ISSN: 2581-5989
PubMed - National Library of Medicine - ID: 101738774

International Journal of Dental Science and Innovative Research (IJDSIR)

IJDSIR : Dental Publication Service

Available Online at: www.ijdsir.com

Volume – 4, Issue – 3, May - 2021, Page No. : 560 - 572

A clinical evaluation of papilla preservation reconstruction using sub-epithelial connective tissue graft

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Citation of this Article: Dr. Sahib Tej Singh, Dr. Pradeep Shukla, Dr. Vandana, Dr. Karandeep Kaur, Dr.(Prof.) Arvinderpal Singh, Dr. Simran Nut, "A clinical evaluation of papilla preservation reconstruction using sub-epithelial connective tissue graft", IJDSIR- May - 2021, Vol. – 4, Issue - 3, P. No. 560 – 572.

Type of Publication: Original Research Article

Conflicts of Interest: Nil

Abstract

Context: Interdental papilla can be lost as a result of several distinct clinical situations which contribute to the loss of interdental papillae and the establishment of "black space" or "black triangle".

Aim: To clinically evaluate the interdental papilla reconstruction using sub-epithelial connective tissue graft by a surgical technique. Also, to assess the gain in the interdental papillary height.

Methods and material: 10 patients selected for study in which there were 2 females and 8 males of age group of 17-50 yrs .15 papillae augmented in 10 cases among those 10 were central papillae 5 were lateral papillae. Clinical Parameters viz Vertical component, Horizontal component, Width of keratinized Gingiva, Facial Recession, Probing depth, Plaque score, Level of interdental bone were recorded at baseline, 10 days, 2 and 4 months.

Results: All patients healed without any complications. At the end of 4th months there was no mobility of the newly gained tissue in any cases. Clinically evaluation of the final readings at different time periods showed a highest reduction in all the recorded parameters.

Conclusion: This study has shown that the surgical technique using an interposed subepithelial connective tissue graft can regenerate a lost interdental papilla. The reconstructed papilla remained stable and without any signs of clinical inflammation 4 months after the surgery.

Keywords: Interdental papilla, subepithelial connective tissue graft, Horizontal component, vertical component, width of keratinized Gingia

Introduction

The interdental space is a physical space between two adjacent teeth. Its form and volume are determined by the morphology of the teeth. The interdental space is composed of four pyramidal embrasures: cervical, occlusal, buccal, and lingual. The apex of each pyramid ends at the contact point or area of two adjacent teeth. The lingual, buccal, occlusal pyramids are empty where as the cervical pyramid is occupied with interdental papilla.

Interdental papilla can be lost as a result of several distinct clinical situations which contribute to the loss of interdental papillae and the establishment of “black space” or “black triangle” between teeth. The first is the presence of naturally occurring midline diastema. This situation can be remedied by orthodontic therapy which has been used to create a papilla in cases of a diastema or non-contact of two adjacent teeth that can be approximated.

Several surgical and nonsurgical techniques have been proposed mainly with free epithelialized gingival grafts, repeated interproximal curettage, or displacement of the buccal direction. While limited success has been achieved with these procedures, the major limited factor for the complete and predictable survival of the graft tissues is the lack of a minimal source of blood supply. However subepithilial connective tissue graft is a highly predictable procedure that lacks the esthetic disadvantages of the thick free gingival graft. Successful defect coverage can be achieved with less donor tissue since revascularization occurs from both the periosteal or osseous base and the overlying flap. This dual blood supply is responsible for the increased predictability of connective tissue graft procedures.

At this point only case reports exist and no single technique has been systematically evaluated in a controlled study. Therefore in the present study the healing principles on which the subepithelial connective tissue graft for root coverage and ridge augmentation are based (double blood supply) have been applied to the reconstruction of the interdental papilla, thus increasing both success and predictability.

Aim and Objective

1. To clinically evaluate the interdental papilla reconstruction using sub-epithelial connective tissue graft by a surgical technique.
2. To assess the gain in the interdental papillary height.

Material and Methods

Inclusion Criteria

1. Age group of 17-50 years, with interdental papillary loss in maxillary anterior teeth.
2. Systemically healthy individual, male or female, with no contraindications to periodontal surgery.
3. Proper contact area between maxillary anterior teeth
4. Norland and Tarnow’s Class I, Class II and class III Interdantal Papilla .
5. Lack of any known allergic reaction.
6. Evidence of patient’s ability to maintain good plaque control.
7. Absence of severe cervical abrasion/root caries that would require restoration

Exclusion Criteria

1. Systemic diseases that affect the periodontium.
2. Allergies to medications or materials used in the study.

3. Requirement for antibiotic prophylaxis
4. Endodontically treated teeth & surgical sites
5. Root exposure with proximal restoration on surgical sites
6. Pregnancy
7. Tobacco use.
8. Steroid therapy.
9. A previous surgical procedure at test or control sites.

Clinical Parameters recorded

- Vertical Component
- Horizontal Component
- Width of Keratinized Gingiva
- Facial Recession
- Probing Depth. (PD)
- Plaque Score
- Level of inter dental bone (Radiographic evaluation)

All the above parameters were assessed at baseline, 10 days, 2 and 4 months with patients consent. All the measurements were made with a William's Graduated Periodontal Probe (API,Germany). Preoperative and Postoperative clinical photographs were taken at baseline, 10^{th} day , 2^{nd} month and 4^{th} month after surgery.

Vertical component (VC)

This measurement was recorded as the distance from apical extent of contact area to the tip of papillary margin by placing the probe in the middle of embrasure from the contact point to the nearest 0.5 mm.

To facilitate measurements on radiograph, digital photographs were taken after placing radiograph in a standardized pouch with grid/mesh of 1mm markings.

Horizontal component(HC)

The distance between proximal surfaces of teeth at the level of papillary margin in interdental region was recorded to assess the width of embrasure to the nearest 0.5 mm.

a) Width of keratinized gingiva (KG)

This measurement was recorded from the crest of gingival margin to the muco-gingival junction (MGJ) in the papillary region and the measurement was scored to the nearest 0.5 mm.

b) Facial recession

It was measured from the cemento-enamel junction (CEJ) to free gingival margin (FGM) on the facial aspect of teeth with associated papillary loss.

c) Plaque index.

Plaque index was scored based on the criteria of Silness and Loe in relation to the teeth with associated papillary loss on the scale of 0-3.

d) Probing Depth

Probing depth was recorded with a standard William's graduated probe to the nearest millimeter. The distance from the gingival margin to the base of the pocket was recorded on either side of papilla by placing the probe along the proximal surface of the affected tooth.

e) Radiographic level of alveolar crest

The distance between crest of bone and contact point was measured from apical most point of contact area to crest of alveolar bone in interdental region using IOPA radiograph. A commercially available film holder and tube aligning system i.e Rinn XCP Bite film holder for anterior region with ring were used to minimize the geometric errors of film placing and tube alignment. Radiographs were taken using Kodak E-speed X-ray film and long cone paralleling technique both pre-operatively and post-operatively after 4 months.

Patient Selection

- 10 patients selected for study
- 2 females and 8 males
- Age group of 17-50 yrs
- 15 papillae augmented among 10 cases
- 10 central papillae
- 5 lateral papilla

- Class I – 2 sit
- Class II – 10 sites
- Class III – 3 sites

Surgical Approach

A semilunar incision was placed 1 mm coronal to the mucogingival junction extending at least one papilla mesial and distal to the defective papilla using 11 no. BP blade fixed in 3 no. BP handle. Instead of placing the semilunar incision over the root surface, this incision is placed in the interdental region. The incision forms a semilunar arc between the mesial line angles of the teeth adjacent to the papilla to be reconstructed. Next intrasulcular incisions are also made around the mesial and distal half of the two adjacent teeth to free the connective tissue from the root surfaces to allow the coronal displacement of the gingival-papillary unit To eliminate the dead space created by the coronal displacement, a section of subepithelial connective tissue is removed from the palate and placed beneath the coronally displaced gingiva.

Immediately after this the donor site is prepared for graft procurement. The graft harvested consists of sub epithelial connective tissue from the posterior palatal region. After harvesting, the graft was placed in a saline soaked gauge until the recipient bed was prepared. Primary closure was obtained in the donor area using polyester 3-0 suture. The semilunar incision allows the coronal displacement without creating tension and prevents the gingiva from rebounding back to its original position. To maintain this new coronal position, the measured amount of the subepithelial connective tissue obtained from the palate is “stuffed” further into the semilunar incision and into the pouch-like space coronal to the incision.

The semilunar coronally repositioned papilla, similar to the procedure reported by Tarnow, appears to be the most predictable procedure at the present time due to the movement of a large segment of gingival-papillary unit with intact blood supply.

A flap was initiated from the initial semilunar incision toward the sulcular incision to completely mobilize the gingivo-papillary unit. Flap was undermined carefully below the papilla towards the palatal mucosa and extended into palatal region without perforating the palatal mucosa. Once the gingivo-papillary unit is completely released careful blunt dissection was carried out to release all the attachment from the tooth surface to allow for the coronal displacement of the papilla.

The void or dead space created between papillary unit and crestal bone was then filled by SCTG procured from the palatal region. The graft was pulled into the void space using horizontal mattress suture starting from palatal side using 4-0 prolene non-absorbable suture. After placement of graft the whole movable gingivo-papillary unit was sutured with immobile attached gingival with horizontal suture “holding suture” thereby reducing the pressure on the papilla and the space is left open for secondary healing of the flap. 4-0 prolene suture was used for the closure of flap. Periodontal dressing was placed over the recipient area.

Post-Operative Care

Patients were advised Cap Amoxicillin 500mg three times daily for 7 days, Tab Ibuprofen 400 mg SOS and 0.12% Chlorhexidine gluconate mouthwash twice daily for a period of 4 weeks.

Sutures from the recipient site were removed after a period of 7-10 days.Patients were recalled frequently for check up. The post operative measurements were recorded at 10days (except probing depth), 2 month and 4 month respectively. The measurements were recorded in the specific case data sheet and necessary photographs were taken.

Results

The present study was conducted in the Department of Periodontics & Implantology, Sri Guru Ram Das Institute of Dental sciences and Research, Sri Amritsar.

Sub epithelial connective tissue graft was used & no rejection neither expected nor found. All patients healed without any complications. At the end of 4 months there was no mobility of the newly gained tissue in any cases.

The study included the following clinical parameters which were assessed at baseline,

2 and 4 months

Clinical Parameters recorded

- Vertical Component
- Horizontal Component
- Width of Keratinized Gingiva
- Facial Recession
- Probing Depth. (PD)
- Plaque Score
- Level of inter dental bone (Radiographic evaluation)

Postoperative clinical measurements

At 10th day : At 10th day post operatively mean vertical component was found to be 0.78 mm (Table 1) , mean horizontal component was 0.73 mm (Table 2) , mean width of keratinized gingival was 4.9 mm (Table 3), mean plaque score was 1 (Table 4), mean pocket depth was 2.26 mm (Table 5), mean interdental bone level 5.71 mm (Table 6) and mean facial recession was 0.36 mm (Table 7).

At 2nd month: At 2nd month of post operative period, the mean vertical component was found to be 1.28 mm (Table 1) ,mean mean horizontal component was 0.91mm(Table 2) , mean width of keratinized gingiva was 4.78 mm (Table 3), mean plaque score was 0.9 (Table 4), mean pocket depth was 2.02 mm (Table 5), mean interdental bone level 5.71 mm (Table 6) and mean facial recession was 0.4 mm (Table 7).

At 4th month of post operative period, the mean vertical component was found to be 1.28 mm (Table 1) ,mean mean horizontal component was 1.01 mm (Table 2) , mean width of keratinized gingiva was found to be 4.78 mm(Table 3), mean plaque score was 0.9 (Table 4), mean pocket depth was 2.02 mm (Table 5), mean interdental bone level was 5.26 mm (Table 6) and mean facial recession was 0.4mm (Table 7).

Vertical Component: Clinically evaluation of the final readings at different time periods showed a highest reduction of vertical height from the baseline to 10th day post operatively i.e approximately 77%.

Horizontal Component: Clinically evaluation of the final readings at different time periods showed a highest reduction of horizontal from the baseline to 10th day post operatively i.e approximately 70%

Keratinized Gingiva: Clinically evaluation of the final readings at different time periods showed a highest reduction of keratinized height from the baseline to 10th day post operatively i.e approximately 48%.

Plaque Score: Clinically evaluation of the final readings at different time periods showed a highest reduction of plaque score was on 2nd month post operatively i.e approximately 53%.

Probing Depth

Clinically evaluation of the final readings at different time periods showed a highest reduction of pocket depth was on 2nd month post operatively i.e approximately 14%.

Interdental Bone Level

Clinically evaluation of the final readings at different time periods showed a highest reduction of bone height was on 4th month post operatively i.e approximately 7.59%.

Facial Recession

Clinically evaluation of the final readings at different time periods showed a highest coverage was found to be on 10th day post operatively i.e approximately 28%.

Discussion

The absence or loss of the interdental papilla is one of the most concerning aspects in the decision making process of clinicians and in gaining acceptance from the patient. This condition may create esthetic impairments, phonetic problems, and food impaction. Interdental papillae can be lost as a result of several distinct clinical situations. The first is the presence of a naturally occurring midline diastema. Several authors orthodontically moved teeth into infrabony defects, showing the possibility to modify the defects' morphology, obtaining probing depth reduction and radiological bone defect resolution (Nevins & Wise 1990, Cardaropoli et al. 2001, Re et al. 2002).

It is clinically well documented that any form of pedicle grafting is much more predictable than a free graft if the proper donor tissue is found adjacent to the recipient site, since there is good blood supply from the base of the pedicle. Tarnow (1986) reported a technique to cover denuded root surfaces by using a semilunar coronally repositioned flap (pedicle). This technique is very successful since the "pedicle graft, blood supply principle" is used. Instead of placing the semilunar incision over the root surface, this incision is placed in the interdental region to get more surface area for the blood supply from the lateral part of the incision as well as from the apical area of the defect. The incision forms a semilunar arc between the mesial line angles of the teeth adjacent to the papilla to be reconstructed. Depending on the extent of the papillary loss, this procedure may be repeated a second or even a third time after 2-3 months of healing. The semilunar coronally repositioned papilla, similar to the procedure reported by Tarnow, appears to be the most predictable procedure at the present time due to the movement of a large segment of gingival-papillary unit with intact blood supply. Interdental papilla reconstruction using subepithelial grafts are widely used in clinical practice, and studies have shown that they provide improved esthetics, maintain the integrity of interproximal tissues, prevent bacterial accumulation by reducing plaque scores, decreases the incidence of periodontal disease (Miller,1982; Tarnow, 1986; Beagle,1992; Langer,1985).

In 1996, Han and Takei proposed an approach based on the use of a semilunar incision placed in the alveolar mucosa of the interdental area. Intrasulcular incisions connect with the semilunar incision to allow the elevation of a split thickness flap and the coronal displacement of the gingivopapillary unit. A subepithelial free gingival connective tissue graft is placed beneath the coronally positioned interdental tissue. The authors claim that the procedure may be repeated a second and third time after 2 to 3 months of healing to reach the goal of papilla reconstruction.

In the present study for the predictable creation of interproximal papilla by surgical means had followed the principle of using the most advantageous pattern of blood supply to the newly created tissue. Similar studies was done by Tarnow et al (1986).The study sample included 10 subjects having Norland and Tarnow's Class I, Class II and class III Interdantal Papilla. Patients were randomly divided into different groups depending upon different sites to receive sub epithelial connective tissue graft and followed up for a period of 4 months.

10 patients selected for study in which there were 2 females and 8 males of age group of 17-50 yrs .15 papillae augmented in 10 cases among those 10 were central papillae 5 were lateral papillae and based on the classification.

Class I – 2 site, Class II – 10sites & Class III – 3 sites

Sub epithelial connective tissue graft was used & no rejection, neither expected nor found. All patients healed without any complications. At the end of 4th months there was no mobility of the newly gained tissue in any cases.-

Clinically evaluation of the final readings at different time periods showed a highest reduction of vertical height from the baseline to 10th post operatively i.e approximately 77% and a highest reduction of horizontal from the baseline to 10th post operatively i.e approximately 70%.

Clinically evaluation of the final readings at different time periods showed a highest reduction of keratinized gingiva from the baseline to 10th post operatively i.e approximately 48% and a highest reduction of plaque core was on 2nd month post operatively i.e approximately 53% and a highest reduction of pocket depth was on 2nd month post operatively i.e approximately 14%.

Clinically evaluation of the final readings at different time periods showed a highest reduction of bone height was on 4th month post operatively i.e approximately 7.59% and a highest coverage was found to be on 10th day post operatively i.e approximately 28%.

Depending on the extent of the papillary loss, this procedure may be repeated a second or even a third time after 2-3 months of healing. The semilunar coronally repositioned papilla, similar to the procedure reported by Tarnow, appears to be the most predictable procedure at the present time due to the movement of a large segment of gingival-papillary unit with intact blood supply. However Clinical studies using large sample sizes are still necessary to determine the long term success rate and predictability of this surgical technique.

Conclusion

This study has shown that the surgical technique using an interposed subepithelial connective tissue graft can regenerate a lost interdental papilla. The reconstructed papilla remained stable and without any signs of clinical inflammation 4 months after the surgery. Clinical studies using large sample sizes are necessary to determine the success rate and predictability of this surgical technique hence concluded that:

- The interposed subepithelial connective tissue graft technique can regenerate a lost interdental papilla.
- To be successful, the surgical technique must involve the maintenance of the integrity of the interposed tissue.
- For long term stability multiple surgical procedures may be required.

References

1. Kohl JT, Zander HA. Morphology of interdental gingival tissues. Oral. Surg. Oral. Med & Oral. Path 1961; 14: 287-295.
2. Cohen D, Ross S: The double papillae flap in periodontal therapy. J. Periodontol. 1968;39:65-70.
3. Sullivan HC, Atkins JH. Free autogenous gingival grafts: Part I. Principles of successful grafting. J. Periodontics. 1968; 6:5.
4. McHugh WD. The interdental gingivae. J. Periodontol. Res. 1971; 6: 227-236.
5. Edel A. Clinical evaluation of free connective tissue grafts used to increase the width of keratinized gingiva. J. Clin. Periodontol. 1974; 1:185-196.
6. Bernimoulin JP, Lusher E: Coronal repositioned periodontal flap. J. Clin. Periodontol. 1975;2;1-13.
7. Donn BJ. The free connective tissue autograft: A clinical and histologic wound healing study in humans. J. Periodontol. 1978; 49: 253-260.
8. Langer B, Calagna L. The subepithelial connective graft. J. Prosthet. Dent. 1980; 44:363–367.

9. Langer B, Calagna LJ. The sub epithelial connective tissue graft. A new approach to the enhancement of anterior cosmetics. Int. J. Perio. Res. Dent. 1982; 2: 22-33.

10. Langer B, Langer L. Sub epithelial connective tissue graft technique for root coverage. J. Periodontol. 1985; 56:715-720.

11. Becker BE, Becker W. Use of connective tissue autografts for treatment of mucogingival problems. Int. J. Perio. Rest. Dent. 1986; 1:89-94.

12. Tarnow DP, Magner AW, Fletcher P. The effect of the distance from the comtact point to the crest of bone on the presence or absence of the interdental papilla. J. Periodontol. 1992;63:995-1004.

13. Beagle JR. Surgical reconstruction of the interdental papilla: Case report. Int. J. Perio. Rest. Dent 1992;12: 145–151.

14. American Academy of Periodontology. Glossary of periodontal terms. J. Periodontol. [special issue] 1992; 63.

15. Reiser GM, Bruno JF, Mahan PE. The sub epithelial connective tissue graft palatal donor site: Anatomic considerations for surgeons. Int. J. Perio. Rest. Dent. 1996; 16; 131-137.

16. Wennstrom J. Mucogingival therapy. Ann. Periodontol. 1996; 1: 671-701.

17. Thomas AH, Henry HT. Progress in gingival papilla reconstruction. Periodontol. 2000, 1996; 11: 65-68.

18. Han TJ, Takei HH. Progress in gingival papilla reconstruction. Periodontol. 2000 1996;11:65–68.

19. Wennström J, Pini Prato GP. Mucogingival therapy .In: Lindhe J, Karring T, Lang NP, eds. Clinical Periodontology and Implant Dentistry, Copenhagen. Munksgaard. 1997:569-591

20. Harris RJ. Creeping attachment associated with the connective tissue with partial thickness double pedicle graft. J. Periodontol. 1997; 68: 890-899.

21. Norland WP, Tarnow DP. A classification system for loss of papillary height. J. Periodontol. 1998; 69:1124-1126.

22. Eduardor Lorenzana, Edward p. Allen. The single-incision palatal harvest technique: A strategy for aesthetic and patient comfort. J. Perio. Rest. Dent 2000;20:297-305

23. Azzi R, Daniel E, Takei HH, Carranza FA. Root coverage and papilla reconstruction using autogenous osseous and connective tissue graft. Int. J. Perio. Rest. Dent 2001;21:141-147.

24. Guiha R, Khodeiry SE, Mota L, Caffesse R. Histological Evaluation of Healing and Revascularization of the Sub epithelial Connective Tissue Graft. J. Periodontol. 2001; 72:470-478.

25. Liu CL, Wiesgold AS. Connective tissue graft: A classification for incision design from the palatal site and clinical case reports. Int. J. Perio. Rest. Dent. 2002;22: 373-379.

26. The ramp mattress suture. A new suturing technique combined with a surgical procedure to obtain papilla between implants in the buccal area. Int. J. Perio. Rest. Dent 2002;22:63-69.

27. Velvart P, Ebner-Zimmermann U. Papilla base incision: a new approach to recession-free healing

of the interdental papilla after endodontic sugery. Int. Endodont. J. ,35,453-460,2002.

28. Cardaropoli D, Stefania Re, Corrente G. The papilla presence index (PPI): A new system to assess interproximal papillary levels. Int. J. Perio. Rest. Dent. 2004; 24: 488-492.

29. Stephen J. Chu, Dennis P. Tarnow. Papilla Proportions in the Maxillary Anterior dentition. Int. J. Perio. Rest. Dent. 2009;29:385-393.

30. Min-Chieh Chen, Yu-Fang Liao. Factors influencing the presence of interproximal dental Papilla between maxillary anterior teeth. J. Periodontol. 2010;81:318-324.

Legend Tables and Figures

Table 1: vertical component

Time-period	Diff. Between time-period	% improvement	P-value	Significance
0^{th} day	-	-	-	-
10^{th} day	2.54 ± 0.8754	77.68	0.00298	P<0.01
60^{th} day	-0.22 ± 0.6273	30.14	0.000391	P<0.01
120^{th} day	-0.03 ± 0.3579	3.16	0.000058	P<0.01

P<0.01 shows a significant difference at 1% level of significance

Table 2: horizontal component

Time-period	Diff. Between time-period	% improvement	P-value	Significance
0^{th} day	-	-	-	-
10^{th} day	1.365 ± 0.6065	70	0.00111	P<0.01
60^{th} day	-0.155 ± 0.51775	26.50	0.0098	P<0.01
120^{th} day	0.07 ± 0.28694	9.46	0.00031	P<0.01

P<0.01 shows a significant difference at 1% level of significance

Table 3: keratinized gingiva

Time-period	Diff. Between time-period	% improvement	P-value	Significance
0^{th} day	-	-	-	-
10^{th} day	-2.54 ± 0.92279	47.65	0.00136	P<0.01
60^{th} day	0.29 ± 0.67897	3.68	0.00031	P<0.01
120^{th} day	-0.02 ± 0.4756	0.2639	0.00022	P<0.01

P<0.01 shows a significant difference at 1% level of significance

Table 4: plaque score

Time-period	Diff. Between time-period	% improvement	P-value	Significance
0th day	-	-	-	-
10th day	0.11 ± 0.4630	17.74	0.00189	P<0.01
60th day	-0.27 ± 0.74989	52.94	0.000989	P<0.01
120th day	0.01 ± 0.26437	1.28	0.00031	P<0.01

P<0.01 shows a significant difference at 1% level of significance

Table 5: pocket depth

Time-period	Diff. Between time-period	% improvement	P-value	Significance
0th day	-	-	-	-
10th day	0.25 ± 0.538	12.69	0.00782	P<0.01
60th day	0.24 ± 0.4325	13.95	0.0069	P<0.01
120th day	0 ± 0.2357	0	0.00011	P<0.01

P<0.01 shows a significant difference at 1% level of significance

Table 6: interdental bone level

Time-period	Diff. Between time-period	% improvement	P-value	Significance
0th day	-	-	-	-
10th day	0 ± 0	0	0	P>0.01*
60th day	0.05 ± 0.1080	0.698	0.00998	P<0.01
120th day	0.54 ± 0.6979	7.59	0.0031	P<0.01

P<0.01 shows a significant difference at 1% level of significance

Table 7: facial recession

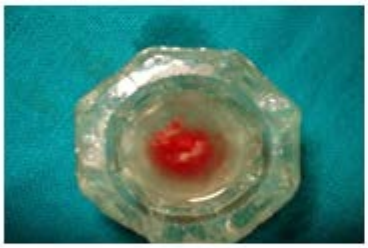
Time-period	Diff. Between time-period	% improvement	P-value	Significance
0th day	-	-	-	-
10th day	0.284 ± 0.2593	28.4	0.00395	P<0.01
60th day	0.066 ± 0.59926	9.22	0.00211	P<0.01
120th day	0 ± 0	0	0.00032	P<0.01

P<0.01 shows a significant difference at 1% level of significance

(A) PRE-OP

(B) PALATAL INCISION AT DONOR SITE

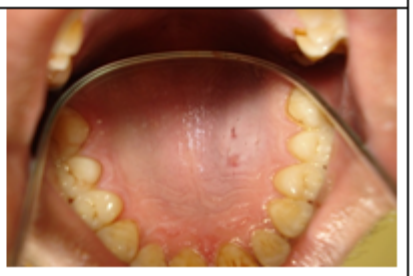
(C) GRAFT SECURED IN NORMAL SALINE



(D) INCISION GIVEN CORANAL TO THE DEFECT

(E) CORONAL POSITIONING OF GINGIVO PAPILLARY UNIT

(F) GRAFT PUSHED INTO POUCH PREPARED

(G) SUTURES PLACED AFTER SURGERY	(H) COE-PAK GIVEN
	
(I) 10TH DAY POST-OP(BUCCAL VIEW)	(J) 10TH DAY (PALATAL VIEW)
	
(K) 2ND MONTH POST OP	(L) 4TH MONTH POST OP
	

(M) PRE-OP	(N) POST-OP(4th month)