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Evaluation of Keratinized Tissue at Peri-Implant Mucosa and Free Gingival Graft Application: Case Series

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Abstract

In recent years, for the restoration of lost teeth, dental implants have been used instead of fixed or removable prosthesis that are supported by neighboring teeth. Some experimental and clinical studies have shown that the absence of the keratinized tissue on peri-implant area, that effects the preservation of periodontal health. Lack of the peri-implant keratinized tissue plays a critical role in the accumulation of bacterial plaque around the dental implants, risen risk of peri-implant inflammation and contributes to implant failure. In this case series, it is aimed to find ideal prosthesis soft tissue compliance by applying free gingival graft that is procedure of peri-implant plastic surgery at dental implants surround placed in the mandibula anterior region where there isn't sufficient keratinized tissue.

Keywords

Free gingival graft; Peri-implant plastic surgery; Dental implant; Keratinized tissue

Summary

In recent years, for the restoration of missing teeth, implants were used instead of the fixed or removable prosthesis supported by neighboring teeth. Peri-implant keratinized tissue deficiency is a critical neuroloarnacular and implant failure contributed to the enhancement of bacterial-accumulation-implant inflammatory disease around the dental implants. In this case, the ideal prosthesis-soft tissue was applied by applying the dental-implant plastic cerrahypyrocedural anesthetic diaphragm in dental implants placed in the mandibular anterior region where there is not enough keratinized tissue.

Introduction

For the restoration of lost teeth in recent years, dental implants have been used instead of fixed or removable prosthesis that are supported by neighboring teeth [1]. However, the preservation and health of the peri-implant soft tissue is required for the longevity of dental implants [2] and prosthesis. The soft tissue healing following implant surgery may result in the formation of a border tissue composed of either keratinized or non-keratinized mucosa [3].

Keratinized tissue is beneficial for healthy peri-implant mucosa. Lack of the peri-implant keratinized tissue plays a critical role in the accumulation of bacterial plaque around the dental implants, risen risk of peri-implant inflammation and contributes to implant failure[4-6] Some experimental and clinical studies have shown that the absence of the keratinized tissue on peri-implant area, that effects the preservation of periodontal health [7].

In spite of that, little is known about the affect of keratinized mucosa (KM) dimension around implants on the hard and soft tissue health. Recent studies showed that plaque accumulation and mucosal inflammation were meaningfully higher around implants with KM < 2 mm.[8] In the same way , it was reported that there was a negative correlation between KM and mucosal recession[9] and that increased width of KM is related to lower alveolar bone loss.[10] More recently, Zigdon and Machtei [6] reported that a thick mucosa (≥1 mm) was related to lesser mucosal recession compared with a thin mucosa (≤1 mm).So that, a task of Working Group 1 of the Osteology Foundation Consensus Meeting was to widely evaluate the effects soft tissue augmentation procedures on peri-implant health or disease [11].

Keratinized Tissue

1. It is expected That plaque control is better relived in the presence of >2 mm of keratinized tissue.
2. When increasing the zone of keratinized tissue is requested around an implant, the clinician should think of performing a free gingival graft.In this case series, it is aimed to find ideal prosthesis–soft tissue compliance by applying free gingival graft that is procedure of peri-implant plastic surgery at dental implant surround placed in the mandibula anterior region where there is not sufficient keratinized tissue.

Case Reports

Case 1: Dental implant treatment was performed in the surgical policlinic for a 35 year old, nonsmoking, female patient with lost teeth 31 and 41 and was directed to the periodontology policlinic before prosthetic restoration. The patient complained of increased tension and pain with localized lip movements in the lower jaw. Intraoral and radiographic examination revealed a shallow vestibule depth in the anterior mandibula, high frenilum attachment, inadequate keratinized tissue thickness around the implants and approximately 2mm gingival recession around the implant placed in the tooth 41 region. Free gingival graft obtained from palatal donor region under local anesthesia was applied to the peri-implant region and stabilized.

Case 2: Dental implant treatment was performed in the surgical policlinic for a 56 year old, no-nsmoking, female patient with lost teeth 33 and 43 and was directed to the periodontology policlinic before prosthetic restoration. Intraoral and radiographic examination revealed a shallow vestibule depth in the anterior mandibula, inadequate keratinized tissue thickness around the implant placed in the tooth 33 region. Free gingival graft obtained from palatal donor region under local anesthesia was applied to the peri-implant region and stabilized.

Operation Descriptions

Initially, locally anesthesia performed with articainhidroclorur 2% associated with epinephrine 1: 100,000 (Maxicaine fort-New DFL Ind. e Com. S.A., Rio de Janeiro, Brazil). Then, a horizontal incision is made in the interdental papillae at the level of the peri-implanter marginal tissue [12,13] two vertical incisions are performed to extend to the alveolar mucosa. The half-thickness flap is dissected up to the apical boundaries of the vertical incision and removed.

The free gingival graft [14,15] was obtained from the palate area at a distance of about 2mm from the teeth. The graft was sutured to the recipient area in a close contact with the periosteum bed. As resorbable suture material (Pegelak, polyglycolide-co-lactide Dogsan Surgical Suture, Istanbul, Turkey, USA) was used. Palate donor site sutured with, 4-0 silk suture (Silk, Cetin Surgical Suture, Adana, Turkey, TR) for hemostasis and clot promote stabilization. The recipient area was covered with surgical cement (coe-pack) and stabilized on mandibular teeth. As post operative patient care, rinsing 0.12% chlorhexidine twice in the morning and evening for 2 weeks, 1000 mg amoxicillin twice daily for 7 days. In case of possible pain, 275 mg naproxen sodium was prescribed. Surgical cement was removed on the 14th day. Sutures of donor and recipient areas were removed on the 14th day. Wound areas healed without any discomfort after the surgery. Oral motivation training was repeated. The patient was invited to the 1st and 3rd month follow-ups. After a 3-month follow-up period, a thickness and a 3 mm increase in the height of the keratinized mucosa were observed, promoting good peri-implant health, facilitating hygiene procedures and complaining of painful symptoms in the period implant area.

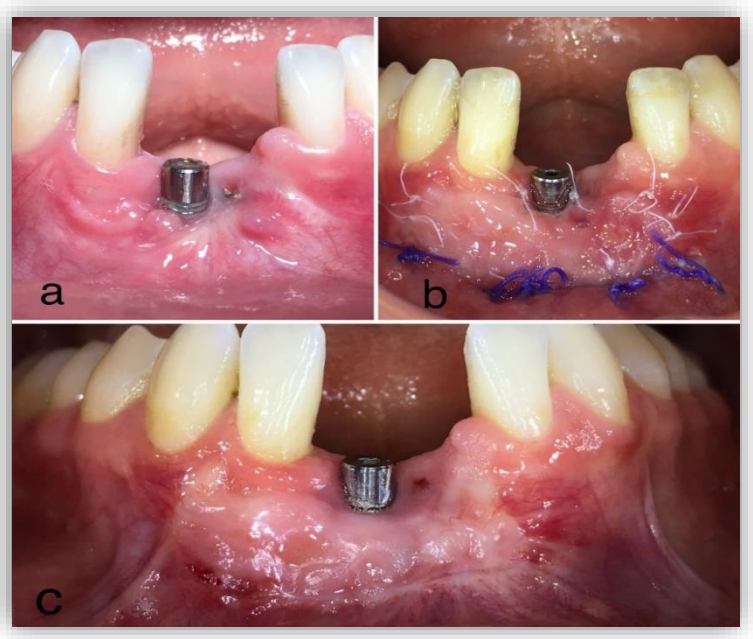

Figure 1a, 1b, 1c: Preoperation, Postop. 14 day, Postop. 3 month of Case 1, respectively.

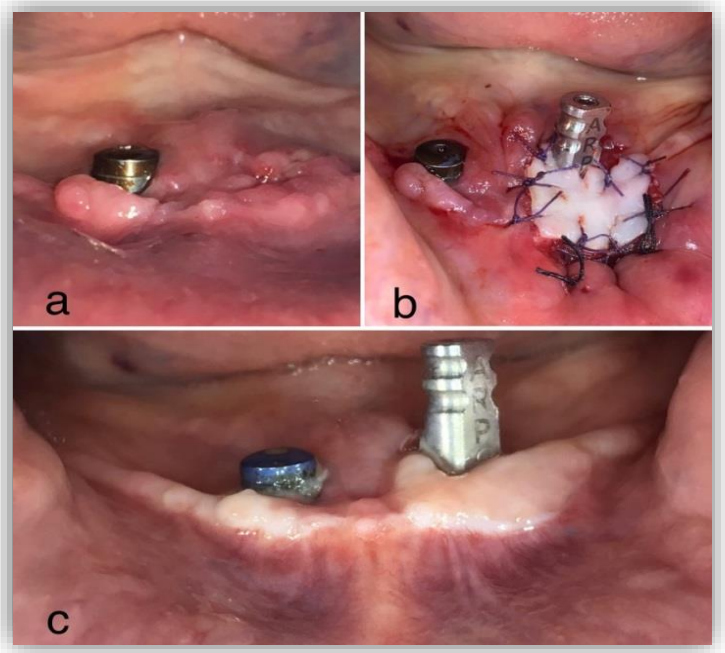

Figure 2a, 2b, 2c: Preoperation, Postop. , Postop. 3 month of Case 2, respectively.

Discussion

Soft tissue procedures around natural teeth can be used in two terms: mucogingival surgery and periodontal plastic surgery. These operations can be performed around the teeth as well as in the implant areas. It is carried out in the form of soft tissue growth or reduction procedures. The term “peri-

implant plastic surgery (PiPS)" can be defined as a group of procedures aimed at correcting acquired or pathologically derived aesthetic and / or functional, peri-implant soft and hard tissue deformities.

As with natural teeth, gingival recession may occur on the buccal side of the implants, which cause aesthetic and functional problems. In cases where there is no interproximal tissue loss, provided that the implant grooves are not exposed, soft tissue augmentation procedures can be used, as with natural teeth, to improve the "peri-implant mucosa phenotype" [18]. This operation in the peri-implant mucosa regions can provide a mechanical barrier of the area, thus reducing potential discomfort associated with tooth brushing thanks to the KT gain.Four different time points can be distinguished to increase the mucosal thickness around CM or dental implants: [16]

(a) Before implant placement,
(b) During implant placement,
(c) Second place After exposing the implant (healing head)
(d) Forward-looking protocol after re-entry

While the first three protocols have more predictable clinical outcomes, the prospective protocol may face aesthetic problems or complications such as mucositis or periimplantitis [17-19]. It has been reported in the literature that adequate CM for peri-implant health is ≥ 2 mm and that when CM <2 mm, problems may affect peri-implant health and cause peri-implant mucocytis / peri-implantitis [3,5,20,21].

Free gingival graft is a successful and predictable technique that can prevent hard and soft tissue problems that develop after implant surgery [22,23]. This procedure can be performed before implant placement, as well as during the second surgical stage of the implants or after the last prosthesis has been placed [22].When the combination of autogenous grafts and apically positioned flap (APF) / Vestibuloplasty (V) was compared with those without any surgical procedure, it was observed that the width of the keratinized mucosa (CM) was significantly increased. [3,5,21]. The use of autogenous or allogeneic grafts in addition to APF / V was found to be superior to autogenous grafts. Wei et al. Conducted a study comparing the efficacy of ADM and free gingival graft to increase the adherent gingival width of [24,25]. The results showed that the tissue formed in the ADM treated region was not parallel to any known mucosa and was more similar to scar tissue.

Conclusion

With the free gingival graft applied to the peri-implant mucosa, the patient's complaints were resolved and environment of reduced risk was provided for the long-term success as providing an adequate keratinized tissue and vestibular depth before prosthesis restoration.

Acknowledgements

None.

Conflict of Interest

The authors deny any conflicts of interest related to this study.

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