

Soft Tissue Augmentation to Increase Width of Keratinized Tissue Around Dental Implants Using Tissue Fixation Screws: A Novel Technique for Graft Tissue Stabilization

Dr. Lank Mahesh¹ • Dr. Nitika Poonia¹ • Dr. Vishal Gupta¹

Abstract



Presence of adequate width of attached gingiva for longevity of implants has long been debated upon. The implant-mucosa interface differs from the interface between the mucosa and natural teeth, and these differences are important to the understanding of the susceptibility of implants to infection. Few studies have examined the relationship between the width of keratinized mucosa and the health of peri-implant tissues. The results of these studies are contradictory. Further studies are there-

fore required to clarify the role of the width of the keratinized mucosa around dental implants and their overall soft and hard tissue health. Most reliable method for increasing WKG is autogenous free gingival graft. However the stability of FG on the recipient site is of paramount importance for the uptake of graft. Traditional methods have described the use of sutures for achieving stability of graft. Through this case report a sutureless technique is described where we achieve stability of FG with help of soft tissue screws.

KEY WORDS: Mucogingival grafting, free gingival graft, width of keratinized gingiva, soft tissue screws

1. Dental Practice, India



Figure 1: Pre-surgical photo demonstrating inadequate keratinized gingival tissue at recipient site.

INTRODUCTION

Although Lang and L oe¹ concluded that 2 mm of keratinized tissue were necessary to maintain periodontal health, this reported figure was refuted by Kennedy et al.² The importance of the amount of keratinized tissue around dental implants is still controversial. Experienced clinicians taking long term follow ups of their cases have never undermined the importance and role of attached gingiva in maintaining longevity of results in implantology. A study on monkeys and humans demonstrated dental implants without kera-



Figure 2: Tacking kit.

tinized mucosa demonstrated significantly more recession and slightly more attachment loss than the other implants.³ The results suggested that the absence of keratinized mucosa around dental endosseous implants might increase the susceptibility of the peri-implant region to plaque-induced tissue destruction.

Various modalities exist to increase the width of keratinized gingiva around implants and to improve quality of soft tissue. Some of these techniques are apically positioned flap, vestibuloplasty, allogeneic soft tissue graft and autogenous soft tissue grafting.⁴ The soft tissue dimensions surrounding dental implants can further be improved by using mini-flaps, using specific incision techniques at the time of abutment connection (ie. U shaped incision, T shaped incision, modified Palacci technique and split finger technique). No soft tissue is removed in these modalities instead soft tissue is pulled in required directions which is usually buccal or interdental.

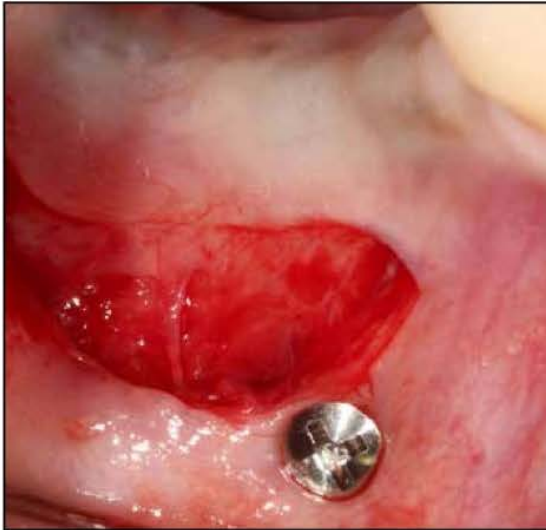


Figure 3: Partial thickness preparation of recipient site and fixation of mucogingival tissue with screw.



Figure 4: Additional fixation of mucogingival tissues with screws.

Based on past scientific evidences, autogenous FGG were proven to be effective and predictable in both animal models and humans in increasing the width of attached gingiva with high success rate. Traditionally FGG is harvested from palatal site of the patient. Ideally anterior and premolar sites are chosen keeping incision 2mm away from free gingival margin. Adipose and gland tissue on the graft are removed using scraping motion. After the donor tissue is shaped suiting the recipient site, tissue is fixed with periosteal sutures and sling sutures.⁵ In the view of the authors, one of the most difficult aspects of a FGG and reason for its failure comes from inadequate fixation of tissue to the underlying bed. To overcome this authors have used soft tissue screws which resulted in immediate stabilization of soft tissue graft to underlying connective tissue and resulted in faster healing.

CASE REPORT

A 54 year female patient reported to the dental office for replacement of her posterior missing teeth desiring dental implants, the patient had no relevant medical history. On examination she had teeth 45,46, 47 (FDI tooth numbering system) missing with adequate ridge width and height (Fig 1) as was observed on the panoramic radiograph. The mesiodistal width of the edentulous span was approximately 20 mm. Therefore, it was decided to place three implant fixtures to support a porcelain fused to metal bridge. The implants (Bioner, Barcelona) placed were 4 x 11.5mm in regions on 45 and 46 and an implant of 5 x 11.5mm at site 47. The implants were placed in a two staged (submerged protocol) following manufacturer's instructions.

Following an uneventful healing period the



Figure 5: Harvesting of free gingival graft.



Figure 6: Screw being used to fixate the free gingival graft to the recipient site.



Figure 7: Additional screws being used to fixate the free gingival graft to the recipient site.



Figure 8: Well healed free gingival graft at recipient site creates a wider zone of keratinized gingival tissue around the dental implants.

patient was recalled and on examination the tissue thickness around the implant area was observed as deficient. A soft tissue augmentation procedure with a free gingival graft harvested from the palate fixed with soft tissue screws (Fig 2) was planned along with healing collar placement on the implants. On the day of surgery an incision was placed at the mucogingival junction adjacent to the implants and a partial thickness flap was elevated and fixed with the soft tissue anchor screws



Figure 9: Stable graft tissue seen at 12 months healing.

(Figs 3, 4). A free gingival graft (FGG) was harvested from palate (Fig 5) and fixated with the screws at the recipient site (Figs 6, 7). No sutures were used to secure the FGG. After healing (Fig 8), open tray impressions were recorded. A screw retained prosthesis was later delivered. Twelve month recall demonstrated stable peri-implant tissues (Fig 9).

DISCUSSION

The role of stable peri-implant tissue for predictable long term functional and esthetic outcomes of dental implants is an evidence based reality. This case report supports the view that narrow zones of keratinized gingiva are less resistant to insult along the implant-mucosa interface. When inflammation is present, its apical proliferation may occur more rapidly compared to those sites with wider zones of keratinized gin-

giva that have an epithelial seal. Wider zones of keratinized gingiva may offer more resistance to the forces of mastication and frictional contact that occur during oral hygiene procedures.⁶ Thus, a lack of keratinized gingiva may create an environment that is less amenable to oral cleansing and more susceptible to irritation and discomfort during such routine procedures.⁷ Sites with less keratinized tissue exhibit higher amount of peri implant recession.⁸ Different remodeling processes in keratinized and non-keratinized tissues or in the underlying bone over time, but especially during the initial healing phase and the first 12 months after prosthesis delivery, could explain these findings.⁹

CONCLUSION

In this Case Report, a free gingival graft was used for augmentation. One disadvantages of using FGG is difficulty of fixation to underlying tissues. Hence, in this Case Report, fixation screws were used to secure the graft in lieu of sutures. Using this technique, the FGG healed uneventfully and remained stable after 12 months of follow up. The technique of soft tissue graft fixation with screws offers an alternate to graft fixation with sutures, however more randomized clinical trials are needed to confirm this technique. ●

Correspondence:

Dr. Lanka Mahesh
drlanka.mahesh@gmail.com

Disclosure

The authors report no conflicts of interest with anything in this article.

References

1. Lang NP, L e H. The relationship between the width of keratinized gingiva And gingival Health. *J Periodontol* 1972; 43: 623–627.
2. Kennedy JE, Bird WC, Palcanis KG, Dorfman HS. A longitudinal evaluation of Varying widths of attached gingiva. *J Clin Periodontol* 1985; 12:667–675.
3. Warrer K, Buser D, Lang NP, Karring T. Plaque-induced peri-implantitis in the Presence or absence of keratinized mucosa. An experimental study in monkeys. *Clin Oral Implants Res* 1995; 6:131–138.
4. Yan JJ, Alex Yi-min. Comparison of acellular dermal graft and palatal autograft in the reconstruction of keratinized gingiva around dental implants: A case report. *Int J Periodontics Restorative Dent* 2006;26:287-292
5. Hall WB, Lundergan WP. Free gingival grafts. Current indications and techniques. *Dent Clin North Am* 1993; 37:227–242.
6. Alpert, A. (1994). A rationale for attached gingiva at the soft-tissue/implant interface: esthetic and Functional dictates. *Compendium of Continuing Education in Dentistry* 15:356, 358, 360-2 passim; Quiz 368.
7. |Hornig GM, Mullen MP. Peri-implant free gingival grafts: Rationale and technique. *Compend Contin Educ Dent* 1990; 11: 604–610.
8. Quarrymen, M., De Soete, M. & van Steenberghe, D. (2002) Infectious risks for oral implants: a review Of the literature. *Clinical Oral Implants Research* 13: 1–19.
9. Bengazi, F., Wennstrom, J.L. & Lekholm, U. (1996) Recession of the soft tissue margin at oral implants. A 2-year longitudinal prospective study. *Clin Oral*