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Research Article

COMPARATIVE EVALUATION OF THREE DIFFERENT TYPES OF RESORBABLE MEMBRANES IN GRADE II FURCATION DEFECT-A CLINICO-RADIOGRAPHIC STUDY

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A R T I C L E I N F O

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A B S T R A C T

Various periodontal regenerative materials have been used for periodontal regeneration to treat periodontal diseases successfully. Apart from nonsurgical treatment, Surgical periodontal regeneration also plays a vital role in treating periodontal diseases. Stem cell Biology and Regenerative Medicine have been proved very useful in the field of periodonticsas tissue engineering and genetic therapy in periodontal regenerative therapy. Amniotic membrane has a wide range of benefits in periodontal regenerative therapy as it eliminates scarring and inflammatory condition, also improves wound healing, and also works as a scaffold for tissue regeneration, apart from these it also great antimicrobial properties and can be easily procured from the source, processed, can be stored and transported easily.

INTRODUCTION

Periodontal disease is a chronic inflammatory condition that occurs in response to predominantly bacterial infection originating from dental plaque. Before 1950 periodontitis was treated mostly by tooth extraction .Until 1980s, the most commonly used treatment consisted of scaling and root planing followed by resective surgery aimed at achieving zero pocket depth. During the 1980s the data obtained demonstrated that neither resective surgery nor non surgical therapy results in significant regeneration of periodontal attachment [1]. Regeneration by grafting may be further enhanced by use of barrier membrane (resorbable and non resorbable membranes) that exclude gingival fibroblast and epithelium from healing site. The successful periodontal regeneration results in the formation of functional epithelial seal, insertion of new connective tissue fibres into the root, reformation of new acellular cementum on the root surface, and restoration of alveolar bone height. The complex events associated with periodontal regeneration involve recruitment of locally derived progenitor cells that can differentiate into periodontal ligament cells, mineral forming cementoblasts or bone forming osteoblasts [2,3].

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Advances in stem cell biology and regenerative medicine have presented opportunities for tissue engineering and gene based approaches in periodontal therapy[4,5].

Human amniotic membrane has been used successfully in medical field for over 70 years. First use of foetal membrane as a skin substitute was reported by Davis in 1910 [6].These new approaches offer interesting alternating to existing therapies for the repair and regeneration. Application of amniotic membrane include chemical or thermal burns, correction of corneal epithelial defects, neutrophic corneal ulcers, leaking blebs after glaucoma surgery, reconstruction of conjunctival and ocular surfaces, ocular cicatricialpemphigoid or Steven Johnson syndrome. These membranes have also been used in furcation defects, intrabony defects and gingival recession coverage [7].

In the field of dentistry amniotic membrane has gained importance day by day because of various beneficial properties like it reduces scarring, inflammation ,enhances wound healing ,serves as a scaffold for tissue regeneration ,has antimicrobial properties and can be easily procured, processed, stored and transported [7]. Regenerative medicine is an emerging era based on the concept to regenerate lost tissue either by transplanting exogenous or stimulating endogenous stem cells and also improve functions .The amniotic epithelial cells are multipotent cells which have ability to differentiate into other cellular elements which have the capabilities to stimulate the

repair of injured tissues. After parturition the amniotic membrane is usually discarded, can be processed, stored and used for further clinical applications in tissue engineering, cell transplantation therapy and periodontal regeneration.

MATERIALS AND METHODS

In this study a total of 15 patients both males and females , in the age group of 18 -60 years with buccal grade II furcation defects in the mandibular and maxillary molars were selected and allotted randomly into group A (Bone graft and amniotic membrane), Group B(bone graft and chorionic membrane) and Group C (bone graft and collagen membrane) . The criteria for selection were: Patients with no medical history or use of any medications in the period of least 6 months were selected. Patients showing furcation defect in the molar region in the radiograph were taken for the research. All the patients involved in the research were given information regarding their condition and treatment which was planned for them, and appropriate oral hygiene instructions were given to each and informed consent was obtained from each patient involved in the research.

Clinical Data Collection

At baseline as well as 1 month and 3 months post operatively , Periodontal status was recorded .Oral hygiene index (simplified), Loe and Silnessgingival index were the indices used along with furcation measurements: horizontal component (Glickman 1958) and Vertical component measurement(Tarnow and Fletcher 1984).Measurements were recorded using Williams periodontal probe and Nabers probe. Each patient was randomly allocated to group A (Bone graft and amniotic membrane, Group B (bone graft and chorionic membrane) and Group C (bone graft and collagen membrane). Intra Oral Periapical radiograph (IOPA) with grid that was taken at baseline and 3 months after surgery Radiographic measurements included: CEJ to the crest of the alveolar bone(horizontal dimension), CEJ to base of defect(vertical dimension), IBD(intra bony defect) and furcation fornix to bone level.

Presurgical Procedure

Thorough scaling and Root Planing was performed before periodontal flap surgery was done, followed by Oral hygiene instructions. All the participants were recalled after two weeks for surgery. IOPA with grid were taken for all 3 groups ,this was carried out at the baseline and 3 months post operatively .

Surgical Management

Two weeks after scaling and root planing and just prior to the surgical procedure each subject was re-examined and baseline data were recorded. After administering local anaesthesia (2%lignocaine 1:1,80,000), a crevicular incision was given on the buccal and lingual aspect of the tooth mesial and distal to the involved tooth .Full thickness Mucoperiosteal flap was then elevated by blunt dissection using a periosteal elevator. The granulation tissue was removed in the furcation defect and thorough debridement was carried out with curettes and an ultrasonic scaler, to ensure a clean site for incorporation of the bone graft material and membrane. Appropriate amount of bone graft was taken in a container and transferred to the sterilised dappendish to which a few drops of saline wasadded. The contents were then mixed with the blunt instrument and transferred to the defect with a plastic filling instrument and condensed. Before placing the membrane at the site, a sterile surgical template was applied and approximated for extensions and trimmed accordingly .The defect was filled with the bone graft, collagen membrane was removed from sterile package and was compared with the surgical template and reduced to the template dimensions .The collagen membrane was soaked in the normal saline solution to improve its adhesion properties as recommended by manufacturer. A coronal portion of the membrane was tightly secured to the cement enamel junction of the tooth using sling technique, with resorbablevicryl 4-0 suture Whereas amniotic and chorionic membrane were placed directly onto the defect site. It was subsequently adapted over the defect extending 2-3 mm apical to the crest of the existing bone, so as to provide stability during the placement. The flap was secured with single interrupted suture to obtain primary closure. Patients were seen at end of 1 st week when the suture was removed and were instructed to use 10 ml of 0.2% chlorhexidine mouthwash twice daily for 4 weeks .They were asked not to brush their teeth in the surgical area for a period of 3 weeks .Clinical measurements were assessed after 3 months.(FIG 1-22)

Group A (Amniotic Group)

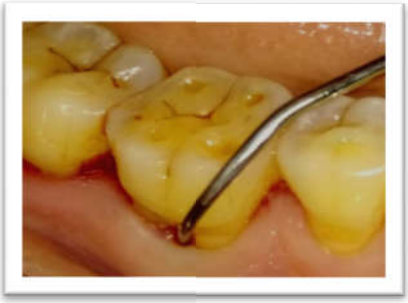


Fig 1 pre-operative grade ii furcation wrt 46

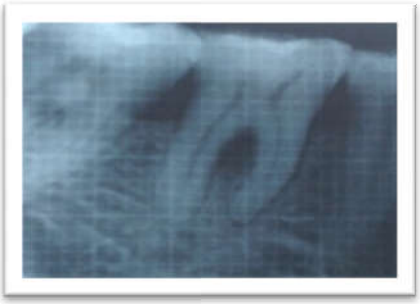


Fig 2 iopa w.r.t 46

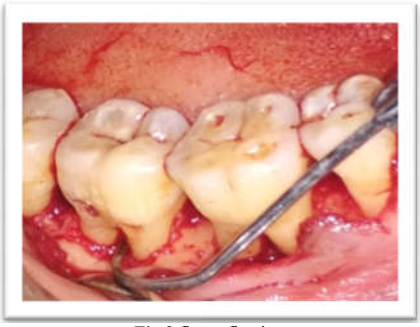


Fig 3 flap reflection

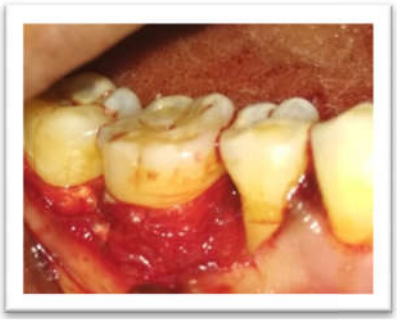


Fig 4 Amniotic Membrane Placement

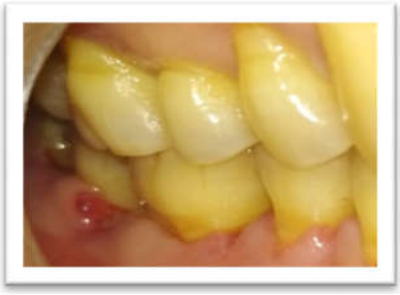


Fig 5 re-evaluation after 1 week

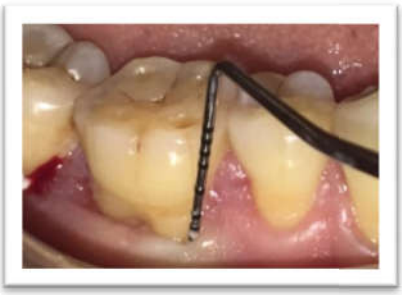


Fig 6 &7 (re-evaluation after 3 months ppd and cal)

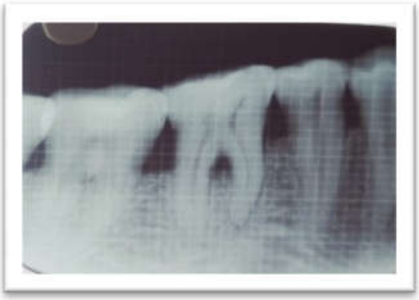


Fig 8 re-evaluation after 3 months iopa showing bone fill

Group B (Chorionic Group)

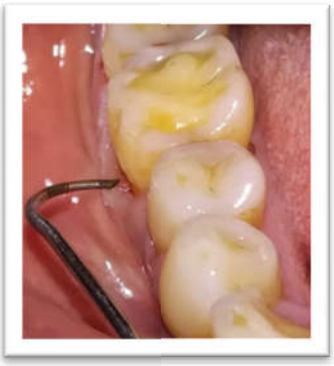


Fig 9 Pre Operative Furcation Measurement

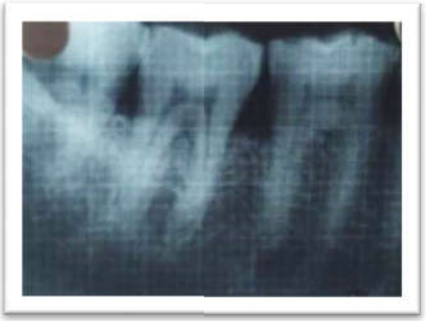


Fig 9 preoperative iopa 46

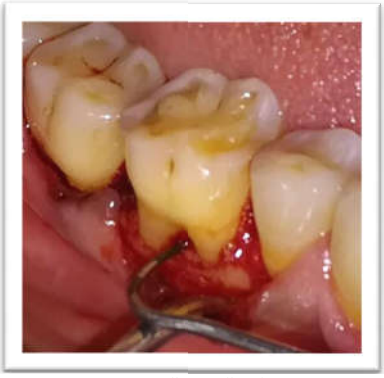


Fig 10 flap reflection

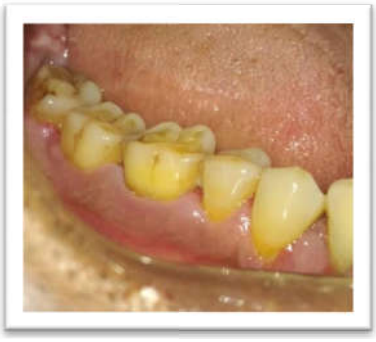


Fig 13 re- evaluation after 3 months

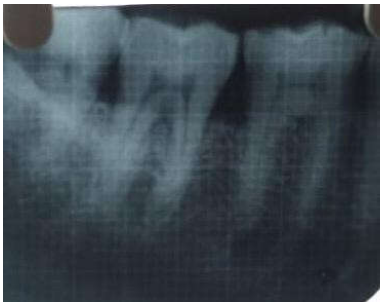


Fig 14 re- evaluation after 3 months iopa showing bone fill

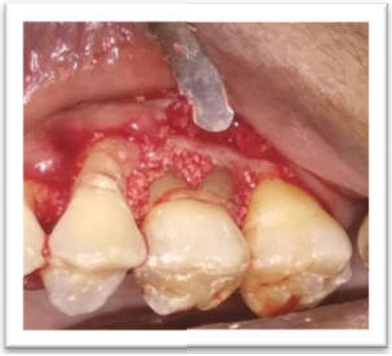


Fig 19 bone graft placement

Group C(Collagen Group)

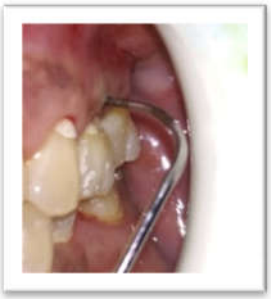


Fig 15 Grade Ii Furcation Involment

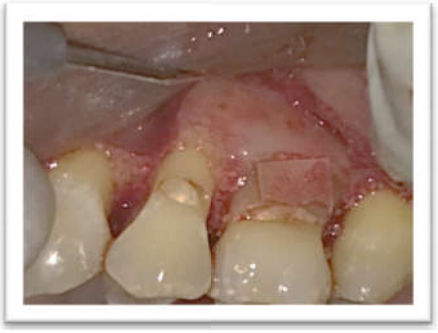


Fig 20 collagen membrane placed

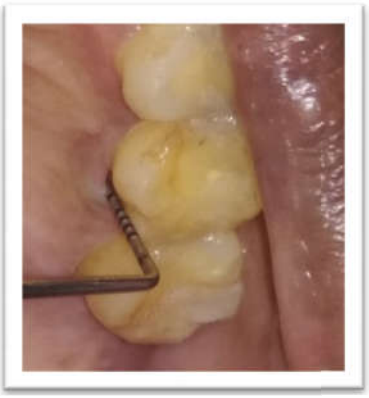


Fig 16 preoperative ppd

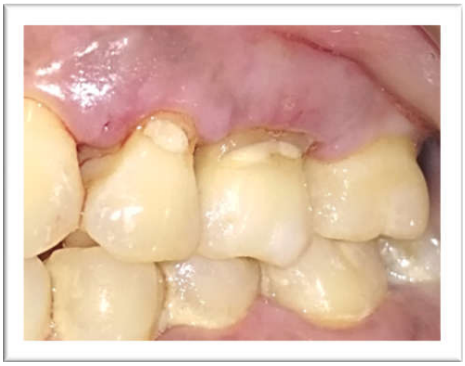


Fig 21 re-evaluation after 1 week

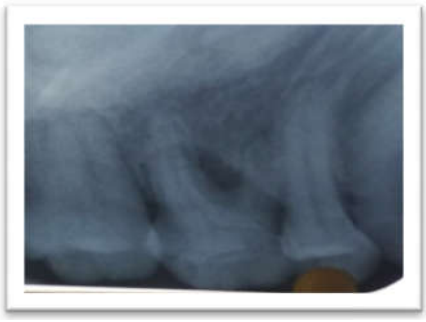


Fig 17 preoperative iopa

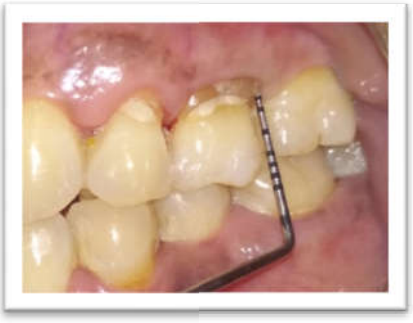


Fig 22 re-evaluation after 3 months

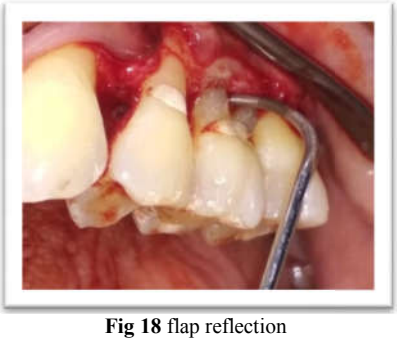


Fig 18 flap reflection

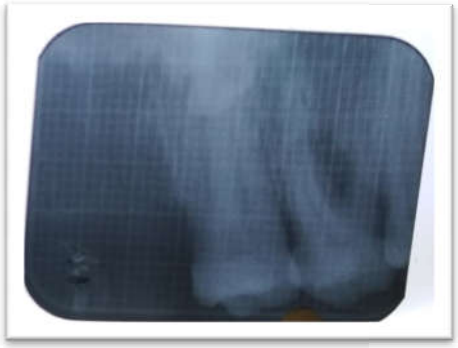


Fig 23 re-evaluation after 3 months iopa showing bone fill

Statistical Analysis

Data was analyzed using the statistical package SPSS 22.0 (SPSS Inc., Chicago, IL) and level of significance was set at $p<0.05$. Descriptive statistics was performed to assess the mean and standard deviation of the respective groups. Normality of the data was assessed using Shapiro Wilkinson test. Inferential statistics to find out the difference between the groups was done using One way ANOVA test

Table 1 Pre Post Comparison –Amniotic Membrane

Variable	Baseline	3 Months	P Value	Difference (Baseline -3 months)
GI	1.6±0.547	0.3±0.447	0.003*	1.3±0.1
OHIS	1.72±0.593	0.8±0.273	0.013*	0.92±0.32
FM	4.2±1.095	0.6±1.341	0.001*	3.6±0.246
PPD	7.8±0.836	1.8±0.836	0.001*	6±0
CAL	1.6±1.141	0.8±1.304	0.378	0.8±0.163

*p<0.05 is statistically significant(student t test)
T test analysis between baseline post mean values of outcome variables showed significant changes (p<0.05)except CAL(p>0.05) in AMNIOTIC MEMBRANE group

Table 2 Pre Post Comparison –Chorionic Membrane

Variable	Baseline	3 Months	P Value	Difference(Baseline -3 months)
GI	1.6±0.547	1±0	0.03*	0.6±0.547
OHIS	1.6±0.547	1±0	0.03*	0.6±0.547
FM	5±1	0±0	0.001*	4±1
PPD	7.2±1.788	1.6±0.547	0.001*	5.6±1.241
CAL	2.4±0.547	0.2±0.447	0.001*	2.2±0.1

*p<0.05 is statistically significant (student t test)
T test analysis between baseline post mean values of all outcome variable showed significant changes (p<0.05) in Chorionic Membrane group.

Table 3 Pre Post Comparison –Collagen

Variable	Baseline	3 Months	P Value	Difference(Baseline -3 months)
GI	1.6±0.547	1±0	0.039*	0.6±0.547
OHIS	1.6±0.547	1±0	0.039*	0.6±0.547
FM	4.4±1.516	0.8±1.09	0.002*	3.6±0.426
PPD	8.6±1.673	1.8±0.83	0.001*	6.8±0.843
CAL	1.4±1.341	1.6±1.141	0.851	-0.2±0.2

*p<0.05 is statistically significant (student t test)
T test analysis between baseline post mean values of outcome variables showed significant changes (p<0.05)except CAL(p>0.05) in COLLAGEN group

Table 4 Baseline Comparison Between The Groups

Groups	Gi	OHIS	Fm	PPD	CAL
Amniotic Membrane	1.6±0.547	1.72±0.593	4.2±1.095	7.8±0.836	1.6±1.141
Chorionic Membrane	1.6±0.547	1.6±0.547	5±1	7.2±1.788	2.4±0.547
Collagen	1.6±0.547	1.6±0.547	4.4±1.516	8.6±1.673	1.4±1.341
P Value	1	0.927	0.573	0.361	0.386

*p<0.05 is statistically significant (One way ANOVA test)
ONE WAY ANOVA analysis of mean values of outcome variables at baseline between three different groups showed no significant changes (p>0.05)

Table 5 Post Comparison Between The Groups

GROUPS	GI	OHIS	FM	PPD	CAL
Amniotic Membrane	0.3±0.447	0.8±0.273	0.6±1.341	1.8±0.836	0.8±1.304
Chorionic Membrane	1±0	1±0	0±0	1.6±0.547	0.2±0.447
Collagen	1±0	1±0	0.8±1.09	1.8±0.83	1.6±1.141
P Value	0.005*	0.104	0.428	0.88	0.141

*p<0.05 is statistically significant(One way ANOVA test)
ONE WAY ANOVA analysis of mean values of outcome variables at 30 days between three different groups showed significant changes only with respect to GI (p<0.05)

Table 6 Pre Post Comparison –Amniotic Membrane

Variable	Baseline	3 Months	P Value	Difference(Baseline -3 months)
CEJ-Crest(Hd)	4.8±0.836	3.6±0.547	0.018*	1.2±0.289
CEJ-Base OF defect(VD)	5.8±0.836	4.6±0.547	0.026*	1.2±0.289
IBD(VD-HD)	1±0	1±0	1	0
DF(VD AT Baseline-VD AT 3 Months)	-	1.2±0.447	-	-
Fx –BL(Furcation-fornix bone level)	2.2±1.643	1.2±1.036	0.285	1±0.607

*p<0.05 is statistically significant (student t test)
T test analysis between baseline post mean values of outcome variables showed significant changes only with resprct to HD &VD values (p<0.05) in AMNIOTIC MEMBRANE group

Table 7 Pre Post Comparison-Chorionic Membrane

Variable	Baseline	3 Months	P Value	Difference(Baseline -3 months)
CEJ-Crest(HD)	5.4±0.894	4±0.707	0.018*	1.4±1.036
CEJ-BASE OF Defect(VD)	6.6±0.547	4.8±0.447	0.001*	1.8±0.1
IBD(VD-HD)	1.2±0.347	0.8±0.26	0.296	0.4±0.087
DF(VD AT Baseline-VD AT 3 Months)	-	1.8±0.447	-	-
Fx –BL(Furcation-fornix bone level)	1.6±0.547	1.1±0.547	0.181	0.5±0

*p<0.05 is statistically significant(student t test)
T test analysis between baseline post mean values of outcome variables showed significant changes only with resprct to HD &VD values (p<0.05) in CHORIONIC MEMBRANE group.

Table 8 Pre Post Comparison-Collagen

Variable	Baseline	3 Months	P Value	Difference(Baseline -3 months)
CEJ-Crest(HD)	4.6±0.894	3.2±0.836	0.03*	1.4±0.058
CEJ-BASE OF Defect(VD)	5.8±0.836	4.4±0.547	0.013*	1.4±0.289
IBD(VD-HD)	1.2±0.058	1.2±0.289	1	0±0.231
DF(VD AT Baseline-VD AT 3 Months)	-	1.4±0.547	-	-
Fx –BL(Furcation-fornix bone level)	1.6±0.894	0.8±0.273	0.09	0.8±0.621

*p<0.05 is statistically significant(student t test)
T test analysis between baseline post mean values of outcome variables showed significant changes only with resprct to HD &VD values (p<0.05) in COLLAGEN group.

Table 9 Pre Comparison Between The Groups

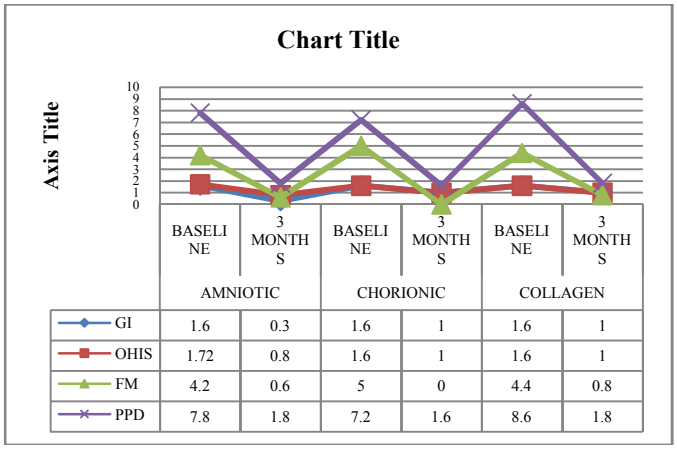
Groups	CEJ-Crest (HD)	CEJ-Base of Defect (VD)	IBD(VD-HD)	DF(VD AT Baseline-VD AT 3 months)	Fx – BL(Furcation-fornix bone level)
Amniotic Membrane	4.8±0.836	5.8±0.836	1±0	-	2.2±1.643
Chorionic Membrane	5.4±0.894	6.6±0.547	1±0	-	1.6±0.547
Collagen	4.6±0.894	5.8±0.836	1±0	-	1.6±0.894
P Value	0.343	0.189	1	-	0.62

*p<0.05 is statistically significant(One way ANOVA test)
ONE WAY ANOVA analysis of mean values of outcome variables at baseline between three different groups showed no significant changes (p>0.05)

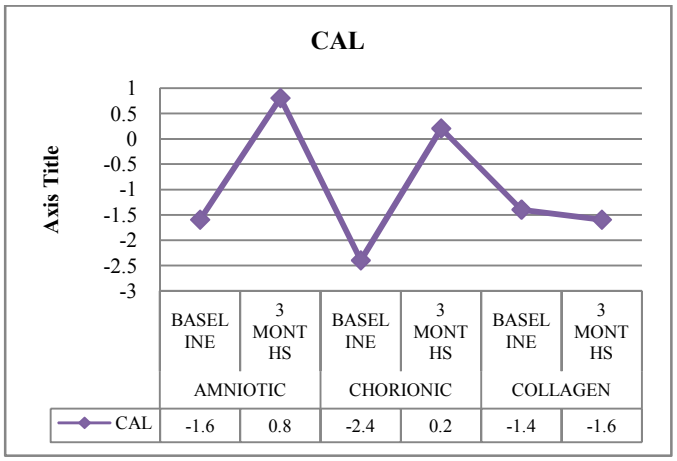
Table 10 Post Comparison Between The Groups

Groups	CEJ-Crest(HD)	CEJ-Base Of Defect(VD)	IBD(VD-HD)	DF(VD AT Baseline-VD At 3 Months)	Fx – BL(Furcation-fornix bone level)
Amniotic Membrane	3.6±0.547	4.6±0.547	1±0	1.2±0.447	1.2±1.036
Chorionic Membrane	3.8±0.836	4.8±0.447	0.8±0.447	1.8±0.447	1.1±0.547
Collagen	3.2±0.836	4.4±0.547	1±0	1.4±0.547	0.8±0.273
P VALUE	0.456	0.483	0.385	0.169	0.644

*p<0.05 is statistically significant(One way ANOVA test)
ONE WAY ANOVA analysis of mean values of outcome variables at 30 days between three different groups showed no significant changes (p>0.05)



Graph 1 Pre Post Comparison



Graph 2

DISCUSSION

The management of furcation involvement presents one of the greatest challenges in periodontal therapy. Furcation involved molar teeth responds less favorably to conventional periodontal therapy and molars are lost more often than any other tooth [8].

Among the factors that make molars particularly susceptible to periodontal disease include accumulation of bacterial plaque. Access to the furcation areas is further complicated by the posterior location of the molars, shape and dimension of the debriding instrument [9], root and furcation anatomy .

Use of osteoconducting and inductive graft material, underfavorable conditions, can induce roughly 60-70% regeneration of the bone lesions or volume, with improvement in the clinical conditions[10].Regeneration by grafting maybe further enhanced by the use of barrier membrane that exclude gingival fibroblasts and epithelium from the healing site. It has also been showed that the GTR procedure , using membranes ,holds promise for increasing the success of bone grafting[11].However if we consider a furcation closure as the main end point of furcation therapy, then the result obtained with the GTR have been found to be inconsistent. Therefore, it was postulated that combining osseous grafting with GTR may enhance the response to membrane only therapy with bone restoration via the conductive effects of the graft and supporting the membrane to a more optimal position in selective sites[12].

In this studywe compared amnion membrane and chorionic membrane (Freeze dried-irradiated -a product of Tata Memorial Hospital, Mumbai) with collagen membrane (Healiguide™; Advance Biotec Products, Chennai, India) which is a second generation membrane .All the membranes were used along with xenograft (Bio-oss™)

Healiguide™is a bio-resorbable type-I bovine collagen membrane available in the form of a thin sheet enclosed in a box and available as three sizes (15 mm × 20 mm, 20 mm × 30 mm, and 30 mm × 40 mm). Collagen membrane as GTR material was used based on the following facts: (1) Type I collagen present in this membrane is also the main constituent of periodontal tissue and seems to be an appropriate barrier in the GTR technique. (2) It is either absorbed into the healing connective tissues or is resorbed by residents cells in 6–8 weeks. (3) Exogenous collagen is chemotactic for periodontal ligament fibroblasts [13,14]. The charge modifications and slight calcification of collagen are done additionally to enhance GTR as these modifications control the rate of biodegradation of collagen and to improve its tensile strength.

One of the main shortcomings of all second-generation GTR membranes is low predictability of regeneration. The condition for predictable tissue regeneration is stimulation of precursor cells with necessary messenger molecules. As the concept of tissue engineering has developed, third-generation membranes have come out in the market, which act both as barriers and also as delivery devices to release specific agents such as antibiotics, growth factors, and adhesion factors, at the wound site and direct natural wound healing.[15]

Amnion membrane, It was first used by Davis 1910 [16]. Amniotic membrane is known to promote epithelial cell migration, adhesion and differentiation and is also an ideal substrate for supporting the growth of epithelial progenitor cells by prolonging their lifespan. It facilitates epithelization, preserves the normal epithelial phenotype, decreases inflammation, promotes angiogenesis, and decreases scar formation. It maintains the structural and anatomical configuration of the regenerated tissues due to the presence of various pluripotent stem cells which has the ability to trans differentiate to other cellular elements of periodontium. The amnion comprises of tresodeum and ectoderm while the chorion includes the trophoblast and the mesoderm. Collagen layers of chorion are rich in types I, IV, V, and VI, proteoglycans, laminin, and fibronectin [17,18,19]. Laminins exhibit a variety of biologic activities, including promotion of cell attachment, growth, and differentiation of a number of cell types. Fibronectin is involved in many cellular processes, Including tissue repair, blood clotting, cell migration, and adhesion. Laminin has a high affinity for binding epithelial cells, and in contrast to traditionally available membranes. This membrane allows for rapid epithelial cell growth rather than epithelial exclusion. Additionally, the matrix of the

chorion contains abundant growth factors, such as keratinocyte growth factor, basic fibroblast growth factor, and transforming growth factor-b, that promote periodontal regeneration and provide a natural environment for accelerated healing[20].

Systemically healthy patients were selected for this study to avoid the altered host response caused by various systemic illnesses. Smokers and tobacco chewers were excluded as they have an altered tissue response and smoking also interferes with the initial healing. No untoward reaction was reported in any of the patients. Soft tissue showed excellent healing regarding achievement of color, contour, and texture integration as that of clinically healthy gingiva.

The present study showed reduction in mean gingival and plaque score at the end of three months in all three groups. Comparison between the groups did not show any statistical difference in the mean gingival and oral hygiene score at the end of three months. This demonstrates that the oral hygiene compliance of the subjects in all three groups, over the observation period, were statistically significant.

In intergroup comparison from baseline to 3 months there was significant reduction in the gingival index and OHI-S in all three groups . Results of the present study are comparable to the study done by Shieh and Zucchelli *et al*.[21,22]

All 3 groups showed satisfactory healing but was more pronounced in Group 1 and 2 after a period of 1 week.According to Mohan *et al* Amniotic chorionic membrane tissue has antimicrobial activity. Aminiotic tissue produces β-defensins, which is a major group of antimicrobial peptides that are expressed by epithelial cells and form an integral part of the immune system. Processed dehydrated allograft amnion demonstrated excellent esthetic results in terms of texture and color match without postoperative discomfort and adverse reactions. They protect epithelial surfaces from microbial colonization. Amniotic tissue also produces secretory leukocyte proteinase inhibitor (SLPI) and elafin. In addition to their anti-inflammatory properties, elafin and SLPI both have antimicrobial actions and act as components of the immune system to provide protection from infection. Furthermore, the antimicrobial agents that are present in amnion membrane, especially secretory leukocyte proteinase inhibitor I, lactoferrin, defensin andelafin might improve wound healing especially in patients with poor oral hygiene.[23]

Amniotic membrane treatment with both the lactoferrin and interleukin-I receptor antagonist make the amniotic membrane antimicrobial as well as anti-inflammatory. Lactoferrin, a global multifunctional protein, has both antimicrobial as well as anti-inflammatory effects, which serves as an antioxidant and iron chelator in tissue. Stromal matrix of amniotic membrane shows a marked suppression of pro-inflammatory cytokines,IL-1α and IL-β expression. It has also been known to have natural inhibitors of MMPs and hyaluronic acid which act as a ligand for CD44 to the amniotic membrane stroma. It has been shown that the human leukocyte antigens (HLA) class I are expressed in amniotic epithelial and mesenchymal cells. Epithelial and mesenchymal amniotic cells secrete a number of anti-inflammatory proteins such as Activin A,IL-1 receptor antagonist (IL-1ra) and IL-10. It is also known to suppress the production of IL-6 in the amniotic fluid during amniotic infection.

Due to its self‑adhering property, sutures are avoided making the procedure simpler and less time‑consuming. Amnion membrane intimately molds easily according to the defect anatomy and root surfaces because of it being extremely thin (approximately 300 nm in cross sectional)[24].Membrane exposure was not observed in any of the cases in the study. The hemostatic function enhances early wound stabilization and clot formation. This indirectly promotes better flap adaptation, thus resulting in less membrane exposure.

The present study showed significant improvement in all periodontal parameters with the exception of gain in attachment level, which improved in all three groups but was least in Group 3 (bone graft + collagen membrane). The findings in the present study were in accordance with findings of the study carried out by Sharma and Pradeep [25] in the treatment of Grade II furcation defect and those of Aroca *et al*[26].

The present study showed significant reduction in probing pocket depth along with reduction in the furcation measurement from base line to three months. Intra group comparison of radiographic measurements showed all three membranes showed significant changes for VD and HD values. Intergroup comparison of radiographic measurements showed no significant value even after 30 days.

All three groups showed significant improvement in periodontal parameters except loss of attachment (CAL) which was increased in case of collagen membrane group.Amnion chorionmembrane strongly resembles the oral mucosa basement membrane. It contain different types of laminins, especially laminin-5, which plays an important role in the adhesion of gingival cells [27]. Laminins can promote regeneration, accelerate tissue adhesions, and preserve tissue, all of which are key factors in improved healing and might have resulted in clinical attachment level improvements. Induction of fibroblast proliferation and presence of vascular growth factor in amnion membrane could accelerate angiogenesis and tissue maturation; these may be responsible for preventing necrosis of the coronal portion of the flap, resulting in better healing and more creeping attachment [28].

Furcation involvement is probably the most difficult type of defect to standardize. Along with the variables associated with the osseous defect itself, aspects associated with the tooth, and more specifically with furcation morphology [29], obviously play a significant role in the outcome of GTR [30]. The results obtained in this study confirm that many variables may render the treatment of grade II furcation defects unpredictable.

During the course of the study, it was observed that amnion and chorion membrane have better handling properties than collagen due to its thickness which makes it easier to manipulate. The ability of amnion and chorion allograft to self-adhere eliminates the need for sutures, making the procedure less technically demanding,less traumatic and decreased surgical time which makes it suitable option for GTR particularly in hard to reach areas such as the molar region.

CONCLUSION

Furcation involvement is probably the most difficult type of defect to standardize. Along with the variables associated with the osseous defect itself, aspects associated with the tooth, and

more specifically with furcation morphology, obviously play a significant role in the outcome of GTR. The results obtained in this study confirm that many variables may render the treatment of grade II furcation defects unpredictable.Due to the reduced thickness and self adhering property of amnion and chorionmembrane, the adaptability of these membranes are far more easier to be used over the defect area compared to collagen membrane. It can moulded according to the varying contour and anatomy of the tooth structure without the need of suturing the membranes. The above found reasons help the clinician to reduce the trauma and surgical time required for the periodontal surgery.

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