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Treatment of esthetic complications in anterior implants: a multidisciplinary approach

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Esthetic complications involving implants are hard to be corrected and require multiple procedures, whose result depends, essentially, on the initial condition of the defect. In short, two scenarios are possible: implant maintenance or implant removal. In both situations, surgeries will be necessary for esthetic improvement of the peri-implant tissues, especially in the transition zone.

Bone and soft tissues augmentation is pivotal to solving esthetic limitations; however, without a restorative integration during all the stages of the process, it is not possible to achieve optimal results from the esthetic standpoint. This article reports, step by step, the clinical resolution of a case with esthetic impairment of an implant in the anterior region.

A 35-year-old patient, in good health, non-smoker, was led to treatment of an esthetic defect around an implant in the region of dental element #21, which showed a dentogingival provisional restoration in acrylic resin. After clinical and tomographic evaluation, it was decided to remove the implant, which was excessively proclined.

The implant was removed with an internal fixation device, under local anesthesia. A connective tissue grafting, removed from the palatal region near tooth #27, was placed on the defect, which was filled with bone substitute, and an adhesive provisional restoration was made.

After twelve weeks of tissue repair without complications, a second surgical procedure was performed for placing a new implant in the region of tooth #21 and making one more connective tissue grafting, as well as causing new augmentation of the buccal wall, with bone substitute.

The adhesive provisional restoration was reinstalled and, after twelve weeks of tissue repair, the implant was exteriorized and tissue conditioning through the prosthetic contouring started, in the form of a screwed provisional restoration. After

two years in masticatory function, the peri-implant tissues were dimensionally stable and clinically healthy, when the final restorative stage began.

A restorative trial (reduction mock-up) was done considering the facial lines of reference and, together with the patient, it was decided that teeth #11, #12, #22 and #23 would also be modified, by means of ceramic restorations, for a better esthetic composition of the smile. After that, a first impression was made for creating a CAD/CAM individualized pillar in zirconia and provisional restorations in acrylic resin for teeth #11, #12, #22 and #23.

In the following session, the patient tried on the individualized pillar in her mouth, dental preparations were finished and a final impression was made. Restorations in feldspathic ceramic on refractory dies were made for teeth #12, #11, #22 and #23 and for the individualized pillar in implant #21. The case was finalized with the esthetic try inside the mouth, for the patient's approval, followed by cementation of the prosthetic pieces.

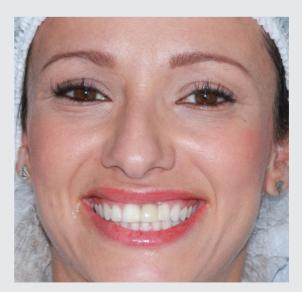


Figure 1: Initial patient's smile.



Figure 2 to 5: Initial intraoral images showing the presence of an implant-supported acrylic dentogingival prosthesis in the region of dental element #21, main reason of the patient's complaint.



Figure 6: Patient's smile after removal of the dentogingival prosthesis.

Figure 7: Intraoral view of the prosthetic pillar, after removal of the dentogingival prosthesis.



Figure 8A: The prosthetic platform (shoulder) of the implant was excessively proclined, impairing, from the esthetic perspective, the restorative finalization.

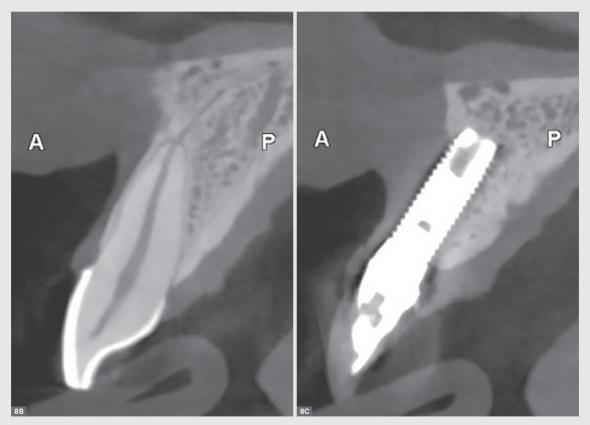


Figure 8B and 8C: B) Cone Beam Computed Tomography (CBCT) – transaxial reconstruction of the region of tooth #11: it is possible to observe the position of anatomic structures such as the cemento–enamel junction, gingival margin and bone crest. C) CBCT – transaxial reconstruction of the region of tooth #21: presence of an implant, there was no oral bone wall, the soft tissues showed low thickness and there was a difference in angulation between the prosthetic component and the insertion axis of the implant.

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tion (Implant Retrieval Instrument External Hex®, Nobel Biocare).

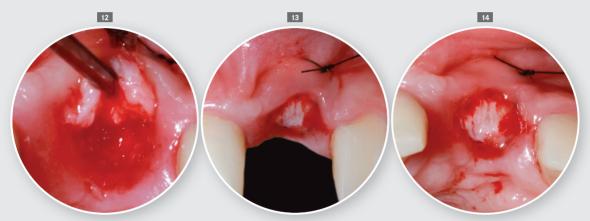


Figure 12, 13 and 14: Placement of a sub-epithelial tissue grafting (SETG) to improve the volume of soft tissues in the area of tooth #21. Filling of the defect in the alveolar ridge with a bone substitute (bovine mineral matrix without proteins and with collagen - Bio-Oss Collagen®, Geistlich).



Figure 15 and 16: Clinical aspect after twelve weeks of tissue repair, after removal of the adhesive provisional.

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Figure 17, 18 and 19: Placement of a Straumann Roxolid® SLActive BL NC 3.3/12mm implant.

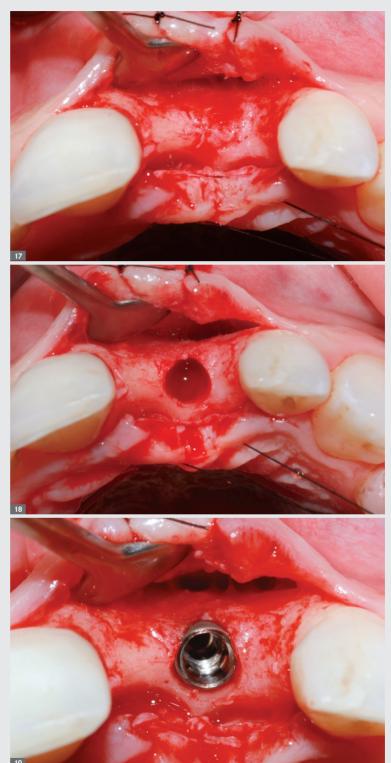




Figure 20, 21 and 22: Removal of a second connective tissue grafting from the palatal region of element #17.

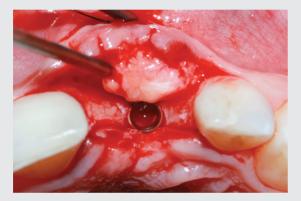


Figure 23: Fixation of the soft tissue grafting in the region of element #21, for a second increase in tissue volume.



Figure 24: Bone augmentation in the oral wall in the region of element #21, with a bone substitute of bovine mineral matrix without proteins and with collagen (Bio-Oss Collagen®, Geistlich).



Figure 25: Primary closing of the surgical wound, with individual sutures (mononylon 5-0).



Figure 26: 7-day post-surgery aspect.



Figure 27 and 28: 12-week post-surgery aspect, after removal of the adhesive provisional.



Figure 29 e 30: Clinical aspect seven days after implant exposure and placement of an implant-supported screwed provisional restoration.

Figure 31 and 32: Tissue stability in the grafted areas was monitored during two years of temporization. At that moment, refinement of the emergence profile began around the implant in the region of element #21. Buccal view.





Figure 33: Occlusal view.



Figure 34 to 43: Facial and smile analysis, for esthetic finalization of the case, with planning of the new dental contours based on the facial reference lines, on the smile curve and on the proportions of teeth sizes.

Figure 44: A) Termination based on digital planning, for the initial restorative trial (mock-up). B-E) Clinical sequence of the reduction mock-up, for testing the new contours proposed for the upper incisive teeth.

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Figure 45: Transfer dies of implant #21 individualized with flowable resin.



Figure 46: Plaster model for making the CAD/CAM individualized pillar and the provisional restorations in acrylic resin.

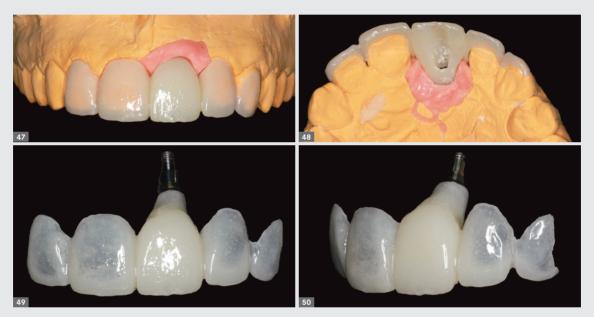


Figure 47 to 50: Acrylic provisional restorations for elements ± 12 , ± 11 , ± 21 , ± 22 and ± 23 , made after adjustments in the initial restorative trial.



Figure 51 and 52: Provisional restorations placement. The relationship between the new dental contours and the soft tissues are highlighted.



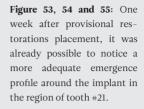








Figure 56, 57 and 58: Restorative check-list: checking the reduction of the dental elements, for making the laminates veneers.



 $\textbf{Figure 59:} \ \textbf{Patient's smile three weeks after provisional restorations placement.}$



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Figure 60: CAD/CAM pillar in zirconia, Straumann Variobase Hybrid abutment® (TPD Fernando Melo).



Figure 61, 62 and 63: Pillar being tried out in the mouth, which must mimic the substrate of the prepared dental elements, as well as properly support the peri-implant soft tissues.



 $\textbf{Figure 64:} \ \ \text{Distancing of the soft tissues, for modeling the teeth and the Variobase individualized pillar.}$

Figure 65: Polyvinylsiloxane-based mold (Virtual®, Ivoclar Vivadent).



Figure 66: Working mold made by applying Geller's technique, with feldspathic ceramic restorations on plaster dies (Creation CC° - DPT Fernando Melo).

Figure 67: Pillar in zirconia and feldspathic ceramic restorations.





 $\textbf{Figure 68 and 69:} \ \ Variobase @ \ individualized \ CAD/CAM \ pillar, in zirconia, with its respective laminate veneers in feldspathic ceramic.$



Figure 70, 71 and 72: Clinical aspect before cementation of the ceramic laminates veneers. The access channel of the individualized pillar was exteriorized via palatal surface, which allows the clinical to choose between intra and extrabuccal cementation of the laminate veneer. In this case, we performed an extrabuccal adhesive treatment of the pillar and intrabuccal cementation of the ceramic laminate veneer.



Figure 73 to 79: Intraoral views right after cementation of the ceramic restorations.



Figure 84: Final result of the treatment. Front facial view.



Figure 85: Final patient's smile.





Figure 86: Approximate view of the esthetic and tissue integration of the ceramic restorations.



Figure 87: A) Three-dimensional reconstruction of the maxilla, after finishing the treatment (Cone Beam Computed Tomography). B) CBCT – transaxial reconstruction of element ± 13 : we can observe the position of anatomic structures such as the cemento-enamel junction, gingival margin and bone crest. C) CBCT – transaxial reconstruction of element ± 12 : we can see the ceramic laminate veneer cemented over the prepared dental element, and its relation with the gingival margin. D) CBCT – transaxial reconstruction of element ± 11 : we can notice the ceramic laminate veneer cemented over the prepared dental element, and its relation with the gingival margin. E) CBCT – transaxial reconstruction of element ± 21 : we can observe the presence of the oral bone wall and of peri-implant soft tissues which are over 4mm thick, the pillar-implant connection in 'swichting platform', the contouring of the individualized pillar in the critical and subcritical areas, and the relation of the entire set with the peri-implant tissues in the transition zone. F) CBCT – transaxial reconstruction of element ± 22 : we can see the ceramic laminate veneer over the prepared dental element, and its relation with the gingival margin. G) CBCT – transaxial reconstruction of element ± 23 : we can notice the ceramic fragment over the non–prepared dental element, and its relation with the gingival margin.

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