

A Technique for Utilizing Upper Lid Blepharoplasty Full thickness Skin for Peri-Implant Keratinized Tissue Grafting^{*,□}

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Abstract. Deeb GD, Dierks EJ. Peri-implant Keratinized Tissue Grafting Utilizing Upper Eyelid Blepharoplasty Full thickness Skin. Presented at the 81st annual meeting of the American Association of Oral and Maxillofacial Surgeons, Boston, September 1999.

Purpose: Patients with an edentulous atrophic mandible restored with endosseous dental implants frequently have an inadequate zone of keratinized tissue in the peri-implant area. The authors present a technique utilizing the skin harvested from an upper eyelid blepharoplasty to augment the zone of keratinized tissue in edentulous implant patients.

Patients and Methods: A series of three patients with endosseous dental implants with an insufficient zone of keratinized tissue in the peri-implant area were selected to undergo peri-implant keratinized tissue grafting using skin harvested from upper eyelid blepharoplasty.

Results: All patients had excellent take of the grafted tissue. All patients were pleased with the cosmetic results of their upper eyelid blepharoplasty. Biopsy of grafted site at three months revealed parakeratotic stratified squamous epithelium consistent with grafted skin.

Conclusions: The authors present a new technique for dealing with the inadequate zone of keratinized tissue in the peri-implant region using the skin harvested from an upper eyelid blepharoplasty. This technique has excellent patient acceptance, provides a reliable source of keratinized tissue, and provides an additional cosmetic procedure.

Introduction

Patients with an edentulous atrophic mandible restored with endosseous dental implants frequently have an inadequate zone of keratinized tissue in the peri-implant area. Soft tissue reconstructive procedures are commonly required to establish a zone of keratinized tissue adjacent to the supracrestal implant structure that will resist abrasion and adhere tightly to underlying bone to provide a tight marginal seal. A variety of procedures have been described to accomplish this goal, such as free gingival grafts, allografts, pedicle grafts and split thickness skin grafts.

Blepharoplasty is a common procedure within the armamentarium of the contemporary oral and maxillofacial surgeon to enhance upper eyelid appearance by removal of excess skin

and/or fat. The authors present a technique and a series of three case reports that utilize the skin harvested from an upper eyelid blepharoplasty to augment the zone of keratinized tissue in edentulous implant patients.

Operative technique

Candidates for the procedure may be determined from the physical examination of the peri-implant soft tissues as well as examination of the eyes. Candidates who have upper eyelid dermatochalasis and poorly defined upper eyelid creases as well as an inadequate zone of keratinized tissue around their dental implants are selected. Appropriate treatment planning should include careful documentation with photography.

Patients are anesthetized with Versed and Fentanyl after an intravenous line is placed. In addition, the patients receive 8 mg of Decadron and 1 gm of Ancef preoperatively if not contraindicated. The patients are prepped and draped in the standard fashion for upper eyelid blepharoplasty. A marking pen is used to demarcate planned incision sites after appropriate soft tissue measurements are made. The upper eyelids are anesthetized with 2% xylocaine containing 1/100,000 epinephrine. Using a scalpel, a skin flap or skin muscle flap is elevated depending upon blepharoplasty technique utilized. Meticulous hemostasis is maintained. Orbital fat may or may not be removed depending upon patient needs. The wound is closed using 6.0 fast absorbing gut suture. The blepharoplasty skin is inspected, and any muscle or fat is meticulously removed. The specimens are placed in sterile saline for storage.

Once adequate intraoral anesthesia is achieved, a split thickness dissection is carried out on the labial aspect of the implants. All mobile tissue must be removed leaving only periosteum on the recipient bed. The mucosa can be sutured in an apical position to increase vestibular depth, if needed.

The full thickness eyelid skin is then placed onto the recipient bed and any excess skin is trimmed. The graft is secured using 4.0 Vicryl suture with deep periosteal suturing at the periphery as well as at the margins. A premade stent lined with a soft denture liner (i.e., Coe-Soft) is then placed over the graft site and secured using standard circum-mandibular wire

technique. This is done to obtain good approximation of the graft to the recipient bed and to prevent hematoma formation, which could adversely affect graft survival. Alternatively, a thermoplastic nasal cast can be used to adapt and secure the graft. This is done by trimming the cast to the appropriate size and warming it to a soft pliable consistency to contour it to the graft site. The cast is then lined with perio-pack or soft denture liner and secured using circum-mandibular wires or titanium microscrews placed into the underlying mandible.

Case 1 (Figures 1a-g)

A healthy 56 year old female was referred to our service for evaluation of her shallow vestibule and lack of peri-implant keratinized tissue. Recent radiographs revealed good bone density and height.

Oral examination revealed two successfully integrated Branemark® endosseous implants. A lack of vestibular height was noted labial and lingually. The labial soft tissue–implant interface consisted of unattached mucosa, while the lingual soft tissue–implant interface was attached gingiva. There was an area of scar tissue formation lingually adjacent to the right implant where the para-functional tongue movements had caused tissue irritation.

Orbital examination revealed redundant upper eyelid skin. Under IV sedation the patient underwent upper eyelid blepharoplasty without orbital fat resection as well as intraoral keratinized tissue grafting around her implants. She tolerated the procedure well, and at six months showed good clinical results with increased vestibular depth and a good zone of peri-implant keratinized tissue. Biopsy of the grafted site revealed parakeratotic stratified squamous epithelium consistent with viable skin. In addition, the patient was extremely pleased with the added cosmetic benefits from the results of her upper blepharoplasty.

Case 2 (Figures 2a-e)

A 66 year old otherwise healthy edentulous female presented to the oral and maxillofacial surgery clinic requesting dental implants. Intraoral examination revealed edentulous ridges with knife-edge morphology. Radiographs demonstrated well-pneumatized maxillary

sinuses with short alveolar ridges. A treatment plan was formalized that provided for bone grafting from the tibia to augment the maxillary sinuses. Six implants were planned in the maxilla and five implants were planned in the mandible.

The surgery was performed and her post-operative healing course was without complications. The patient was allowed a period of six months for osseointegration of the implants and integration of the bone graft. At the second stage surgery, it was evident that there was an abundance of soft tissue with a lack of adequate keratinized tissue. Even with seven millimeter healing abutments, the mucosal tissue was noted to cover the abutments (fig. 2b). In addition, the patient had minimal vestibular depth in the anterior mandible. A decision was made to perform a vestibuloplasty with transfer of keratinized tissue. Treatment options were presented to the patient, which included split thickness grafting from either the palate or thigh or full- thickness grafting from the upper eyelids. The patient chose the eyelid skin without blinking an eye hesitation.

The second stage surgery was performed in the clinic operating room under intravenous sedation. Upper blepharoplasties were done without resecting fat. The recipient site was prepared in a standard split thickness fashion. Both pieces of skin were utilized to graft the vestibule. A custom splint was lined Coe-Soft® and secured with circummandibular wires. After a healing period of ten days the splint was removed. The tissue was pink and viable. Three months post operatively she has a significant improvement in her vestibular depth and a generous band of keratinized tissue around the implants. The patient was also pleased with the added cosmetic benefits from the results of her blepharoplasty.

Case 3

A 66-year-old white female was diagnosed with squamous cell carcinoma of the left posterior mandibular alveolar ridge. A left marginal mandibulectomy and left modified radical neck dissection were performed followed by reconstruction with a radial forearm free flap. No radiation therapy was utilized. After the patient had remained free of recurrent disease for over one year, the mandible was reconstructed. The inferior alveolar nerve was lateralized and a block

iliac crest bone graft was secured to the residual mandible with mini plates. Three Calcitek® implants were placed through the graft and into the native mandible. The area healed well and the implants integrated. When the implants were uncovered, the radial forearm tissue was noted to be rather thick, even with the longest healing abutments. The flap was debulked and full thickness upper eyelid skin was used as a peri-implant graft. A thermoplastic cast filled with perio-pack was secured with titanium micro screws placed into the grafted bone. One week later the dressing was removed. The grafts were viable. At 5 months follow-up, the tissue was pink and moist and it was noted that the peri-implant gingival pocket depths were within 3 mm from the crest of the tissues at all grafted site.

Discussion

Adequate attached keratinized tissue and lack of vestibular depth represent common problems in the edentulous anterior mandible following implant placement. The presence of a good tissue-implant interface is important in maintaining a healthy stable environment.¹ There are many options available for restoring this equilibrium. Some of these options include palatal split thickness graft, split thickness skin graft from the thigh or elsewhere, and full thickness skin grafts. Each technique has certain advantages and limitations.

Skin grafts have traditionally been a useful source of tissue for intraoral use. Both full thickness skin grafts (FTSG) and split thickness skin grafts (STSG) are viable options. STSG are considered to be the gold standard of skin grafts. They are reliably successful (>90%) and easily obtainable.^{2,3} Shrinkage from secondary contraction is greater with STSG than with FTSG, and donor site morbidity is low and generally well tolerated. FTSG, on the other hand, exhibit less shrinkage yet are bulky and sensitive to movement of the host bed. Additionally, FTSG donor sites can require complex closure techniques.

Acceptable intra-oral keratinized donor tissue for peri-implant placement is limited to the palate. While limited in quantity, this tissue is grafted quite successfully. Palatal tissues have been shown to prevent secondary wound contraction.⁴ Donor site morbidity is often an issue, however, due to the period of time required for healing by secondary intention.

The ideal graft for peri-implant use should be of unlimited quantity and excellent quality, have minimal shrinkage, have minimal morbidity associated with harvest, be viable 100% of the time, and form a hemidesmosome attachment to the implants. While this graft does not yet exist, we present a viable option when considering keratinized peri-implant grafting. The use of full thickness upper lid blepharoplasty skin for grafting purposes has been described previously.⁵ This graft enjoys many advantages. It is a thin FTSG with a high ratio of dermis to epidermis. Also, because it is a FTSG, its secondary shrinkage is less than that of STSG. It is also extremely thin, which theoretically allows it a better take rate than thicker grafts. Furthermore, it is locally accessible in the head and neck region.

In our case series, viability is highly successful, with shrinkage comparable to that of a palatal graft. In each case, a zone of at least five millimeters of attached tissue was obtained with an increase in vestibular depth. While the quantity of eyelid skin is limited, it seems to be adequate in our cases thus far. Up to 8sq. cm can be obtained.⁵ If more tissue were needed, an alternative donor site would be required. In addition, the thinness of this skin makes it a very easy tissue to work with and allows it excellent adaptation to the donor site. A biopsy of one patient at 6 months showed viable skin.

The advantage in using this graft is that its procurement usually results in an enhancement in the cosmetic appearance of the patient. With other donor sites, including STSG or FTSG or palatal grafts, there is usually a timely and uncomfortable healing period associated with the donor site. In addition, the donor site sometimes leaves an obvious and unfavorable scar. The patients in our series have been extremely satisfied with the added benefit from their donor harvest site, and have even requested other types of cosmetic procedures.

In conclusion, we present a technique for using upper eyelid blepharoplasty full thickness skin for keratinized peri-implant tissue grafting. When indicated, it should be considered as a viable option in the treatment plan of carefully selected patients.

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