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Case Series

Evolution of Peri-Implantitis Around Implants in Grafted v/s Non-Grafted Bone Sites: Literature Review and Three Clinical Cases

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Abstract

Peri-implantitis is considered a major complication of dental implant treatment, which affect hard and soft surrounding tissues and can lead to implant loss. Following teeth extraction, alveolar ridge resorption occurs which can complicate implant placement, therefore, ridge preservation technique and guided bone regeneration, is used prior to implant placement. In the following article we will be presenting a new prevalence factor for peri-implantitis which is "grafted v/s non-grafted site", more studies need to be conducted in order to confirm the following prevalence factor.

***Keywords:** Peri-implantitis, implant, prevalence factor, grafted and non-grafted site, teeth extraction, resorption.*

Introduction

Dental implants have been considered for years as standard treatment to replacing missing teeth, yet its success is correlated to many factors such as implant surface, history of periodontitis, oral hygiene and smoking[1].

By definition, peri-implantitis is a term used to describe inflammatory processes as an answer to bacterial biofilm that causes bone loss around osseointegrated implants[4,11,12].

After a tooth is extracted, alveolar bone resorption occurs which alters the possibility of placing the implant in its ideal position, therefore guided bone regeneration technique is considered the treatment of choice in many cases. But as peri-implantitis develops in some patients, some questions are still to be answered on how the evolution might be in grafted compared to non-grafted sites.

In the following article we will be exposing 3 clinical cases of peri-implantitis that were treated using surgically associated to drug and laser combined therapy shedding the light on the fact of enhanced evolution of peri-implantitis in grafted sites compared to non-grafted ones.

The aim of the present article is to assess the influence of having a grafted v\s a non-grafted site on the evolution of peri-implantitis, in 3 healthy patients.

Clinical Case 1

A 37 year-old female patient presented to our practice with an advanced horizontal bone loss on site# 3,4,5. Patient was healthy with no medical record. A guided bone regeneration was planned to reconstruct the bone defect prior to implant placement using xenograft material (Bio-Oss, Geistlich Pharma AG) and Cross-linked collagen membrane (Bio-guide) (Figure 1).

After 8 months the implants type Nucleos T4 #4,5 (3.8*8mm) and #3 (4.2*8mm), were placed in the edentulous site insuring a very good primary stability. The cemented zirconia crown were restored in the following 3 months (Figure 2).

Patient came back to us 18 months later for a check-up with pain as her main concern and swollen gum in implants region, intraoral probing showed high bleeding rate with pus discharge. On X-ray a bone loss was associated to the scene and diagnosed as moderated peri-implantitis (Figure 3).

A mechanical associated to drug treatment was adopted at first and showed stabilized evolution of symptoms for 2 months where the patient came back afterwards for same reasons, pain and pus discharge.

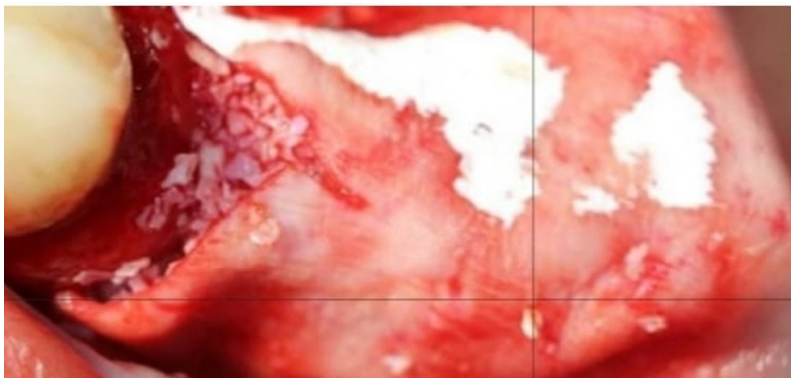

Fig 1: *Intraoral view shows site of teeth# 3,4,5, grafted using xenograft with cross linked collagen membrane.*

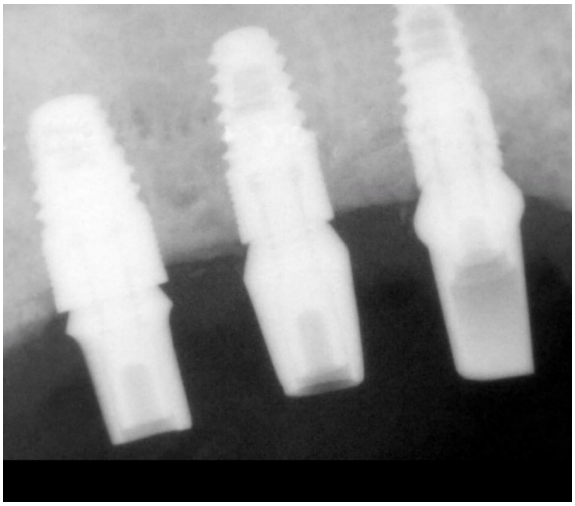

Fig 2: *Intraoral radiographic image taken at time of loading.*

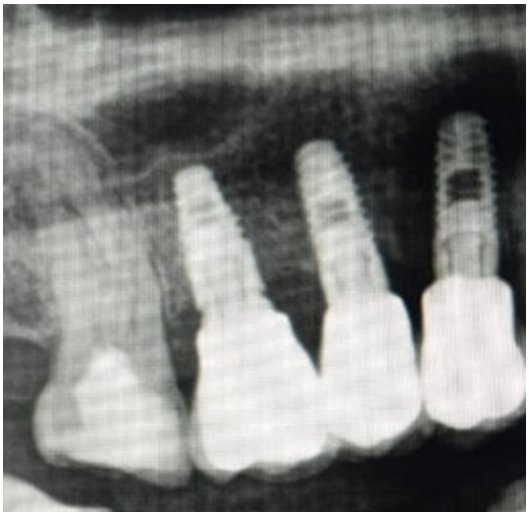

Fig 3: *Intraoral radiograph image of implant revealed moderate peri-implant bone loss.*

A surgical associated to drug approach was decided, a surgical flap was elevated with curettage and usage of Er:YAG -(Erbium-doped:yttrium-aluminum-garnet) laser followed by irrigation saline-chlorhexidine 0.2% mixture with drug therapy (Amoxicillin 1g with metronidazole 400 mg) prescribed for 7 days.

A recurrence of peri-implantitis was detected after 1 year follow-up and was treated same way. A four years control showed stable results, no further symptomatic bone loss was noted.

Clinical Case 2

A 57 year-old male patient was referred to our center for pain on implant # 27 type Nobel Biocare, Replace Select 3.5*10 mm holding a hybrid acrylic based bridge composed of 6 implants placed since 5 years. Intraoral examination showed a swollen gum with advanced bone loss localized on implant #27. Radiographic examination confirmed the diagnosis of severe peri-implantitis (Figure 3). Records of the patient shows no prior bone graft previously done on any of the 6 implants.

No medical condition was mentioned. A surgical flap was elevated with mechanical curettage followed by laser therapy using Er: YAG-and irrigation using saline associated to chlorhexidine 0.2% with. Antibiotherapy using Amoxicillin 1g and metronidazole 400mg)1 tablet each 12 hour for 7 days.

Surgical non associated to guided bone regeneration technique showed to be effective. Replacement of acrylic supra-structure was done with metal reenforced one 2 months following stabilization of bone loss with absence of any symptoms.

A one year follow-up showed a satisfactory bone healing (Figure 4).

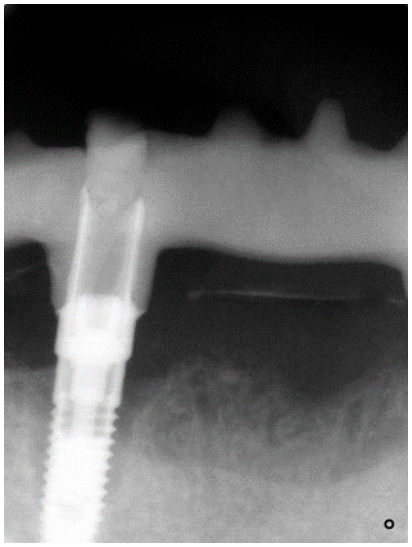

Fig 4: *Intraoral radiographic image shows advanced peri-implant marginal bone loss.*

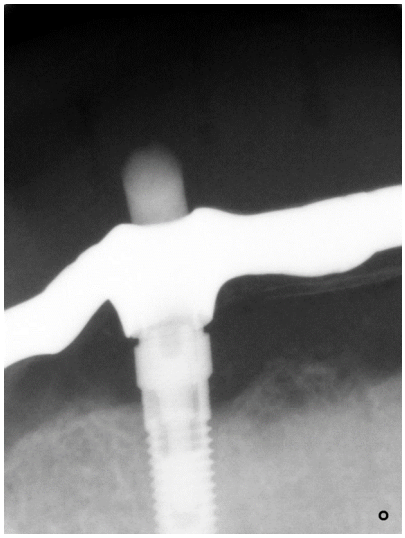

Fig 5: *Intraoral radiograph 3 months post-surgical laser-drug associated treatment shows bone healing around implant surface.*

Clinical Case 3

A 52 year-old male patient was referred to our practice for a pain felt in the upper right side of his jaw. Intraoral examination showed advanced bone loss with high bleeding index on tooth#4 and mobility type III. An extraction of tooth#4 was planned (Figure 6).

Simple extraction was done with curetage of socket followed after 2 months by vertical and horizontal bone graft using Bio-oss (Geistlich Pharma AG) associated to Bio-guide as a cross-linked collagen membrane.

The implant was placed 8 months post graft using Nobel Biocare 4*10mm, Replace Select (Figure 7).

The patient came back to us 3 years following implant placement with severe pain on implant #4 and swollen gum with bleeding. Intraoral radiography showed bone loss surrounding implant threads (Figure 8).

Treatment was done to limit evolution of peri-implantitis using surgical flap reflection with curetage and laser Er:YAG-with saline associated chlorhexidine 0.2% irrigation a drug treatment of amoxicillin 1g and metronidazole 400mg was prescribed 2 times a day for 7 days.

The evolution was so fast and aggressive that did not respond to the proposed treatment (Figure 9). A removal of implant #4 and extraction of tooth#3 with root canal on tooth #6 was planned.

After 3 months post extraction, 2 implants Megagen Any Ridge,4*8.5mm#4 and 4*7mm#3 with Bio-Oss (Geistlich Pharma AG) and Cross-Linked collagene membrane (Bio-guide) were used as guided bone regeneration.

Stable results were found on the 4 years follow-up (Figure 10).

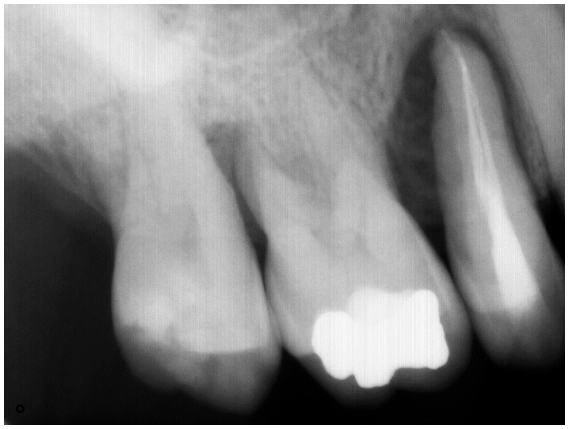

Fig 6: *Intraoral radiograph showing bone loss around tooth#4, indicated for extraction, bone graft was done 2 months later.*

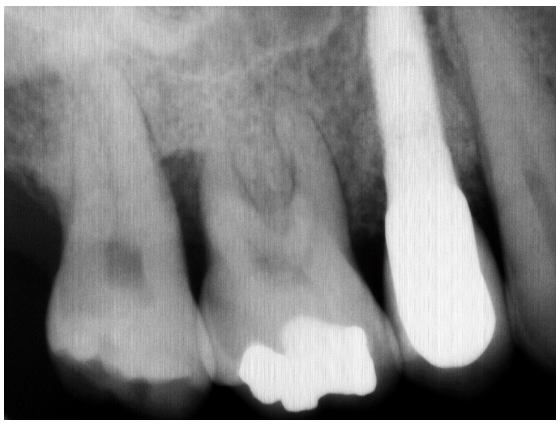

Fig 7: *Intraoral radiograph showing implant #4 at time of loading.*

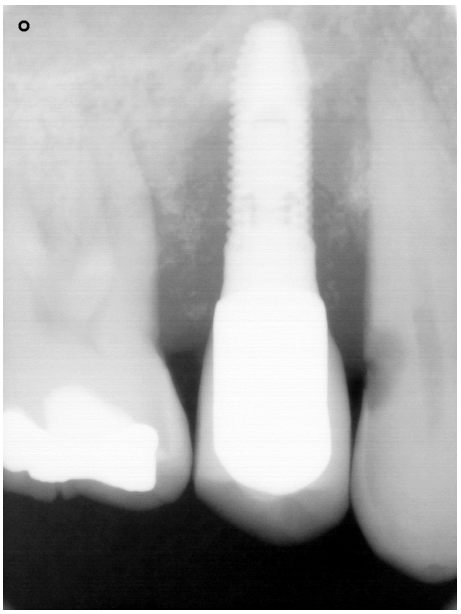

Fig 8: *Intraoral radiographic image shows extensive peri-implant marginal bone loss.*

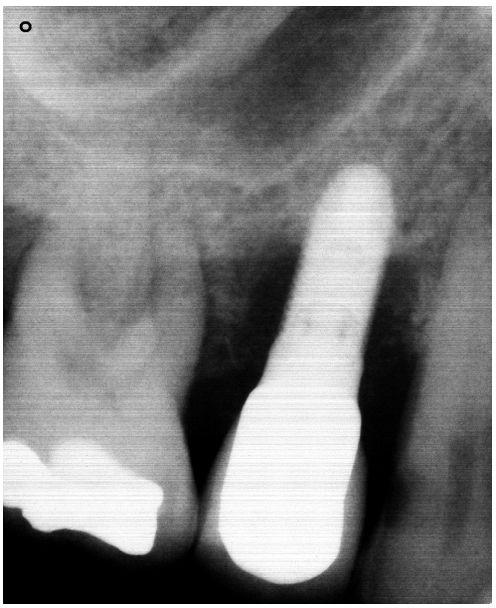

Fig 9: *Intraoral radiograph shows the evolution of bone loss following surgical associated to laser and drug treatment.*

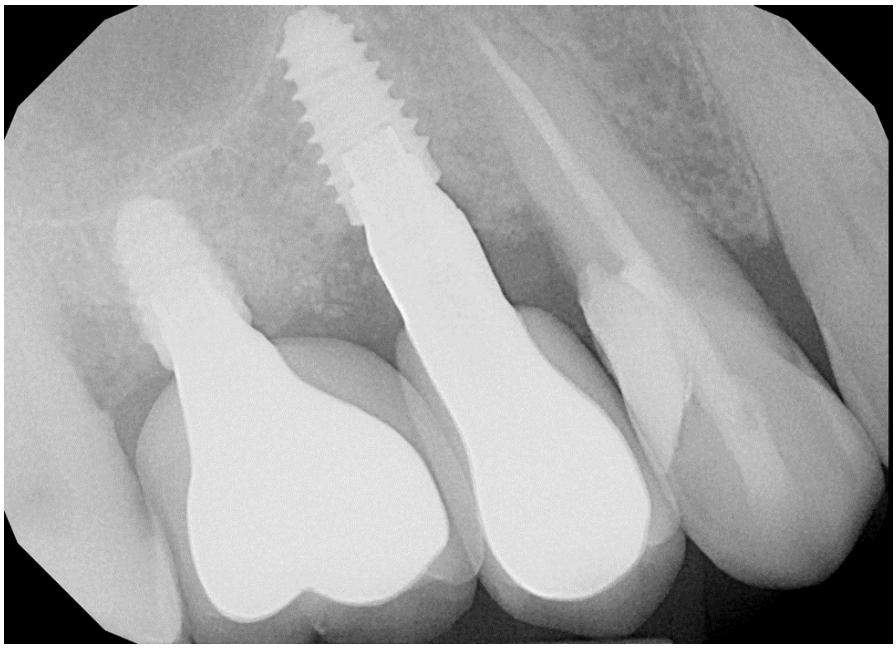

Fig 10: *Radiographic image after removal of tooth#3 and of implant#4 and replacement with 2 Megagen implants.*

Discussion

Implant treatment is considered a highly successful treatment as far as the implant entity and the supra-structure part[3].

Many risk factors for peri-implantitis were discussed over the years, smoking and a history of periodontitis where the most influential on severity of the evolution[2]. Nevertheless, implant outcomes in grafted sites in terms of marginal bone loss around implants were found by Ramanauskaite A. et Al. to be greater in non-grafted than in grafted sites[7]. Although the following data doesn't confirm it, the evolution of peri-implantitis was more advanced in grafted sites in the above clinical cases.

In the enclosed clinical cases, the diagnosis of peri-implantitis was established based on the following criteria: Bleeding and suppuration, pocket depth, bone loss evaluated on x-rays, and periodontal status[13].

In the following article all patients had no medical problems, and all had same surgical associated to drug approach for treatment of peri-implantitis which consisted of flap reflection and curettage and usage of Er: YAG-(Erbium-doped: yttrium-aluminum-garnet) laser therapy, followed by irrigation saline mixed to chlorhexidine 0.2% with drug therapy (amoxicillin 1g with metronidazole 400mg) for 7 days[9].

The treatment is close to that of periodontitis since the bacterial colonization of teeth are similar to implants and irradicating the microbial biofilm is a must in these cases in order to treat the region of peri-implantitis[5]. Many articles focused on the use of drug therapy as a way to reduce pocket depth[6,7].

Previous researches never focused on prevalence factors of peri-implantitis as much as risk factors. Many risk factors have been discussed over the years such as supra-structure marginal fit. As per Saaby and Al., a poor marginal fit of the supra-structure and gingival limitations on implant-supported fixed full-prosthesis may be an important risk factor[2,] such as in Clinical case 2 where changing the acrylic supra-structure into a metal adapted helped in stabilization of the peri-implantitis in a non-grafted site.

First and third patient showed poor response and enhanced evolution of peri-implantitis compared to the second one, even though all received same surgical associated drug and laser treatments, note that no guided bone regeneration was used. Which may be correlated to the fact that patient 1 and 3 had received bone graft prior to implant placement.

As the Bacterial biofilm seems to have the most impact on inflammatory response of soft and hard tissue surrounding dental implants, more data needs to be collected concerning this topic[14].

The aim of the following article was to assess the potential of considering grafted and non-grafted site as a prevalence factor of evolution of the peri-implantitis while excluding the efficiency factor used for the treatment of peri-implantitis [10].

Consequently, the present knowledge about grafted and non-grafted sites as being a potential prevalence factor is inadequately described over the years, therefore the objective of the following article was to expose three clinical cases, as a proposal to opening the way for more investigations concerning the following prevalence factor.

Conclusion

As dental implant treatment has become an indispensable therapy, more information is being detected on this delicate treatment. Peri-implantitis considered as a frequent complication of dental implants was related to many local and general risk factors yet nevertheless a prevalence factor should be assessed when discussing this main subject.

Within the limits of this overview, more evidence needs to be investigated aiming to shed the light on a new prevalence factor, proposing that the evolution of peri-implantitis is more enhanced in grafted than in non-grafted bone when dealing with bony defects resulting from peri-implantitis.

Conflict of Interest

The authors declare no conflict of interest.

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