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The effect of pedicle flab and free connective tissue graft in soft tissue augmentation.

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ABSTRACT

One of the biggest developments in restorative dentistry has been the clinical use of osseointegrated implants to replace missing natural teeth. Most dentists were skeptical of implants and rejected them outright two decades ago. These days, it is uncommon to find a dentist who does not use dental implants or who does not actively participate in one of the many workshops or classes provided by implant manufacturers, professional associations, and institutions.With the knowledge and assurance that implants will steadily integrate into the jaw, doctors may now recommend their usage.Many doctors are aware of the advantages of implementing implant therapy in their practices due to the well-documented clinical success of this treatment in patients who are edentulous or partially edentulous[(1)].

Key words:implant, pedicles, omega, periodontal probe, free gingival graft.

I. INTRODUCTION

The tissues that surround osseointegrated dental implants are known as peri-implant tissues; separated into sections for hard and soft tissues. The "peri-implant mucosa" is the name of the soft tissue compartment, which forms during the wound healing the period that occurs after implant or abutment insertion[(2)].

The majority of knowledge on the peri-implant mucosa's structural characteristics comes from research done on animals, primarily on dog models. Implants were positioned in the edentulous ridge (or, alternatively, the newly extracted socket) in these trials, its masticatory mucosa covered the outside osseous portion. Additionally, measurements from the mucosal margin to the crest of the peri-implant bone revealed that the average height of the healed peri-implant mucosa on the buccal aspect was between 3 and 4 mm.

A delicate plexus of vascular structures, like the dentogingival vascular plexus, is consistently present in the connective tissue immediately lateral to the barrier and sulcular epithelium, while the connective tissue adhesion zone seems to contain a restricted number of vascular structures[(3)].

The zone of connective tissue adhesion limited to a 200-µm broad zone of the connective tissue facing the implant was examined under an electron scanning microscope by Moon et al[(4)].

The masticatory mucosa, which is present at many implant sites but not all of them, is referred to as KM. KM reaches the moveable lining (oral) mucosa from the edge of the peri-implant mucosa. There is a lamina propria in KM (fibrous connective tissue coated in an Ortho keratinized squamous epithelium, containing fibroblasts and equivalent levels of type I and type III collagen)[(5)].

Implant Bone Tissue

The term "osseointegration" was first used by to refer to the light microscopic contact between the implant and bone. Later, osseointegration was described as "a direct functional and structural connection between the surface of a load-carrying implant and live bone.The wound chambers were initially filled with coagulum, which, by four days had given way to be replaced by granulation tissue including many mesenchymal cells, newly created capillaries, and inflammatory cells[(6)].

Following roughly a week of healing, finger-like projections of woven bone developed in close proximity to small sections of the implant as well as surrounding vascular systems in the middle of the chambers[(6)].

Attached peri-implant soft tissues

There are good reasons why connected tissues are present around implant restorations, according to a number of authors; these justifications are typically predicated on knowledge of the peri-implant's fragility.Attached tissues improve esthetic blending, resist recession, and maintain steady levels over time. Additionally, by reducing food intake, those with the right shapes enable the implant restoration to maintain a self-cleaning environment[(7)].

The majority of proficient medical professionals concur that a sufficient area of firmly

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linked soft tissues that have intimately adapted to the developing implant structures is essential for the sustained success of an implant repair in the somewhat partially edentulous patient[8].

Assessment of gingiva:

Visual: in clinical practice, simple visual inspection is employed to determine the gingivalphenotype[9].

Probing: achieving aesthetic outcomes requires the gingival tissue's capacity to conceal the color of any underlying material, particularly in implant and restorative dentistry situations where subgingival alloys are frequently utilized[10].

Conventional caliper: only during surgery may a tension-free caliper be utilized; it cannot be used for preoperative assessment[11].

Transgingival probing: a periodontal probe can be used to measure gingival thickness[12].

Due to CBCT scans, improved diagnostic capabilities, hard tissue imaging has made widespread use of them. Labial gingival and bone thickness were assessed by Fu et al., and they found no statistically significant difference between the clinical both direct measures using a caliper and radiographic measurements using CBCT scans; yet, CBCT measurements might be a more objective approach. To see soft tissue borders more clearly, wooden spatulas, tongue retractors, and plastic lips might be used[13].

Soft tissue augmentation

Indications: it might not be overstated to say that soft tissue grafting is indicated for every surgical implant operation performed in the aesthetic zone. Following a tooth extraction, the alveolar ridge's proportions will inevitably change, and this frequently leads to the implant being positioned in a region where the volume of the soft and hard tissues has decreased relative to nearby dentate sites[14].

Contraindications:the application of a soft tissue augmentation approach surrounding dental implants is subject to both general and specific constraints. Surgical intervention is generally contraindicated in certain medical situations. Diseases involving collagen, conditions like pemphigoid and erosive lichen planus can jeopardize the survival of autogenous connective tissue grafts applied to recipient beds showing pathologic healing response[15].

How to prevent soft tissue problems:the clinical features of each case as well as the wants and preferences of the patient are taken into consideration when choosing the kind and timing of treatment. A detailed examination of the patient's health history, bone health, periodontal condition, and any soft tissue management treatment should be carried out before addressing quantity and restorative wants[16].

Keratinized Mucosa:the ideal course of treatment in cases where the mucosa is not keratinized is an apically positioned flap/vestibuloplasty operation, either alone or in conjunction with a graft material**.**A collagen matrix or allogenic dermal matrix grafts combined with an apically positioned flap or vestibuloplasty are examples of further therapeutic treatment techniques [17].

Soft tissue issues: deficits in soft tissue volume surrounding dental implants can be effectively addressed by soft tissue grafting techniques that thicken the mucosa.It is possible to insert dental implants early, late, or neither. Remodeling procedures can have already resulted in volume shortages at these places.Subsequent time periods for connected mucosa augmentation or volume are typically utilized to make up for quantity loss rather than being a part of the regular treatment plan, particularly after the definitive reconstruction is inserted. And/or tissue quality that changes throughout time. These rescue procedures typically have worse predictability and call for additional surgical abilities that are sensitive to method[17].

Buccal soft tissue recession: many clinical conditions may have an impact on the midfacial mucosal level surrounding a dental implant. Treatment options for buccal mucosal dehiscence vary in severity and may involve mucogingival surgery, the replacement of the crown or possibly the implant's removal. The clinician's care becomes more difficult after recession sets in and the implant restoration is in place.In order to avoid and manage soft tissue complications around implants, the clinical principles as they are given are based on a risk assessment of the peri implant tissues covering several time points. Different techniques can be used depending on the stage of the treatment, with varying degrees of prosperity and forecastability[18].

To increase attached gingiva around dental implants:

Rotated double-pedicle flap (RDF):two split-thickness keratinized pedicles were cut from the distal and mesial interproximal tissues close to the implant during this technique[19].

Apically repositioned flap (ARF): in second stage implant surgery, we can apically place a flap to mobilize the keratinized zone from the lingual side towards the buccal side of the abutment when the

keratinized zone surrounding the implant is insufficient[20].

Free Gingival Graft:in cases where there is insufficient keratinized gingiva, Free Gingival Graft (FGG) is typically taken from the palate or tuberosity to cover the area surrounding the implant site. The non-esthetic area is where it is most preferred because the gingival color of the area treated changed[21].

Subepithelial connective tissue graft:the donor location, such as the palate, is typically used to harvest sub-epithelial connective tissue grafts (CTG). This may expand the area of keratinized gingiva and is used to treat thin biotype cases. It is best applied in aesthetic region in order to preserve the treated area's gingival color in its original state[22].

Omega roll:the "roll technique" that was introduced by Abrams [23] in 1980, is a soft tissue management technique used in the second stage of implant surgery that enhances the buccal soft tissue and permits the correction of minor horizontal faults.This innovative method can be regarded as less invasive since it does not require a connective tissue graft from a different autologous donor site.

The roll envelope flap technique (REF) with involvement of the contiguous sulcus of neighbouring teeth and the Omega roll envelope flap (OREF) are variants of centra crest incision. A modification of the original pouch roll technique was proposed by Saade et al. (2015) to enhance the aesthetics of single or multiple implant prosthetic rehabilitations and augment marginal gingival thickness on the buccal side during the placement of a non-submerged implant or during the second stage of a submerged implant[24].

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