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## Research Article

### SOFT TISSUE MANAGEMENT IN DENTAL IMPLANTS

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#### ABSTRACT

The primary goal of implant soft tissue management is to establish a healthy periimplant soft tissue environment. This goal is accomplished by obtaining circumferential adaptation of attached tissues around the transmucosal implant structures, thereby providing the connective tissue and epithelium needed for the formation of a protective soft tissue seal

##### Key Words:

Soft Tissue Management, Soft Tissue,  
Dental Implants, Implants, Immediate  
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#### INTRODUCTION

Dental implant is defined as a surgical component that interfaces with the bone of the jaw or skull to support a dental prosthesis such as a crown, bridge, denture, facial prosthesis or to act as an orthodontic anchor. The basis for modern dental implants is a biologic process called osseointegration where materials, such as titanium, form an intimate bond to bone. The implant fixture is first placed, so that it is likely to osseointegrate, then a dental prosthetic is added. A variable amount of healing time is required for osseointegration before either the dental prosthetic (a tooth, bridge or denture) is attached to the implant or an abutment is placed which will hold a dental prosthetic. The perfect aesthetic soft tissue result, it is easy to focus only on the surgical and clinical techniques to recreate ideal soft tissue forms without due regard to the biology of soft tissue in health and in disease. It is therefore important that the clinician understands the biology of the peri-implant soft tissue so that the process of tissue remodeling can be harnessed to achieve a satisfactory and lasting result for the final restoration.

##### Flap Management Consideration

The primary goal of implant soft tissue management is to establish a healthy periimplant soft tissue environment. This goal is accomplished by obtaining circumferential adaptation of

attached tissues around the transmucosal implant structures, thereby providing the connective tissue and epithelium needed for the formation of a protective soft tissue seal<sup>(1)</sup>

Based on our understanding of the constancy of gingival tissue thickness overlying alveolar bone surrounding teeth or dental implants and our knowledge of the healing behaviour of peri-implant soft tissue after wounding, it is possible to estimate the "final position" of the healed tissue around restorations placed on dental implants. The ability of the clinician to accurately forecast the final position of the healed tissue will underpin the long term success of any implant restoration. On the other hand, unrealistic expectation of reconstituting lost tissues by placing gingival tissue a greater distance from the underlying alveolar bone, such as in the case when the implant is placed apically relative to the adjacent teeth, will inevitably lead to future complications. This scenario can arise when the implanted site has been compromised by previous extraction or exposed to infection of long standing. In these situations, bone augmentation should be considered as part of the treatment plan if a stable soft tissue result is to be achieved.

During the treatment planning stage of dental implant treatment, special attention should be given to assessing the proposed implant site as well as other systemic factors that may influence the performance and survival of the implant. Implant site assessment should include:

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1. Checking for pre-existing pathology - such as chronic and persistent granulomatous.
2. lesions associated with the extracted tooth, non-healing abscesses, dentigerous cysts etc.
3. Evaluating the anatomical defect at the site - such as extreme ridge resorption following extraction.
4. Determining the biotype of the patient especially when the treatment site is in the aesthetic zone.
5. Deciding on the appropriate time for the implant placement in relation to the time of extraction.
6. The systemic factors that require special attention are the important "risk factors" associated with implant complications and failures such as past history of periodontal disease and a smoking habit.

When placing a submerged implant, the buccal flap must be designed to preserve both the blood supply to the implant site and the topography of the alveolar ridge and mucobuccal fold. The access flap is outlined by a pericrestal incision and one or more linear or curvilinear vertical releasing incisions that extend onto the buccal aspect of the alveolar ridge. The pericrestal incision is beveled to the lingual or palatal aspects. Typically, linear vertical releasing incisions are used in edentulous situations and curvilinear beveled incisions are used in partially edentulous situations. In either case, reflection of the buccal flap exposes the entire ridge crest and provides ample access for implant instrumentation. This is accomplished with minimal lingual or palatal flap elevation, thus preserving periosteal circulation and providing attached tissue to anchor the buccal flap during subsequent wound closure.

#### **Design for Abutment and Submerged Implant Placement**

Except for the location and bevel of the pericrestal incisions, the same flap design is used for an abutment connection to submerged implants as for placement of nonsubmerged implants. The pericrestal incision is initiated in a position that ensures the maintenance of approximately a 3 mm apicocoronal dimension of attached lingual tissue or good-quality palatal mucosa (free of rugae) for re-adaptation around the emerging implant structures. The quantity and position of the existing soft tissues guide the location of the incision; the incision is located closer to the midcrestal position than the one made for submerged implant placement by adjusting the location and bevel of pericrestal incisions and precisely locating linear or curvilinear vertical releasing incisions. The implant surgeon is equipped with practical flap designs for submerged implant placement, abutment connection, and nonsubmerged implant placement in edentulous and partially edentulous and esthetic case types.

**Resective Contouring** When the width of the gingival tissues remaining on the buccal flap is 5 to 6 mm, resective contouring facilitates circumferential adaptation of the soft tissues around the emerging implant structures. A fine scalpel blade held in a round handle is used to perform a gingivectomy on the buccal flap corresponding in shape and position to the anterior-most abutment or nonsubmerged implant neck. After resective contouring the tissue is adapted around the emerging implant structure; this process is then repeated sequentially around each implant. The contoured flap is then repositioned apically and secured around the abutments with a suture passing through

each interimplant area, and additional sutures are placed to close the curvilinear releasing incisions.

#### **DISCUSSION**

This anatomical feature around titanium implant was found to be consistent for titanium surfaces irrespective of the type of implant system used.<sup>(2)</sup> Furthermore, the surface roughness of the titanium had no bearing on the adherence of the soft tissue.<sup>(3)</sup> Neither was the clinical protocol used in implant placement (one-stage as versus two-stage protocol).<sup>(4)</sup> Despite these observations, the clinical performance of this seal in protecting against bacterial ingress and thus peri-implant infection remained untested. Indirect evidence from human clinical studies which generally reported very low incidence of peri-implantitis and peri-implant mucositis suggesting that indeed, the soft tissue cuff around titanium implant/abutment could provide comparable protection as gingiva around teeth.

The dimension of the soft tissue attachment to the implant/abutment surface was considered important for the maintenance of peri-implant health and for the overall aesthetics of the final restoration. For many years, the concept of a biological width was used to explain the clinical observation of a constant dimension of dento-gingival junction around teeth and dental restorations.<sup>(5)</sup>

The controversy about the need for a keratinized (attached) gingival zone around implant supported restorations is an interesting one. Based on the data from long-term implant success and implant survival studies, there appeared to be little or no difference in the success rate for implants to be placed in oral mucosa zone or keratinized gingival zone.<sup>(6,7,8,9,10.)</sup> The amount of peri-implant mucosal tissue movement during function is influenced by a number of physical variables and is difficult to measure. Until there is a reliable and accurate way of clinically assessing soft tissue movement during function, for many clinicians there is a case for routinely providing a keratinized gingival band around implant restorations to facilitate plaque control and hence reduce the incidence of plaque-related peri-implant disease. Peri-implant mucositis was used to describe the soft tissue inflammation surrounding implant restorations. In the dog model<sup>(11,12)</sup> and in humans,<sup>(13)</sup> experimentally induced plaque accumulation resulted in inflammatory lesions being established in the peri-implant soft tissue. Many similarities in the pathogenesis and histopathological features between this lesion and gingivitis (around natural teeth) were noted. Furthermore, long-standing exposure to plaque accumulation led to peri-implantitis (where bone loss around osseointegrated implants were observed).<sup>(14)</sup> On the other hand, treatment with antimicrobial therapy together with local debridement resolved tissue inflammation<sup>(15).</sup>

#### **CONCLUSION**

Good aesthetic finish in implant dentistry requires appropriate soft tissue management. Satisfactory soft tissue results cannot be achieved with the good blood supply and hard tissue support. Hence, it is of critical importance that attention is paid during the treatment planning step and the execution of the surgical procedures in implant placement for the preservation and recreation of the loss of alveolar bone. Without the laying down of these foundations, the manipulation of the soft tissue alone is not sufficient to bring about a satisfactory result.

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