

*Study Comparing the Clinical Efficacy of Fibrin Sealant System with Non-Absorbable 4-0 Surgical Sutures in the Treatment of Localized Gingival Recession: A case series.*

---

**Dr. Ninad Jamdade\*;** **Dr. Varsha Rathod\*\***

**Abstract:**

In the current practice of periodontics, clinicians are faced with the of not only addressing biological and functional problems present in the periodontium, but also providing therapy that result in acceptable aesthetics. The presence of mucogingival problems and gingival recession around anterior, highly visible teeth exemplifies a situation in which a treatment modality that addresses both biological and aesthetic demands is required.

When perioplastic surgical procedures are done or implants are placed in esthetic zone, Fibrin sealants may be used as an alternative to closing flaps with sutures with histologic benefits and has potential uses in field of dentistry. Fibrin sealant has proved to be an excellent beginner in the era of sutureless periodontal flap surgery effective as means of fixing tissues after mucogingival surgery as compared to sutures.

Therefore the main aim of the current study is to determine the clinical efficacy and consequences of fibrin sealants as an alternative to sutures in mucogingival surgeries.

**Key words:** Mucogingival surgery, fibrin sealants, esthetic zone.

---

**INTRODUCTION:**

Esthetic improvement is the common and primary indication for performing plastic and reconstructive surgery. Esthetics, or the concept of beauty, is determined by social, cultural,

economic and personal factors. The phrase “**beauty lies in the eyes of the beholder**” is very true and the esthetic requirements ultimately are determined by each patient. Esthetic demands in the dental profession continue to increase as

patients become more educated about the available options for improving their smile. Advancements in technology and modifications are continuously taking place to achieve best end result for the patient.

The patients are generally pleased to have “too much tissue” rather than the exposed root surfaces. “Gingival recession” is the exposure of root surface due to apical migration of gingival margin. Many patients seek treatment because of concerns with esthetic appearance, root sensitivity or fear of early loss of the affected teeth. However, other complications that can arise are root caries and tooth discoloration.

Marginal tissue recession is a common feature in populations with high standards of oral hygiene as well as in populations with poor oral hygiene. The predominant cause for localized gingival recessions in populations maintaining high standards of oral hygiene is trauma due to faulty tooth brushing.

To correct these esthetic problems periodontal procedures are compiled under the title mucogingival surgeries / periodontal esthetic surgeries /

periodontal plastic surgical procedures. There are multiple periodontal plastic surgery approaches designed to improve aesthetics, such as the free gingival autograft<sup>1</sup>, the double papilla graft<sup>2</sup>, the laterally positioned flap<sup>3</sup>, the coronally positioned flap<sup>4</sup> and connective tissue grafts<sup>5</sup>. These procedures are only the beginning of a branching out of innovations, modifications and variations comprising atleast 50 surgical solutions to the problem of gingival recessions.

Whenever flap surgeries are done to treat the periodontal diseases, sutures are usually used, but these sutures have disadvantages such as delayed wound healing, poor oral hygiene, pain & discomfort, more time consuming during surgery. In order to overcome these disadvantages of sutures, an adhesive material called fibrin sealant has been introduced.<sup>6</sup>

When perioplastic surgical procedures are done or implants are placed in esthetic zone, Fibrin sealants may be used as an alternative to sutures for closing flaps with histological benefits and has potential uses in field of dentistry. Fibrin sealant has proved to be

an excellent beginner in the era of suture less periodontal flap surgery with advantages like easy and quick to use, early wound healing, effective as means of fixing tissues after mucogingival surgery as compared to sutures.

The desire for an agent which will produce a biostable union between tissue planes has led to the development of tissue adhesive, fibrin sealant i.e., TISSEEL<sup>®</sup>. This biological two-component system (FFSS), which acts by forming fibrin clot, is able to achieve hemostasis, seal leakages, glue tissues or support sutures.<sup>7,8</sup>

Medline search using keywords like “Fibrin glue, Fibrin adhesive sealant, suture less Periodontal surgery” revealed limited data. Therefore the aim of the current study is to determine the clinical efficacy of the fibrin sealants as an alternative to sutures in the treatment of localized gingival recession.

#### **RESEARCH OBJECTIVES:**

1. To compare the clinical efficacy of fibrin sealant system with non-absorbable 4-0 surgical sutures in the treatment of localized gingival recession.
2. To compare the clinical stability of flap

after using fibrin sealant with non-absorbable 4-0 surgical sutures in treatment of localized gingival recession.

#### **MATERIALS AND METHODS:**

##### **Study design:**

The study design selected was a split mouth design and the patients were selected from the outpatient department of Periodontology. Selected patients were randomly assigned to either the control group (site A) or experimental group (site B).

##### **Method of data collection:**

**Study sample:** Study is a split mouth randomized control trial type. 10 patients meeting the following inclusion criteria were selected and randomly divided into two sites i.e. control site A; sites with placement of non-absorbable 4-0 surgical sutures after surgery and experimental site B; sites with placement of Fibrin sealant system after surgery.

##### **Selection criteria:**

These patients were selected consecutively during study period as and when they presented with following inclusion and exclusion criteria in both the sexes.

**Inclusion criteria:**

1. Patients with age group between 18 years and above.
2. Patients in good general health
3. Those patients who shows a tendency to maintain a good oral hygiene during the phase I therapy.
4. Having bilateral identical gingival recession defects, labially/buccally.
5. Miller's class I & II gingival recessions

**Exclusion criteria:**

1. Patients with systemic diseases.
2. Patients with known allergic response.
3. Smokers
4. Pregnant or lactating women.
5. Patients who had periodontal therapy for the past 6 months.
6. Those undergoing radiation therapy.

**ETHICAL CONSIDERATIONS:**

The research protocol was initially submitted to the Institutional Ethical Committee (IEC) and scientific review board. After getting ethical clearance from IEC, subjects who took part in the study were explained about the surgical procedure, the use of bovine derived material and the possible complications that might occur after the surgery. Their willingness regarding the participation in

the study was assured and written informed consent document (ICD) was taken from each of the participants.

**METHODOLOGY:**

**Phase I therapy (etiopathic phase):**

All the patients were subjected to Phase I therapy (etiopathic phase). Detailed instructions regarding self-performed plaque control measures and instructions to eliminate habits related to the etiology of gingival recession defects and to improve gingival health were given. Trauma from occlusion if detected was eliminated. At the end only those patients demonstrating the acceptable oral hygiene standards and gingival health were considered for the present study. Each patient was explained about treatment design. An informed consent was taken from each of the participating subject.

Before recording the baseline data, alginate impressions were made and study casts were prepared for each patient. A customized acrylic stent was fabricated for each patient to fit it over the selected sites. A groove was made on the stent corresponding to the test site to guide the position and angulation of periodontal

probe during the clinical measurements at baseline and the subsequent follow-up visits. The stents were preserved on the study casts throughout the study period to avoid any distortion.

**Surgical procedure:**

The technique used was a split mouth design. The selected 20 recession defects were assigned randomly either to Experimental site A or Experimental site B as follows:

**Control sites A:** 10 sites treated with coronally advanced flap and non-absorbable surgical sutures were used at these sites to approximate flap.

**Experimental sites B:** 10 sites treated with coronally advanced flap and fibrin glue was used at these sites to approximate flap.

**Preparation of Tisseel solution, (The first component):**

- 1) The vials containing the lyophilized Tissucol and Aprotinin solution were maintained at 37° C before they are mixed together.
- 2) The aprotinin solution was transferred into the vial containing lyophilized Tissucol using a blue-scaled syringe.
- 3) The vial was swirled briefly and

vigorously to ensure homogeneity of the solution, but avoiding excessive frothing and then drawn into a blue-scaled syringe.

**Preparation of thrombin solution: (Second component):**

The contents of the vial containing calcium chloride was transferred to the vial containing lyophilized thrombin 4/500 I.U. using a sterile black scaled syringe. Reconstituted Tissucol® and thrombin solutions must be used within 4-6 hours. Hence, solutions were prepared just before use.

**Method of loading syringes with two components and mounting them on the Duploject:**

The contents of the vial containing the first component were withdrawn into the blue scaled syringe using hypodermic needle. Similarly, the contents of vial containing the second component were withdrawn into a black scaled syringe. Both the syringes were placed into the clip of the duploject and were filled with equal volumes without any air bubbles. The nozzles of the two syringes were connected to the joining piece which was secured by fastening the strap to the clip. Finally, the application needle was fitted

onto the joining piece. Now the duploject system was ready for use.

**Method of application:**

The sealant components were applied by simultaneous application using duploject and application needle. Separate syringes and needles were used for reconstitution and application of Tisseel and thrombin for each patient. The duploject system (Baxter AG, Vienna, Austria), allows simultaneous application of the two components and ensures that they are quickly and thoroughly mixed, which is essential for the sealant to gain optimum strength.

The duploject system consists of a clip for two identical disposable syringes and a common plunger which ensures that equal volumes of the two components are fed through a common joining piece before being mixed in the application needle and ejected. A slight pressure on the plunger dispenses the material and drops through the application needle.

**CORONALLY ADVANCED FLAP PROCEDURE<sup>19</sup>:**

The surgical area was prepared and adequately anaesthetized using 2% Lignocaine HCl containing 1:80,000

epinephrine by giving block and infiltration anaesthesia. A trapezoidal flap was designed using three different types of incisions.

Incisions:

a) Primary incisions were made in mesial and distal directions from the cemento-enamel junction upto 1 mm of the proximal line angle of the adjacent teeth, perpendicular to the long axis of the tooth, leaving the interdental papilla intact.

b) A sulcular incision was made connecting the primary incisions and preserving all the existing radicular gingiva.

c) Two apically diverging vertical incisions were placed at each end of the primary incision extending apically into the alveolar mucosa.

The initial incisions (a, b, c) were given with No.15 and No.12 scalpel blades. An initial blunt followed by sharp dissection with No. 15 scalpel blade was accomplished to raise a combined full-partial thickness flap. The flap was extended well beyond the mucogingival junction so that it exhibited no tension when pulled coronally beyond the CEJ

and should be extended atleast 5 mm apical to the most apical margin of the bony dehiscence. The intact papillae mesial and distal to the recession were sharply excised.

Coronally advanced flaps were done bilaterally and on control side, approximation was done using non-absorbable surgical silk sutures while experimental side was approximated with the help of tisseel fibrin glue alone.

**CASE PHOTOGRAPHS**



**Fig. 1: armamentarium**

**CONTROL SITE A (SUTURES)**



**fig. 2(a): control site a (suture group) pre-operative view of surgical site.**



**fig. 2(b): recession depth measured with stent and probe.**



**Fig. 2(c): vertical incisions**



**Fig. 2(d): crevicular incision**



**Fig. 2(e): coronal advancement of flap**



**fig. 2(f): flap positioned coronally using sutures.**

**EXPERIMENTAL SITE B (FIBRIN GLUE, TISSEEL)**



**Fig. 3(a): experimental site B pre-operative view of surgical site**



**fig. 3(b): recession depth measured with stent and probe.**



**Fig. 3(c): vertical incisions**



**fig. 3(d): crevicular incision**



**Fig. 3(e): coronal advancement of flap**



**fig. 3(f): application of fibrin glue on inner aspect of flap and on bone.**

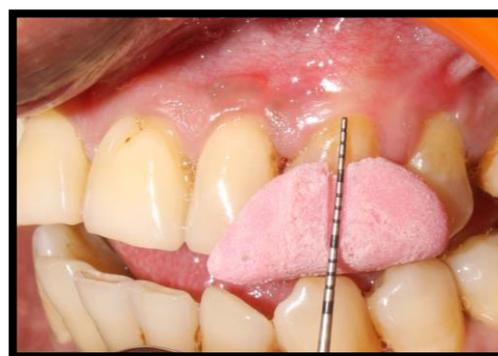


**Fig. 3(g): flap coronally positioned  
Using fibrin glue.**

**FOLLOW UP PHOTOGRAPHS (CONTROL SITE A)**



**Fig. 4(a): post-operative view of  
control site A after 4 weeks**



**fig. 4(b): recession depth of control  
site A after 4 week of follow up**

**FOLLOW UP PHOTOGRAPHS (EXPERIMENTAL SITE B)**



**Fig. 5(a): post-operative view of experimental site B after 4 weeks of follow up.**



**fig. 5(b): recession depth measured after 4 weeks of follow up.**

**RESULTS:**

The following clinical parameters were recorded at the selected sites.

- 1) Plaque index (P.I)
- 2) Gingival index (G.I)
- 3) Width of keratinized gingiva (W.K.G.): Measured with a UNC-15 periodontal probe.
- 4) Recession depth (R.D.): Measured with a UNC-15 probe and occlusal stent.
- 5) Clinical attachment level (C.A.L.): Measured with a UNC-15 probe and stent.
- 6) Percentage of root coverage.

Clinical parameters such as gingival index and plaque index were recorded at the baseline, on 7<sup>th</sup> day and 28<sup>th</sup> day post operatively.

Clinical parameters which include width of keratinized gingiva, clinical attachment level and recession depth were recorded at the baseline and on the 28<sup>th</sup> day postoperatively.

The percentage of root coverage was calculated at the end of subsequent follow up on the 28<sup>th</sup> day post operatively.

Clinical stability and the post operative

bleeding were assessed immediately after the completion of flap approximation within 5 minutes.

Width of keratinized gingiva, recession depth, clinical attachment level was measured on one standard point mid facially using the occlusal stent prepared for each treated site.

Values were rounded off to nearest 0.5 mm.

**Statistical analysis:**

All the clinical parameters recorded were subjected to the following statistical analysis:

- 1) For intragroup variations, Paired t-test was performed.
- 2) For comparison between the two groups / inter-group variations Unpaired t- test was performed.

**PLAQUE INDEX:**

**Table 1: Mean plaque index (PI) and change from baseline in PI with ‘Suture’ and ‘Fibrin’**

	Suture (n=10)		Fibrin (n=10)		Unpaired ‘t’ test (between groups)	
	Mean	SD	Mean	SD	t	p
<b>Plaque Index (PI)</b>						
- Baseline	0.94	0.11	0.94	0.11	0.000	>0.05 (N.S.)
- Day 7	1.05	0.12	0.83	0.08	5.196	<0.0001 (Sig.)
- Day 28	0.74	0.06	0.74	0.06	0.000	>0.05 (N.S.)
<b>Change from baseline in PI</b>						
	Mean	%	Mean	%		
- Day 7	0.11*	11.7	-0.11*	-11.7	7.850	<0.0001 (Sig.)
- Day 28	-0.19**	-20.2	-0.19**	-20.2	0.000	>0.05 (N.S.)

\*  $p < 0.0001$ ; \*\*  $p > 0.05$  (Comparison versus baseline, paired ‘t’ test)

Note: Negative value signifies reduction from baseline

**GINGIVAL INDEX:**

**Table 2: Mean gingival index (GI) and change from baseline in GI with ‘suture’ and ‘fibrin’**

	Suture (n=10)		Fibrin (n=10)		Unpaired ‘t’ test (between groups)	
	Mean	SD	Mean	SD	t	p
<b>Gingival index (GI)</b>						
- Baseline	0.87	0.16	0.90	0.14	0.000	>0.05 (N.S.)
- Day 7	1.27	0.10	0.89	0.06	9.899	<0.0001 (Sig.)
- Day 28	0.99	0.11	0.88	0.08	2.779	>0.05 (N.S.)
<b>Change from baseline in GI</b>						
	Mean	%	Mean	%		
- Day 7	0.40*	45.97	-0.02*	-2.2	7.551	<0.0001 (Sig.)
- Day 28	0.12**	13.89	-0.02**	-2.2	2.678	>0.05 (N.S.)

\*  $p < 0.0001$ ; \*\*  $p > 0.05$  (Comparison versus baseline, paired ‘t’ test)

Note: Negative value signifies reduction from baseline

**WIDTH OF KERATINIZED GINGIVA:**

**Table 3: Mean width of keratinized gingival (WKG) and change from baseline in WKG with ‘suture’ and ‘fibrin’**

	Suture (n=10)		Fibrin (n=10)		Unpaired ‘t’ test (between groups)	
	Mean	SD	Mean	SD	t	p
<b>Width of keratinized gingiva (WKG)</b>						
- Baseline	2.50	0.71	2.60	1.35	0.208	>0.05 (N.S.)
- Day 28	4.70	0.82	5.40	1.65	1.202	>0.05 (N.S.)
<b>Change from baseline in WKG</b>	<i>Mean</i>	<i>%</i>	<i>Mean</i>	<i>%</i>		
- Day 28	2.20*	88	2.80*	107.6	1.877	<0.0001 (Sig.)

\*  $p < 0.0001$ ; \*\*  $p > 0.05$  (Comparison versus baseline, paired ‘t’ test)  
 Note: Negative value signifies reduction from baseline

**CLINICAL ATTACHMENT LEVEL:**

**Table 4: Mean clinical attachment level (CAL) and change from baseline in CAL with ‘suture’ and ‘fibrin’**

	Suture (n=10)		Fibrin (n=10)		Unpaired ‘t’ test (between groups)	
	Mean	SD	Mean	SD	t	p
<b>Clinical attachment level (CAL)</b>						
- Baseline	4.50	0.53	4.50	1.35	<0.01	>0.05 (N.S.)
- Day 28	0.40	0.52	0.20	0.42	0.949	>0.05 (N.S.)
<b>Change from baseline in CAL</b>	<i>Mean</i>	<i>%</i>	<i>Mean</i>	<i>%</i>		
- Day 28	4.10*	91.1	4.30*	95.5	-0.849	<0.0001 (Sig.)

\*  $p < 0.0001$ ; \*\*  $p > 0.05$  (Comparison versus baseline, paired ‘t’ test)  
 Note: Negative value signifies reduction from baseline

**RECESSION DEPTH:**

**Table 5: Mean recession depth (RD) and change from baseline in RD with ‘suture’ and ‘fibrin’**

	Suture (n=10)		Fibrin (n=10)		Unpaired ‘t’ test (between groups)	
	Mean	SD	Mean	SD	t	p
<b>Recession depth (RD)</b>						
- Baseline	7.28	2.62	6.80	1.99	0.385	>0.05 (N.S.)
- Day 28	2.90	1.45	2.20	1.40	1.099	>0.05 (N.S.)
<b>Change from baseline in RD</b>						
	Mean	%	Mean	%		
- Day 28	4.30*	59.06	4.60*	67.68	-0.553	<0.0001 (Sig.)

\*  $p < 0.0001$ ; \*\*  $p > 0.05$  (Comparison versus baseline, paired ‘t’ test)  
 Note: Negative value signifies reduction from baseline

**ROOT COVERAGE PERCENTAGE:**

**Table 6: Root coverage percentage**

	Suture (n=10)		Fibrin (n=10)		Unpaired ‘t’ test (between groups)	
	Mean	SD	Mean	SD	t	p
<b>Recession depth (RD)</b>						
- Day 28	61.68	9.72	71.41	12.65	1.099	>0.05 (N.S.)

**Table 7: CLINICAL STABILITY OF FLAP:**

	Suture (site A)	Fibrin (site B)
Mean scores	1	0

Score 1: flap is unstable at 5 minutes

Score 0: flap is stable at 5 minutes.

**Table 8: POST OPERATIVE BLEEDING:**

	Suture (site A)	Fibrin (site B)
Mean scores	1.80	0

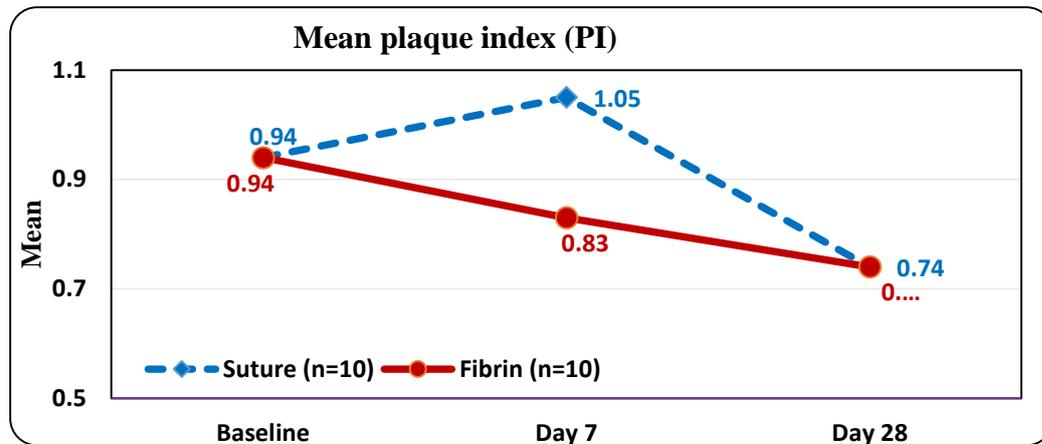
Score 1 : bleeding at 1 min.

Score 5: bleeding at 5 min.

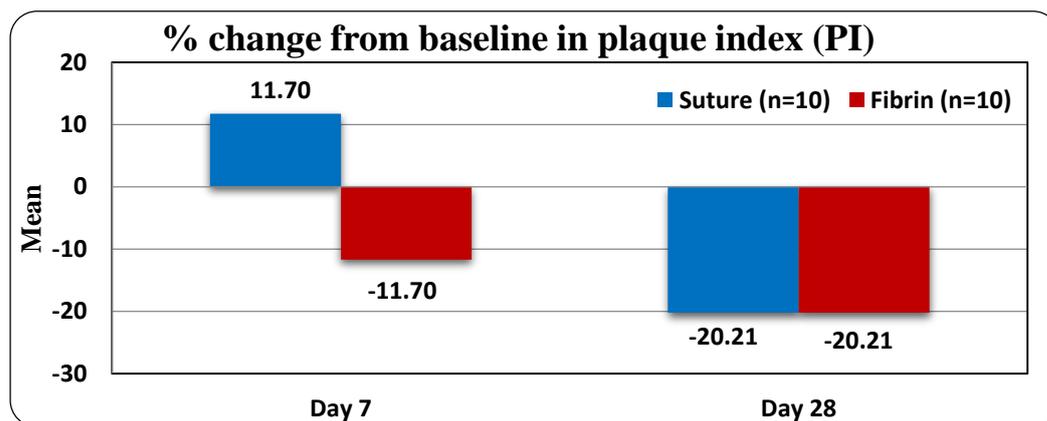
Score 0 : no bleeding at 1 min.

**GRAPHS:**

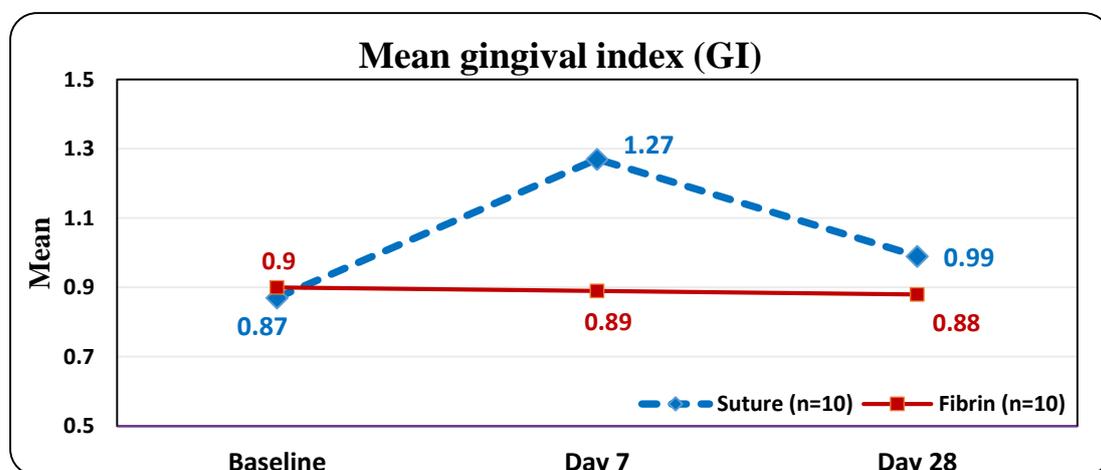
**Graph 1 (a): Mean plaque index:**



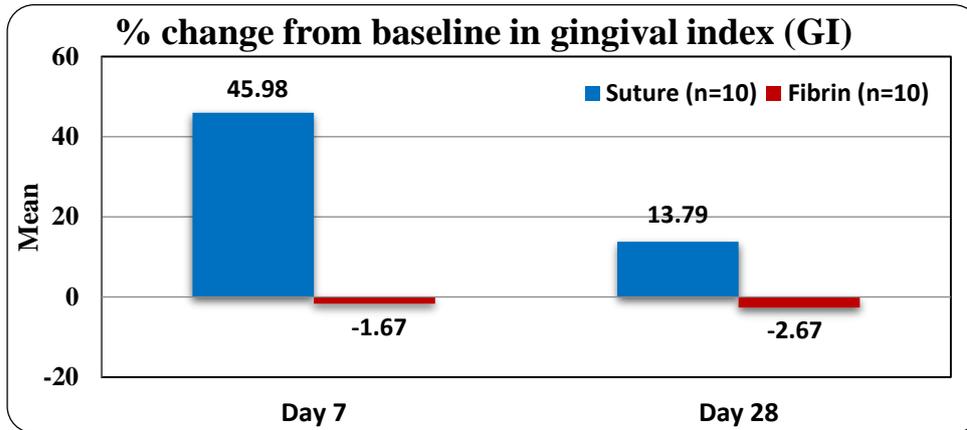
**Graph 1 (b): % change in plaque from baseline in plaque index:**



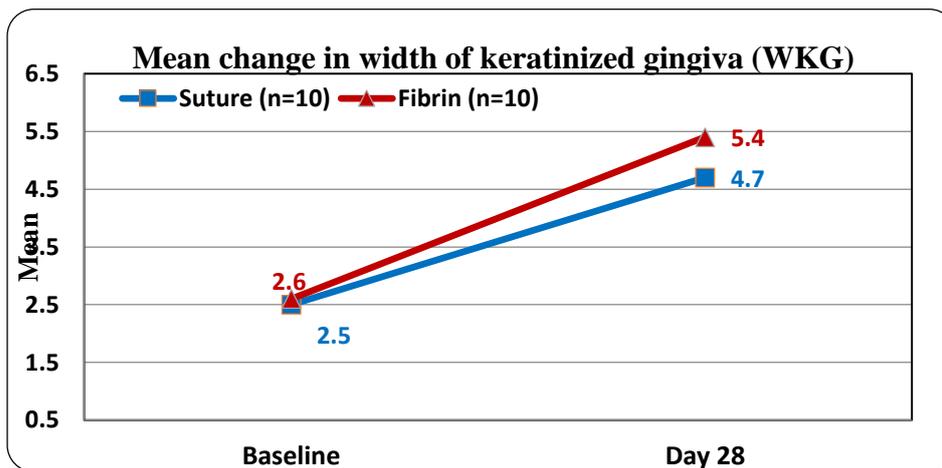
**Graph 2 (a): Mean gingival index:**



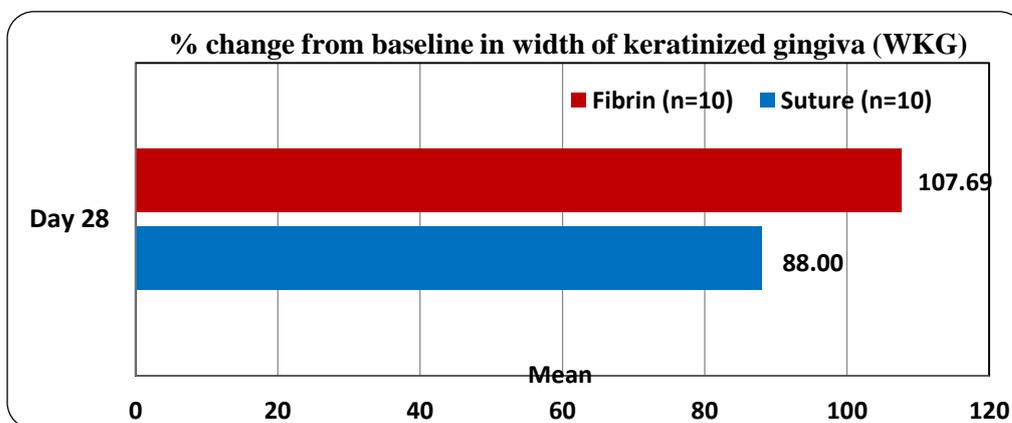
Graph 2 (b): % change from baseline in gingival index:



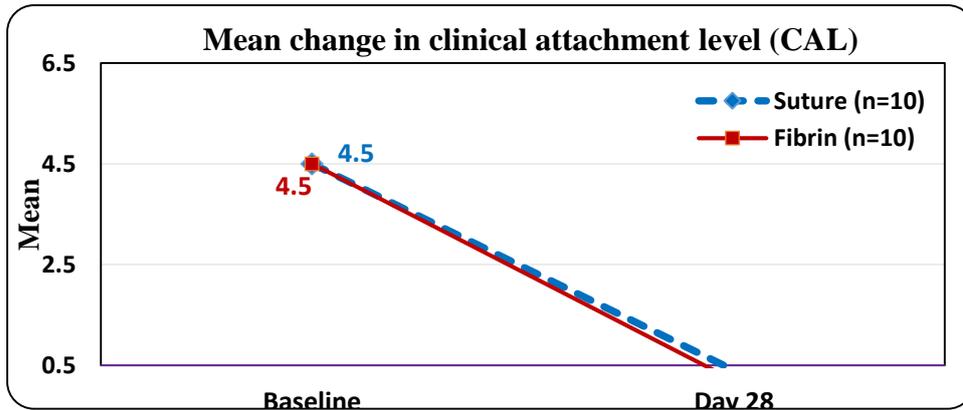
Graph 3 (a): Mean width of keratinized gingiva:



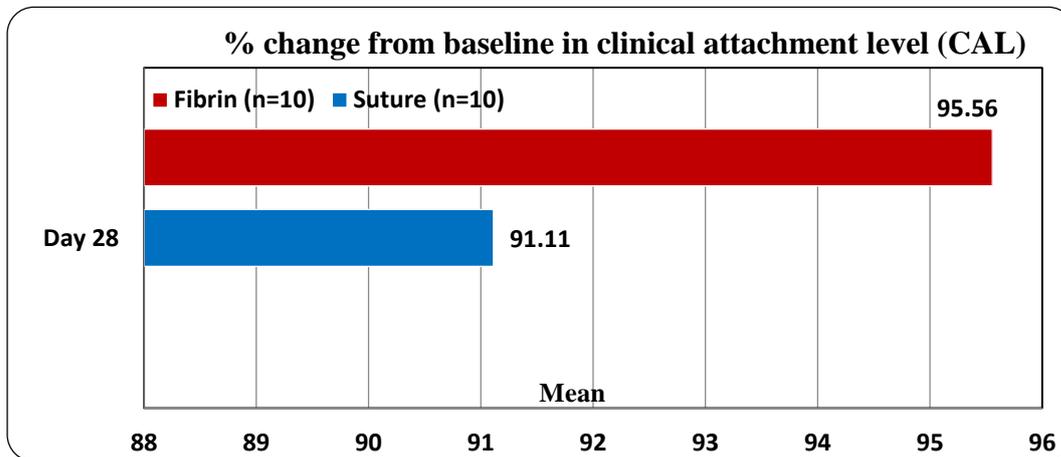
Graph 3 (b): % change in width of keratinized gingiva from baseline:



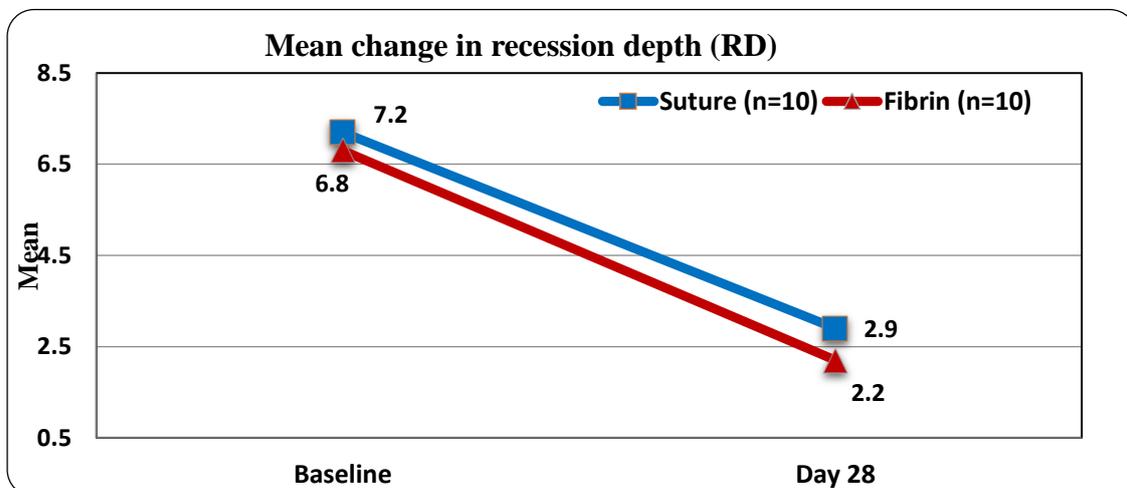
**Graph 4 (a): Mean clinical attachment level:**



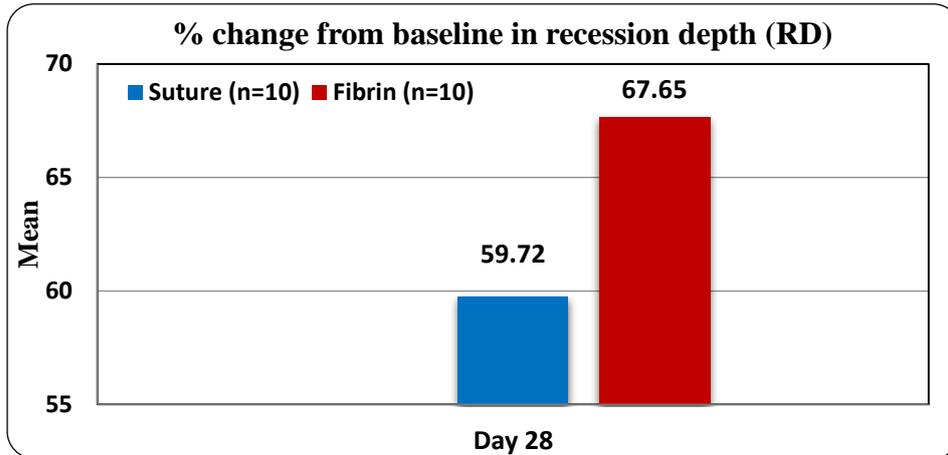
**Graph 4 (b): % change from baseline in clinical attachment level:**



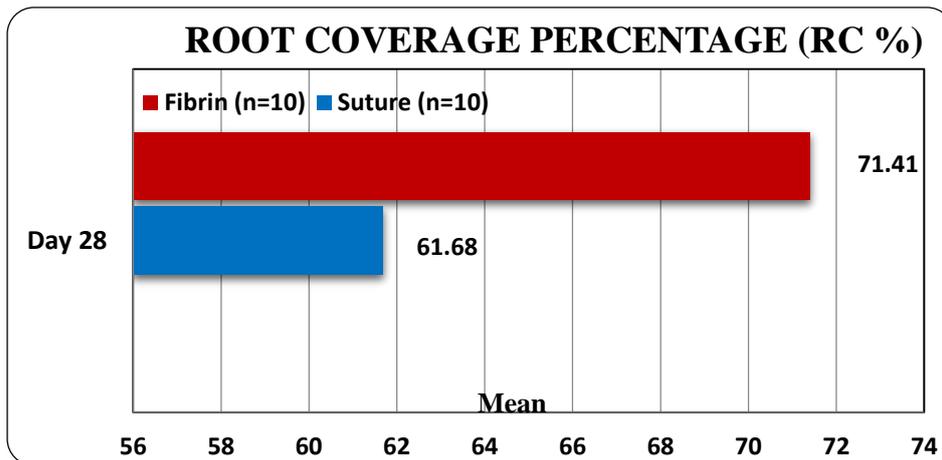
**Graph 5 (a): Mean recession depth:**



Graph 5 (b): % change from baseline in recession depth:



Graph 6 (a): Root coverage percentage:



## **DISCUSSION:**

Since the middle of the 20th century, different techniques have been developed to cover the denuded roots. One of the most acceptable techniques currently used for root coverage is the use of pedicle graft. Retained blood supply at such pedicle graft definitely enhances the success of root coverage procedures. Among the pedicle grafts, the use of coronally advanced flap for the root coverage has better treatment outcome over the other treatment modalities as it achieves the gain in keratinized gingiva, good amount of retained blood supply and the lesser technique sensitivity. Also the coverage obtained from coronally advanced flap procedure is highest when recession defect is augmented in combination with different available soft tissue graft/ membranes.

Fibrin sealant was first used to fix periodontal flaps and grafts in 1982. Later, the fibrin–fibronectin sealing system was used with guided tissue regeneration in the treatment of gingival recession. In 1996, it was used with coronally repositioned flap to treat

gingival recession defects. However, recently in 2003, it was used along with guided tissue regeneration to treat gingival recession, in experimental animals<sup>20</sup>.

Though the fibrin sealants have strong fibrin-fibronectin bond established well immediately after its placement, the feasibility for its isolated use has to be verified. Along with the flap stability provided by FFSS, the added advantages if any over the conventional sutures should be elaborated. To best of our knowledge, no study has been reported the use of fibrin sealant alone excluding the use any type of sutures in combination with pedicle graft for root coverage.

Hence, the purpose of this present study was to compare the clinical efficacy and the clinical stability of fibrin sealant system (Tisseel®) with non absorbable 4-0 surgical sutures in the treatment of localized gingival recession. Subjects suffering from systemic diseases such as diabetes mellitus or taking any immunosuppressive drugs

were excluded from the study as wound healing is almost always impaired in these patients. Only non-smokers were selected for the study because smokers respond less favorably than the non-smokers to the mucogingival therapy<sup>21</sup>.

Results obtained in intra-group comparison between baseline and on 7th day were contradictory with the results in the study done by Harris RJ in 2000, where he observed mean reduction in plaque scores while treating the recession defects with CAF by using acellular dermal matrix and CTG in split mouth study. This variation can be explained by the plaque retentive surface formation at the region of suture placement. Plaque may accumulate more in these areas in spite of giving other oral hygiene aids to the patient (patient instructed not to brush the treated area for at least a week.)

Findings of gingival index were in contrast with the results from the study done by Trombelli L. et al in 1996, where he found consistent fall in the gingival index scores. This change was may be because of strong inflammatory response of surgical sutures at suture sites and comparing the localized gingival index

scores.

Clinical attachment level (CAL) is another important clinical parameter which is more predictable and reliable in clinical research studies. In the present study, there was statistically highly significant ( $P < 0.001$ ) gain in clinical attachment in both the control and experimental groups when baseline CAL was compared to the 28 day CAL value. Similar trends were observed in study done by Ozcan G. in 2006 when the SCTG impregnated with PRP or fibrin-fibronectin was used in the treatment of localized gingival recession.

Recession depth (RD) is an important clinical parameters in the study of gingival recession treatment. Reduction in the mean RD will result into root coverage and restoration of esthetics. In the present study, the mean recession depth (RD) on the mid-facial surface was significantly ( $P < 0.001$ ) reduced in both the experimental groups when the baseline RD were compared with the 28 day post-operative values.

In the present randomized clinical study, the mean root coverage (RC) observed for the Experimental Site

A was 61.68% showing a range of 42% - 75%. However, the root coverage was further improved to 71.41% (in the range of 55-100%) for Experimental Site B. The previous clinical studies done by Jahnke PV in 1993 and Wennstorm JL in 1996 reported the root coverage between 65% and 98% which falls well within the range shown in the present study.

In the present study, the post-operative gain in the width of keratinized gingiva at control sites on 7 day and 28 day was observed as  $2.20 \pm 1.36$  mm (88%) and  $2.80 \pm 1.51$  mm (107.6%) respectively in control Site A. while experimental sites B (fibrin group) showed a mean increase of keratinized gingiva as  $2.80 \pm 1.78$  mm (107.6%), which was statistically highly significant ( $P < 0.001$ ). These findings were consistent with the previous studies conducted by Trombelli L. in 1996, Griffin TJ in 2004 where they obtained mean gain of 2.7 mm while restoring recession defects with CAF along with GTR membranes.

In almost all the cases treated with FFSS there was good adaptation of whole of the flap surface observed after

its coronal advancement. The flap surface was attached from the base till the margins which enhances the treatment outcome. In case of control sites (suture group), only marginal attachment of flap margins can be possible which increases the healing period at the treated site. This can be estimated from the scores of clinical stability which was recorded as score 1 for all the control sites which means flap was unstable at 5 minutes after approximation. All the experimental sites showed score 0 which reflects complete adaptation of flap.

These findings were well in consistent with one of the previous in vitro study done by Bouchard P. in 1997 to assess the attachment with fibrin-fibronectin system.

The post-operative bleeding scores in case of most of the control sites (suture group) were found to be 1 which denotes bleeding was present at that particular site 1 minute after flap advancement. In one patient the bleeding persisted after 5 minutes of flap advancement. On contrary, at experimental sites (fibrin group) the complete stoppage of bleeding achieved

after 1 minute of flap advancement which can be correlate with the haemostatic property of fibrin-fibronectin system. Findings of this study were well similar with the study done by Manimeglai A. in 2010 to compare suture with the fibrin glue.

No post-operative complications other than those considered normal following any surgical procedure on either site were noticed. Also no antigenic reactions were observed in any of the patients, thereby indicating the safety of TISSEEL<sup>®</sup>, and of the human thrombin used for activation of TISSEEL<sup>®</sup>.

#### **CONCLUSION:**

In case of clinical stability, fibrin glue provides complete adaptation and adherence of flap to the underlying structures form the base of flap till the margins which facilitate early healing and provides maximum fibroblast attachment. Suture can only provide marginal tissue fixation.

Thus, the haemostatic nature and the increased fibroblast attachment resulting in stable flap were the two

important properties of TISSEEL<sup>®</sup> fibrin-fibronectin system which gain an attention during the present study period.

#### **LIMITATIONS:**

1. Histological evaluation was not done due to ethical considerations.
2. The sample size was small and study period was short as it did not assess the long term effects

#### **RECOMMENDATIONS:**

1. A long term clinical trial, larger sample size, with histologic evaluation is recommended to evaluate the use of TISSEEL<sup>®</sup>. The application of TISSEEL<sup>®</sup> in combination with soft tissue grafts like connective tissue graft/free gingival grafts etc. for the treatment of localized gingival recession is recommended for better results.
2. Use of fibrin glue alone for approximation in case of soft tissue augmentation and under excess tension is not possible. In such cases, fibrin glue can be used to stick the soft tissue graft with underlying surface and to enhance the healing process for sure.

**The Authors:**

**\*Dr. Ninad Jamdade**

Post graduate student

Department of Periodontology

Bharati Vidyapeeth Dental College & Hospital, Navi Mumbai.

*Correspondence:*

*e-mail:* [drninadjamdade96@gmail.com](mailto:drninadjamdade96@gmail.com)

**\*\*Dr. Varsha Rathod**

Professor and Head

Department of Periodontology

Bharati Vidyapeeth Dental College & Hospital, Navi Mumbai

*Correspondence:*

*e-mail:* [drvarshavora92@gmail.com](mailto:drvarshavora92@gmail.com)



*The present study was self-funded and authors reported no conflicts of interest.*

**ACKNOWLEDGEMENT:**

The authors wish to thank all the staff of Department of Periodontics of Bharti Vidyapeeth Dental College and Hospital, Navi Mumbai for their constant support at needy times throughout the study period.

**REFERENCES:**

- 1) *Sullivan HC, Atkins JH.* Free autogenous gingival grafts. III. Utilization of grafts in the treatment of gingival recession. *Periodontics* 1968;6:152-160.
- 2) *Cohen DW, Ross SE.* The double papilla positioned flap in periodontal therapy. *J Periodontol* 1968;39:65-70.
- 3) *Grupe HE, Warren RF.* Repair of gingival defects by a sliding flap operation. *J Periodontol* 1956;27:290-295.
- 4) *Bernimoulin JP, Luscher B, Muhleman HR.* Coronally repositioned periodontal flap. *J Clin Periodontol* 1975;2:1-13.
- 5) *Edel A.* Clinical evaluation of free connective tissue grafts used to increase the width of keratinized gingiva. *J Clin Periodontol* 1974; 2: 185–196.
- 6) *Friedman N.* Mucogingival surgery. *Tex Dent J* 1957;75:358-362.
- 7) *Pierce GF, Mustoe TA, Altrock BW, Duel TF, Thomason A.* Role of platelet-derived growth

- factor in wound healing. *J Cell Biochem* 1991;45:319–326.
- 8) **Trombelli L, Scabbia A, Wikesjo UM, Calura G.** Fibrin glue application in conjunction with tetracycline root conditioning and coronally positioned flap procedure in the treatment of human gingival recession defects. *J Clin Periodontol* 1996;23:861-867.
- 9) **Miller PD.** Regenerative and reconstructive periodontal plastic surgery. *Mucogingival surgery. Dent Clin North Am* 1988;32:287–306.
- 10) **Allen E.P.** Use of mucogingival surgical procedures to enhance esthetics. *Dent Clin North Am* 1988; 32: 307-33.
- 11) **Jathal B, Trivedi A, Bhavsar S N.** Use of fibrin glue in periodontal flap surgery. *J Indian society of periodontology* 2008;12:121-25
- 12) **Bartolucci EP, Pini Prato GP.** Preliminary observations on the use of anbiologic sealing system (Tissucol®) in periodontal surgery. *J Periodontol* 1982;53:731–735.
- 13) **Pini Prato GP, Cortellini P, Clauser C.** Fibrin and fibronectin sealing system in a guided tissue regeration procedure. A case report. *J Periodontol* 1988;59:630–634.
- 14) **Trombelli L, Schincaglia G, Checchi L, Calura G.** Combined guided tissue regeneration, root conditioning, and fibrin-fibronectin system application in the treatment of gingival recession. A 15 case report. *J Periodontol* 1994;65:796-803.
- 15) **Trombelli L, Schincaglia GP, Zangari F, Griselli A, Scabbia A, Calura G.** Effects of tetracycline HCl conditioning and fibrin-fibronectin system application in the treatment of buccal gingival recession with guided tissue regeneration. *J Periodontol* 1995;66:313-320.
- 16) **Langer B, Langer L.** Subepithelial connective tissue

graft technique for root coverage.

J Periodontol 1985;56:715-720.

- 17) **Petrungaro PS.** Using platelet rich plasma to accelerate soft tissue maturation in esthetic periodontal surgery. *Compend Contin Educ Dent* 2001;22:1-10.
- 18) **Cheung WS, Griffin TJ.** A comparative study of root coverage with connective tissue and platelet concentrate grafts: 8-month results. *J Periodontol* 2004;75:1678-1687.
- 19) **Jan Lindhe;** Textbook of clinical periodontology and implant dentistry; 5<sup>th</sup> edition.
- 20) **Lynch SE, Genco RJ, Marx RE, eds.** Tissue engineering. Applications in Maxillofacial Surgery and Periodontics. Chicago: Quintessence Publishing Co., Inc.;1999;71 – 82.
- 21) **Woofter C.** The prevalence and etiology of gingival recession. *Periodont Abst* 1969;17:45-50.

