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Frequency and Distribution of White Spot Enamel Lesions in Cleft Patients.

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ABSTRACT

Background: Objective: To find out the frequency and distribution of white spot enamel lesions (WSL) in cleft patients. **Methods:** Total fifteen subjects(M=7,F=8) in the range of 10-21 years seeking orthodontic treatment were screened out for the study. Among 15 subjects a total of 315 teeth were examined and evaluated for white spot enamel lesions in cleft patients. The frequency and severity were recorded on standard proforma at the beginning of orthodontic treatment by direct visual assessment and diagnodent method.In the study pearsons correlation coefficient was used to find out relationship between plaque score, diagnodent and white spot enamel lesions. **Results:** The distribution of white spot enamel lesions in cleft patients was found 100%.The frequency of white spot enamel lesions in 315 teeth examined were 192 teeth (61% with score 1 without WSL), 107 teeth (34% with score 2 with WSL), 10 teeth (3% with WSL and without cavitation) and 06 teeth (2% with WSL and cavitation). **Conclusion:** Increased numbers of initial/white spot lesions in CLP patients predisposes to an increased risk for further development of carious cavitated lesions during the comprehensive orthodontic treatment.There is immense need to evaluate the white spot lesions, reinforce good oral hygiene measures, institute preventive fluoride regimen and manage white spot enamel lesions before orthodontic treatment to obtain optimum esthetic results.

Keywords: White Spot Enamel Lesions, Cleft Patient.

INTRODUCTION

White spot lesions (WSLs) is a clinical manifestation of early enamel caries shown in [Figure 1]. The appearance of WSL is an optical phenomenon caused by subsurface mineral loss.
White-spot enamel lesions (WSL) are among the most undesired side effects of multibracket appliance treatment and have been reported to occur in 2% to 96%1-2 of patient. Key role of orthodontist is to recognize the high risk patients (cleft patients), evaluate the white spot lesions shown in [Figure 1], reinforce good oral hygiene measures, and manage white spot enamel lesions before orthodontic treatment to obtain optimum aesthetic results.

MATERIALS AND METHODS

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This cross sectional study was carried out in the unit of Orthodontics, OHSC PGIMER on 15 patients (M=7, F=8 with age range (10-21 years) In 15 subjects, a total of 315 teeth were examined for the evaluation of WSLs. The frequency and severity of WSLs were recorded on a standard proforma at the beginning of orthodontic treatmet by direct visual assessment and by DIAGNOdent (KAVO Dental Corporation, Lake, Zurich, III).

Figure 1: White spot lesions.

The frequency and distribution of white spot enamel lesions in cleft patients were estimated before the comprehensive orthodontic treatment.

Evaluation of plaque score

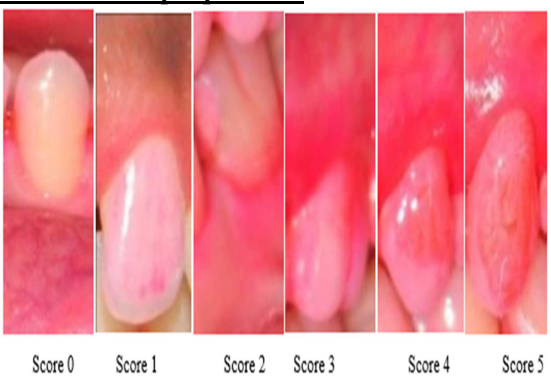


Figure 2: Plaque score by Turesky-Gilmore (1970)

The plaque deposit was evaluated as described by Turesky-Gilmore.[3] Various scores and criteria for the evaluation of plaque score is described in [Table 1 and Figure 2]. For the evaluation of plaque, the teeth were first isolated and then 2% mercurochrome was applied on facial surfaces with the help of cotton pellet. For the homogeneous stain in all teeth, one pellet was used to disclose plaque in one arch. Patients were asked to rinse after 1 minute of mercurochrome application. All the recordings were done on a standard proforma.

Table 1: Plaque score and criteria according to Turesky-Gilmore.[3]

Score	Criteria
0	No plaque
1	Separate flecks of plaque at cervical margin of the tooth
2	A thin continuous band of plaque (1mm) at cervical margin.
3	Band of wider than 1 mm but covering less than 1/3rd of the crown of the tooth
4	Plaque covering more than 1/3rd and less than 2/3rd of the crown of the tooth
5	Plaque covering 2/3rd or more than 2/3rd of the tooth

Evaluation of White Spot Lesion

The frequency and distribution of white spot enamel lesions was evaluated by:

1) Visual score method
2) DIAGNOdent score method

Evaluation by Visual score method

The evaluation of white spot enamel lesions was done by visual score method as described by Goerlick et al.[1] All teeth were polished by non-fluoridated pumice powder with the help of rubber cup in contra angle hand piece at slow speed. Surfaces were cleaned with Oevaluated on clinical light. The scores and criteria for the evaluation of white spots as suggested by Gorelick et al.[1] is described in [Table 2] and shown in [Figure 3]

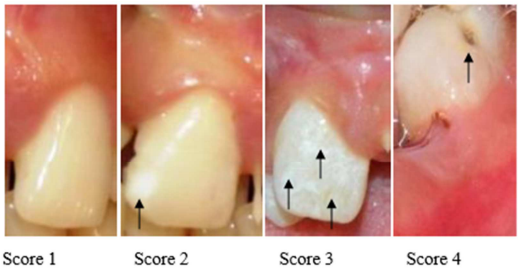


Figure 3: Visual inspection score by (Ghiz et al 2009 AJODO)

Table 2: The scores and criteria as suggested by Gorelick et al. 1 for the evaluation of white spot lesions

Score	Criteria
1	No white spots or decalcification
2	Slight white spot formation or decalcification in 1 area
3	Severe white spot formation or many areas of decalcification
4	Excessive white spot formation and cavitations.

DIAGNOdent score method

The DIAGNOdent was first calibrated for each patient with a sound enamel site (labial surface of central incisor or buccal surface of first molar if central incisors were missing, carious or restored or if both central and molars were missed then any tooth which showed minimum readings was calibrated as standard baseline). The DIAGNOdent recordings were done on the buccal surface of teeth. Measurements with the DIAGNOdent were performed with a conical tip B and the teeth were scanned carefully, with the tip held in contact with the tooth surface and tilted around the measuring site so that fluorescence was collected from all directions. An assistant resident was called upon to note the readings while examiner made the measurements. In each tooth the measurements were done thrice and the mean was considered for statistical analysis. The method of white spot evaluation by DIAGNOdent is described in [Figure 4].

Figure 4: Distribution of Visual score of WSLs among Cleft Patients

Table 3: Distribution of Visual score of WSLs among Cleft Patients

Description of white spot enamel lesions	Frequency	Percentage
No WSL	0	0
One WSLs	15	100
Multiple WSL without cavitation	8	53.3
WSL with cavitation	4	26.7

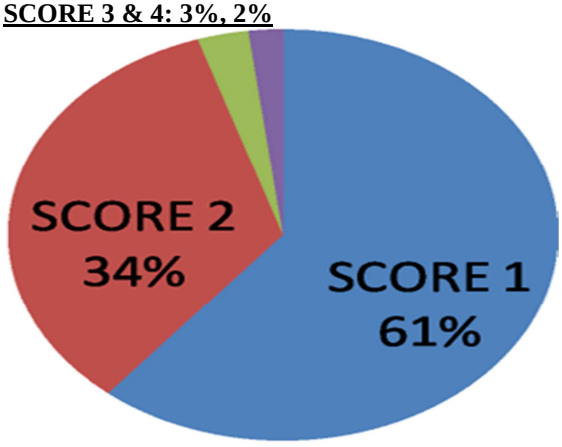
Table 4: Frequency of WSLs in total No. of teeth examined

Score	Frequency	Percentage
1	192	60.95
2	107	33.96
3	10	3.17
4	6	1.9
Total	315	100 %

Table 5: Correlation of Plaque score, White spot lesion score and DIAGNODENT score

		PS	DIAG	WS
PS	(p-value) NS		.800	.434
DIAG	(p-value)NS	.800		.327
WS	(p-value)NS	.434	.327	

SCORE 3 & 4: 3%, 2%



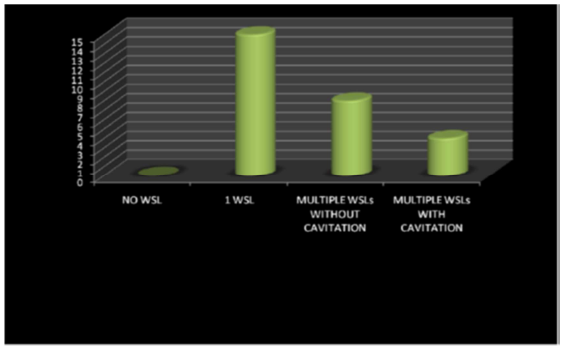


Figure 5: Distribution of Wsls among 315 Teeth

RESULTS

Distribution of WSLs among Cleft Patients was found to be 100% (one WSL, score 2, in 15 patients), (Multiple WSLs without cavitation, score 3, in 8 patients), (WSL with cavitation score 4, in 4 patients)

A total of 315 teeth were scored for decalcification, the findings were as followed; 192 (61%) teeth had a score of 1 (No white spot formation), 107 (34%) had a score of 2 (white spot formation in one area), 10 (3%) had a score of 3 (multiple areas of decalcification), 4(2%) had a score of 6(white spot with cavitation)

DISCUSSION

White spot lesions are one of the most common adverse effects of orthodontic treatment and can have lasting negative effects on dental esthetics.[4] The overall prevalence among orthodontic patients varies from 2% to 96%1,[5] depending on the methods used to assess the decalcification. On visual examination we found significant increase in the frequency of WSLs

White spot lesions have been found in 85 % CLP patients [Parapanisiou 2009] 6 in permanent dentition, which may be because of difficulty in tooth cleaning due to the presence of residual scar tissue as a result of the multiple surgical procedures carried out at the cleft region; the lack of interest for oral hygiene due to many other health problems such as otitis media, difficulty in speech and other snydromic and non snydromic patients. Study is witnessed with cleft lip and/or palate have higher caries prevalence, both in the deciduous and the permanent dentitions.[7] There is study which showed genetic association for caries susceptibility among cleft lip and/or palate individuals8

Frequency and distribution of WSLs in CLP patients in this study have been found higher than the previous studies i.e, 100% in permanent dentition. A total of 15 subjects (M=7, F=8) were included in the present study and in these subjects a total of (315) teeth were examined for the assessment of white spot lesions with the help of visual score method given by Goerlic et al1 and diagnodent method. The frequency of incidence in all cleft patients taken in the study had white spot enamel lesions (WSL) shown in the [Table 3]. In the present study, the Pearson's correlation coefficient was used to find out the relationship between plaque score, diagnodent and white spot enamel lesions. However the correlation coefficient of white spot enamel lesions verses diagnodent was found 0.272 which showed a weak positive relationship i.e, with the increase in value of white spot enamel lesions, the value of diagnodent also increased. Since, there was apparently no coorelation between the plaque score verses diagnodent score and plaque score verses white spot enamel lesions, shown in [Table 5]. The reason could be because of small sample taken in the study which contradicts other studies9-10. On direct conversation with the patients, it was found

that irregular tooth brushing, rotated teeth, difficulty in brushing due to scar tissues may be the prominent reasons for the development of WSLs. Therefore need for preventive precautionary measures are imperative before going for the orthodontic treatments.

CONCLUSION

- Increased numbers of initial/white spot lesions in CLP patients predisposes to an increased risk for further development of carious cavitated lesions during the comprehensive orthodontic treatment.
- There is immense need to evaluate the white spot lesions, reinforce good oral hygiene measures, institute preventive fluoride regimen and manage white spot enamel lesions before orthodontic treatment to obtain optimum esthetic results

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