Treating soft tissue deformities around osseointegrated dental implants

Dr. Maria Retzepi presents a selection of recent studies and published research

Efficacy of soft tissue augmentation around dental implants and in partially edentulous areas: a systematic review.


The aim of this systematic review was to evaluate the efficacy of different soft tissue augmentation procedures in terms of increasing the width of peri-implant keratinized mucosa, and gain in soft tissue volume around implants and in partially edentulous areas.

The authors conducted a Medline search for human clinical trials (case studies, cohort studies, controlled trials) with a follow-up of at least 3 months reporting on augmentation of keratinized mucosa or gain in soft tissue volume around implants or partially edentulous areas.

Nine clinical studies were included with a total of 283 patients and 375 sites treated for gain of keratinized tissue around the implants.

The authors reported that:

- An apically positioned flap/vestibuloplasty combined with a graft material (free gingival graft/subepithelial connective tissue graft/collagen matrix) resulted in an increase of keratinized tissue by 1.4 mm–3.3 mm for an observation period up to 48 months.
- An apically positioned flap plus autogenous graft was the best documented method of increasing the peri-implant keratinized mucosa width.
- The combination of an apically positioned flap with collagen matrix demonstrated less keratinized tissue gain, but also significantly reduced patient morbidity and surgery time compared to an apically positioned flap, and combined with autogenous graft based on two randomized controlled clinical trials.
- All studies found shrinkage of the augmented grafts, which may result in a decrease in width of keratinized tissue of more than 50% within a couple of months. The results were more favorable for the autogenous grafts (59.7% shrinkage) compared to collagenous matrix grafts (67.2% shrinkage) at 30 days postoperatively.

A total of 296 patients and 320 sites treated for augmentation of soft tissue volume around implants or in partially edentulous areas were included in 11 studies. The authors reported that:

- Autogenous (subepithelial connective tissue) grafts should be considered as the treatment of choice, as they were the best documented method for soft tissue volume gain at implant and partially edentulous sites.
- Three studies used casts to evaluate the soft tissue volume over time and reported that the mean augmented thickness following autogenous grafting ranged between 0.55 mm and 1.18 mm. One randomized controlled clinical trial reported superior results following grafting of alveolar defects with subepithelial connective tissue graft (159 mm³ volume gain) compared to free gingival graft (104 mm³ volume gain).

Soft tissue augmentation procedures for mucogingival defects in esthetic sites


The objective of this systematic review was to evaluate the esthetic outcomes of soft tissue procedures performed and soft tissue deficiencies present around maxillary anterior implants.

A Medline database search was performed, which led to 123 full-text articles for further evaluation. A total of 18 studies were finally included in the present systematic review, the vast majority of which were case series, with only one randomized controlled clinical trial identified.

The included studies were grouped according to the intervention performed on the peri-implant soft tissues. The authors reported that, overall, six therapeutic modalities have been studied in terms of addressing peri-implant soft tissue deficiencies. These include the connective tissue graft with a fill and higher marginal mucosal levels were obtained using subepithelial connective tissue grafts compared to non-grafted sites.
coronally advanced flap (seven studies), the connective tissue graft in combination with an envelope flap or pouch (three studies), the free gingival graft (three studies), the acellular dermal matrix with a coronally advanced flap (one study), the pediculated connective tissue graft (two studies), and the injection of hyaluronic acid (one study).

The data indicated that the periodontal plastic surgery procedures performed around dental implants gave good initial results, partly owing to the inflammation involved in the healing process. As such, in virtually all cases, significant recession occurred as healing resolved and the tissues matured. The authors have further reported that immediate implant placement is associated with an alarmingly high incidence of mucosal recession in the range of 20% to 40%, and that several case studies have shown that, with immediate implant placement, there is a benefit in augmenting both the buccal gap and using a connective tissue graft to thicken the buccal tissue for biotype conversion. Furthermore, it was reported that the available literature indicated that unpredictable esthetic results are common in the treatment of a dental implant for facial gingival recession.

The authors concluded that the available literature on the effectiveness of soft tissue procedures in promoting the esthetic parameters around dental implants was based on very limited literature support. Furthermore, the available studies were lacking long-term follow-up, a large number of patients, and were subject to inclusion bias.

A novel surgical-prosthetic approach for soft tissue dehiscence coverage around single implant


This prospective case series study aimed to evaluate soft tissue coverage and patient esthetic satisfaction of a novel surgical-prosthetic approach to soft tissue dehiscences around single endosseous implants in the esthetic region.

Twenty patients with buccal soft tissue dehiscence around single implants in the esthetic area were enrolled. The treatment protocol included removal of the implant-supported crown, reduction of the implant abutment, coronally advanced flap combined with connective tissue graft and final restoration. The soft tissue coverage was evaluated 1 year after the final restoration, and the unrestored contralateral tooth, which did not present recession, served as a reference. The study also evaluated patient satisfaction 1 year after the treatment.

One year after treatment, the mean soft tissue dehiscence coverage was 96.3%. Complete coverage was achieved in 75% of the treated sites. The increase in buccal soft tissue thickness amounted to 1.54 ± 0.21 mm and correlated significantly with the thickness of the connective tissue graft at the time of the surgery. Furthermore, esthetic analysis demonstrated a significant improvement in the visual analogue scale (VAS) score, (median, 3.8; 95% CI, 2–4 at baseline compared to 8.0; 95% CI, 8–10 at 1 year [median]). The authors concluded that the combined prosthetic-surgical technique was effective in addressing buccal soft tissue deformities around single dental implants.