

Bittencourt S, Ribeiro EDP, Sallum EA, et al. Comparative 6-month clinical study of a semilunar coronally positioned flap and subepithelial connective tissue graft for the treatment of gingival recession. J Periodontol 2006; 77: 174-81. (43 ref.)

Purpose: To compare the semilunar coronally positioned flap (SCPF) procedure to the subepithelial connective tissue graft (SCTG) for the treatment of gingival recessions with randomized controlled study.

Materials and Methods: The subjects were 17 patients (11F and 6M, 21-52 years of age). All patients were non-smokers who were periodontally and systemically healthy. The inclusion criteria were ¹⁾ bilateral Miller Class I gingival recession (≤ 4 mm) in maxillary canines or premolars, ²⁾ PD ≤ 3 mm without BOP, ³⁾ width of keratinized tissue ≥ 2 mm, ⁴⁾ vital tooth, ⁵⁾ absence of caries or restorations in the areas to be treated.

The following clinical parameters were assessed 1) recession height (RH) – the distance from the CEJ to the gingival margin, 2) recession width (RW) – one border of the recession to another at the CEJ, 3) width of keratinized tissue (WKT) – the distance between the most apical point of gingival margin and the MGJ, 4) thickness of keratinized tissue (TKT) – the thickness of 2 mm apical to the gingival margin, 5) PD, and 6) CAL.

<SCPF group> A semilunar incision was made extending from the mesial papilla to the distal papilla of the tooth with the recession and following the curvature of the receded gingival margin. The apical part of the flap should expose bone. The flap was reflected with a partial-thickness flap. After free flap was achieved, the flap was advanced as coronally far as possible without tension. Light pressure was given during 5 minutes, and An adhesive was applied in the coronal portion of the flap.

<SCTG group> An horizontal incision was made slightly coronal to the CEJ at the mesial/distal papilla. A second incision, 1 to 2 mm apart and parallel to the first incision, was made apically. A sulcular incision was made linking the second incisions. The flap was created with a uniform split-thickness flap. The 1-mm-thick connective tissue was harvested and the graft was placed in the recipient site.

Results: (1) *Clinical parameters*

- SCPF group: Statistically changes from baseline were found for RH (1.99 mm), RW (2.89 mm), WKT (-0.90 mm), and CAL (1.96 mm).
- SCTG group: Statistically changes from baseline were found for RH (2.05 mm), RW (3.13 mm), WKT (-1.15 mm), TKT (-0.46 mm), and CAL (1.79 mm).
- The average percentages of root coverage: SCTG (96.10%) > SCPF (90.95%)
- The complete root coverage: SCTG (76.47%) > SCPF (52.94%)
- The increase of TKT: SCTG (0.46 mm) > SCPF (0.03 mm)
- There were no significantly differences between the two groups with regard to other parameters.

(2) *The esthetic outcome*

Treatment	Excellent	Good	Sufficient
SCPF	9	7	1
SCTG	12	5	0

(3) *Patient preference of SCPF or SCTG based on esthetics achieved*

- The two treatments showed equal results.

(4) *Pain intensity and number of pills taken*

- There were statistically different between groups only on the first day.

Conclusions: SCPF and SCTG procedures show highly effective and predictable in obtaining root coverage of gingival recessions and esthetic outcome.

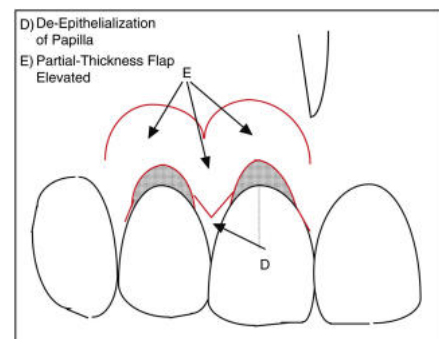
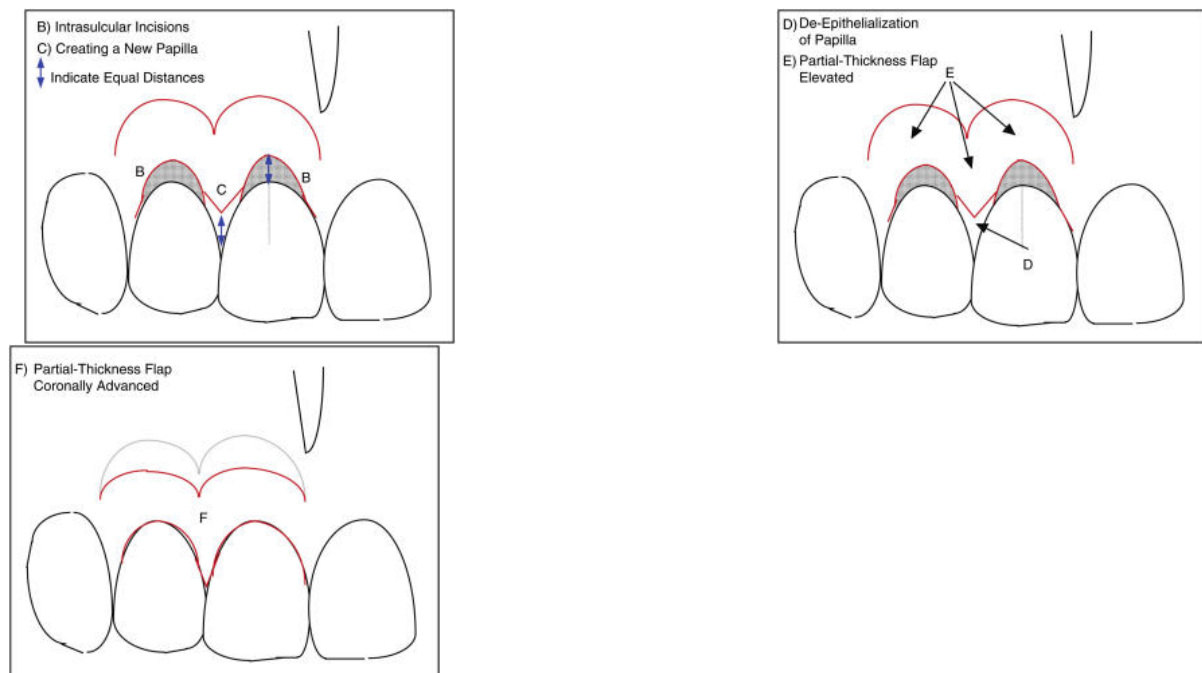
Haghighat K. Modified semilunar coronally advanced flap. J Periodontol 2006; 77:1274-9. (38 refs.)

Purpose: The purpose of this article was to introduce the semilunar coronally advanced flap as a technique for correction of gingival recession present on adjacent teeth.

Materials and Methods: Case Report and technique description.

Findings: The semilunar coronally advanced flap was first described in 1986 by Tarnow. A prerequisite for using this technique is the presence of a thick-tissue biotype, with adequate tissue thickness apical to the recession defect, to prevent tooth root or alveolar bone fenestration.

Technique: The exposed root surfaces are carefully debrided. A semilunar incision is made apically, following the curvature of the gingival margins of the teeth with recession. The most apical extent of the arc of this incision is usually located in mucosa. The lateral extensions of the incisions curve coronally within the keratinized tissue to terminate apical to the papilla, mesial and distal to the teeth exhibiting recession, and maintaining an adequate distance from the papilla tip in the vertical axis such that the vascularity to the mobilized pedicle is not compromised. A partial-thickness intrasulcular incision is made along the gingival margins of the two adjacent teeth. A partial-thickness flap, extending from the marginal tissue coronally to the double semilunar incision apically, is mobilized. The mesial and distal papilla are left intact; over the middle papilla, between the two teeth with recession defects, the incision along the gingival margin is extended to create a new middle papilla tip located apical to that of the original, at a distance equal to that of the recession defect. Following a partial-thickness flap reflection over the midline papilla, the remaining papilla is deepithelialized. The partial-thickness flap is coronally advanced, with the newly created papilla positioned over the deepithelialized segment. The flap is sutured through the midline papilla to stabilize it coronally.



Conclusion: Seven cases have been treated using the modified semilunar coronally positioned flap. All cases have demonstrated minimal postoperative discomfort. A follow-up period of 8-22 months has shown complete root coverage. Suturing the semilunar coronally advanced flap through the midline papilla offers stabilization of the mobilized pedicle and marginal tissues in the desired location.

Moses O, Artzi Z, Sculean A. et al. Comparative Study of Two Root Coverage Procedures: A 24-Month Follow-Up Multicenter Study. J Periodontol 2006;77:195-202. (46 refs.)

Purpose: To compare and evaluate the long-term clinical efficacy between a coronally advanced flap performed with the addition of enamel matrix derivative (EMD) and a subpedicle connective tissue graft (CTG) procedure.

Materials and Methods: The sample size of the study included 65 patients who presented with Miller Class I and II buccal recession type defects in the anterior and premolar areas. The patients who presented for the study were examined at baseline, 12 months, and 24 months. The coronally advanced flap with EMD group consisted of 28 patients while the CTG group consisted of 37 patients. The following measurements were obtained before the surgical procedures were performed (baseline), 12 months after surgery, and at 24 months: 1) vertical recession defect (VRD); 2) height of keratinized tissue (HKT); and 3) pocket depth (PD). The percentage of root coverage (PRC) was also calculated for the two procedure groups. A millimeter graded periodontal probe was utilized for all the measurements in the study. The results of the examinations were statistically analyzed using analysis of variance with repeated measures (ANOVA), *t* tests, and analysis of covariance (ANCOVA).

Findings:

	Preoperative	Preoperative	12 Months	12 Months	24 Months	24 Months
	EMD	CTG	EMD	CTG	EMD	CTG
VRD (mm)	4.29 ± 1.10	4.57 ± 0.99	1.18 ± 0.72	0.59 ± 0.55	1.0 ± 0.72	0.7 ± 0.57
HKT (mm)	1.07 ± 0.66	1.65 ± 0.92	1.75 ± 0.59	4.24 ± 0.89	2.25 ± 0.52	4.05 ± 0.94
PD (mm)	1.64 ± 0.56	1.51 ± 0.65	1.86 ± 0.36	1.49 ± 0.51	1.3 ± 0.46	1.5 ± 0.55
PRC %			73.2 ± 15.58	86.8 ± 12.48	76.9 ± 16.77	84.3 ± 13.32

Within groups, vertical recession defect changes were statistically significant compared to baseline. When the 12 and 24 month measurements were compared, no statistical differences in VRD was seen. At the sites where the coronally advanced flap with EMD was performed, the PD increased from 1.64 mm at baseline to 1.86 mm at the 12 month reexamination. At the 24 month exam, these PDs decreased to 1.3mm. In the CTG procedure groups, the PDs remained nearly the same from the baseline exam to the 12 and 24 month follow-up period. At 24 months, the final measurements demonstrated a difference of 0.2 mm between the groups. Changes in PD between the groups between the 12 and 24 month exams were statistically significant when compared using the *t* test. A statistically significant difference in HKT was found between the groups at the baseline exam. In the coronally advanced flap with EMD group, the HKT increased from 1.07 mm (baseline) to 1.75 mm at the 12 month exam and 2.25 mm at the 24 month exam. In the CTG groups, the HKT increased from 1.65 mm at baseline to 4.24 mm and 4.05 mm at the 12 month and 24 month exams, respectively. The HKT values in the CTG group were noted to be significantly larger than the coronally advanced flap with EMD group at both the 12 and 24 month exams. For percentage of root coverage, the CTG group had a higher percentage of root coverage at both the 12 month and 24 month examinations. PRC decreased roughly 2.5% in the CTG group and increased about 3.7% in the coronally advanced flap with EMD group. These differences between the groups were noted to be statistically significant when analyzed using ANOVA.

Conclusions: Both the coronally advanced flap with EMD and the subpedicle connective tissue graft procedures resulted in successful root coverage. However, the CTG group demonstrated both an increased height of keratinized tissue and a greater percentage of root coverage when compared to the EMD group.

Castellanos A., Rosa M, Garza M. and Caffesse R. Enamel matrix derivative and coronal flaps to cover marginal tissue recessions. J Periodontol 2006;77: 7-14.

Purpose: To clinically evaluate the use of enamel matrix derivatives (EMD) in association with coronally positioned flaps (CPF) to cover localized recessions compared to coronally positioned flaps alone.

Materials and Methods: Twenty two healthy and non smoking patient with Miller Class I or II buccal gingival recessions >2mm were selected.

Subjects were evaluated at baseline and 1,6, and 12 months after the surgical procedure. The following measurements were recorded: vertical recession (measured at the point of the deepest recession from the CEJ to the gingival margin); horizontal recession (measured at the level of the CEJ in a mesio-distal direction); probing depths, and width of keratinized tissue. The attachment level was calculated by combining probing depth and recession depth measurements.

Surgical procedure: The test treatment consisted of a coronally advanced flap technique as described by Allen with the additional application of EMD on the denuded root surface. Control sites were treated similarly but with no application of EMD.

After scaling and root planning, an intrasulcular incision was performed on the buccal aspect of the involved tooth. Oblique incisions were performed mesially and distally to the recession at the level of the CEJ without reaching the neighboring gingival margins. Two oblique releasing incisions were carried out from the mesial and distal extremities of the horizontal incision accros the mucogingival junction reaching the alveolar mucosa. A trapezoidal full thickness flap was raised. The papillae adjacent to the involved tooth were deepithelialized to create a connective tissue bed.

On the test sites only, the roots were conditioned with EDTA 19% for 2 minutes to remove the smear layer and then rinsed with saline to obtain a surface devoid of organic debris. The root surfaces were then coated with EMD starting at the most apical level and covering the entire root. The flap was coronally advanced to the level of the CEJ and stabilized to the de-epithelialized papillae.

All patients were seen at 1,2,3 weeks post surgery to monitor their oral hygiene condition and at 1,3,6,9 and 12 months.

Statistical methods: changes from baseline were evaluated for each technique by the t test, and comparisons between techniques were done by Student's t test.

Results: The two groups were homogenous at baseline for all parameters tested except for the plaque index. The plaque index showed a significant difference, with the test teeth having significantly less plaque than controls.

Vertical recession: In the test group, the recession depth changed from 2.68 ± 1.63 mm at baseline to 0.36 ± 0.6 mm at 12 months, a reduction of 2.32 ± 1.03 mm, corresponding to a root coverage of 88.6% in the control group, the base line recession depth decreased 2.31 ± 1.52 mm to 0.9 ± 0.95 mm at 12 months, a reduction of 1.41 ± 0.57 mm, corresponding to a root coverage of 62.2%

Horizontal recession: In the test group, the recession width decreased from 4.27 ± 2.06 to 0.77 ± 0.87 mm at 12 months. In the control group, it decreased from 3.68 ± 1.91 mm to 1.72 ± 1.31 mm. When the treatments were compared, the differences were significant at 6 and 12 months in favor of the test group.

Keratinized gingiva: The difference between the keratinized tissue changes in the treatment groups were statistically significant after 12 months. In the test group, keratinized gingival changed from 3.81 ± 1.95 mm to 4.63 ± 2.15 mm.

Plaque index and gingival Index: Oral hygiene in terms of the plaque index and gingival inflammation remained low over time and showed no significant differences.

Probing depths: Probing depths remained shallow over time. There was no statistical differences between or within groups.

Clinical attachment level: there was no statistical difference in the clinical attachment level gain between the groups.

Histologic findings: One of the teeth treated in the experimental group was removed with the attached buccal gingival after the 12month evaluation for orthodontic reasons.

The findings demonstrated that the junctional epithelium ended at a level coronal to the treated recession, as indicated by the level of root instrumentation. The regeneration of periodontal support was evident coronal to this area.

Conclusion: Within the limits of this study, the following conclusions can be made: CPF + EMD and CPF alone provide root coverage and gain of clinical attachment with acceptable esthetic results; and the addition of EMD may promote further gains in clinical results.

Pilloni A, Paolantonio M, Camargo PM. Root coverage with a coronally positioned flap used in combination with enamel matrix derivative: 18-month clinical evaluation. J Periodontol 2006;77:2031.

Purpose: The objective of this study was to compare the clinical effectiveness of EMD in enhancing the root coverage results achieved with CPF in Miller Class I and II gingival recession areas over an 18 month period.

Materials and Methods: Thirty non-smoker patients, 17 males and 13 females ranging in age from 19 to 67 years, presented with Miller class I and II gingival recessions on the buccal aspect of single rooted teeth.

All patients received initial therapy consisting of oral hygiene instructions and scaling and root planing. Six weeks after conclusion of phase therapy, a reevaluation was conducted to assess gingival tissue response and to confirm the need for root coverage surgery. Control teeth (15 teeth) received a CPF alone and experimental teeth (15 teeth) were treated with CPF plus EMD. At the beginning of the study the following measurements were made on the mid-mesio-distal point of the keratinized tissue. The CPF was conducted according to the technique described by Bernimoulin et al., the root surface was mechanically planed with curets and 12 fluted burs. An internally beveled intrasulcular incision was made for proper envelope design. A full thickness flap was then elevated to the mucogingival line exposing any underlying bone dehiscences. A split thickness flap was initiated at the mucogingival junction. Exposed root surfaces were treated with a 24% EDTA gel for 2 minutes and rinsed abundantly with sterile saline solution.

EMD was applied on the root surfaces in the apico-coronal direction. Control sites were subject to the exact same treatment steps but saline solution was used instead of EDTA or EMD.

Postoperative treatment consisted of rinses with 0.12% chlorhexidine gluconate twice daily for 3 weeks. Analgesic medication was prescribed and taken as needed. No periodontal dressing was applied, and sutures were removed at 1 week. After three weeks mechanically oral hygiene was performed, patients were subsequently examined 3, 6, 12 and 18 months post-surgically.

Findings and Conclusions: Both treatment groups presented with significant post-surgical improvement in gingival recession, clinical attachment level, and probing depth. No significant change in the apico-coronal dimension of the keratinized tissue was observed at 18 months for either control or experimental sites.

Root coverage success was $93.80\% \pm 12.90\%$ in the experimental group and $66.50\% \pm 26.03\%$ in the control group. Complete root coverage was achieved in 13 cases of experimental group 81.25% and five cases of the control group 31.25% .

The experimental group presented with significantly greater root coverage ($2.66 \pm 0.61\text{mm}$) than the control group ($1.73\% \pm 0.70\text{mm}$), more gain in clinical attachment than the control group and a greater gain in the apico-coronal dimension of the keratinized tissue. The reduction in probing depth was similar between the two treatment groups. The results of this study indicate that topical application of EMD is beneficial in augmenting the effects of the coronally positioned flap.

Monnet-Corti V, Santini A, Glise JM, et al. Connective tissue graft for gingival recession treatment: Assessment of the maximum graft dimensions at the palatal vault as a donor site. J Periodontol 2006;77:899-902. (13 refs.)

Purpose: To assess the maximum dimensions of the graft, particularly the height and length, that could be safely taken from the palatal vault.

Materials and Methods: 198 periodontally healthy patients were included in this study. Impressions of the upper and lower jaws were made using irreversible hydrocolloid impression material and poured with type IV dental stone. All measurements were made on the model using Boley gauge to the nearest millimeter. The emergence of the greater palatine artery midway between the gingival margin of the second molar and the midline raphae and its course along the junction of the vertical and horizontal walls of the palatal vault were marked on the models. The maximum length for harvesting the CT graft was defined as the distance from the mid-palatal aspect of the canine to the mid-palatal aspect of the second molar. The height of the palatal vault was measured from the gingival margin to the level of the greater palatine artery at the interproximal aspect of the mid-palatal aspect of each tooth from the canine to the second molar. A safety area of 3 mm from the GPA and 2 mm from the gingival margin were subtracted from the previous measurements. The ability to harvest a CT graft with a height of 5 or 8 mm was assessed. Data were analyzed.

Results: The mean length of the maximum available graft was 31.7 ± 4.0 mm. There was a statistically significant difference in the mean length between men and women and was greater from men. The distance extending from the gingival margin to the GPA ranged from 12.07 ± 2.9 mm at the canine level to 14.7 ± 2.9 mm at the mid-palatal aspect of the second molar.

Conclusions: The maximum available tissue graft as measured in the palatal vault was large enough to allow a safe withdrawal from this donor site.

Zucchelli G, Testori T, De Sanctis M. Clinical and anatomical factors limiting treatment outcomes of gingival recession: A new method to predetermine the line of root coverage. J Periodontol 2006;77:714-21. (12 refs.)

Purpose: To identify some of the most frequent diagnostic mistakes leading to incomplete root coverage in Miller class I and II gingival recessions and to suggest a method to predetermine the position of the soft tissue margin after a mucogingival surgery.

Materials and Methods: Authors' opinions and clinical trials.

Findings:

Mistakes in the selection of reference measurement parameters: In many cases of gingival recessions associated with cervical abrasion, a line separating the enamel from the coronal dentin does appear, and this is frequently confused with the anatomic CEJ. The most coronal portion of the exposed dentin belongs to the anatomic tooth crown and this part is not coverable with the soft tissues. Thus, the differential diagnosis between abrasion line and the anatomic CEJ should be made. A careful observation will allow the clinician to distinguish the straight outline of the abrasion line from the more scalloped and convex outline of the anatomic CEJ.

Mistakes in the selection of the clinical case: Following conditions make complete root coverage up to the CEJ impossible.

- 1) Loss of interdental papilla height: A loss of papilla height decreases the potential advancement of the coronal flap and reduces the vascular exchanges between the root covering soft tissues and the interdental connective tissue. If some papilla is lost, coverage up to the CEJ cannot be achieved.
- 2) Tooth rotation: In a rotated tooth, the topographic relationship between the CEJ and the interdental papilla changes. The situation in which the CEJ gets closer to the tip of anatomic papilla configures a condition of a loss of papilla height clinically similar to that caused by trauma.
- 3) Tooth extrusion: In an extruded tooth, the CEJ gets closer to the tip of both interdental papilla, and thus a condition of bilateral reduction of interdental papilla height is created.
- 4) Occlusal abrasion: A tooth with occlusal abrasion is frequently extruded which configures a condition of bilateral loss of interdental papilla.

A method to predetermine the line of root coverage: A predetermined line can substitute the anatomic CEJ which is not clinically detectable on the tooth with recession. Ideal dimension of the papilla is calculated at the homologous contralateral tooth which is not extruded not rotated. This dimension is reported apically starting from the tip of both mesial and distal anatomic papilla. Projections of these measurements permit discovery of the two points on the recession margin that are connected by the root coverage. This method was applied to 120 recession defects affecting non-molar teeth of 80 healthy subjects over the last 5 years.

Conclusions: The predetermination of the clinical CEJ might be used as follows: 1) evaluation of root coverage outcomes when anatomic referring parameter (CEJ) is lacking; 2) improvement of esthetic outcomes; and 3) combination of restorative/ periodontal treatment of a cervical abrasion associated with gingival recession.

Park JB. Increasing the width of keratinized mucosa around endosseous implant using acellular dermal matrix allograft. *Implant Dent* 2006;15:275-81. (16 refs.)

Purpose: 1) To investigate the clinical efficacy of an acellular dermal matrix allograft to achieve increased peri-implant keratinized mucosa, and 2) to evaluate the effect with regard to whether the increase of the keratinized mucosa has a positive effect on oral hygiene.

Materials and Methods: 10 male subjects (ranging from 43 to 53 years of age) with the width of keratinized gingiva ≤ 2 mm on the buccal side of implants participated in the study. The modified plaque index, the modified gingival index, PD, and the width of keratinized gingiva were recorded at baseline, 3 months, and 6 months postoperatively. A horizontal incision was placed along the mucogingival junction. A partial thickness flap was elevated and secured apically to the periosteum. An acellular dermal matrix (SureDerm) was placed on the periosteal bed and strapping sutures were made. A periodontal dressing was applied and left for 2wks postoperatively. The subjects were on Amoxicillin for the first 5 days and Mefenamic acid for the following 5 days. CHX was recommended for 6 wks. Follow-up visits were made at 2, 4, 6, 8, 12, 16, 20, and 24 wks postoperatively and plaque control and healing were monitored. The data were analyzed.

Findings: The soft tissue healing was uneventful. It seemed that there was some revascularization within the healing wound bed at 2wk postoperatively. Maturation and stability of the keratinized mucosa were maintained up to 6 months. The change of peri-implant probing depth was statistically different among 3 measurements.

	Baseline	3 mons	6 mons
Peri-implant PD (mm)	1.9±0.7 mm	1.6±0.5 mm	1.4±0.6 mm
Modified plaque index	1.6±0.5	0.9±0.3	0.4±0.5
Modified gingival index	0.8±0.4	0.6±0.5	0.4±0.5
The width of keratinized mucosa (mm)	0.8±0.6 mm	3.2±0.9 mm	2.2±0.6 mm
Shrinkage rate (%)		27.3±12.2 %	50.7±9.2%

The modified plaque index measured at 3 and 6 months postoperatively showed statistical difference from the measurement at baseline. The modified gingival index did not show any significant

difference among measurements. The width of peri-implant keratinized mucosa increased from a mean of 0.8±0.6mm to 3.2±0.9mm at 3 months, and 2.2±0.6mm at 6 months.

Conclusions: The acellular dermal matrix allograft could be used as a grafting material to increase the width of the peri-implant keratinized mucosa. This procedure seems to have some benefits for oral hygiene