|| ISSN(online): 2589-8698 || ISSN(print): 2589-868X ||
International Journal of Medical and Biomedical Studies
Available Online at www.ijmbs.info
PubMed (National Library of Medicine ID: 101738825)
Index Copernicus Value 2018: 75.71
Original Research Article
Volume 4, Issue 3; March: 2020; Page No. 138-140

COMPARATIVE STUDY OF BIOACTIVE GLASS AND FREEZE DRIED BONE ALLOGRAFT IN CLASS II FURCATION DEFECTS

Dr. Anant Raghav Sharma[1], Dr. Spoorti Pattanashetty[2], Dr. Pradnya Wagh Kamat[3], Dr. Ramisetty Sabitha[4], Dr. Nidhi Chhaparia[5]

[1]Reader, Department of Periodontics, Pacific Dental College, Udaipur
[2]Senior Lecturer, Department of Endodontics and Conservative, Maitri College of Dental Sciences and Research
[3]Senior lecturer, Department of Periodontics, Saraswathi Dhanavantri Dental, College, Parbhani
[4]Professor, Department of Oral Pathology, St.Joseph Dental College, Eluru
[5]Reader, Department of Prosthodontics, Clldsrc, Kasaragod

Article Info: Received 20 February 2020; Accepted 22 March 2020
DOI: https://doi.org/10.32553/ijmbs.v4i3.1069
Corresponding author: Dr. Anant Raghav Sharma
Conflict of interest: No conflict of interest.

Abstract

Background: In periodontal therapy, furcation defects are one of the most therapeutically challenging periodontal therapies. Till now various treatment methods have been tried which have shown different success rates. The present study was undertaken to compare the efficacy of bioactive glass (alloplast) with Freeze dried bone allograft (FDBA) in the treatment of Class II furcation defects.

Materials and Methods: Twenty patients were selected for the study which had bilateral Class II furcation defects in molars from which ten patients were male and ten patients sere female in the age group of 45-55 years. Various clinical measurements were recorded at three times i.e. at baseline, at one month and at six months post surgery which included the Turesky-Glimore-Glickman modification of the Quigley Hein plaque index, the Loe and silness gingival index, relative clinical attachment level vertical probing depth in the mid-furcation area, and horizontal probing depth in the furcation area. The statistical analysis was done using SPSS version 23.0.

Results: In the relative clinical attachment levels, the mean gain in the test and control groups was 2.45 and 1.58 mm, respectively at the end of six months. In the horizontal probing depth values, the mean change in the bioactive glass graft and freeze dried bone allograft was 1.45 and 1.33 mm, respectively.

Conclusion: From our study it was concluded that efficacy of Bioactive glass is much better as compared to Freeze dried bone allograft in the treatment of Class II furcation defects.

Keywords: Bioactive glass, Freeze dried bone allograft, furcation defects

Introduction

Furcation involvement management is one of the biggest challenges in the periodontal therapy. The molar teeth in which furcation are present do not respond much favorably to conventional periodontal therapy. As a result as compared to other tooth, they are lost more often[1].

The molar teeth due to its location are difficult to reach. Hence, hygiene issues prevail. Also, the anatomy of molar teeth makes it difficult to access to proper cleaning[2]. It is very difficult to debride root and usually required efficiency is not achieved in furcations.

Studies have been conducted to assess which material is more efficient for furcation areas in molars. Various studies show that it is biologically possible to regenerate previously damaged periodontal attachment tissues[3].

Till date various graft materials have been tried but still the search for efficient graft material is on. We have combined two graft materials Bioactive glass and Freeze dried bone allograft to compare which graft material has more efficacy in the furcation area.

Materials and Methods

Total twenty patients, ten males and ten females in the age group of 45-55 years with bilateral grade II furcation defects in mandibular molars were included in the study. The patients were selected on the basis of not using any antibiotics or anti-inflammatory drugs since last six months, having no complicated medical history, mandibular molar teeth showing radiographic evidence of furcation defects bilaterally.

The subjects were well informed and a signed consent was taken from each of them.

The measurements were recorded clinically at baseline, three months and six month after surgery: Plaque index – Turesky-Gilmore-Glickman modification of Quigley Hein plaque index, Gingival index – Loe and silness gingival index, relative clinical attachment level (in millimeters) which was taken from groove on the stent to the base of

the pocket, vertical probing depth (in millimeters) in the mid-furcation area and horizontal probing depth (in millimeters) in the mid-furcation area.

Two groups were made. One group comprised of males in which bioactive glass graft was used and other group comprised of females in which freeze dried bone allograft was used (Figure 1).

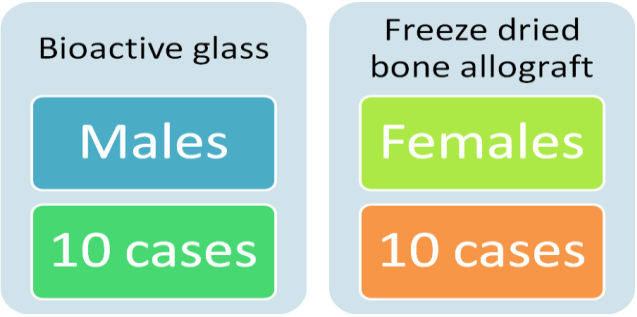
Statistical analysis

The groups were compared with independent student t test. The comparisons were done for mean plaque and gingival scores, for relative clinical attachment levels, for horizontal probing values and for vertical probing values between both the groups. The statistical analysis was carried out with SPSS version 23.0.

Results

The mean change in the gingival scores for both the groups was 1.33 (at the end of six months) which was not statistically significant. The mean change in the plaque scores for both the groups was 2.01 and 2.26 (at the end of six months) which was not statistically significant.

The mean change in the relative clinical attachment in both the groups was found to be 2.45 mm and 1.58 mm (at the end of six months) which was statistically significant. In the values of vertical probing depth the mean change in both groups was found to be 1.45 mm and 1.33 mm which was not statistically significant. In the values of horizontal probing depth the mean change (at the end of six months) was found to be 2.85 mm and 1.58 mm in both the groups which was statistically significant.



Discussion

Various grafts have been introduced in the field of periodontal therapy till date and they are giving a very good benefit in the management of furcation. The selection of mandibular grade II defects in this study was done as per study of 'Sanz and Givannoli'[4].

This study is a rare study as use of bioactive glass graft has not been reported. All the measurements were done with the use of UNC-15 probe. The custom-made acrylic stent was made fixed reference point as followed by Sivertson and Burgett[5].

The graft material used are biocompatible to the tissues and do not cause any harmful effects. These graft materials help in enhancing stabilization of wound and formation of clot. This quality helps in better adaptation of flaps and less of membrane is exposed. Also, migration of fibroblasts is promoted which helps in coverage of wound.

The mean change in gingival and plaque scores was found to be decreased at the end of three months. The same pattern was followed after six months in both the groups. However, no statistical significance was found on comparing the scores of both the groups.

Comparison between mean changes of relative clinical attachment values was found to be statistically insignificant at baseline. While at the end of three months and six months the mean changes for the same were found to be statistically significant in both the groups. According to Lekovic et al there is no benefit on use of bone graft at the level of clinical attachment in cases of furcation defects[6].

The mean change in values of vertical probing depth between both the groups at the baseline was found to be statistically insignificant. According to Anderson et al, Couri et al, Cury et al and Tsao et al, the vertical probing depth changes at the site of furcation were found to be statistically insignificant in all the groups[7, 8, 9, 10].

In the treatment of furcation defects the primary response varies at the horizontal level of attachment. After treatment with both the grafts, the value of horizontal probing depth was found to be decreased. These results were similar in accordance with Lekovic et al, Anderegget al[6, 11].

As compared to patients treated with freeze dried boneallograft, patients treated with bioactive glass graft showed more reduction in horizontal and vertical probing depth levels. There was decrease in horizontal inter-radicular penetration of probe. This can be due to formation of ne attachment of connective tissue. Other reason can be formation of long junctional epithelium at the site.

The results from our study confirm that bioactive glass material is a better graft material as compared to freeze dried bone allograft. The reduction in horizontal and vertical probing depth was found to be more with bioactive glass material than with freeze dried bone allograft.

Conclusion

Thus, from our study it could be observed that bioactive glass graft has more efficacy as compared to freeze dried bone allograft. However, more studies are required to confirm the findings.

References

1. Khanna D, Malhotra S, Naidu DV. Treatment of grade II furcation involvement using resorbable guided tissue regeneration membrane: A six month study. J Indian SocPeriodontol 2012;16(3):404-410.
2. Loos B, Nylund K, Claffery N, Egelberg J. Clinical effect of root debridement in molar and non-molar teeth. A 2-year follow-up. J ClinPeriodontol 1989;16:498-504.
3. Yukna RA, Harrrison BG, Caudill RF, Evans GH, Mayer ET, Miller S. Evaluation of durapatite ceramic as an alloplastic implant in periodontal osseous defects. II. Twelve-month reentry results. J Periodontol 1985;56:540-7.
4. Sanz M, Givannoli JL. Focus on furcation defects: Guided tissue regeneration. Periodontol 2000;22:169-89.
5. Sivertson JF, Burgett FG. Probing of pockets related to the attachment level. J Periodontol 1976;47:281-6.
6. Lekovic V, Kenney EB, Carranza FA, Danilovic V. Treatment of Class II furcation defects using porous hydroxylapatite in conjunction with a polytetrafluoroethylene membrane. J Periodontol 1990;61:575-8.
7. Andersson B, Bratthall G, Kullendorff B, Grondahl K, Rohlin M, Attstrom R. Treatment of furcation defects. Guided tissue regeneration versus coronally positioned flap in mandibular molars; a pilot study. J ClinPeriodontol 1994;21:211-6.
8. Couri CJ, Maze GI, Hinkson DW, Collins BH III, Dawson DV. Medical grade calcium sulfate hemihydrates versus expanded polytetrafluoroethylene in the treatment of mandibular class II furcations. J Peridodontol 2002;73:1352-9.
9. Cury PR, Sallum PA, Nociti FH, Jr, Sallum Aw, Jeffcoat MK. Long term results of guided tissue regeneration therapy in the treatment of class II furcation defects: A randomized clinical trial. J Periodontol 2003;74:3-9.
10. Tsao YP, Neiva R, Al-Shammari K, Oh TJ, Wang HL. Effects of a mineralized human cancellous bone allograft in regeneration of mandibular class II furcation defects. J Periodontol 2006;77:416-25.
11. Anderegg CR, Martin SJ, Gray JL, Mellonig JT, Gher ME. Clinical evaluation of the use of decalcified freeze dried bone allograft with guided tissue regeneration in the treatment of molar furcation invasions. J Periodontol 1991;62:264-8.