DOI: 10.69605/ijlbpr_13.10.2024.92

ORIGINAL RESEARCH

Evaluation of prevalence of WSL among patients who underwent fixed orthodontic treatment with passive self-ligation mechanotherapy

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Received Date: 19 August, 2024

Accepted Date: 24 September, 2024

ABSTRACT

Background: White spot lesion (WSL) is the earliest macroscopic evidence of enamel caries and is commonly seen during orthodontic therapy. The present study assessed the prevalence of WSL among patients who underwent fixed orthodontic treatment with passive self-ligation mechanotherapy. **Materials & Methods:** 88 patients in the age range of 10-30 years who received orthodontic treatment using the Damon self-ligating system of both genders were selected. The presence of WSL was investigated. Modified Gorelick's scale was used for scoring the lesions. **Results:** Out of 88 patients, 32 were males and 56 were females. A non- significant difference in occurrence of WSL between different teeth of males and females (P> 0.05). The prevalence of WSL was 75% in males and 78.5% in females. **Conclusion:** The prevalence of WSL was 75% in males and 78.5% in females. During the first few months of treatment, doctors should assess the patients' dental hygiene habits and, if necessary, take further precautions to prevent demineralization.

Keywords: Orthodontic therapy, Gorelick's scale, White spot lesion

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INTRODUCTION

White spot lesion (WSL) is the earliest macroscopic evidence of enamel caries and is commonly seen during orthodontic therapy.1 By maintaining a harmonious occlusal and jaw relationship, orthodontic therapy seeks to enhance face functions and aesthetics while also improving patients' dental health and quality of life.² But there are hazards and involved complications as well. Despite advancements in orthodontics and preventive dental and techniques materials, enamel surface demineralization, often known as white spots lesions (WSL), continues to be one of the principal adverse sequelae of fixed orthodontic device therapy.³

Other factors that affect the accumulation of dental plaque include appliance design, particularly the ligation procedure for archwires.⁴ A small number of published research have examined the effects of self and conventional ligation therapies on microbial flora and dental plaque retention. Richter AE et al found that oral hygiene and the patient's age at the beginning of treatment were important variables in the development of WSLs.⁵ A longer course of treatment

affects the frequency of WSLs. There are several ways to detect WSLs both qualitatively and quantitatively. In fact, Damon passive self-ligation brackets are frequently used to treat borderline instances without requiring tooth extraction.⁶ This study was suggested because it is crucial to determine whether the treatment regimens, ligation technique, and bracket design affect the occurrence of WSLs. Existing research compares the prevalence of WSLs in conventional and self-ligation settings.^{7,8} The present study assessed the prevalence of WSL among patients who underwent fixed orthodontic treatment with passive self-ligation mechanotherapy.

MATERIALS & METHODS

The study was carried out on 88 patients in the age range of 10-30 years who received orthodontic treatment using the Damon self-ligating system of both genders. All gave their written consent to participate in the study.

Data such as name, age, gender etc. was recorded. The presence of WSL was investigated. Modified Gorelick's scale was used for scoring the lesions.

enamel surface area in question and score 3-WSLs

involving more than two-thirds of the vestibular

enamel surface area in question. Results thus obtained were subjected to statistical analysis. P value < 0.05

was considered significant.

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Score 0-no white spot formation, score 1-WSLs involving less than one-third of the vestibular enamel surface area outside the area covered by bracket and bonding material, score 2-WSLs involving more than one-third but less than two-thirds of the vestibular

RESULTS Table I Distribution of patients

Total- 88							
Gender	Male	Female					
Number	32	56					

Table I shows that out of 88 patients, 32 were males and 56 were females.

Fable II Modified Gorelick's scorir	g for severity	y of white sp	ot lesions (WSLs)
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Tooth type	Gender	Score 0	Score 1	Score 2	Score 3	P value
CI	Male	8	10	6	8	0.71
	Female	14	12	16	14	
LI	Male	7	8	12	5	0.25
	Female	13	14	16	13	
С	Male	9	11	8	4	0.63
	Female	12	15	13	16	
1 PM	Male	7	13	9	3	0.85
	Female	15	11	13	17	
2 PM	Male	8	5	17	2	0.32
	Female	11	16	13	16	
1 M	Male	9	15	7	1	0.69
	Female	12	11	18	15	
2 M	Male	10	5	7	10	0.57
	Female	13	10	15	18]

Table II, graph I shows non- significant difference in occurrence of WSL between different teeth of males and females (P > 0.05). The prevalence of WSL was 75% in males and 78.5% in females.



Graph I Modified Gorelick's scoring for severity of white spot lesions (WSLs)

DISCUSSION

White spots appear to be caused by a combination of factors, such as the patient's modifying factors, changes in the bacterial flora during the wear of fixed appliances, and insufficient removal of dental plaque from intrabuccal appliances that restrict the oral musculature's and saliva's self-cleaning mechanism.⁹ One of the biggest problems facing orthodontists is prevention, early detection, and treatment because of how quickly these lesions can form. This calls for a deep understanding of the caries disease and the risk factors unique to each patient.¹⁰ To reduce tooth decay

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and discolouration that could impair smile appearance, these risk factors should be precisely assessed both before and during any orthodontic treatment. Clinicians could use preventive measures if they could identify WSL early on during orthodontic therapy.¹¹

We found that out of 88 patients, 32 were males and 56 were females. Ramsundar et al¹² evaluated the prevalence of WSL among patients who underwent fixed orthodontic treatment with passive self-ligation mechanotherapy. The records of 97 patients in the age range of 10-30 years who received orthodontic treatment using the Damon self-ligating system regardless of gender were obtained. Data of total of 97 subjects (45 females (46.39%) and 52 males (54.63%), mean age: 17.70±5.72 years) undergoing orthodontic treatment with self-ligation brackets was included in the study. The overall prevalence percent of WSLs in the study was 71.13%. The prevalence of WSLs among females was 70.5% and in males, it was 73%. There was no statistical significance for association between gender and severity of WSLs and there was a statistical significance for association of age group and severity of WSLs in upper lateral incisors and canines (p<0.05).

We found non- significant difference in occurrence of WSL between different teeth of males and females. Tiwari A et al¹³ compared enamel demineralisation around self-ligation brackets and conventional ligation brackets at the 3rd month and 12th month of orthodontic treatment using laser fluorescence. Nineteen subjects who were scheduled for fixed orthodontic treatment were selected for the study and were divided into two groups that is conventional ligation and passive self-ligation. Diagnodent (DD) was used to take enamel demineralisation scores at the time of bonding (T0), 3 months (T1) and 12 months (T2) into treatment. One-way ANOVA test reported that in conventional ligation groups there was a statistically significant difference in the mean DD scores between T0 and T1, T0 and T2 (p0.05). No gender association was noted.

CONCLUSION

Authors found that the prevalence of WSL was 75% in males and 78.5% in females. During the first few months of treatment, doctors should assess the patients' dental hygiene habits and, if necessary, take further precautions to prevent demineralization.

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