desired specifications in the implant system used by the patient being treated. In this case report, the process of reconstructing the aesthetic area of the upper jaw of a 70-year-old female patient with implant-based restoration is discussed, and the problems encountered in this case and how to solve these problems are discussed.

Clinical Report

A 70-year-old female patient with four Bego bone level implant units (BEGO Semados® RS/RSX) in positions (13,21,23, and 25) that were 6 months after surgery and implant placement were referred to the Prosthodontist to take the final impression for the prosthetic phase by means of A silicone impression material) Zhermack Hydrorise® A-Silicone). Then the impression was sent to the laboratory for making the restoration. Due to the old age of the patient, as well as the location of the implants and their access holes and the severe wear marks On the teeth of the lower, along with severe protrusive tilt of the lower jaw teeth, which gave the patient's mouth a state similar to class 3 patients which had a similar appearance to Kennedy class 3 patients (Figure 1), it was decided that The restoration should be made of screw-retained and PFM type according to the financial conditions of the patient and Biomechanics and limitations of zirconia restorations [2]. Also, due to the strong desire of the patient to maintain. Appropriate lip support and maintain the beauty of the restoration, it should have an overjet as much as possible and be made edge-to-edge with the lower jaw teeth. After the examinations with the Prosthodontist and also consultation with the companies that supply prosthetic parts of the relevant brand in the country, 4 UCLA metal connection abutments with hex (Bego Universal Abutment PS UNI* hex) due to the lack of non-hex UCLA (which is the best choice in this cases [3]). And also an emphasis on the use of original Prosthetic parts for restoration was prepared. After cutting the abutments based on the occlusal plan, a Pattern resin (GC Initial® PATTERN RESIN™ LS) shell was made on them using the GC resin pattern as a Verification jig and also to determine the approximate position of the teeth in the mouth, and then it was sent to the Prosthodontist doctor for checking and final examination Before making the restoration frame). (Figure 2 c and d).

After examining the resin pattern, the problem of the frame not sitting was known due to the different angles of the connection of the implants with each other, so the anterior. Fixtures access channel had a severe buccal tilt, which led to the problem of parallelizing it with other connections And as a result, it led to the inability to design an identical insertion path for all abutments. In the first face of this problem, The hexagonal part of the anterior abutment attachment was removed (manual non-hexing of the abutment by using tungsten carbide and diamond burs) and after that, the resin pattern was tested again inside the mouth. The result was the siting of the frame with great difficulty, as well as the presence of rock and Not having passive fit inside the mouth. (Figure 3). In the second encounter, it was decided to make a prosthesis with two pieces: in such a way that implants 13 and 21 are splinted with each other (and support teeth 13 to 21) and implants 23 and 25 are also splinted with each other (and teeth support 22 to 25).

However, due to the patient's conditions, including age and cosmetic problems, the anterior implant not being parallel with the implant placed in the area of the 13th tooth, and also due to the formation of a large number of cantilever pontics in the restoration (Teeth 22 and 23), which eventually led to the creation of many aesthetic and biomechanical problems, this treatment plan was not implemented. In the third face of this problem, it was decided to replace the anterior abutment with a multi-unit abutment and its cylindrical

part (burn-out plastic) (BEGO MultiPlus system). In this treatment plan by placing a multi-unit abutment. Instead of the UCLA abutment, which was in the place of the anterior fixture in the previous treatment plan, the angle of the anterior implant connection was modified and paralleled with other connections. And finally, using the cylindrical part as a part of the frame design pattern was completed. After examining this solution and consulting with the Prosthodontist and companies supplying parts, unfortunately, a similar piece but with a larger gingival height was the only available piece, so that piece was inevitably prepared and placed on the stone cast for examination. (Figure 4).

After placing the multi-unit abutment with its cylindrical piece, the anterior of UCLA abutment, removed from the Resin pattern in a way the arrangement of the teeth in the Resin pattern remained (because the arrangement and placement of the teeth were approved by both the Prosthodontist and the patient) and then the Resin pattern repaired with the remaining abutments on the cast. Here, i.e. the show of the metal part of the multi-unit abutment inside the mouth, because the gingival height and diameter of the multi-unit abutment were much larger than the UCLA abutment, and Considering its placement in the mouth, this case had a negative effect on the beauty of the patient. (Figure. 5 a and b). After the examination, dental technition was forced to prepare and grind the multi-unit abutment to reach the appropriate diameter and dimensions in order to cover the part that is visible in the mouth with a frame and pink porcelain (VITA Zahnfabrik VMK Master Gingiva powder). After that, the connection area of the cylindrical part was cut as far as possible (up to the connection part with the multi-unit abutment) and designed again with wax (DeguDent PLASTODENT® ART LINE) based on the prepared part of the multi-unit abutment, and finally, the Resin pattern using that reconstruction.

Then the necessary buildups and supports for this frame were created by wax. (Figure. 6 a to c). Finally, the frame after casting with base metal alloy (Supercast Industries base metal alloysuper cast) and the necessary adjustments for the frame was sent for the frame test, and after reciveing the Prosthodontist's confirmation that the frame is passivefit and it was suitable, the restoration entered the porcelain stage Using fuse-to-metal porcelains (VITA Zahnfabrik VMK Master kit). At first, after the Preparation of the frame for this step [4]. the surface of the frame was baked twice using Opaque wash and Opaque, and the final teeth were shaped on the surface with dentine buildup and enamel. (Figure 7 a to d).

Figure 1. The condition of the casts after mounting (note that the impression screws of open technique couplings are used as a guide to determine the path of the implants).

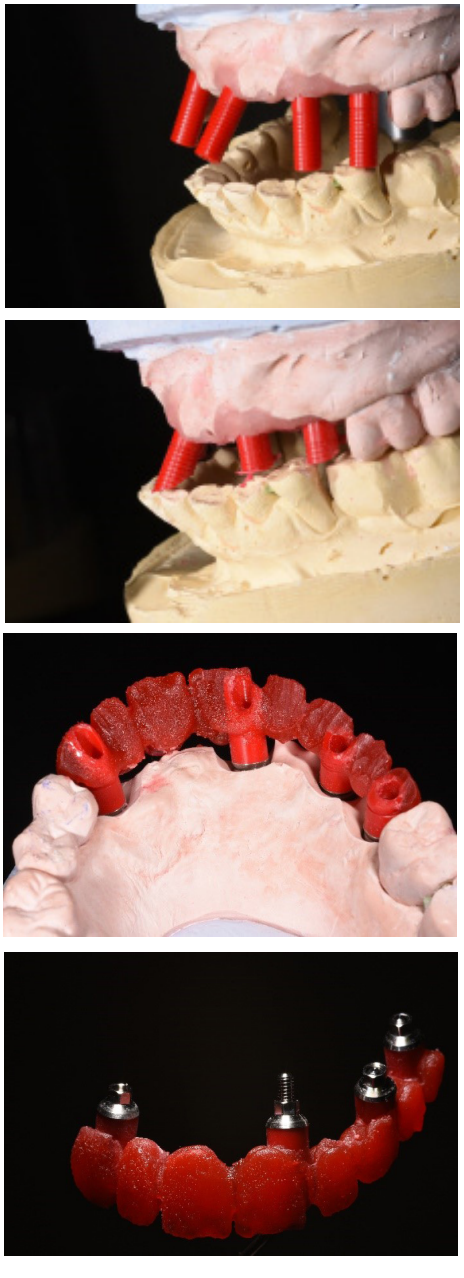

Figure 2. UCLA abutments closed on the cast (a). After cutting the abutments (b). Resin pattern from lingual view (C), buccal view (D).

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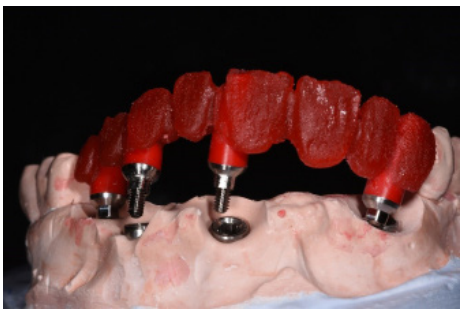
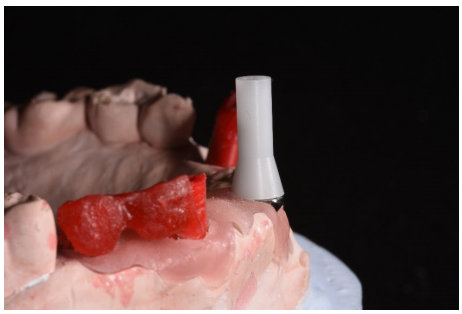


Figure 3. Resin pattern while the anterior abutment connection is made non-hex by handpiece.

A



B

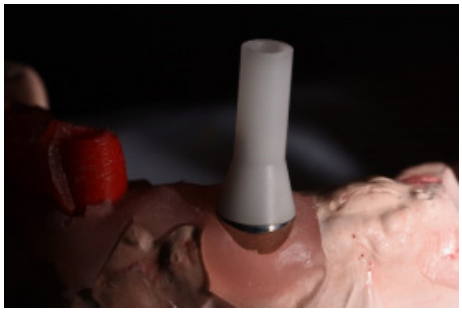
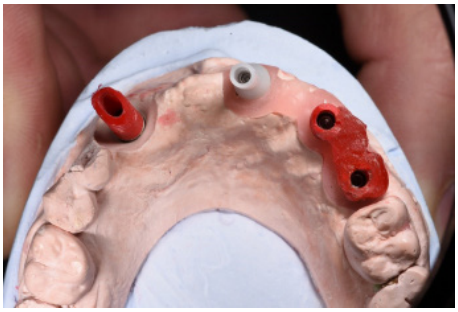


Figure 4. The piece prepared by the company Proximal view (A) Buccal view (B).

A



B

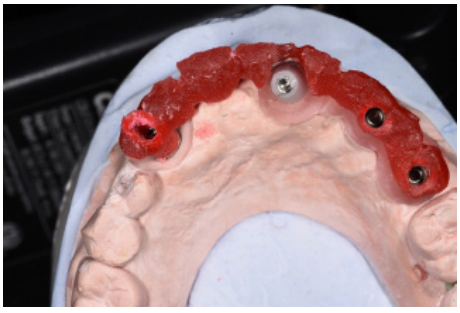
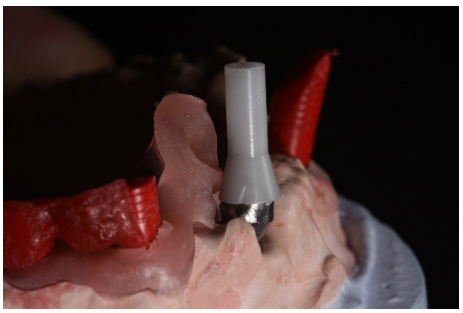


Figure 5. Placing the multi-unit abutment (a) Restoring the resin pattern around the new abutment (b).

A



B

C

Figure 6. Modified multi-unit abutment (a) Cylindrical reconstructed part with wax (b) Lingual view of the frame (c).

A

B

C

D

Figure 7. The final frame (A) after preparation (B) after two OPEC firing stages (pay attention to the OPEC termination point) (C) Final restoration after the glaze and polishing stage (D).

A

B

Figure 8. Restoration delivered to the patient, buccal view (a), occlusal view (b).

Restoration Delivery Phase and Follow-Ups

Finally, the restoration was delivered to the patient and according to the pictures of the final prosthesis, it benefited from the function and quality of the prosthesis. Also, in the next follow-ups after 5 8 months, the patient is using the prosthesis without any problems, and things like screw loosening, chipping, and so on. Were not observed. (Figure 8 a,b and c).

Conflict of Interest

There is no conflict of interest to declare.

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