CLINICAL CASE

"Mucogingival implant therapy: correcting the mucosal sequelae of peri-implantitis"

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Peri-implant diseases are a growing problem that compromise the outcome of implant-supported restorations. They are considered to be inflammatory diseases in nature and of infectious origin, they potentially lead to the loss of peri-implant tissues and cause retraction of the mucosal margin, resulting in aesthetic and social complications. Although it is difficult to measure the exact impact of these diseases, studies on their prevalence suggest that one in every 5 implants may be affected (Mombelli et al. 2012).

The principles suggested for managing the treatment of these diseases were listed by Mombelli in 1999 (Mombelli 1999). These principles are based on resolving the inflammatory component by removing biofilm from within the peri-implant pocket and decontaminating and conditioning the implant surface, and also on eliminating retentive areas and establishing efficient oral hygiene habits to allow for the prevention of mucositis and of residual pocket reinfection. Finally, once the infection is resolved, the possibility of bone regeneration can be raised.

This therapeutic strategy places the emphasis on resolving the cause of the infection and, only then, on considering bone regeneration. Interestingly, there is no need to correct the soft tissue sequelae that may occur. Many times, resolving the inflammation and loss of support can lead to retraction of the peri-implant mucosal margin and the exposure of metal areas. This situation causes clear social and aesthetic drawbacks, and in many cases, results in the failure of implant therapy by not meeting patients' expectations. The application of mucogingival techniques to implants is one option for resolving these complications. However, the structural diversity of peri-implant tissues is an added factor to consider, in order to increase the predictability of these procedures.

By presenting a patient with an implant located in an aesthetic area affected by peri-implantitis, we are able to consider the sequence of approaching the mucosal sequelae of peri-implantitis.

- ***CLINICAL CASE***

1. Anamnesis:

30 year old female patient.

2. Reason for Consultation:

The patient reports having "receding gums in implants" and being concerned about the aesthetic and social consequences of the "gray edge that has appeared over time".

3. General Medical History:

Does not show or report any disease classifying her as an ASA I patient. Does not smoke. Does not report any family history of disease.

4. Dental Background:

Patient has agenesis of maxillary lateral incisors. After orthodontic treatment, situating canines in the position of the mentioned lateral incisors, the edentulous gaps were treated with tooth-supported prosthesis in the first quadrant and implant-supported prosthesis in the 2nd quadrant. After 2 years of evolution, the peri-implant mucosa at the buccal surface of implant number 23 began to recede (Figs 1 and 2).

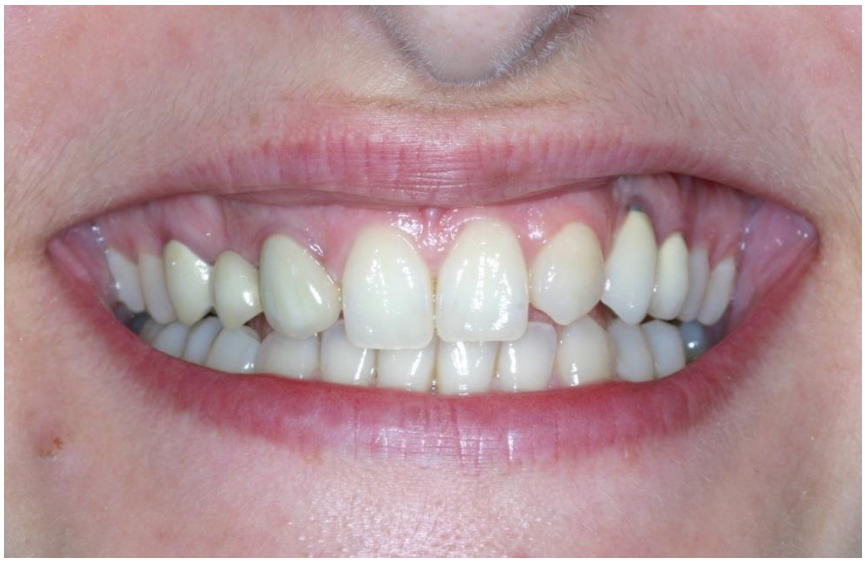


Figure 1

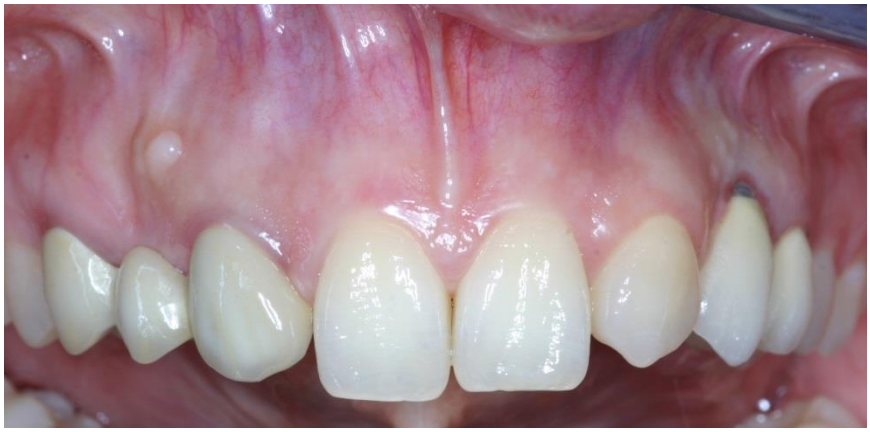


Figure 2

5. Intraoral exploration:

Marginal gingivitis at prosthetic implant abutments and peri-implant mucositis at implant 23, linking a 3mm recession in the implant with 1mm exposure of the metal neck (Fig. 3).

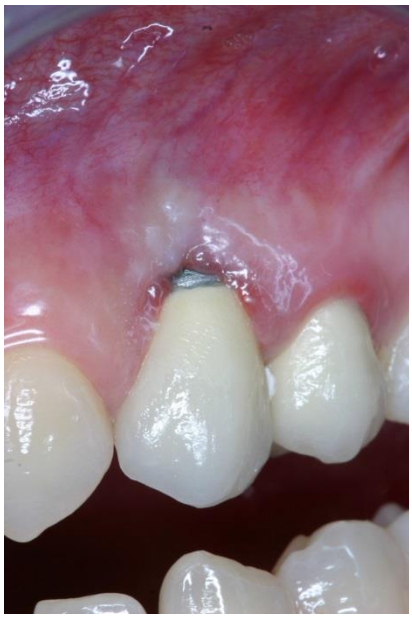


Figure 3

6. Clinical Examination:

Periodontal examination revealed 4 and 5 mm pockets localised exclusively in the interproximal region, with a bleeding on probing index of 27% and a small presence of plaque which was only detectable in some lingual-palatal sites.

7. Radiographic Examination:

Double radiographic bone contour around the implant showing a 3mm deep bone defect of two walls whose most apical part coincides with the beginning of the

threads. The distance between the bone crest and the cementoenamel junction of adjacent teeth is approximately 1.5 mm (Fig 4).

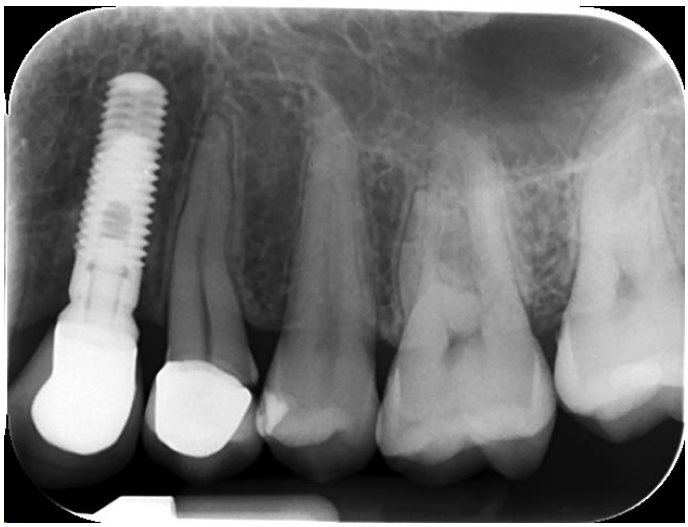


Figure 4

- ***DIAGNOSIS***

In accordance to the 6th European Workshop on Periodontology (Lindhe and Meyle 2008), we diagnosed the patient with peri-implantitis with mucosal recession and an associated aesthetic problem.

- ***TREATMENT PLAN***

Due to the similarity between periodontal and peri-implant diseases, we decided to adopt the therapeutic approach proposed by Ramfjord (Ramfjord 1953) consisting of the following phases:

- Systemic control phase:
- Aetiological phase
- Corrective phase
- Maintenance phase

1. Systemic control phase
In the absence of systemic disease (ASA I patient), no intervention was necessary at this stage. However, the patient was informed of the impact that continual stress could have on immunocompetence and, therefore, on the peri-implant tissue defense response. Likewise, she was provided an explanation regarding the association between dental plaque accumulation and the occurrence of inflammation and its connection with her grounds for consultation.

2. Aetiological phase
The patient was taught how to perform effective plaque control using the Stillman

technique with a VITIS® ultrasoft toothbrush (DENTAID®). She was advised to use VITIS® soft dental floss (DENTAID®) as a means for interproximal cleaning, with special emphasis on taking care to gently insert the floss into the peri-implant sulcus. Also, adjuvant oral antiseptic therapy was established, by prescribing the patient with the use of a gingival acting mouthwash after brushing, morning and night for 15 days (Perio·Aid® treatment: Chlorhexidine 0.12% + Cetylpyridinium chloride 0.05%), as studies have shown that combining chemical methods with brushing and flossing yields better results than mechanical means alone.

Quadrant scaling and root planing was performed under periapical infiltration anaesthesia. When treating implants, Teflon® curettes were used to avoid scratching the exposed metal portion of the implant. Due to the buccal gingival phenotype, ultrasounds (*implant tip® SONICflex*. KAVO™) were only used in the palatal area to prevent possible damage to the peri-implant soft tissues.

3. Corrective phase

Six weeks after completing the aetiological phase and having confirmed the effectiveness of the patient's oral hygiene habits, treatment was assessed, and the results are as follow: (Fig 5 and 6)

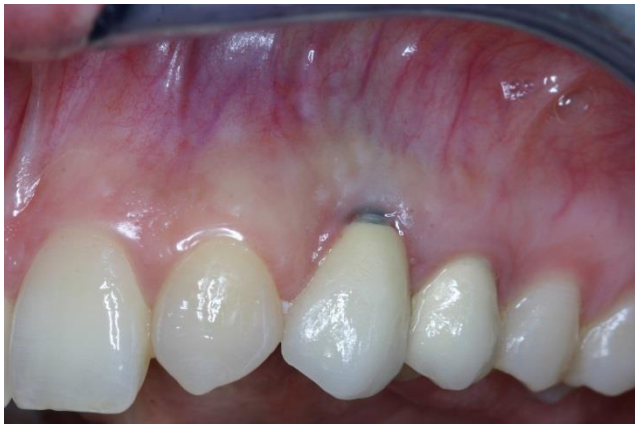


Figure 5

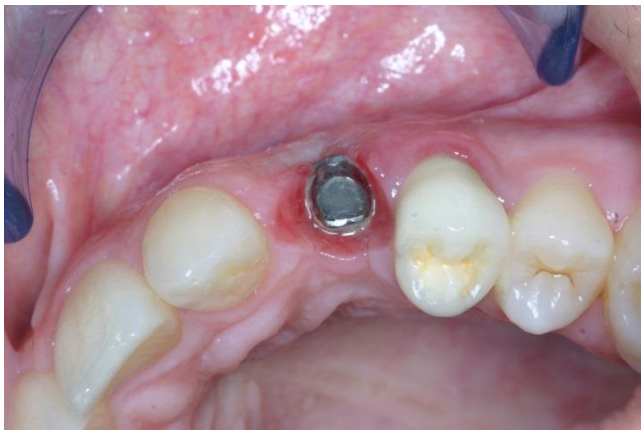


Figure 6

- Plaque index score of zero
- Disappearance of bleeding on probing
- Reduced probing depth in several interproximal sites
- Increased buccal peri-implant mucosal retraction

Having resolved the inflammatory factor, mucogingival surgery was considered for correcting the retraction. The recipient bed was prepared with a partial thickness flap as per the envelope (Raetzke 1985) and modified tunnel (Zabalegui et al. 1999) techniques. A palatal connective tissue graft was harvested and fixed to the recipient area with simple, non-absorbable sutures, covering the exposed metal area. (Fig 7 and 8)

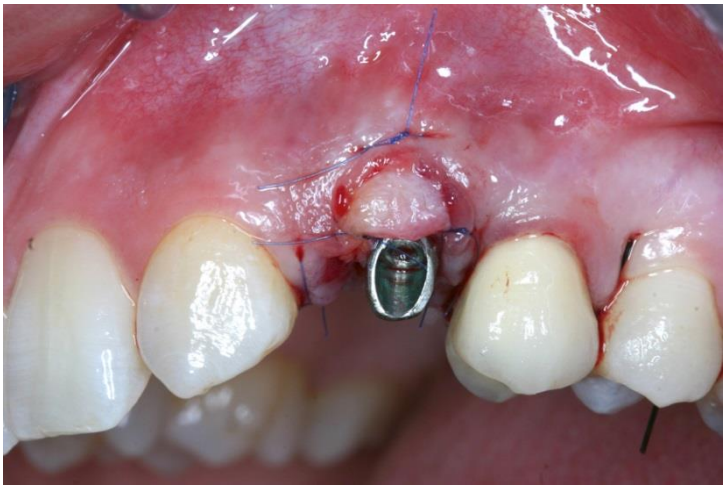


Figure 7

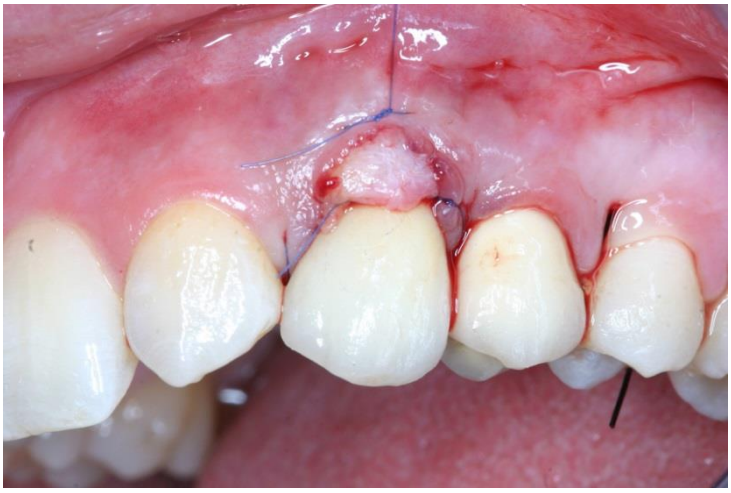


Figure 8

As postoperative care, antibiotic coverage was prescribed (amoxicillin/ clavulanic acid 500/125mg every 8 hours for 8 days) and rinsing resumed with a 0.12% chlorhexidine and 0.05% cetylpyridinium chloride mouthwash (Perio·Aid® treatment) two times per

day for 30 days. After 10 days, sutures were removed and the patient was instructed to resume the use of a brush with very soft filaments (VITIS® surgical brush) (Figs. 9 and 10).

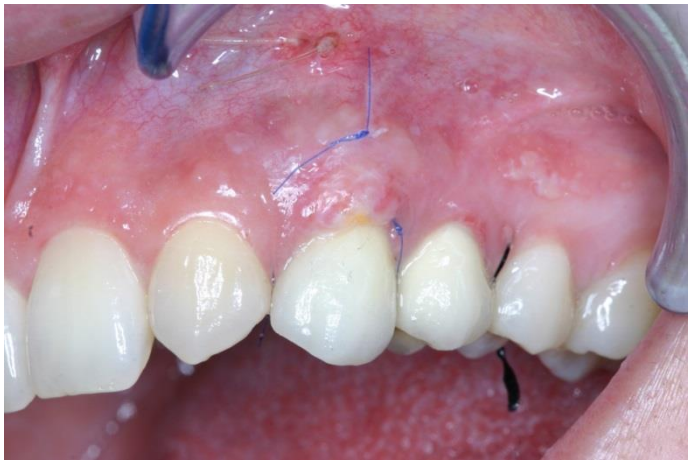


Figure 9

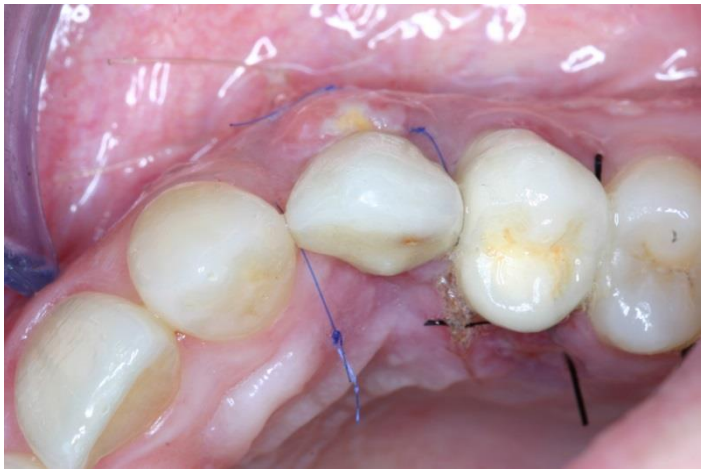


Figure 10

Six weeks later, the patient transferred to a brush with greater filament hardness (VITIS® ultrasoft brush) (Figs. 11 and 12), and after 12 weeks, the patient went back to flossing, with particular emphasis on submucosal insertion (Fig. 13).

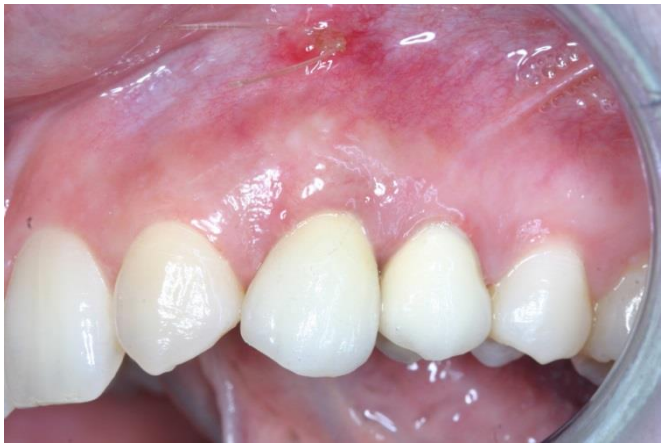


Figure 11

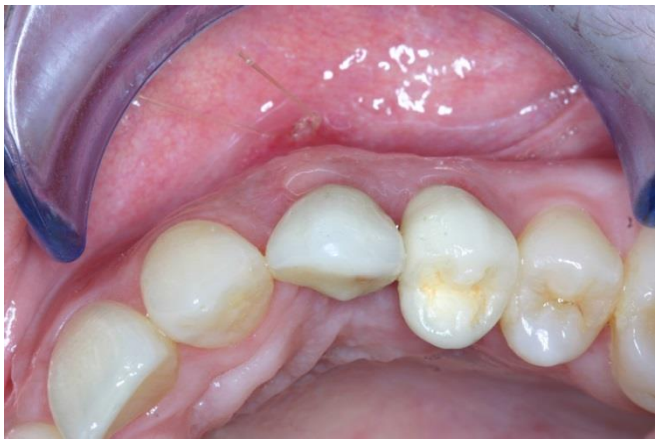


Figure 12

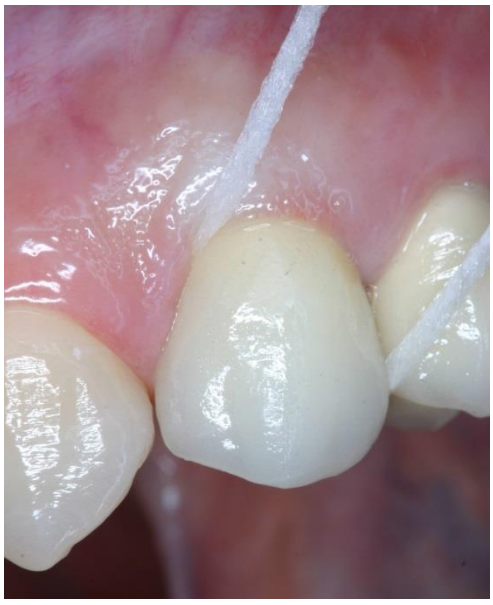
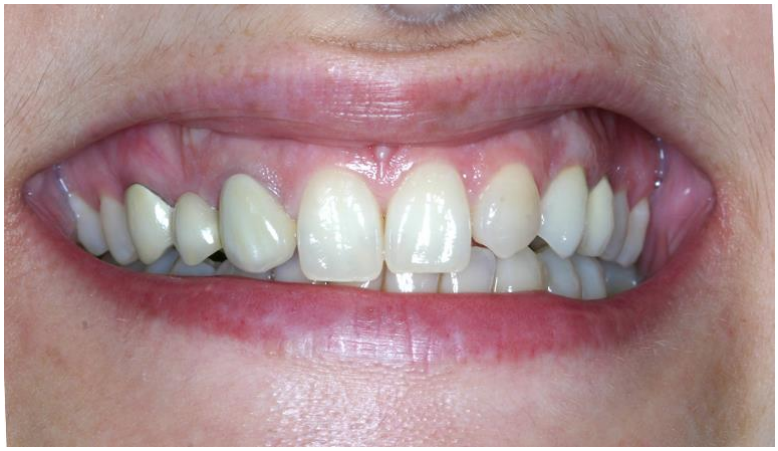


Figure 13

After 16 weeks, surgical treatment was re-assessed, confirming complete coverage of the exposed metal area and integrity of the interproximal peri-implant soft tissue with no signs of inflammation or bleeding on probing. It was suggested that the patient enter a Periodontal Support Programme with quarterly appointments (Figs. 14, 15 and 16).



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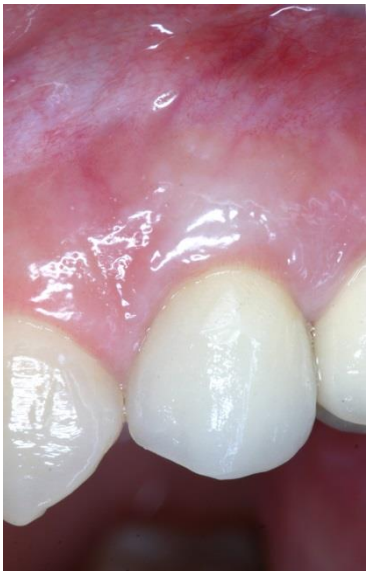

Figure 15

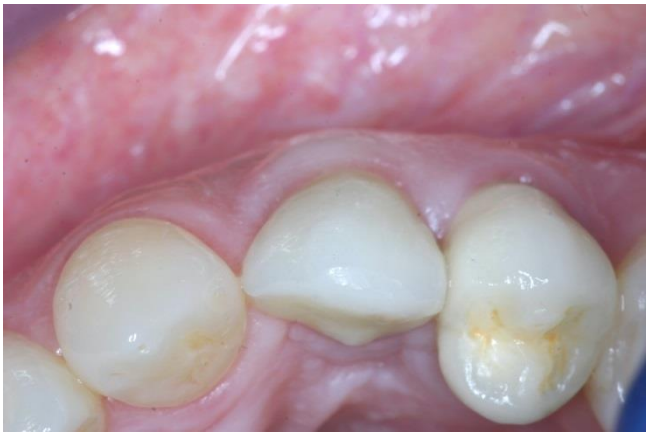

Figure 16

4. Maintenance phase

After a 3-year follow-up period characterised by steady compliance with scheduled visits and with the prescribed oral hygiene procedures, we verify the stability of the results achieved with regard to both the maintenance of implant-supported prosthesis coverage, and the integrity of the hard tissue with no signs of inflammation during examination or during probing (Figs. 17, 18 and 19).

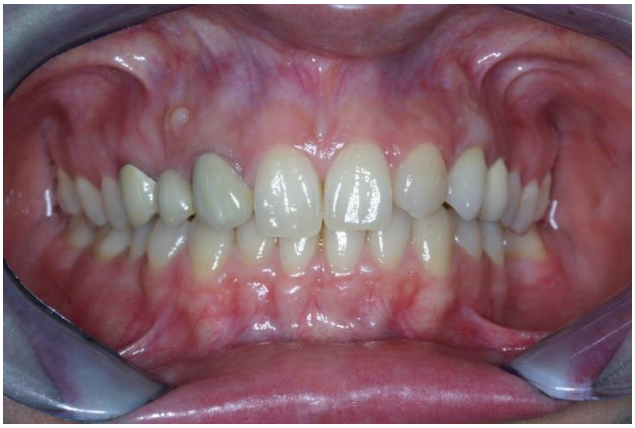

Figure 17

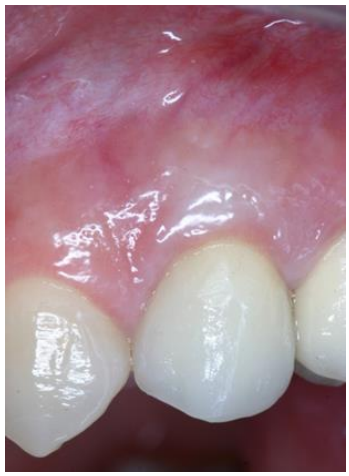

Figure 18

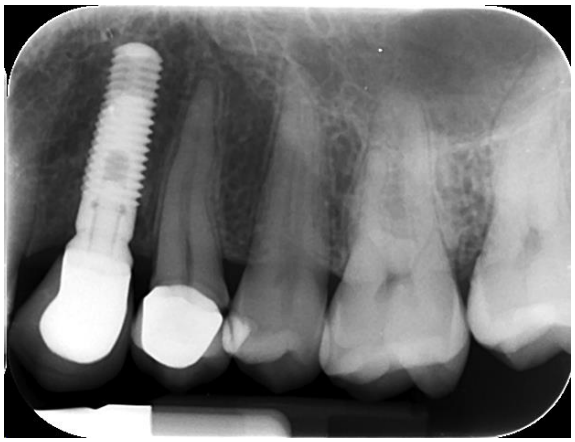

Figure 19

- ***DISCUSSION***

It was concluded at the 3rd European Workshop on Periodontology that in regard to prognosis, there is no difference between the masticatory mucosa and alveolar mucosa in maintaining healthy and functional soft tissue in the biological seal around the implant, as per clinical criteria (Tonetti & Sanz 1999). This conclusion was reinforced by periodontal evidence that did not consider the gum among the essential requirements for periodontal health (Wennström and Lindhe 1983). However, more recent studies have revealed that the presence of a band of masticatory mucosa of at least 1 mm around the implant is a protective factor to prevent the onset and progression of complications (Costa et al. 2012) and that thick gingival phenotypes show less bone loss than thin phenotypes (Linkevicius et al. 2009; Puisys & Linkevicius 2015).

Furthermore, the conclusion of the 3rd European Workshop on Periodontology did not consider the patient's perspective. We should not disregard that, as is emphasised by the Workshop in a later chapter, "no measurement carried out by a clinician nor the objective function variables may necessarily reflect the way the patient feels and functions" (Schou, 1999). This reveals the importance of dental implant treatment in respect to its psychological impact, and that it should be taken into account when evaluating results in attempting to balance the orofacial area in relation to body image, subjective quality of life, perceived satisfaction with the prosthesis and its effect on self-esteem and interpersonal relationships.

These 2 circumstances widely support the indication of mucogingival surgical procedures in implants. However, correcting mucosal retraction presents a clear challenge to clinicians. Its complexity lies not only in the difficulty of selecting a particular surgical technique, but also in the uncertainty of the result, even with scientifically-based decisions. When dealing with these techniques, the clinician must take into account the periodontal prognostic factors identified for these types of procedures: aetiological control, morphology of the recession, smoking, thickness of tissues, tooth position and surface characteristics (Roccuzzo et al. 2002). To these factors, we must add the structural differences between the peri-implant soft tissues (Berglundh et al. 1991). Less vascularisation, fewer fibroblasts, as well as a greater concentration of collagen fibres, are conditions that most probably affect their ability to be repaired. Therefore, in our opinion, the technical skill and experience of the technician, as well as the use of non-aggressive surgical techniques, such as microsurgical procedures, which reduce tissue trauma to a minimum, are particularly important, as reported in the literature (Burkhardt & Lang 2005).

Lastly, we cannot forget that the correction of mucogingival defects surrounding implants should be established on a basis of a coherent and properly planned treatment strategy. Prior identification and elimination of aetiological factors, as well as the subsequent control of risk factors via an adequate Follow-up and Support programme are key elements in obtaining satisfactory results and in their maintenance over time.

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