



ORIGINAL RESEARCH PAPER

Dentistry

EVALUATING THE HIDDEN INCIPIENT LESION AMONG POST ORTHODONTIC TREATED ADULTS IN CHENGALPATTU DISTRICT- A CROSS SECTIONAL STUDY

KEY WORDS: INCIPIENT LESIONS, POST ORTHODONTIC TREATMENT,

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ABSTRACT

Introduction: One of the most frequent side effects of fixed orthodontic therapy is the development of white spot lesions (WSL) surrounding fixed orthodontic treatment. The purpose of this study was to ascertain the patients' awareness of the possibility of developing WSLs while undergoing fixed orthodontic treatment, as well as the patients' oral hygiene practices and any preventive measures administered during treatment. **Methodology:** Questionnaires are used in this cross-sectional observational study. Convenience sampling was used to choose the subjects from among orthodontic patients who visited the orthodontic OPD. Individuals who met the requirements for inclusion were requested to respond to the surveys. The knowledge evaluations focused on how orthodontic patients should maintain their dental hygiene and how WSL develops during treatment. **Results:** The questionnaires were distributed to 32 subjects in total. The majority of them were unaware that having braces can result in the development of WSL around the brackets. Of those who maintained oral hygiene, a large number of people brush their teeth more than twice a day. Of them, about 75% said that their orthodontic doctor placed a strong emphasis on proper tooth cleaning technique. **Conclusion:** The majority of patients have a rudimentary understanding of white spot lesions as a side effect of fixed orthodontic treatment and good mouth hygiene habits. Treatment outcomes will be improved by raising their knowledge on fixed orthodontic treatment and their development of WSL for ortho patient.

INTRODUCTION

White spot lesions are a result of fixed orthodontic treatment that demineralize tooth enamel. They are more common in cases where poor oral hygiene is present. The acidic by products of bacteria in plaque that get stuck around permanent orthodontic attachments are what cause white spot lesions (WSL), which demineralize the enamel (Reilly et al 1985)¹. White spot lesions (WSLs) are seen as huge decalcified patches with or without cavitation in some patients; in others, they show as tiny lines surrounding the brackets. These may result in cavities, which could compromise patient satisfaction, look bad, and generate legal issues (Zachrisson 1978, Ogaard 1988, Sangamesh 2011)². Orthodontics, which aims to improve dento-facial aesthetics, is discouraged by the growth of WSL, following treatment.

WSL is associated with the use of orthodontic devices like as bands, brackets, arch wiring, ligatures, and and other items that impede good oral hygiene habits and prolong the buildup of plaque. Orthodontists need to take the initiative to actively teach their patients the value of upholding proper dental hygiene and dietary compliance.

Clinically, white patches may appear around orthodontic attachments as early as week four of treatment. (Reilly 1985), and between 2% and 96% of orthodontic patients have them(Mizrahi 1982, Gorelick 1982, Mitchell 1992).The labio- gingival region of the lateral incisors is the most common site for WSL, with males being more affected than females. The maxillary posterior segments are the least common place. (Zachrisson and Zachrisson 1971)¹. In their clinical trial, Tufekci et al. (2011) came to the conclusion that there was a significant spike in WSLs during the first six months of treatment, followed by a slower growth until the 12-month mark. For this reason, during the first few months of treatment, dental hygiene is critically important².

White spot lesions are typically caused by the combination of four factors: time, fermentable carbohydrates, sensitive teeth, and bacterial plaque (Kamna et al 2013). White spot lesions

may start to form around orthodontic attachments as soon as four weeks following treatment. The teeth with the greatest damage in both the treated and untreated groups were the maxillary lateral incisors and mandibular first molars (Alessandra et al 2012). The length of orthodontic treatment also revealed a marked rise in the incidence of white spot lesions(Sandhya et al 2013)³.

By using mechanical plaque management methods to improve patient oral hygiene and topical fluoride and other treatments to strengthen enamel resistance to microbial acid, the probability of enamel getting demineralization during fixed orthodontic therapy can be avoided. Since patients were primarily in charge of preventing white spot lesions, effective communication was essential(Maxfield et al 2012)⁴.

In their research, Essamet and Darrout (2016) shown that participants who have recently undergone orthodontic treatment are more knowledgeable and aware of orthodontic therapy than those who have not⁵. However, how much do patients know about potential side effects like WSL that could arise with orthodontic treatment. This motivated us to investigate the awareness of patients receiving orthodontic treatment of white spot lesions as a potential consequence, as patients' degree of knowledge will dictate their likelihood of getting a white spot lesion. The study's findings may also assist the physician in creating clinical guidelines—a plan for teaching patients about WSL.

Thus, the goals of this study are to ascertain patient awareness regarding the possibility of white spot lesions during fixed orthodontic treatment, as well as patient oral hygiene practices and preventive measures provided during treatment.

MATERIALS AND METHOD

Questionnaires are used in this cross-sectional observational study. The investigation was conducted in a dental clinic at APDCH. 50 orthodontic patients who wear fixed appliances made up the samples, which were chosen via convenience

sampling. Patients undergoing orthodontic treatment who have worn the equipment for at least one month. Dental students, children under the age.

The questionnaires asked questions on preventive measures, oral hygiene practices, knowledge of white spot lesions, and demographic information. The pertinent published papers in the international journals served as the model for the questions. Included was an instruction sheet outlining the purpose of the study and how to answer the questionnaire. The inquiries were concerning the participants' knowledge of the occurrence of white spot lesions after fixed orthodontic treatment, as well as their age, race, sex, and length of braces usage. The questionnaires asked about the participants' views towards keeping their teeth in good condition.

A picture demonstrating WSL's presence throughout the bracket was also sent to help with the questions. Before responding to the surveys, consent was asked. Before the study was conducted, a pilot study with ten volunteers who met the inclusion and exclusion criteria and wore fixed appliances was conducted to validate the questionnaire.

For statistical data analysis, completed surveys were entered into an Excel spreadsheet and imported into the SPSS edition of the Statistical Package for Social Sciences. Using descriptive statistics, SPSS was used to evaluate the results.

RESULTS

50 patients - all took part in the investigation. there were 75% female and 25% male participants in the demographic data. Eighty-seven percent of the subjects were Malays, and the remaining thirteen percent were Indians. In this study, the majority of participants (59%) and 41% have used orthodontic fixed appliances for more than a year, less than a year has been spent using the equipment. Refer Table 1.

Table 1: General Data Of The Participant

Mean age		Total
Gender	Male	38(75%)
	Female	12(25%)
Age	18-24	12(25%)
	25-31	25(50%)
	32-38	13(25%)

An equal number of participants recognised that wearing braces or fixed orthodontic appliances can result in the development of white spot lesions, according to the questionnaires used to gauge their knowledge of the risk of acquiring WSL during orthodontic treatment. Over 50% of the participants (56.2%) were aware that a WSL could result in a cavity inside their mouth, and 59.4% stated that white spot lesions may result from the inability to wash their teeth due to their braces. Approximately 84.4% of people are aware that bad dental hygiene can hasten the onset of white spot lesions. Only 25% of respondents could recognise the white spot lesions in their mouths, and 15.6% of respondents said that the length of therapy could have an impact on the lesion's development.

Table 2: Awareness on the Risk of Developing White Spot Lesion Among Fixed Orthodontic Patients.

	Yes	No
Whether Wearing braces can cause WSL	50% (n=25)	50% (n=25)
Whether WSL can lead to cavity	56.2% (n=28)	43.8% (n=22)
Whether Difficulty in brushing while wearing braces can lead to WSL	59.4% (n=30)	40.6% (n=20)
Can Poor oral hygiene can lead to WSL	84.4% (n=42)	15.6% (n=8)
Did you think long duration ortho treatment can lead to WSL	15.6% (n=8)	84.4% (n=42)

Can WSL inside your mouth can be identified by you	25% (n=13)	75% (n=37)
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In terms of dental hygiene, 96.9% of people clean their teeth more than twice a day. The other subjects only come into contact once. The individuals also utilised mouthwash (50%) and dental floss (4.1%) and interdental brushes (46.7%) as additional oral care tools. Refer Table 3.

Table 3: Oral Hygiene Practice

Dental health practice	n (%)
Brushing for less than or equal to 2	38(76.6%)
Brushing only once	5(10%)
Usage of mouthwash	4(8%)
Interproximal toothbrush	2(4%)
Usage of Dental floss	1(2%)

The subjects remembered the preventive measures that the orthodontists had prescribed. Roughly 75% of the participants reported that the orthodontists informed them of the complications associated with orthodontic therapy. 75% of the individuals reported that they had shown the patients how to brush their teeth. 25% of the advise was to choose a toothbrush and toothpaste; 8% was to use fluoridated mouthwash; and 15% was to use an interdental toothbrush. Refer Table 4.

Table 4: Preventive Measures Given By Orthodontists

Preventive Measures	Yes	No
Brushing technique used	80%	20%
Type of toothbrush and toothpaste used	20%	80%
Did they gain knowledge on fluorinated mouthwash	12%	78%
Did they gain knowledge on interdental toothbrush	15%	85%
Did they receive knowledge on complications of ortho-treatment	75%	25%

DISCUSSION

It was shown that half of the study participants knew that having fixed orthodontic treatment may cause white spot lesions to appear on their teeth. Of the participants, 56.2% were aware that white spot lesions could lead to cavities or caries developing inside their mouths. The results demonstrated that patients are aware of white spot lesions. Nevertheless, no prior research has been discovered to evaluate the knowledge of the chance of acquiring white spot lesions during orthodontic treatment, making it difficult to compare the outcomes. The majority of participants (84.4%) were aware that white spot lesions can result from poor oral hygiene brought on by difficulties brushing. According to a study by Jena and Duggal (2006), having orthodontic attachments increases the difficulty of cleaning teeth and increases the risk of plaque buildup on the surface of the teeth⁵. Additionally, it limits the tongue's, lips', and cheeks' natural ability to clean themselves and remove food particles from the surface of teeth. Another study also shown that dental plaque produced by fixed orthodontic appliances increased quickly and had a lower pH than that of non-orthodontic patients. The fixed appliance's ability to retain plaque increases the patient's cariogenic risk. (Kamena et al., 2013, Ogaard 1989, Summit et al., 2006)^{8,7}. The participants' inability to independently recognise the lesion and ignorance of how treatment duration may impact their teeth were further revealed by the results.

In terms of dental hygiene routines, 96.9% of patients clean their teeth twice a day or more. Mouthwash is the oral hygiene tool most frequently utilised, with a percentage of 50.0, followed by dental floss, an interdental brush, and 46.9 and 3.1 respectively⁵. Therefore, mouthwash and brushing are the oral hygiene tools that participants utilise the most frequently. Therefore, it can be said that patients follow a rather decent oral hygiene regimen, indicating that they are aware of the need to maintain good oral hygiene while undergoing

therapy. According to a study, orthodontic patients receiving fixed appliance treatment should follow a stricter regimen for oral hygiene than people who are not receiving treatment (Kamna et al 2013)^{9, 10}. Poor dental hygiene can result in periodontitis, gingivitis, cavities, plaque buildup, and gum disease, all of which can delay or even cause orthodontic therapy to be discontinued.

Approximately 80 % of orthodontists stressed the importance of proper toothbrushing technique, then using an interdental brush, choosing the right toothbrush and toothpaste, and finally using fluoride mouthwash. The method of brushing is the most common OHI recommended by orthodontists. A study conducted among Syrian orthodontists likewise showed the same outcome. In the study, brushing ranks as the orthodontist's most common OHI (approximately 97.0%). Fluoride mouthwash, mouthwash containing chlorhexidine, oral irrigator, disclosing pill, floss, and electric toothbrush come next (Dannan 2008). Due to fluoride's well-known ability to lower dental cavities and gingival inflammation, it is thought that orthodontists may need to bring up fluoride mouthwash (Boyd 1992, Denes and Gabris 1991)¹⁰. An orthodontist's job is to reduce the likelihood that a patient would have decalcification as a result of orthodontic treatment by encouraging and teaching good oral hygiene habits (Kamna 2013)⁸. Despite being aware of the potential problems of orthodontic treatment, patient involvement is crucial for maintaining proper oral hygiene and appropriate hygiene throughout the course of treatment.

Advantages And Limitations:

CONCLUSION

Based on the study's findings, it can be said that even though orthodontists have provided sufficient information and preventive measures, most patients only have a fair understanding of WSL as a side effect of fixed orthodontic treatment and maintain a good standard of oral hygiene. In order to get the greatest outcome with the fewest complications after treatment, patients wearing fixed appliances in the clinical setup should know more about WSL and their chance of developing it during treatment. It is important to examine alternative strategies for patient motivation.

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