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A Clinical and Radiographic Assessment of Periodontal Regeneration in Vital and Nonvital Teeth

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Abstract
Introduction: *Pulpal and periodontal diseases are main etiological factors of tooth mortality. Inter relationship between these two diseases is the topic of research. Less literature is available on the effect of endodontic treatment of periodontal tissue healing. The, present study is conducted to evaluate effect of regenerative periodontal therapy in vital and non-vital teeth.*
Materials and Methods: *10 sites with intrabony defect requiring regenerative periodontal therapy divided into 2 groups, Group-I 5 sites with intrabony defect where tooth is nonvital and root canal treatment is completed. Group-II 5 sites with intrabony defect and tooth is vital. At baseline sites were measured for probing pocket depth (PPD), clinical attachment level (CAL) and radiographic bone defect depth. 6 month post operatively sites were measured for probing pocket depth (PPD), clinical attachment level (CAL) and radiographic bone fill. After phase I therapy, follow up was done at 6 weeks. Intrabony defect ≥ 5mm clinically and ≥ 3mm radiographically were included in the study. Regenerative periodontal therapy with DFDBA and chorion membrane was performed.*
Result and Conclusion: *In Group I the mean reduction in pocket depth from baseline to 6 months was 3.3±0.42, gain in clinical attachment level was 3.6 ± 0.4 and amount of bone fill was 3.6±0.54 which was statistically significant. In Group II the mean reduction in pocket depth from baseline to 6 months was 3.78±0.78, gain in clinical attachment level was 1.9 ±0.3 and the mean amount of bone fill was 2.8±0.57 which was statistically significant. On intergroup comparison the mean reduction in PPD and gain in CAL were not statistically significant and the radiographic bone fill was statistically significant.*

Introduction

Periodontitis is a disease of the periodontium characterized by clinical attachment loss and formation of osseous deformities, including furcation and intrabony defects. The intrabony defect is defined as pathologic sulcus in which the base of the pocket is apical to the alveolar bone crest.[1] The ultimate objective of periodontal therapy is to regenerate tissues lost as a consequence of periodontal disease. The most positive outcome of periodontal regeneration procedures in intrabony defect has been achieved with a combination of bone graft and guided tissue regeneration, this association is called as Combined Periodontal Regenerative Technique (CPRT).[2,3] The interaction between the pulp and the periodontal apparatus and their effects on wound healing has not been clearly elucidated.

Definitive conclusions could not be obtained regarding the regenerative potential of the attachment apparatus of endodontically treated teeth. The scanty literature and lack of comparative studies between periodontal regeneration in vital and non-vital teeth merits present study. The present study aimed to compare effect of Combined Periodontal Regenerative Technique in intrabony defects using DFDBA as a bone substitute and Chorion as a bioresorbable membrane in the treatment of vital and non-vital teeth.

Materials and Methods

10 sites with intrabony defect requiring regenerative periodontal therapy divided into 2 groups, Group-I 5 sites with intrabony defect where tooth was nonvital and root canal treatment was completed. Group-II 5 sites with intrabony defect and tooth was vital.

Exclusion criteria- Known systemic illness &/ drug therapy that would interfere with wound healing, Pregnancy/lactation, smoking (or tobacco use in any other form), unacceptable oral hygiene after re-evaluation of phase I therapy.

At baseline sites were measured for probing pocket depth (PPD), clinical attachment level (CAL) and radiographic bone fill and 6 month post operatively sites were measured for probing pocket depth (PPD), clinical attachment level (CAL) and radiographic bone fill. After phase I therapy, follow up was performed after 6 weeks. Intrabony defect ≥ 5mm clinically and ≥ 3mm radiographically were included in the study. Regenerative periodontal therapy with DFDBA and chorion membrane was performed.

Surgical procedures

All the selected patients, following an initial examination, were subjected to phase I periodontal therapy and were given detailed instructions for plaque control measures. The non vital teeth were endodontically treated. The patients were subjected to surgical procedure 4-6 weeks after phase I therapy. A full thickness mucoperiosteal flap was reflected using the periosteal elevator. After reflection of the flap and exposure of osseous defect, thorough surgical debridement of both soft and hard tissues was done using curettes. The surgical site was irrigated with normal saline. In both the vital and nonvital teeth groups, 2-3 walled osseous defects were filled with DFDBA and covered with chorion membrane. The mucoperiosteal flaps were repositioned and secured in place with 4-0 black braided silk suture. Interrupted sutures were placed to obtain primary closure of the interdental papilla and the area was protected with non eugenol dressing (coe-Pack). All the patients were prescribed with analgesics and antibiotics. Post operative instructions were given to all the patients and After 10 days following surgery, the dressing and sutures were removed.

Results

Table 1 Showing clinical comparison of mean values of probing pocket depth (PPD), clinical attachment level (CAL), at baseline and 6month postoperatively in group I and group II

	Group I			Group II		
	At baseline	6month	P value	At baseline	6 month	P value
PPD	8.9±0.7	3.3±0.42	<0.0001	7.2±0.7	3.78±0.78	<0.0001
CAL	7.9±0.7	4.34±0.32	<0.0001	6.2±0.7	4.3±0.44	<0.0001

Table 1 shows reduction in PPD, gain in CAL from baseline to 6 months in Group I and Group II which is statistically significant.

Table 2 Showing comparison of radiographic defect depth (RDD) at baseline & 6 month postoperatively, in Group I and Group II.

	Group I	Group II
RDD at baseline	6.2±0.83	6 ± 0.79
RDD at 6month	2.6± 0.54	3.2± 0.44
Amount of bone fill at 6month	3.6±0.54	2.8±0.57

Table 2 shows that the amount of bone fill was statistically significant in Group I and Group II. On intergroup comparison amount of bone fill was more in Group I because RDD at baseline was more compared to Group II.

Discussion

In a clinical study done by Vandana et.al [4] 16 intrabony defects in nonvital and vital teeth were treated by regenerative periodontal therapy. Results showed that there is reduction in PPD, gain in CAL in both groups & on intergroup comparison difference was nonsignificant. In the present study there is reduction in PPD, gain in CAL, in vital and novital groups and statistically there was no difference. Morris[5], using human teeth with nonvital pulps was unable to demonstrate cementogenesis on dentin of endodontically obturated teeth. The work of Bjorn[6,7], Diem[8] and Mitsis[9] indicate that endodontically obturated teeth should respond to periodontal therapy as do the vital teeth. Dunlap et al[10] indicated that the planed root surfaces of the endodontically obturated teeth were compatible with fibroblast growth in the in vitro study. No difference in growth was noted on the root-planed surfaces of vital teeth as compared to the root-planed endodontically obturated teeth. In this study, the endodontic treatment in nonvital teeth preceeded periodontal surgery to minimize the penetration toxic substances from the pulp to the periodontal area. This is in accordance with the recommendation by Prichard[11], who suggested debridement and medication of the canals before intrabony surgery. The sample size of the present study does not allow us to derive definitive conclusions and further studies are required on larger sample size.

Conclusion

Regenerative periodontal therapy performed in intrabony defects of vital and nonvital teeth showed reduction in PPD, gain in CAL and radiographic bone fill from baseline to 6 months. On intergroup comparison there was no statistically significant difference between vital and nonvital group.

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