

Prevalence of Caries in Lower Anterior Teeth Bonded with Fixed Orthodontic Retainer in Jammu Population

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Abstract

Aim: To find the prevalence of caries in lower anterior teeth bonded with fixed orthodontic retainer after one year of orthodontic treatment completion in Jammu population.

Materials and Methods: Out of a total sample size of 157 subjects aged 15-25 years coming to the Department of Orthodontics in Indira Gandhi Government Dental College, Jammu, 100 were selected based on the inclusion criteria and were equally divided into 2 groups of 50 patients each. Group I contains 25 males and 25 females who were given bonded canine to canine retainer in lower anterior teeth after orthodontic treatment whereas Group II consists of 25 males and 25 females who were given removable retainers. Lower anterior teeth from 3 to 3 of every subject in both the groups were examined both clinically and radiographically. These subjects were provided with retainers post orthodontic treatment from 1 year.

Results: Majority of the subjects showed carious lesion relation to Central Incisors and Lateral Incisors with fewer incidences of caries in canines. However, the difference between genders is statistically insignificant ($p=0.9012$). There are more incidences for caries in Central and Lateral Incisors in comparison to canines with insignificant association with different genders ($p=0.6666$). There was statistically insignificant relation between caries incidence for different teeth in two groups ($p=0.6475$).

Conclusion: It can be concluded that the mandibular central and lateral incisors in the experimental group had equal caries frequency compared to each other, but with higher frequency when compared to canines. In spite of increased plaque accumulation around bonded orthodontic retainer, patient can prevent damage to their teeth by good oral hygiene with various oral hygiene products available.

Key words: Prevalence, Caries, Bonded orthodontic retainer, Jammu

INTRODUCTION

One of the major concerns for every orthodontist is retaining orthodontically moved teeth in their new position. Various appliances have been introduced in the past for better stability and maintenance of orthodontic treatment results. Several authors in their studies related long-term

stability of achieved orthodontic results to maintenance of intercanine width and arch form, interincisal angle correction and post treatment growth respectively.^[1-5]

According to several studies, most of the relapse occur during the first two years after the completion of treatment and in addition to it, there is a continuous risk of teeth change position throughout life which is due to aging processes and the inheritance/genetics of the individual.^[6-8]

Few authors found that that the gingival elastic fibers contribute to relapse after correction of rotations and favored circumferential supracrestal fibrotomy to prevent rotational relapse.^[9,10]

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In spite of the previously conducted studies, orthodontists concluded that the only effective method to avoid relapse after orthodontic correction of malaligned teeth is by placement of fixed permanent bondable retainer for decades or throughout life.

Bondable fixed retainers consist of a length of orthodontic wire bonded with composite from canine to canine or premolar to premolar in the mandibular arch. The major advantage of lingually bondable retainers is that they are compliance free but can interfere with the maintenance of the oral hygiene which leads to increased plaque accumulation and can cause iatrogenic damage to the teeth and supporting structures.^[11-13]

With the introduction of different types of wires and bonding materials for bonded retainers, their evaluation for their effects on oral hygiene status should be done.

Therefore, the purpose of this study was to evaluate the prevalence of caries in lower anterior teeth bonded with fixed orthodontic retainer in Jammu population both clinically and radiographically.

METHODOLOGY

Out of a total sample size of 157 subjects aged 15-25 years coming to the Department of Orthodontics in Indira Gandhi Government Dental College, Jammu, 100 were selected based on the inclusion criteria and were equally divided into 2 groups of 50 patients each. These subjects were provided with retainers post orthodontic treatment from 1 year.

Inclusion Criteria

- Permanent dentition.
- Orthodontically treated.

Exclusion Criteria

- Carious lower anterior teeth.
- Missing or extracted lower incisors.

Group I contains 25 males and 25 females who were given bonded canine to canine retainer in lower anterior teeth after orthodontic treatment whereas Group II consists of 25 males and 25 females who were given removable retainers. Lower anterior teeth from 3 to 3 of every subject in both the groups were examined both clinically and radiographically.

RESULTS

Table 1 showed the age and gender distribution among the different study groups i.e. Group I- Subjects with

Lower Bonded Retainer (3-3) and Group II- Subjects with Removable Retainers.

Table 2 showed the frequency distribution of carious tooth in different study groups. In Group I majority of the subjects showed carious lesion relation to Central Incisors and Lateral Incisors with fewer incidences of caries in canines. However, the difference between genders is statistically insignificant ($p=0.9012$). Similarly in Group II there is more incidence for caries in Central and Lateral Incisors in comparison to canines with insignificant association with different genders ($p=0.6666$).

Table 3 showed that there was statistically insignificant relation between caries incidence for different teeth in two groups ($p=0.6475$).

Table 1: Age and gender distribution of subjects

Age (years)	Groups	Number of subjects	
		M (n)	F (n)
15-25 years	Group I Lower bonded retainer (3-3)	25	25
	Group II Removable retainer	25	25

Table 2: Frequency distribution of caries in different study groups

Groups	Cariou teeth	Noumber of subjects involved		Total	P value
		M (%)	F (%)		
Group I Lower bonded retainer (3-3)	Central incisor	9 (36)	7 (28)	16 (32)	$P=0.9012$
	Lateral incisor	8 (32)	8 (32)	16 (32)	
	Canine	3 (12)	2 (8)	5 (10)	
Group II Removable retainer	Central incisor	4 (16)	5 (20)	9 (18)	$P=0.6666$
	Lateral incisor	5 (20)	3 (12)	8 (16)	
	Canine	2 (8)	3 (12)	5 (10)	

Table 3: Inter-Group comparison for caries incidence

Involved teeth	Group I Lower bonded retainer (3-3)	Group II Removable retainer	Total
Central incisor	16	9	25
Lateral incisor	16	8	24
Canine	5	5	10
Total	37	22	59

$\chi^2=0.869$, $df=2$, $\chi^2/df=0.43$, $P(\chi^2>0.869)=0.6475$

DISCUSSION

This study was done to find the prevalence of caries in lower anterior teeth bonded with fixed orthodontic retainer after one year of orthodontic treatment completion in Jammu population. The findings of our study showed that more number of subjects showed caries incidence for central and lateral incisors in Group I as compared to Group II, similar results were found by Axelsson *et al.* and Al -Kuwari HM *et al.*^[16,17] Axelsson *et al.* concluded that two cases of enamel demineralization were found after two years of placing labial bonded retainers in the buccal segments. However contradictory results were found by Artun [11] who reported that no apparent damage was caused to the enamel after long-term usage of lingual fixed retainer. Furthermore, Artun *et al.*^[13] found that instead of occasional accumulation of plaque and calculus along such retainers, caries was not a problem.

The findings of our study also suggest that there were no significant gender differences related with the frequency of carious lesions among teeth in both the study groups. Various studies in the past have found increased incidence of enamel decalcification around bracket bases with significant gender differences, however very sparse data regarding the gender predominance for caries around bonded retainers was available in the literature.^[18]

In the present study, canines showed the least frequency for carious lesions in both the study groups, which were in accordance with the results of Al -Kuwari HM *et al.*^[17]

Although, there is a difference between the frequency of carious lesions between the two study groups but the result is statistically insignificant. The limitations of our study are that oral hygiene index to measure plaque and calculus scores was not done. Further studies with inclusion of respective shortcomings and inclusion of more variables and maxillary arch should be conducted for more better and elaborated results.

CONCLUSION

It can be concluded that the mandibular central and lateral incisors in the experimental group had equal

caries frequency compared to each other, but with higher frequency when compared to canines. In spite of increased plaque accumulation around bonded orthodontic retainer, patient can prevent damage to their teeth by good oral hygiene with various oral hygiene products available.

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