

Aesthetic Enhancement around Immediate Implant by Soft Tissue Augmentation with Free Gingival Graft: A Case Report

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ABSTRACT

Increasing keratinized tissue around immediate implant by soft tissue augmentation with free gingival graft. Immediate implant placement has been advocated as it reduces treatment time, allowing socket healing simultaneously along with implant osseointegration. Peri-implant plaque index is increased due to inadequate keratinized tissues. Peri-implant plastic surgery aims at creating adequate peri-implant keratinized tissue for proper oral hygiene maintenance and improving implant aesthetics. A 26 year old male patient reported to the Department of Periodontology complaining of unaesthetic appearance due to fractured permanent maxillary left lateral incisor. Following a thorough periodontal examination, treatment modality chosen was immediate implant placement at the respective site. Six months following implant placement, soft tissue augmentation using free gingival graft was performed to increase the width of keratinized tissue. The permanent prosthesis was placed one month after second stage surgery. Free gingival grafting resulted in increase in keratinized tissue around implant site one month after second stage surgery. This case report presents a form of peri-implant plastic surgery for maxillary anterior rehabilitation by free gingival grafting following implant placement for improving prognosis of implant reconstruction, thereby restoring function and aesthetics of maxillary anteriors.

KEYWORDS: Implant, Gingiva Graft, Aesthetics, Soft Tissue Augmentation

INTRODUCTION

Different implant placement protocols can be pursued by the clinician while replacement of the extracted tooth using implants. It is utmost important to determine, prior to extraction, which of these is to be followed, be it immediate (Type 1), early (Type 2, 3), or late placement.

Certain clinical criteria, however, need to be met in order to achieve a successful treatment outcome, namely: intact extraction socket walls, facial bone residual at ≥ 1 mm, thick gingival biotype, an absence of acute infection, and sufficient residual bone at the palatal and apical tooth socket. For long term coverage these criteria may also lead to aesthetic complications, hampering the health of peri-implant tissues, even if functional survival is maintained.

With recent advances, osseointegration poses as less of a challenge. However, the strength and condition of the peri-implant tissue become an essential factor for better prognostic outcomes. Lang and Loe estimated the amount of keratinized gingiva required to maintain gingival health and concluded that regardless of the patient's health inflammation still persists in areas with less than 2.0 mm of keratinized gingiva.¹ However, the age of the patient, oral hygiene maintenance, aesthetic considerations and

patient's expectations are few of the major look out which should be viewed.

REVIEW OF LITERATURE

Clinical significance of Attached gingiva around implants as stated by Krygier et al. is as follows²:

- Attached gingiva helps to maintain patient comfort and resistance to mechanical trauma during oral hygiene procedures, especially in patients with severe atrophy where the retraction of the lip and tongue hinder hygiene efforts.
- A non-keratinised epithelium may not be able to form a functional junctional epithelium.
- The alveolar mucosa, due to its elastic and moveable nature, would under functional movement constantly challenges the epithelial seal around implants.
- Tissue prolapse can occur while attaching or removing prosthetic components.

The depth of the vestibule as well as the width of keratinized gingiva can be increased using free gingival graft even in shallow vestibule.

Listgarten et al. stated that it is preferable to locate the implants in the masticatory mucosa.³ Hence if there is

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inadequate gingiva present it is better to augment the gingiva before the placement of fixtures or at the time of second stage surgery.

Depending on the patients requirement and the techniques used various methods have been known for obtaining adequate amounts of keratinized tissue. Which can be brought into account while the implant is being placed or prior to surgery and even during the second stage implant surgery. For increasing the zone of keratinized tissue around implants Apically positioned flaps, laterally positioned flaps, free gingival grafts or connective tissue grafts are few of the grafts and tissue coverage methods utilized.

Autogenous free gingival grafts is an effective option in places where there is less than 0.5 mm of keratinized tissue available. one of the methods widely used is Free gingival grafts which are proven to be successful. However, these also represent with various disadvantages like; increased discomfort, potential for postoperative bleeding from donor site owing to the wound that heals by secondary intention, difference in color of the grafted tissue and adjacent gingival tissues.⁴ Two surgical sites have been used with similar anguishment in both the areas. Also, discrepancies in color and texture with the surrounding mucosa oftentimes result in a compromised esthetic outcome. When using these techniques, a few percentile for this shrinkage is expected. A shrinkage of 38 to 45% after one year, been reported in the case of a free gingival graft occurs in relation to the graft thickness.⁵ This shrinkage is even greater in cases where acellular dermal allografts are used.

Zucchelli et al. reported an average of 1.5mm increase in the width of the keratinized tissue for connective tissue graft around single implant restoration. Pedicle Graft can also be utilized as a part of second stage surgery. This technique is less invasive. In unilateral single implant cases this method has is of great importance where small area of keratinized tissue is required to be augmented.⁶

Presented here is a case report, where the free gingival graft technique was used to increase the width of keratinized tissue after immediate implant placement.

CASE REPORT

A 26 year old male patient reported to the Department of Periodontology, SDKSDC, Nagpur complaining of unaesthetic facial appearance due to dislodged prosthesis of the permanent maxillary left lateral incisor six months ago. He informed that the tooth had been fractured due to trauma 2 years ago, following which he underwent endodontic treatment for the same along with post and core build up (Fig 1). Intraoral periapical radiograph revealed periapical radiolucency as well as 2mm of tooth structure above the alveolar crest. The patient was systemically healthy with good overall periodontal status. Clinical examination revealed an adequate width of attached gingiva with respect to permanent maxillary left lateral incisor. The patient desired for replacement of the



Fig 1: Pre operative view

broken tooth, which was indicated for extraction. The patient was given the option of immediate implant placement which he selected amongst the different treatment alternatives.

Two weeks prior to the implant placement surgery non-surgical procedure including scaling and polishing was performed. Preoperative treatment planning was brought about using casts with an anatomical wax-up.

First stage surgery: On the day of treatment, atraumatic extraction of the permanent maxillary left lateral incisor was carried out. The tooth socket was retained with all its walls intact and thoroughly debrided to devoid it of all granulation tissue. On measuring with a graduated periodontal probe, the length of the socket from crestal bone was found to be 11mm whereas the bucco-palatal and mesiodistal widths were found to be 6mm and 5mm, respectively. After sequential osteotomies, up to 2.8; an immediate implant of size 4.2 x 13mm was placed in relation to the missing permanent maxillary left lateral incisor. No bone graft was required since the jumping distance was 0.5mm only. The cover screw was secured in place. A fresh radiograph was taken to evaluate the implant position (Fig 2-7).



Fig 2: Extracted tooth

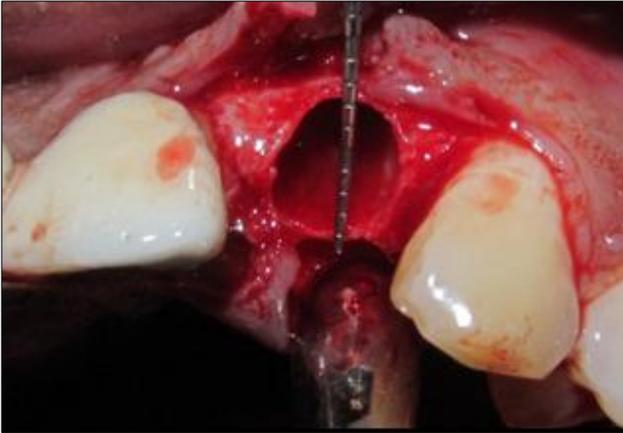


Fig 3: Post extracted socket



Fig 4: Immediate implant placement



Fig 5: Bone graft (DFDBA) was placed



Fig 6: Site was sutured



Fig 7: Pre & post operative radiographic view

Postoperative instructions required the patient to avoid the use of and directly chew with the provisional crown for 6 weeks minimum and not to brush in the area for at least 10 days. The patient was instructed to avoid smoking following surgery. Post-operative medications included Amoxicillin(500mg) thrice daily and Aceclofenac(100mg) Paracetamol(500mg) combination twice daily for five days. The recall and follow up was systematically recored at 1 week, and at 1, 3, 6, 7 and 10 months intervals. The soft tissue coverage was clinically documented via photographs at the implant site.

Osseointegration was evaluated at 3 months following which gingival former was placed. Provisionalization was done and while performing various movements including excursive or protrusive occlusion was checked and adjusted to ensure, no contact when the same movements being recorded (Fig 8).



Fig 8: Recall at 6 months

Six months later inadequate width of attached gingiva (2mm) was noted in the respective region. Hence, it was decided to perform peri-implant plastic surgery by free gingival grafting for the better prognostic outcome of the implant. The technique which was used for obtaining the a free gingival graft was the stirp technique for augmentation of the gingiva and increase of the vestibule depth on the desired area. The recipient area was prepared with a split thickness flap which was fixed apically with periosteal sutures. The donor palatal tissue measuring (15 x 7 x 2) mm was harvested and fixed in

the recipient area with resorbable (5-0 vicryl) sutures and covered with the periodontal dressing (Fig 9-15).



Fig 9: Partial thickness flap raised at recipient site



Fig 10: Template placed to measure amount of tissue to be grafted



Fig 11: Template placed at donor site



Fig 12: Graft harvested from donor site



Fig 13: Graft harvested from donor site



Fig 14: Graft placed in recipient site



Fig 15: Fixed with resorbable (5-0 vicryl) sutures



Fig 16: Recall visit 2 months after grafting

Recall visit one month after grafting (7 months after implant placement) reported good acceptance of the graft at the recipient site. The permanent prosthesis was placed at this recall visit. Three months later (10 months after implant placement) the bulk of the graft was reduced and increase vestibular depth keratinized tissue was observed (Fig 16-19).



Fig 17: Recall visit 2 months after grafting



Fig 18: Recall visit 2 months after grafting



Fig 19: Recall visit 2 months after grafting

DISCUSSION

During this procedure there is an altered morphology of

bone which is unfavourable for implant placement and implant placement becomes impossible without surgical correction.⁷

Implants when indicated for placement in extraction sockets or healed ridges, bone augmentation is required, where subsequent placement of the implant may be achieved using an immediate provisionalization procedure.⁸ The outcomes of immediate provisionalization of implants placed into recently grafted bone have not been fully investigated.

Even though reports have stated that a lack of keratinized tissue may not influence the long-term survival rate of implants, the presence and reconstruction of keratinized tissue around implants seems to decrease in the patients discomfort as well as irritation while carrying out the oral hygiene procedure.

In a retrospective study of 339 implants in 69 patients over 3 years, it was reported that regardless of the implant surface configuration and absence of adequate keratinized tissue in dental implants it was associated with higher plaque accumulation and gingival inflammation.⁹

Another study that randomly collected data on 200 implants which covered various indices including the mean gingival index score, plaque index and radiographic alveolar bone loss in these cases, found that all these indices showed a significantly higher value for those implants which were placed in a narrow zone of keratinized tissue compared with those implants placed within a keratinized tissue which was not more than 2 mm.¹⁰ Thus, it should be widely considered that implant placed in enough keratinized tissue width aid in the long-term maintenance of implants, especially in patients whose oral hygiene maintenance is inadequate. Apically positioned flap, laterally positioned flap, free gingival grafting or connective tissue graft Clinicians usually opt for as an appropriate technique to maximize the width of keratinized tissue.

In a pilot study conducted by Ali Hassani et al. 2010, second stage peri-implant surgery using free gingival graft was performed in 5 implant sites followed by immobilization of the graft with a newly designed stent. At 1 year follow up, the mean size of the remained gingival graft approximated 37% of the initial size.¹¹

In a case report by Grover et al. in 2011, free gingival grafting was done in the edentulous region prior to implant placement in the edentulous region at the future implant sites, which resulted in an increase in keratinized tissue along with an increase in the vestibular depth.¹²

In this case, free gingival graft was chosen over connective tissue graft and Alloderm because: 1. Increased width of attached gingiva obtained compared to connective tissue; 2. Creeping attachment; 3. Unlike free gingival graft, connective tissue graft placement would result in frenum pull; 4. Economical compared to Alloderm.

CONCLUSION

The present case report puts forward a treatment option for management of a complication after First stage surgery with a Second stage peri-implant plastic surgery. This procedure following successful rehabilitation of the maxillary anterior helps to improve the prognosis, esthetics and function. Further, long-term studies should be undertaken to determine the success rate of the procedure.

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