

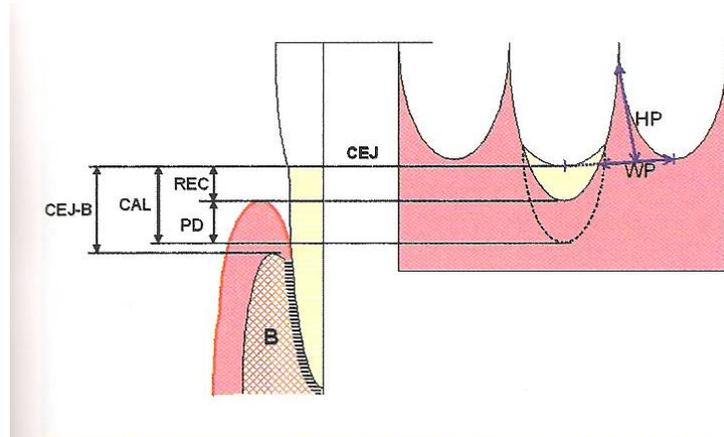
Berlucchi I, Francetti L, Del Fabro M, Basso M and Weinstein R. The influence of anatomical features on the outcome of gingival recessions treated with coronally advance flap and Enamel Matrix derivate: A 1-year prospective study.

Purpose: To determine whether anatomical factors such as tissue thickness, papillae height and width, recession depth, and vestibular bone height influence soft tissue coverage of Miller Class I and II defects.

Materials and Methods: A total of 30 subjects (13 males, 17 females) were selected for the study. Selection criteria included: Systemically healthy individuals, non-smoking, no previous periodontal surgery in the area to be treated, gingival recession > 2mm, no restorations or caries related to the surgical site, FMPS <15% and FMBS < 15%. Clinical parameters recession, PD, CAL and KG were recorded. The patient was divided into 2 groups according to the baseline recession: group 1- REC <4mm and group 2- REC >4mm linear dimensions of the mesial and distal vestibular papillae adjacent to involved site were recorded (papillae height and papillae width). During surgery the distance between the CEJ to the bone crest (CEJ-B) was recorded as well as the flap tissue thickness (FT).

Surgical procedure involved SRP before flaps elevation, intrasulcular incisions, full thickness flap reflection, partial thickness reflection at the apical portion, EDTA gel, 24%, was applied for 2 min, coronal adaptation of flaps 1-2 mm above the CEJ, and sling suture.

Post-operative instructions were 0.12% chlorhexidine rinse 1 min bid X 3weeks. Nimesuline 100mg bid X2days. Clinical parameters at baseline and 12 months were compared by using a paired student t-test.



Findings and Conclusions: Each patient was treated for one single recession.

1. Root coverage: Overall mean root coverage after 12 months was 91.4%. Group 1 (94.7%) and for group 2 (85.8%).
2. PD: mean PD at 12 months was 1mm for both groups
3. CAL: Differences in baseline CAL and 12 months measurements were for group 1 (2.84+/-0.69) and for group 2 (3.91 +_1.04)
4. FT: is positive correlated to the percentage of root coverage; when the gingival defect is >4mm(100% RC was achieved only when tissue thickness is >1mm)

For this study it could be concluded that baseline recession depth and FT may influence the outcome of marginal tissue recession therapy with CAF plus EMD at 12 months. No clear correlation between root coverage and anatomical factors were observed.

Gapski R, Parks CA, Wang HL. Acellular dermal matrix for mucogingival surgery: a meta-analysis. J Periodontol 2005; 76:1814-22.

Purpose: To evaluate the efficacy of a cellular dermal matrix (ADM) over connective tissue graft (CTG), coronally advanced flap (CAF) or free gingival graft (FGG).

Materials and Methods: Three data sources were used for this review:

- 1) MEDLINE database
- 2) Cochrane Library
- 3) Hand searching of specific journals

Inclusion criteria were:

- 1) In English
- 2) At least 3 months follow-up
- 3) Randomized controlled clinical trials
- 4) From Jan. 1st 1990 to Oct. 2004.

8 studies were selected based on the criteria for inclusion. The most common reason for study exclusion was the lack of a control group, lack of randomization, or lack of outcome measured. 4 studies were eligible for comparisons between ADM-based root coverage and CTG, 2 for comparisons between ADM-based root coverage and CAF, and 2 for comparisons between ADM-based augmentation of keratinized tissue (KG) and FGG.

Findings:

(1) ADM vs. CTG (4 studies: Aichelmann-Reidy et al., Novaes et al., Tal et al., and Barros et al.)

- Recession coverage: No statistically significant differences (0.41mm favoring ADM, P=0.39)
- Probing depths: NS (0.02mm increase, P=0.89)
- Increased KG: NS (0.52mm favoring CTG, P=0.11)

(2) ADM vs. CAF (2 studies: Woodyard et al. and Cortes et al.)

- Recession coverage: NS (0.62mm favoring ADM, P=0.28)
- Probing depths: NS (0.00mm, P=0.99)
- Clinical attachment levels: NS (0.56mm favoring ADM, P=0.16)
- Increased KG: NS (0.31mm favoring ADM, P=0.19)

(3) ADM vs. FGG (2 studies: Wei et al. and Harris)

- Increased KG: NS (1.51mm favoring FGG, P=0.31)

Conclusions: It is difficult to draw the definitive conclusion of ADM, primarily because of weakness in the design and reporting of existing trials.

Harris RJ, Miller LH, Harris C, Miller RJ. A comparison of three techniques to obtain root coverage on mandibular incisors. J Periodontol 2005; 76:1758-67. 19 (Refs)

Purpose: To compare three variations in the treatment of recession on mandibular incisors (Coronally positioned flap (CPF) + connective tissue graft (CT), Partial thickness double pedicles (DP) + connective tissue graft (CT), Laterally positioned (LAT) pedicle and a tunneling (TUN) + connective tissue graft (CT)).

Materials and Methods: A total of 63 patients participated in this study.

	No. of patients	No. of defects	No. of smokers	Type of defects
CPF + CT	21 (15 F/ 6 M)	41	3	Miller Class I or Class II on mandibular incisions
DP + CT	21 (14 F/ 7 M)	39	3	
TUN-LAT + CT	21 (16 F/ 5 M)	38	2	

Preoperative photographs were taken and initial clinical measurements were recorded. Marginal tissue recession, probing depth, and attachment were included in initial measurement. Patients were seen at 1 to 2 weeks, 4 to 6 weeks, and ~3 months after the surgery got postoperative care. The same clinical measurements were recorded and statistical evaluation was done.

Findings: There was no statistically significant difference in the preoperative clinical measurements. All of the procedures produced a statistically significant change in all of the clinical parameters evaluated. The mean root coverage for group CPF + CT (80.2%) was statistically less than for group DP + CT (95.9%) and group TUN-LAT + CT (90.5%). The defects in group CPF + CT that initially had ≥ 3 mm of recession depth had statistically less mean root coverage (68.4%) than the other groupings. Also, the defects in group CPF + CT that were treated with other defects (not treated as isolated defects) had statistically less mean root coverage (77%) than the other groupings. Complete root coverage was obtained in 10 out of 21 patients (47.6%) and 20 out of 41 defects (48.8%) in group CPF + CT, 14 of 21 patients (66.7%) and 30 of 39 defects (76.9%) in group DP + CT, and 12 of 21 patients (57.1%) and 24 of 38 defects (63.2%) in group TUN-LAT + CT.

Conclusions: The results of this study confirm that all three techniques can produce a statistically significant improvement in clinical parameters. However, overall, the DP + CT and TUN-LAT + CT techniques offered an advantage over the CPF + CT technique.

Harris Randall, Miller R, Harris L and Harris C. Complications with surgical procedures utilizing connective tissue grafts: A follow-up of 500 consecutively treated cases. Int J Periodontics Restorative Dent 2005; 25: 449-59. 36 (Refs)

Purpose: To evaluate the incidence and severity of complications following root coverage and gingival augmentation procedures that involve a connective tissue graft. To determine the influence that additional factors that may have on this post-operative complications.

Materials and Methods: Five hundred consecutively treated patients (mean age was 40.8 years), were included in this study. Of these 500 patients, 479 were treated with CT graft for root coverage procedure and 21 were treated with CT graft to achieved gingival augmentation w/out root coverage. When root coverage was attempted the CT graft was covered with an overlaying pedicle. Gingival augmentation was accomplished in a similar manner to a conventional free gingival graft. The only modification was that a CT graft was used and the epithelial border was allowed to remain on The CT graft. The donor areas (palatal of molar/premolars) were covered with a surgical stent. Non-steroidal anti-inflammatory drug, clorhexidine rinse and a narcotic were prescribed to the patients. Complications were divided into 5 categories: pain, bleeding, infection, swelling, and other. At the same time complications were sub-categorized according to the subjective and objective data (clinician/patient) as follows: 0=none, 1=minimal, 2=moderate and 3=severe. To determine the whether any factors were associated with the grade of severity of the complications, age, sex, smoking, goal of surgery (root coverage/gingival augmentation), size of the recipient area and location of the defect were recorded. Each factor was evaluated individually using a Chi-Square test. Therefore the entire group of 500 subjects was used to determine what the incidence and severity that could be expected.

Findings and Conclusions: Complications rate represented by the whole study population are summarized in the following table:

Complication	None	Minimal	Moderate	Severe
Pain	81.4%	14.2%	3%	1.4%
Bleeding	97%	2.2%	0.2%	0.6%
Infection	99.2%	0.2%	0.4%	0.2%
Swelling	94.6%	3%	2%	0.4%
Other	88.6%	9.6%	0.8%	1%

Complications rate with respect sex demonstrated no statistical differences between male and female with the exception of moderate/severe pain that was reported more frequently and more severe in women than men. Complications rate with respect to smoking status (smoker 68 versus 432 nonsmokers); more pain, bleeding and swelling was reported in the nonsmoker group when compare to smokers. Complications rate with respect to root coverage versus gingival augmentation (RC 479 subjects versus 21 GA), demonstrated that the GA group reported more swelling that the RC group. Complications rate with respect to size of recipient area (# of defects treated), showed more pain, bleeding, infection and swelling when 2+ areas were treated when compared to single treated defects. Based on the results from this study it could be concluded that the incidence and severity of the

complications associated with connective tissue grafts seem to low and well controlled by following the basic post-operative parameters.

Hirsch et al. A 2 year follow up of root coverage using subpedicle acellular dermal matrix allografts and subepithelial connective tissue autografts. J Periodontol 2005; 76:1323-1328.

Purpose: to compare the long term effectiveness and predictability of ADMA and CTG in the treatment of relatively severe recessions.

Materials and Methods:

ADMA patients: the ADMA group consisted of 101 patients with Millers Class I and II. All patients were healthy. 48 were smokers. The initial recession defect was 4.2 ± 0.1 mm. All patient underwent full periodontal evaluation and presurgical preparation, including oral hygiene instructions and scaling and root planning. The exposed root surfaces were planed using a curette and flushed with water. No root conditioning was performed. A coronally positioned flap procedure was performed. An effort was made to completely cover the ADMA grafts. The grafts were fixed by means of 4/0 resorbable sutures and the flaps coronally repositioned by means of sling sutures. CT patients: 65 patients with Millers class I and II gingival recession were treated with CTG. The subepithelial connective tissue procedure was a modification of the method described by Langer and Langer. A Connective tissue graft was obtained from the palate and placed under a full thickness flap with mesial and distal vertical releasing incisions. The flap was then coronally positioned over the graft. Sutures were used to hold the flap in position. Follow up visits for the two groups were every 2 weeks for 6 weeks and then every 3 months for 2 years. Statistical significance was determined using Bonferroni's modification of Student t test.

Findings: Mean residual root recession after root coverage with acellular dermal matrix allograft was 0.2 ± 0.04 mm, with defect coverage of $95.9\% \pm 0.9\%$. Frequency of defect coverage was 82.2%. Root coverage was $98.8\% \pm 0.2\%$, resulting in a frequency of root coverage of 100%. Gain in keratinized gingiva was 2.2 ± 0.04 mm and attachment gain was 4.5 ± 0.1 mm per patient. Connective tissue autografts resulted in mean residual root recession of 0.1 ± 0.04 mm, with percent defect coverage of $97.8\% \pm 0.6\%$ and frequency of defect coverage of 95.4%. Root coverage was $99.1\% \pm 0.2\%$, and frequency of root coverage was 100%. Gain in keratinized gingiva was 3.0 ± 0.1 mm and attachment gain was 5.3 ± 0.2 mm per patient. No significant differences in final recession and root coverage between the two treatment methods were found. However, autografts resulted in significant increases in defect coverage, keratinized gingival gain, attachment gain, and residual probing depth. The clinical results were stable for the 2-year follow-up period. The mean final root recession after root coverage with ADMA in 101 patients was 0.2 ± 0.04 mm with defect coverage of $95.9\% \pm 0.9\%$. the frequency of defect coverage was 82.2%. Root coverage was $98.8\% \pm 0.2\%$, resulting in a frequency of root coverage of 100%.

Conclusions: These results indicate that coverage of root by subpedicle acellular dermal matrix allografts or subepithelial connective tissue autografts is a very predictable procedure which is stable for 2 years postoperatively. However, subepithelial connective

tissue autografts resulted in significant increases in defect coverage, keratinized gingival gain, attachment gain, and residual probing depth.

Tozum TF, Keceli HG, Guncu GN, et al. Treatment of gingival recession: comparison of two techniques of subepithelial connective tissue graft. J P 2005; 76:1842-48. 51 (Refs)

Purpose: To examine and compare the coverage of gingival recession defects after two different subepithelial connective tissue graft procedures - the Langer and Langer technique and modified tunnel technique.

Materials and Methods: 31 patients (21 females and 10 males) with Miller's Class I and Class II gingival recessions were included in the study. 17 patients were treated with Langer and Langer technique and 14 patients were treated using modified tunnel technique. Vertical recession (VR), probing depth (PD), and attachment level were measured prior to surgery. Six months following the surgery, measurements were recorded again.

Root coverage = $([\text{preoperative vertical recession} - \text{postoperative vertical recession}] / \text{preoperative vertical recession}) \times 100$.

Attachment gain = $([\text{preoperative attachment level} - \text{postoperative attachment level}] / \text{preoperative attachment level}) \times 100$.

Recipient site preparation: Langer and Langer technique: A partial thickness flap with two vertical incisions were placed at least $\frac{1}{2}$ to one tooth wider mesio-distally than the area of gingival recession. The coronal margin of the flap was started with a horizontal sulcular incision to preserve all existing facial gingiva. The proximal papillae were left intact. Flaps were extended to the mucogingival junction. Modified tunnel technique: Sulcular incisions were placed on the buccal aspects of gingival tissues in adjacent teeth. A split-thickness incision was performed and extended to include the intermediate papilla and extended horizontally to the mesial and distal areas to provide enough space for the SCTG. The full-thickness dissection was used to elevate the flap in the coronal direction, where the major gingival blood supply was preserved.

Donor site preparation: Donor site was prepared on the palate. Incisions were placed between the distal aspect of the canine and the mid palatal region of the first molar area with the parallel incision technique or the trap-door technique. A connective tissue graft in an adequate of 2mm thickness was harvested.

Graft placement: Langer and Langer technique: The graft was introduced to the recipient area, where the flap was pulled over a major portion of the SCTG. The recipient flap was sutured directly over the graft and vertical incisions closed with silk 5-0 sutures. Modified tunnel technique: The mesial part of the graft was sutured with a single knot, and the needle passed underneath the tunnel created. The graft was let to slide under the tunnel and was positioned to the CEJ of adjacent teeth. The graft was secured to the mesial and distal papillae using silk 5-0 sutures with a single surgeon's knot.

Dry foil was applied to the recipient area for both groups, and a non-eugenol periodontal dressing placed over the dry foil to stabilize and protect the donor tissue for 10 days postoperatively. Postoperative instructions were given to the patient. Data were subjected to statistical analysis.

Findings:

- A significant reduction in vertical recession depth was noted in both groups after 6 months.
- Probing depths did not show a statistically significant change after treatment in both groups.
- Statistically significant differences were found between the tunnel and Langer and Langer techniques for root coverage and attachment gain. A mean root coverage of 3.36 ± 0.17 mm and 3.93 ± 0.27 mm attachment gain was noted in the tunnel group compared to Langer and Langer group, where a mean root coverage of 2.56 ± 0.19 mm and 2.44 ± 0.34 mm attachment gain was achieved.
- The percentage of root coverage was 96.4% and 75.5% and attachment gain was 77.1% and 56.4% in the tunnel and Langer and Langer groups, respectively.

Conclusions: Although both studies demonstrated highly predictable root coverage, the modified tunnel technique resulted in better root coverage and better attachment gain after 6 months follow-up.

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; 77:714-721. 12 (Refs)

Purpose: To describe the most frequent diagnostic mistakes that may lead to incomplete root coverage in Miller Class I and II gingival recessions and to present a method to predetermine the level/line of root coverage in non-molar teeth.

Materials and Methods: Review of the literature and author's opinion.

Findings and Conclusions: The success of various mucogingival surgeries in covering gingival recessions has been well documented. However some procedures have been shown by studies to be more predictable than others. Even for those procedures 100% root coverage is sometimes far from predictable. It could be argued that some presumed failures in terms of root coverage could be ascribed to mistakes in the selection of the clinical case or of the referring measurement parameters rather than to the inefficacy of the surgical technique. The article then classified these potential diagnostic mistakes:

- 1) Mistakes in Selection of reference measurement parameters: The localization of the reference parameters concerns the localization of the anatomic CEJ on the tooth with the recession defect. In recent data published out of 900 teeth the CEJ was detectable in 30% and partially recognizable in 25% of the selected cases. Therefore there was no sign left of the anatomic CEJ in about half of the examined teeth. The abrasion defect that is commonly the cause of the recession is seldom restricted to the root surface and is almost always affecting the part of the crown. If the goal of the surgical procedure becomes covering the coronal portion of the defect, the desirable root coverage becomes difficult. To avoid this mistake the clinician must carefully observe the outline of the line which is considered to be the anatomic CEJ. In fact this line has a curved convex outline, more or less scalloped, according to the patient's biotype. On the contrary, in the great majority of cases, the abrasion lines are flat.
- 2) Mistakes in selection of the clinical case: The following local conditions at the tooth with the recession defect may limit root coverage even in the absence of interdental attachment and bone loss: 1) loss of interdental papilla height: Interdental papillae act as the most coronal vascular beds to which the soft tissue, covering the root exposure, is anchored. A loss of the papillae height will decrease the potential advancement of the coronal flap and reduce the vascular exchanges between the root covering the soft tissues and the interdental connective tissue. 2) Tooth rotation: In a rotated tooth, the topographic relationship between the CEJ and the interdental papillae, mesial and distal to the tooth with recession, changes at one tooth according to the direction of rotation, the CEJ gets closer to the tip of the papilla, whereas at the other side, it gets farther. The side in which the CEJ gets closer to the top of anatomic papilla configures a condition of a loss of papilla height clinically similar to that caused by trauma. In that case the height of one papilla will be reduced in the same manner described above. Root coverage will leave a portion of the root surface uncovered at the tooth side where there is reduction of papilla height. 3) Tooth extrusion: In an extruded tooth, the CEJ gets closer to the top of the papillae and thus a condition of bilateral reduction of interdental papillae height is created. Root coverage to

the anatomic CEJ is not possible and the persistence of root exposure should not be considered a failure. 4) Occlusal abrasion: is frequently associated with progressive tooth extrusion, which by itself, configures a condition of bilateral loss of interdental papillae, which affects the complete root coverage.

If the above local conditions are missed by the clinician, the result could be erroneously considered a failure of the root coverage surgical procedure.

A Method to Predetermine the Line Root Coverage:

This line should correspond to the level of where the root coverage is desired. Certain situations could complicate this estimation. These situations include:

1) Clinical CEJ Predetermination in a Tooth with Loss of Interdental Papilla height:

In this case the ideal papilla height, measured from the contact point, will be calculated starting from the tip of the existing papilla. The scalloped line connecting the base of the new papilla measurements is the coronal level of the root exposure that is coverable.

2) Clinical CEJ Predetermination in a Rotated Tooth:

In a rotated tooth the contact points with adjacent teeth are not correct. Thus, the ideal vertical dimension of the papillae will be taken from the contralateral tooth. This measurement is reported apically starting from the tip of both anatomic papillae of the rotated tooth with gingival recession. The CEJ is the scalloped line connecting both apical points.

3) Clinical CEJ Predetermination in an Extruded Tooth:

The correct measurement is once again done at the adjacent homologous non-extruded tooth, or at the homologous contralateral tooth. The measurements are carried apically on the anatomic papillae. The line connecting the base of both measurements will be apical to the CEJ and is where root coverage will be anticipated.