

A modified free gingival graft approach in the treatment of a peri-implant soft tissue complication

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SUMMARY

The aim of the present case report is to demonstrate the use of thick epithelialized free gingival grafting method for the treatment of a soft tissue complication occurring around dental implants placed into a fibula-free flap reconstructed mandibular defect. Desirable amount of keratinized tissue was obtained around all implants at the end of the treatment. Although graft dimensions were decreased with time, no marginal tissue movement or any other mucogingival problem were determined. The hyperplastic tissue formation was totally eliminated. The modified thick epithelialized free gingival grafting method may be a suitable alternative method for the elimination of certain mucogingival problems arising around dental implants in the presence of a scar-like tissue.

Key words: Dental implant, free gingival graft, peri-implant, soft tissue problem

ÖZET

Peri-implant yumuşak doku komplikasyonunun tedavisinde bir modifiye serbest diş eti grefti yaklaşımı

Bu olgu sunumunda, kalın epitelize serbest diş eti grefti yöntemi kullanılarak, kemiksel gerftleme ile rekonstrüksiyona tabi tutulmuş bir mandibular defekt bölgesinde bulunan implantların çevresindeki yumuşak doku komplikasyonunun tedavisi gösterilmektedir. Tedavi bitiminde tüm implantların etrafında hedeflenen keratinize doku miktarı izlendi. Greft boyutlarında zamanla azalma olmasına rağmen, marjinal doku hareketi veya başka bir mukogingival problem tespit edilmedi. Hiperplastik doku formasyonu tamamen elimine edildi. Modifiye kalın serbest diş eti grefti yöntemi, dental implantlar etrafındaki skar ve benzeri dokuların varlığında ve bazı mukogingival problemlerin giderilmesinde alternatif bir tedavi seçeneği olarak düşünülebilir.

Anahtar kelimeler: Dental implant, serbest diş eti grefti, peri-implant, yumuşak doku problemi

Introduction

Mucosal irritation, gingival hyperplasia, peri-implantitis, inadequate vestibular depth and insufficient attached tissue are most of the reported problems associated with the soft tissue around dental implants (1-3). Although the lack of keratinized tissue may not influence implant survival, careful management of soft tissue around implants is considered essential by clinicians to prevent the potential problems indicated above (4). The increasing esthetic demand in implant dentistry and the subsequent need to treat and/or prevent soft tissue problems occurring around dental implants have favoured the development of many surgical techniques including vestibuloplasty, use of freeze-dried skin, split or full thickness skin grafts and free gingival grafts (2,3,5). Since it was described by Bjorn in 1963 (6), the free gingival graft technique was widely utilized for the treatment of mucogingival problems in periodontal surgery and its predictability was marked, which demonstrated the stability of newly keratinized tissue up to several years (7).

The use of fibula osteoseptocutaneous flaps (fibula-free flaps) in the presence of bone and soft tissue continuity defects has become a valuable means for the rehabilitation of these patients. Further, the possibility of placing dental implants in the reconstructed areas permits to overcome the problems related to the dental rehabilitation with removable prostheses (8). However, scar (or scar-like tissue) formation is usually an inevitable complication that occurs following a fibula-free flap surgery and may cause several problems such as tissue resistance to blade or other surgical instruments, interruption of the vascularization during or following subsequent intraoral operations. Unfortunately, present mucogingival surgical techniques do not indicate any solutions in order to eliminate this problem.

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The aim of the present case report is to demonstrate the use of thick epithelialized free gingival grafting method for the treatment of a soft tissue complication occurring around dental implants placed into a fibula-free flap reconstructed mandibular defect.

Case Report

A 23-year-old male patient was referred to the Department of Periodontology of Gulhane Military Medical Academy. The history revealed that the anterior mandible was defective and the relevant anterior teeth had been lost due to a gun shot accident experienced nine months ago. A fibula-free flap surgery had been performed by the Plastic and Reconstructive Surgery Department to treat the defective area 2 weeks after this injury. After a 6 months of healing period, 4 dental implants were placed to the grafted area and 4 weeks after the implant placement, a severe hyperplasia with a labile tissue around the surrounding mucosa of the implants was noticed.

Intraoral examination of the patient revealed an exaggerated hyperplastic tissue originating from the inner mucosa of the lower lip covering 3 of the 4 dental implants (Figure 1). Shallow vestibular sulcus with insufficient keratinized tissue around dental implants and a scar-like tissue remaining from fibula-free flap surgery displaying continuity with the adjacent area were also present. No peri-implant pathology was determined.



Figure 1. Preoperative view of the area revealing an exaggerated hyperplastic tissue originating from the inner mucosa of the lower lip and covering three of the four dental implants

Scaling and polishing were performed to the exposed implant and oral hygiene instructions were given to the patient at the beginning of the therapeutic procedure. For the epithelialized free gingival graft surgery, a local anesthetic solution (Ultracaine D-S forte, Hoechst Roussel, Frankfurt, Germany) was administered to both the donor and recipient sites. Following excision of the exaggerated amount of hyperplastic

tissue with #15 scalpels and surgical scissors (Hufriedy Manufacturing, Chicago, IL, USA), a marginal horizontal linear incision was made along the mucogingival junction at the recipient site. Split-thickness incision was extended mesiodistally to the most-distant point where inadequate vestibular depth was determined and the incision was extended apically to the deepest point that would provide the desirable band of keratinized mucosa around implants after completion of the wound healing. A second surgical site was created on the palate. A thick, rectangular thick graft in large dimensions (25 mmX9 mmX2.5 mm) was harvested from the donor site at the bicuspid area by a partial thickness incision. The harvested graft was then trimmed according to the borders of the recipient site and sutured in contact with the labial mucosa by 4-0 silk sutures (Dogsan, Yalincak, Trabzon, Turkey) although its mobility was observed (Figure 2). Mild compress was exerted onto the sutured tissues for 5 minutes with gauze soaked in saline. A previously fabricated acrylic stent was delivered to the patient for the protection and stabilization of the donor site.

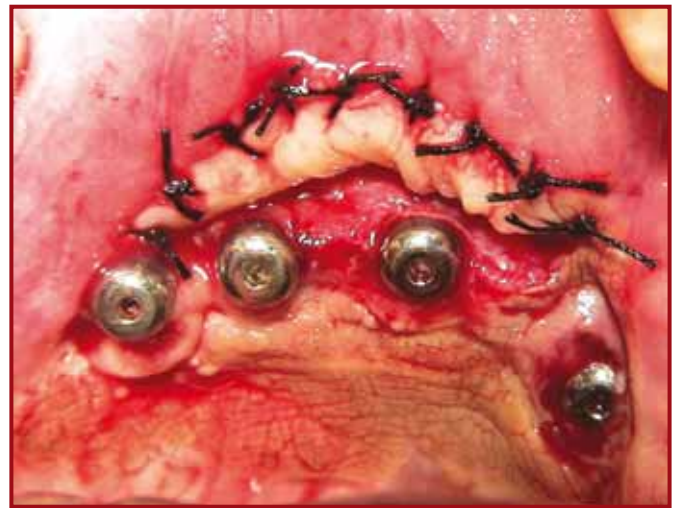


Figure 2. Operative view following suturation of the graft. Note that it was fixed in contact with the labial mucosa (First surgery)

A second operation was performed 3 months later to eliminate the mucogingival problems that still existed (Figure 3). For this purpose, 2 pieces of free gingival grafts were obtained from the hard palate (dimensions: 10 mmX9 mmX2.5 mm and 15 mmX9 mmX2.5 mm) and placed in front of the 2 implants in the right mandibular area with the same surgical technique. Tooth brushing activity around the implants was discontinued during this period. The sutures were removed 15 days after both surgeries and follow-up visits were carried out 1, 3 and 6 months after the second operation.

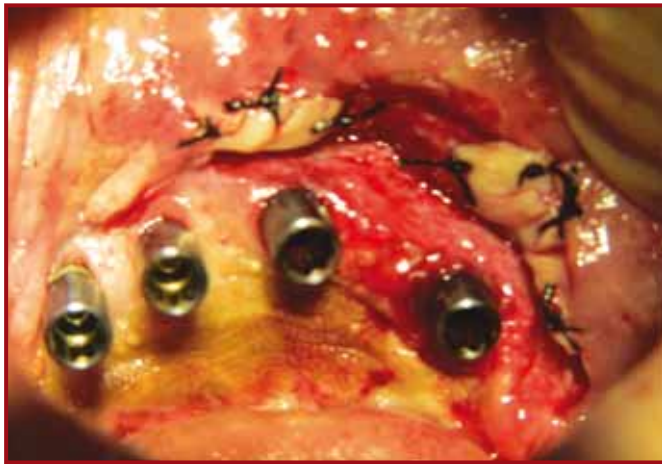


Figure 3. The graft was again sutured in contact with the labial mucosa (Second surgery)

The postoperative healing was generally uneventful at the day of the suture removal after both surgeries. Desirable amount of keratinized tissue was obtained around all implants except for one at the left side of the mandible. No marginal tissue movement or any other mucogingival problems were determined (Figure 4). Horizontal and vertical dimensions of all grafts were partially decreased with time. No sign of mucosal proliferation was observed and the amount of keratinized tissue was sufficient.

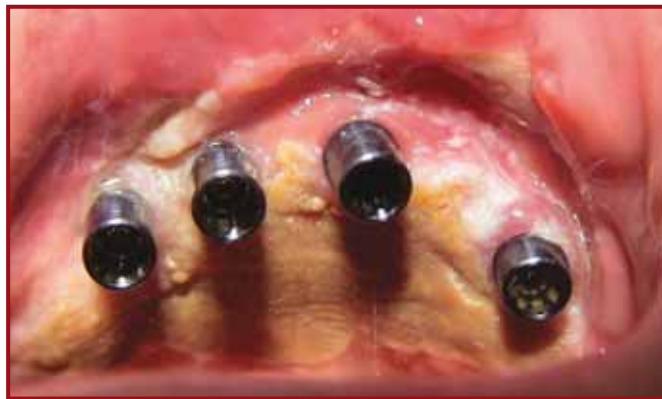


Figure 4. Postoperative view following second modified free gingival graft surgery

It was preferred to wait for 6 months after second free gingival graft surgery to be sure about the complete healing without any recurrence. The patient was then oriented to the Department of Prosthodontics for the fabrication of permanent implant supported dentures.

Discussion

This clinical report presents the treatment of an aggressive tissue hyperplasia around mandibular implants using a modified free gingival graft approach performed to a 23-year-old man. Although many studies have reported dental implant use following

an intra-oral fibula-free flap procedure, there are sparse data about the rehabilitation of a mucogingival problem around implants following a fibula-free flap.

Some authors suggested several techniques to obtain adequate amounts of keratinized tissue around implants, mainly based on the preservation of keratinized tissue. Free gingival graft is utilized in case of an inadequate keratinized tissue or a shallow vestibular depth around the edentulous ridge and/or dental implants (3,9). Conventional epithelialized free gingival graft technique involves placement of the graft in contact with the attached gingiva and no other modifications exist in periodontology literature. However, an alternative modality is needed especially in the presence of a scar-like tissue which may interrupt the utilization of the conventional free gingival technique. In the present case report, the authors sutured a thick free gingival graft to the labial mucosa instead of attached gingiva and obtained sufficient amount of attached gingiva. Free gingival graft was thought to make function as a physical barrier to prevent the proliferation of labial mucosa through the implant region.

The healing of the free gingival graft primarily depends on the formation of collateral circulation from the periosteal and connective tissue bed. A thin blood clot promotes tensile strength and stability of the wound and healing of a transplanted tissue is dependent on the development of a new blood supply between donor tissue and recipient site (10). This stability of the wound/graft is one of the most critical factors in achieving a desirable treatment outcome. For this reason, it is considered by the clinicians to place the graft away from the movable mucosa to protect the stability of the graft.

Conventional application of epithelialized free gingival graft procedure involves the suturation of the transplanted tissue to the attached gingiva. In the present case report, since the floor of the patient's mouth was previously rehabilitated with a fibula-free flap surgery before, it was decided to perform a modification. Although mobility is a major risk factor for graft mortality, the free gingival graft was sutured proximal to the labial mucosa in this case. Nevertheless, it was taken care to obtain the thickest tissue as it can be to reduce the disadvantage about the vascularization. At the end of the healing period, 32-40% of the graft dimension was lost due to the usual contraction and this range was compatible with the previous report of Hatipoglu and his co-workers (11).

Acrylic surgical stents were fabricated by some authors for the management of postoperative healing following intra-oral surgical procedures and satisfactory results were obtained (12). On the contrary,

the prefabricated stents placed onto the surgical area following 2 previous vestibuloplasty procedures were unable to eliminate the recurrence at this patient. As described in the present report, free gingival technique can be modified by suturing a thick epithelialized tissue in the presence of an interrupting factor such as a scar-like tissue in such cases. This technique may also reduce the necessity of a surgical stent and can be a fair alternative for protecting the vestibular depth.

Sometimes an undesirable tissue formation such as scar tissue may interrupt the ideal recipient site preparation and/or graft placement in free gingival graft operations. In such cases, literature review does not demonstrate a suitable alternative to solve this kind of problems. In conclusion, modified thick epithelialized free gingival graft procedure may be a suitable alternative method for elimination of certain mucogingival problems around dental implants in the presence of a scar-like tissue secondary to a previous surgical procedure. In this technique, the graft was sutured in contact with the labial mucosa where it was thought to act as a barrier between proliferating labial mucosa and the implantogingival unit. Although the suggested modified technique does not seem to be in coherence with the classical graft healing physiology knowledge, clinicians may consider the reported method in cases they could not obtain intact and immobile suturing areas.

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