



Journal Homepage: -www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI:10.21474/IJAR01/16271
DOI URL: <http://dx.doi.org/10.21474/IJAR01/16271>



RESEARCH ARTICLE

A COMPARATIVE EVALUATION OF VESTIBULAR INCISION SUBPERIOSTEAL TUNNEL ACCESS (VISTA) VERSUS CORONALLY ADVANCED FLAP WITH COLLAGEN MEMBRANE FOR THE TREATMENT OF MILLER'S CLASS I AND CLASS II GINGIVAL RECESSION: A CLINICAL STUDY

Dr. Ritika Kabra, Dr. Lakshay Sethi, Dr. Vidya Sekhar, Dr. Sumit Malhotra, Dr. Anisha Kaul and Dr. Varun Tyagi

Manuscript Info

Manuscript History

Received: 15 December 2022
Final Accepted: 19 January 2023
Published: February 2023

Key words:-

Gingival Recession, Coronally Advanced Flap, Collagen Membrane, Vestibular Subperiosteal Tunnel Access

Abstract

Background: Gingival recession is defined as "The displacement of soft tissue margin apical to CEJ with exposure of root surface. Factors such as abnormal tooth alignment in the arch, fenestration, dehiscence, faulty tooth brushing, periodontal diseases etc. are few of the causes of gingival recession. The aim of the present study was to compare the effectiveness of minimally invasive Vestibular Incision Subperiosteal Tunnel Access (VISTA) technique and coronally advanced flap using a bioresorbable collagen membrane in Miller's Class I and II gingival recessions

Material and Methods: 20 sites with Millers Class I or II gingival recession were recruited and allocated into 2 groups with 10 sites each. Test group: VISTA with bioresorbable collagen membrane control group: CAF with bioresorbable collagen membrane. Plaque Index (PI), Gingival Index (GI), relative Clinical attachment level (CAL) Pocket Probing Depth (PPD) Recession Height (RH) and width of keratinized gingiva (WKG) Recession Width (RW) were measured at baseline 3 months and 6 months.

Results: A significant improvement was found in all the clinical parameters in the Test group from baseline to 3 months and 6 months Recession width reduction was significantly more in the Test group as compared to Control group. Conclusion: Both the groups, viz: VISTA with resorbable collagen membrane and CAF with resorbable collagen membrane were effective in the treatment of Miller's Class I and II gingival recessions VISTA being minimally invasive can be used for covering recession defects.

Copy Right, IJAR, 2023., All rights reserved.

Introduction:-

Periodontitis is defined as an inflammatory disease of supporting tissue of the teeth. It is characterised by pocket formation, recession or both.¹

Several surgical techniques exist to correct recession defects The Coronally advanced flap (CAF) is one of the time tested surgical methods opted for the treatment of Miller's Class I and Class II gingival recession. However, the vertical incisions used in CAF leads to impaired blood supply, increased healing time, and immediate postoperative scar formation.

To overcome the limitation of CAF technique, one of the newer techniques introduced by Zadeh in 2011 was the vestibular incision subperiosteal tunneling access, i.e., VISTA. Among the various determinants behind successful root coverage, maintenance of adequate vascular supply is one of the most important determinants.¹VISTA offers an advantage of easy access, single surgical site and reduced trauma in multiple gingival recession management.²

The goal of recession coverage is not merely the coronal advancement of gingiva on the denuded root surface but the formation of new attachment resulting in complete regeneration. This may be attempted by the additional use of bioresorbable collagen membrane as per Melcher's hypothesis.

Thus, the present study was undertaken to compare the effectiveness of minimally invasive Vestibular Incision Subperiosteal Tunnel Access (VISTA) technique and coronally advanced flap using a bioresorbable collagen membrane in Miller's Class I and II gingival recessions.

Material And Method:-

Source Of Data:

The study was conducted in the Department of Periodontology and Oral Implantology, ITS-CDSR, Muradnagar, Ghaziabad and was approved by the Institutional Ethical Committee.

Sample Size Estimation:

The sample size was calculated using Gpower software. The power of the study was kept at 80% and confidence interval was 95%.

Study Design:

The study was a structured parallel mouth, single-blinded randomized controlled clinical trial with a total of 20 sites with Miller's Class I or Class II GR. The age group of the selected patient was 18–50 years. The 20 sites were randomly assigned to the two groups i.e. 10 sites in each group. The two groups were as follows Test group (Vista with bioresorbable collagen membrane) and Control group (CAF with bioresorbable collagen membrane) by the toss of a coin.

The inclusion criteria consisted of systematically healthy individuals with Millers Class I and Class II gingival recession with good oral hygiene compliance and no history of smoking for the last 5 years. The exclusion criteria were Non vital tooth, Subjects who were on medication known to affect the periodontium or undergone surgical procedures in the past 3 months, with active infectious diseases (Hepatitis, tuberculosis, HIV infection etc), Pregnant and lactating mothers, Active tobacco users, High frenal attachment in the vicinity of the tooth.

Presurgical Procedures

The participants were informed regarding their condition and the treatment plan, and written consent was taken from the patient after explaining the aim of the project. All the patients received thorough supragingival and subgingival scaling and root planing and oral hygiene instructions was given to the patient. Patients were evaluated for optimum oral hygiene at the end of 1 week. All clinical parameters were recorded at baseline 3 months and 6 months.

Clinical Parameters:

Clinical parameters were recorded at baseline (just prior to the surgery) as well as at the 3rd month and 6th month for Test and Control Group using a UNC-15 probe. Custom-made self-cured acrylic stents grooved in an occlusoapical direction corresponding to the mid-buccal area as a fixed reference point was fabricated to provide reproducible alignments of the probe for each patient. The clinical parameters assessed were as follows: Plaque index (PI), Gingival index (GI), relative attachment level (RAL measured from fixed point on custom made stent to the most apical part of the sulcus), pocket probing depth (PPD)(PPD measured from free gingival margin to the most apical part of the sulcus), recession height (RH from CEJ to the crest of marginal gingiva), and width of keratinized gingiva (WKG measured at the mid buccal point from the free gingival margin to the mucogingival junction). Recession Width (RW) measured at CEJ.

Surgical Procedure:

After oral scrubbing with Betadine (Povidone iodine 5%), local anaesthesia (Xylocaine HCl 2% with 1:80.000 adrenaline) was administered. In the control group after obtaining adequate anaesthesia Coronally Advanced Flap was elevated. Resorbable collagen membrane (Periocol[®]) of corresponding shape and size was trimmed to fit

the dimensions of the surgical area. Once the membrane was properly positioned, the mucogingival complex was then advanced coronally and sutured to a new position with 4-0 Mersilk sling suturing technique.

In the test group the recessions were treated by the VISTA approach as proposed by Zadeh et al¹⁰ sufficiently beyond the mucogingival margin as well as through the gingival sulci of the teeth being augmented to allow for low-tension coronal repositioning of the gingiva. The Collagen membrane was inserted in to the prepared tunnel and positioned. The mucogingival complex was advanced coronally and sutured using the coronally advanced anchor suture while the interrupted suture technique was used to close the vertical access incision at the vestibule. This rigid fixation of gingival margins reduces micromotion and provides more favourable outcome.

After 1 week, the interrupted suture was removed while the coronally anchored suture were removed after 3 weeks.

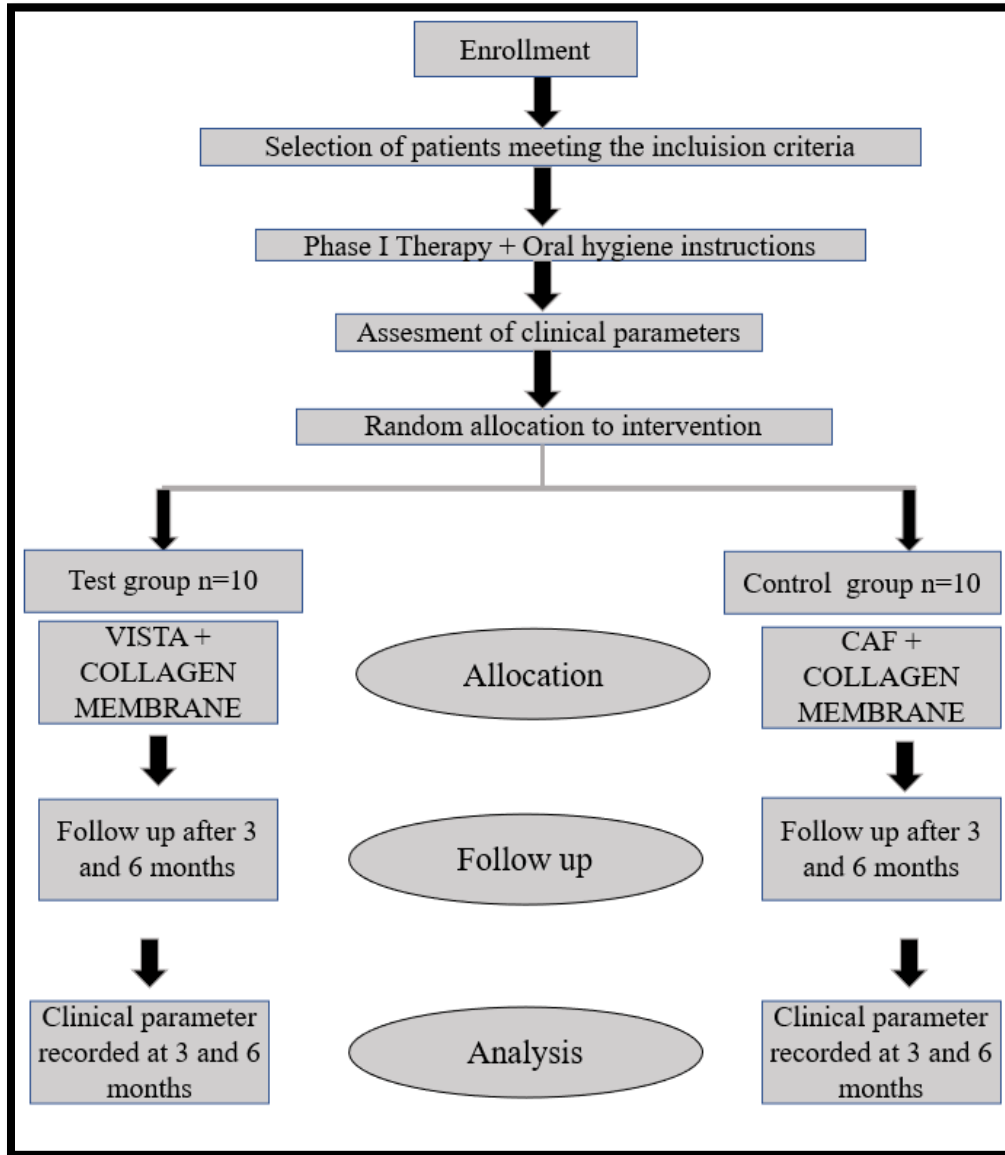


Figure 1:- Consort flow diagram showing study design; N - number of sites; VISTA - Vestibular Incision Subperiosteal Tunnel Access technique; CAF- Coronally Advanced Flap.

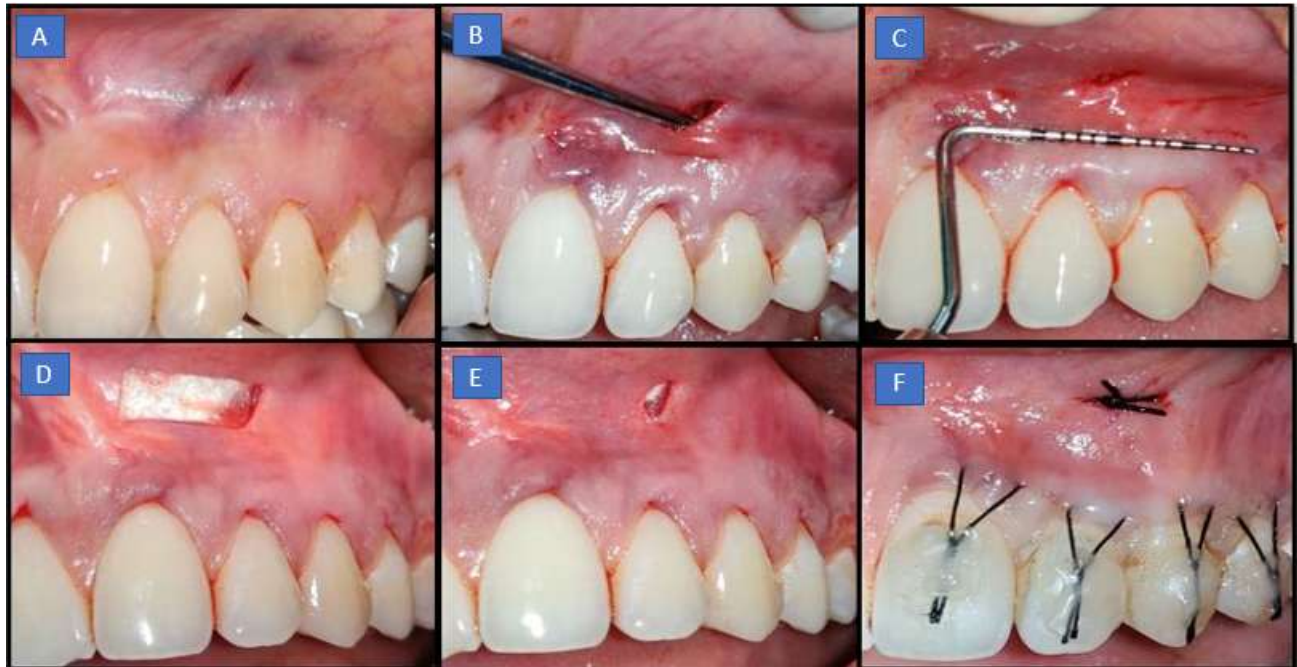


Figure 2:-Test Group A: vertical incision in the vestibule, B: Tunnel preparation, C :Coronally advancement to the mucogingival complex , D and E: insertion of the bioresorbable collagen membrane, F:coronally advanced anchor suture given.

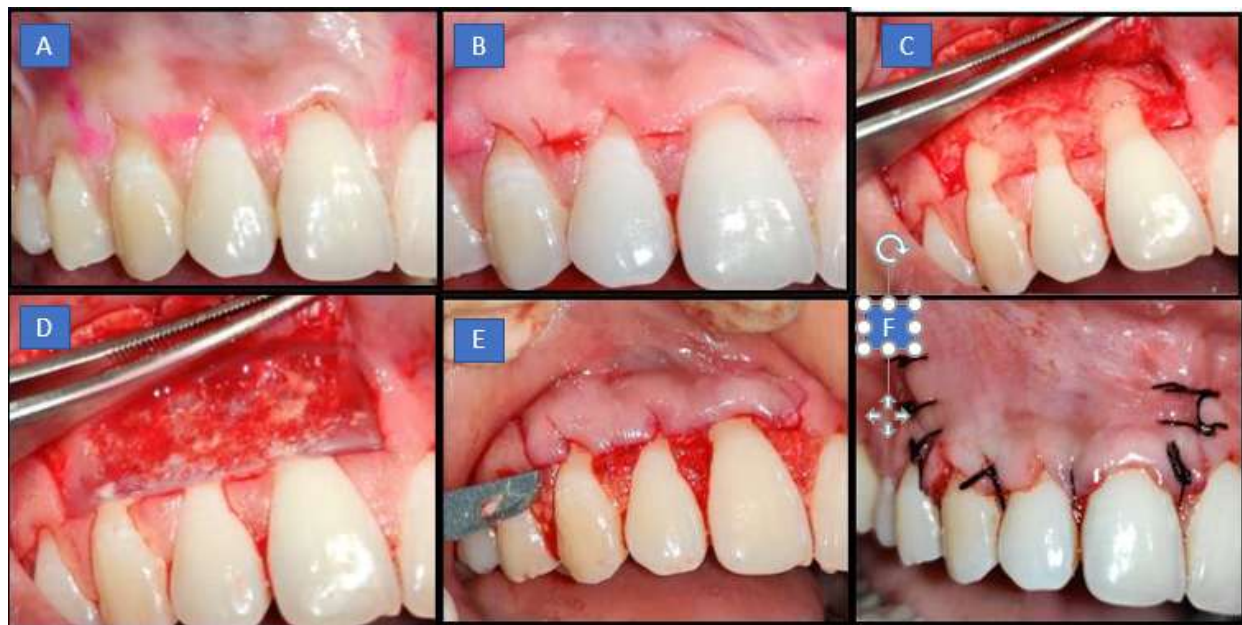


Figure 3:- Control Group: A: Incision line markings, B: Incisions , C: Flap reflection, D: placement of collagen membrane E:De-epithelization, F:Suturing



Figure 4:- Test Group : A: Baseline , B: 3 months follow up , C: 6 months follow up.



Figure 5:- Control Group:A: Baseline , B: 3 months follow up, C: 6 months follow up.

Results:-

The numerical data were statistically analysed using IBM SPSS Statistics 20.0. IBM® SPSS® Statistics 20.0. Since the data was normally distributed, Paired t-test was used for intragroup comparison and unpaired t-test for intergroup analysis maintaining the confidence interval at 95%. Mean, standard deviation, and test of significance were analysed in both the groups at baseline, 3 months and 6 months.

There was no significant difference in clinical parameters at baseline between the test and the control groups. A decrease in the PPD, RH and RW values while an increase in the WKG & RCAL values were observed and found to be statistically significant in both the groups as compared to baseline. On comparison between the two groups, at the various time intervals, better root coverage (statistically significant) in terms of RW was obtained in the test group. The other clinical parameters were non significant. at baseline, 3 months and 6 months but there was significant difference in RW values between Test group and Control group at baseline, 3 months and 6 months

There was a significant decrease in PPD WKG RCAL RH RW values from baseline to 3 months and 6 months for Test group

Table 1:- Intergroup And Intragroup Comparison Of Plaque Index.

CLINICAL PARAMETERS	TIME	TEST GROUP (MEAN ± SD)	CONTROL GROUP (MEAN ± SD)	p-value
PLAQUE INDEX (In mm)	Baseline	0.93 ± 0.24	0.72 ± 0.25	0.057
	3 months	0.83 ± 0.26	0.68 ± 0.17	0.131
	6 months	0.79 ± 0.24	0.65 ± 0.16	0.134
	p-VALUE	0.201	0.237	

* Significant difference (p<0.05)

student's paired and unpaired t test

Table 2:- Intergroup And Intragroup Comparison Of Gingival Index.

CLINICAL PARAMETERS	TIME	TEST GROUP (MEAN ± SD)	CONTROL GROUP (MEAN ± SD)	p-value
GINGIVAL INDEX (In mm)	Baseline	1.11 ± 0.39	1.21 ± 0.38	0.552
	3 months	0.87 ± 0.22	1.15 ± 0.22	0.079
	6 months	0.77 ± 0.33	0.98 ± 0.32	0.146
	p-value	<0.001*	<0.001*	

* Significant difference (p<0.05) student's paired and unpaired t test

Table 3:- Intergroup And Intragroup Comparison Of Pocket Probing Depth.

CLINICAL PARAMETERS	TIME	TEST GROUP (MEAN ± SD)	CONTROL GROUP (MEAN ± SD)	p-value
POCKET PROBING DEPTH (In mm)	Baseline	1.64 ± 0.50	1.55 ± 0.52	0.682
	3 months	0.73 ± 0.48	0.91 ± 0.31	0.291
	6 months	0.73 ± 0.51	0.91 ± 0.42	0.291
	p-value	<0.001*	<0.001*	

* Significant difference (p<0.05) student's paired and unpaired t test

Table 4:- Intergroup And Intragroup Comparison Of Width Of Keratinized Gingiva.

CLINICAL PARAMETERS	TIME	TEST GROUP (MEAN ± SD)	CONTROL GROUP (MEAN ± SD)	p-value
WIDTH OF KERATINIZED GINGIVA (In mm)	Baseline	4.64 ± 1.21	4.64 ± 0.67	1.000
	3 months	5.27 ± 0.90	5.09 ± 0.30	0.534
	6 months	5.27 ± 0.84	5.09 ± 0.47	0.534
	p-value	<0.001*	<0.001*	

* Significant difference (p<0.05) student's paired and unpaired t test

Table 5:- Intergroup And Intragroup Comparison Of Relative Attachment Level.

CLINICAL PARAMETERS	TIME	TEST GROUP (MEAN ± SD)	CONTROL GROUP (MEAN ± SD)	p-value
RELATIVE ATTACHMENT Level (In mm)	Baseline	9.73 ± 2.24	10.82 ± 1.99	0.24
	3 months	8.64 ± 2.16	9.82 ± 1.91	0.182
	6 months	8.64 ± 2.22	9.82 ± 1.88	0.182
	p-value	<0.001*	<0.001*	

* Significant difference (p<0.05) student's paired and unpaired t test

Table 6:- Intergroup And Intragroup Comparison Of Recession Height.

CLINICAL PARAMETERS	TIME	TEST GROUP (MEAN ± SD)	CONTROL GROUP (MEAN ± SD)	p-value
RECESSION HEIGHT (In mm)	Baseline	1.55 ± 0.69	1.82 ± 0.98	0.459
	3 months	0.45 ± 0.52	0.73 ± 0.73	0.349
	6 months	0.45 ± 0.70	0.73 ± 0.78	0.349
	p-value	<0.001*	<0.001*	

* Significant difference (p<0.05) student's paired and unpaired t test

Table 7:- Intergroup And Intragroup Comparison Of Recession Width.

CLINICAL PARAMETERS	TIME	TEST GROUP (MEAN ± SD)	CONTROL GROUP (MEAN ± SD)	p-value
RECESSION WIDTH (In mm)	Baseline	2.91±0.30	2.82±0.40	0.557
	3 months	0.55±0.69	2.09±0.67	0.001
	6 months	0.55±0.70	2.09±0.87	0.001
	p-value	<0.001*	<0.001*	

* Significant difference (p<0.05)

student's paired and unpaired t test

Discussion:-

Gingival recession and root exposure represent a therapeutic problem to the clinician and an esthetic and functional problem (hypersensitivity) to the patient. Chambrone had reported that CAF with subepithelial connective tissue graft (SCTG) is gold standard for achieving complete root coverage (CRC) in maximum cases being treated with multiple recession defects. However, CAF involves use of vertical releasing incisions (VRIs) which shows unesthetic results in the esthetic zone.³ From a biologic standpoint, VRIs might damage the lateral blood supply to the flap; this could be important in root-coverage procedures in which the stability of the surgical margin is critical for the success of the surgery. Furthermore, VRIs often result in unesthetic visible white scars that can be unsatisfactory for the patient. Hence, more recently there has been research for minimally invasive and aesthetically superior techniques for root coverage which include the tunnel and pouch preparation.⁴

As a consequence of these limitations, the approach of vestibular incision subperiosteal tunnel access (VISTA) was developed to avoid some of the potential complications of intrasulcular tunnelling techniques. VISTA was introduced by Zadeh in 2011 and involves a single vestibular incision through which multiple recession in the anterior can be accessed using specialized instruments and coronal advancement of the gingiva can be done.¹⁰

PI there was no significant difference in PI between Test group and Control group at baseline, 0.93 ± 0.24 and 0.72 ± 0.25 , 3 months 0.83 ± 0.26 and 0.68 ± 0.17 and 6 months. 0.79 ± 0.24 and 0.65 ± 0.16 ($p > 0.05$) Also, there was no significant change in PI values on intragroup comparison in both the groups ($p > 0.05$) These results may be attributed to reinforcement of oral hygiene and regular monitoring and compliance to the instructions rendered. These results are in accordance with the studies done by Bansal et al (2016)⁹ and Uraz et al (2015)

Pocket Probing Depth (PPD) at baseline for Test group and Control group was 1.64 ± 0.50 mm and 1.55 ± 0.52 mm, respectively. At 3 months, the mean PPD was found to be 0.73 ± 0.48 mm and 0.91 ± 0.31 mm for Test group and Control group, respectively; while at 6 months they were 0.73 ± 0.51 mm and 0.91 ± 0.42 mm, respectively. There was no significant difference in mean pocket probing depth between Test and Control group at baseline, 3 months and 6 months. ($p > 0.05$) There was a significant reduction in PPD values from baseline to 3 and 6 months, in both Test and Control group.

Technical differences exist between the two techniques. Some of the advantages of preferring VISTA to CAF include use of a tunnelling flap preparation that avoids any releasing incisions resulting in better healing and clinical outcomes. The CAF procedure was however carried out with vertical releasing incisions; assumed to hamper the vascularization of the elevated periodontal flap which might impair healing. VISTA and CAF technique both allow for the management of multiple recession defects.⁵ However only the VISTA technique maintains papillary integrity resulting in an unhampered blood supply and thereby faster healing. The rigid fixation of the gingival margins introduced with the present coronally anchored suturing technique minimizes micromotion of the regenerative site.⁶ Reduction of micromotion has proven to be a major advantage of the VISTA technique. Additionally, in VISTA technique, all the detachments are subperiosteal and incisions are far from the gingival margin, which minimizes the risk of marginal tissue loss. Subperiosteal tissue detachment also enhances coronalization of the flap and prevents gingival margin stretching when the graft is located beneath the flap.¹¹⁻¹²

Certain limitations of our study include small sample size, histological analysis which was not done in our study. Certain authors also suggest that the gingival biotype increases after using the vista technique. However, we have not evaluated the gingival biotype in our study. Healing index and patients VAS score to assess intra operative as well as postoperative pain during the procedure could have been estimated to assess the patients' acceptability of both the procedures. In our study, follow up was done at 3 months and at 6 months.

Conclusion:-

Within the limitations of the present study, it can be concluded that VISTA technique can be successfully used for root coverage in the treatment of Miller's Class I and II GR defects. With no complications encountered in any patient who participated in this study. Both the groups resulted in improvement in clinical parameters with the considerable promise for root coverage. Hence the VISTA technique, a minimally invasive technique, could be more routinely used for the treatment of Miller's Class I and Class II recession.

References:-

1. Saini R, Marawar PP, Shete S, Saini S. Periodontitis, a true infection. *J Glob Infect Dis* 2009 ;1(2):149-50.
2. The American Academy of Periodontology. Glossary of periodontal terms, 4th ed. Chicago: The American Academy of Periodontology; 2001.
3. Kassab MM, Cohen RE. The etiology and prevalence of gingival recession. *J Am Dent Assoc* 2003;134(2):220-5.
4. Albandar JM, Kingman A. Gingival recession, gingival bleeding, and dental calculus in adults 30 years of age and older in the United States, 1988–1994. *J Periodontol* 1999;70:30–43.
5. Rocuzzo M, Bunino M, Needleman I, Sanz M. Periodontal plastic surgery for treatment of localized gingival recessions: a systematic review. *J Clin Periodontol* 2002; 29(3):178–94.
6. Jepsen K, Jepsen S, Zucchelli G, Stefanini M, de Sanctis M, Baldini N :Treatment of gingival recession defects with a coronally advanced flap and a xenogeneic collagen matrix: a multicenter randomized clinical trial, *J Clin Periodontol* 2013;22(1): 31-43.
7. Trombelli L, Scabbia A, Tatakis DN, Checchi L, Calura G. Resorbable barrier and envelope flap surgery in the treatment of human gingival recession defects. Case reports. *J Clin Periodontol* 1998 ;25(1):24-9
8. Guided Tissue Regeneration- Based Root Coverage; Meta Analysis *J Periodontol* 2003; 74:1520-1533.
9. Burns W, Peacock M, Hokett S. Case Report Gingival Recession Treatment Using a Bilayer Collagen Membrane Case Report. *J Periodontol* 2000;71(8):1348-1352. 114
10. Zadeh HH. Minimally invasive treatment of maxillary anterior gingival recession defects by vestibular incision subperiosteal tunnel access and platelet-derived growth factor BB. *Int J Periodontics Restorative Dent* 2011;31:653-660
11. Shkreta M, Atanasovska-Stojanovska A, Dollaku B, Belazelkoska Z. Exploring the Gingival Recession Surgical Treatment Modalities: A Literature Review. *Open Access Maced J Med Sci*. 2018 2;6(4):698-708
12. Loe H, Listgarten MA. In *Periodontal therapy* by Goldman HM and Cohen DW, 6th Ed, CV Mosby Co, 1980: P-1.