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Results: Present the results with a minimum discussion. Use tables, charts, Figures and photographs as appropriate to clarify the findings. Mention the methods of statistical analysis if applicable.

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first three and add et. al.). Mixon JM, Sik JD, D David L, Moore DL, Daviel E, Tiva DE, Effect of two dentin bonding agents on Microleakage in to two different cavity designs. J. Prosthet Dent 1992; 67(4): 41-45.

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Editorial

It is my privilege to declare that the dedicated team members of Bangladesh Academy of Dentistry International have worked hard to publish Volume 1, No.1 January 2011, the first issue of Bangladesh Journal of Dental Research and Education with its ISSN # 2225-9015. My heart felt gratitude to all the contributors, who made our journal a standard one. The publication of the first issue along with the present issue, Volume1, No.2, will further encourage others who are still in doubt about our endeavor and outstanding support from most of the member of Bangladesh Academy of Dentistry International. We are committed to keep our international standards. We believe you will find this journal a valuable media to publish and share your clinical techniques and academic knowledge on dental research and education.

I thank all the members of Bangladesh Academy of Dentistry International, the editorial Committee and all the valuable contributors both from home and abroad for their sincere cooperation for the fulfillment of the responsibility entrusted upon me as an Editor-in Chief of this official publication.

Finally, may I wish you all, wherever you are, a happy new journey in the field of Dental Research and Education in Bangladesh with the publication of '*Bangladesh Journal of Dental Research and Education*'



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Mapping the mineral architecture in biofilm induced WSEL by SEM-EDS

S Sultana¹, M Asafuzzoha², K Matin³, A Anjum⁴

Abstract

To map the architectural pattern of demineralized enamel in biofilm induced white spot enamel lesions (WSELs) Ca, P and F elements were analyzed. Circular WSELs were induced on bovine enamel coupons by *Streptococcus mutans* MT8148 (*S. mutans*) biofilms *in vitro* for time intervals of 5, 10, 20, 30 and 40 hours. After analyzing by QLF resin embedded coupons were trimmed longitudinally up to the middle of each WSEL. In the present study, coupons were examined by an SEM S-4500 (Hitachi, Japan) and each surface was analyzed by an energy dispersive X-ray spectroscopy (EDS) EMAX-7000 (Horiba, Japan). The Ca, P and F elements were mapped on the scan line from secondary electron images of the enamel coupons. In addition, the depth of the WSEL, the actual white part that lost most of the mineral particles was also measured on SEM photomicrographs by using SemAfore software (Jeol, Finland). Experiments were repeated for three times (n=5) and numerical data were analyzed by One-way ANOVA and Tukey's HSD. Ca and P elements equally get dissolved from the prism rods and produce similar architectural landmark on the demineralized enamel and some of the element particles get trapped in mesh of crystallites at the edge below biofilms.

Key words: EDS, White Spot Enamel Lesion (WSEL), biofilm, *S. mutans*, QLF

Introduction

Enamel demineralization and white lesions occur during and sometimes remain after orthodontic treatment.¹ When the pH of the oral cavity drops below 5.5, the hydroxyapatite crystalline lattice is damaged and the tooth surface becomes rough.² Therefore, either due to some altered environmental factors in the oral cavity or as an adverse effect of some dental treatment primarily occurred damages to the enamel structure are described to be as white spot enamel lesions (WSEL); appear as white spots on tooth surface clinically. However, there is contradiction in defining WSEL and a standard classification for non-invasive treatment or restoration

and prevention is yet to be established.

In the late 19th century Magitot.³ Miller.⁴ proposed the concept of artificial mouth systems. The complexity of oral environment, and the ethical problems associated with *in vivo* studies of oral diseases such as caries and periodontal diseases in humans have inevitably led to the development of laboratory models, which simulate the oral environment *in vitro*. These model systems are given the epithet 'artificial mouth' (AM).

Materials and Methods:

Sample preparation

64 bovine incisors were used for this study. Approximately 4×4×2 mm³ enamel blocks were cut by using low speed diamond saw. Enamel surfaces were flattened and polished with 800/1200/1500 silicon carbide papers. Then the Enamel surfaces were covered with paraffin wax (GC.medical.co) 1.4 mm thick before making 1mm whole at the center of the wax. Circular WSELs were induced on bovine enamel coupons by *Streptococcus mutans* MT8148 (*S. mutans*) biofilms *in vitro* for time intervals of 5, 10, 20, 30 and 40 hours. After analyzing by QLF resin embedded coupons were trimmed longitudinally up to the middle of each WSEL.

Scanning electron microscopic (SEM) observation:

In order to examine the fine structural changes of WSEL, the specimens were embedded in a self-curing

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epoxy resin (Epon 815, Nissin EM, Tokyo, Japan). They were subsequently trimmed to expose the mid-longitudinal cut surfaces, which were then polished with silicon carbide papers under running water and further polished to high gloss with abrasive discs and diamond pastes of decreasing abrasiveness, down to 0.25 μm . The specimens were cleaned ultrasonically at each step. In the present study, coupons were examined by an SEM S-4500 (Hitachi, Japan) and each surface was analyzed by an energy dispersive X-ray spectroscopy (EDS) EMAX-7000 (Horiba, Japan).

Polished specimens were subjected to argon ion beam etching (EIS-1E, ELIONIX, Tokyo, Japan) for 5 min 0.20 mA 1kv to disclose the decomposed enamel structures, gold-sputter coated and inspected by SEM (Fig. 1).

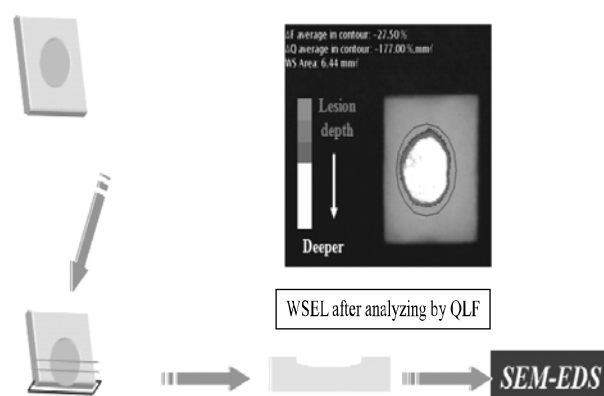


Fig. 1: Resin embedded coupons were trimmed longitudinally up to the middle of each WSEL

Results:

SEM (Fig. 2) and EDS (Fig. 3) data showed that there was about four fold increase in lesion depth (μm) after 40 hrs (60.23 ± 2.17) from that of after 10 hrs (14.83 ± 1.4) in WSEL, difference was significant ($p < 0.05$).

Discussion:

The WSEL maintained similar architecture and depth increased as Ca and P elements continuously dissolved from prism rods with the increase of time. However, parts of these dissolved elements got trapped at the edge that appeared as a peak on EDS element line mapping.

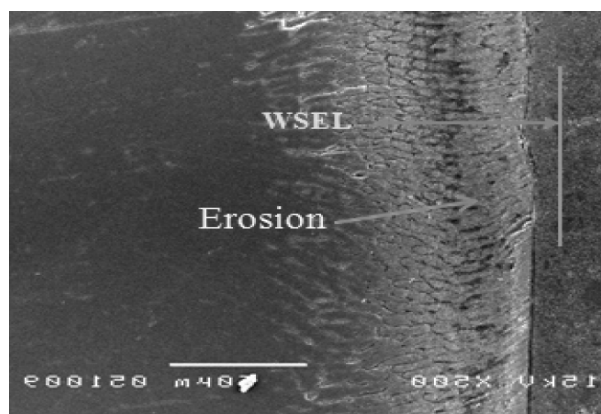


Fig 2: Depth of the WSEL

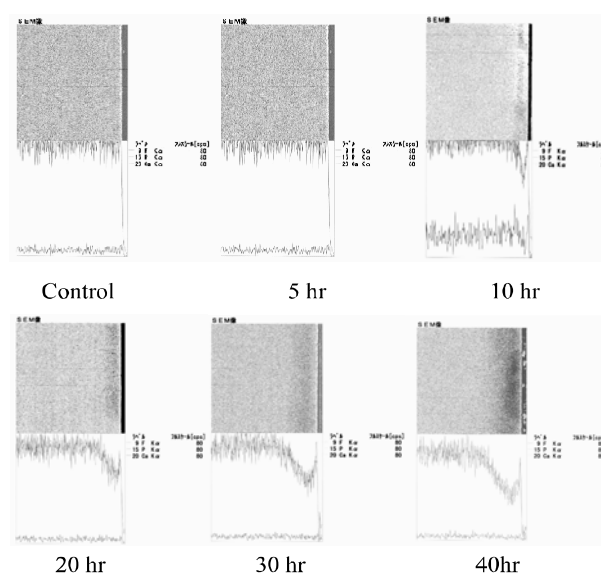


Fig. 3: Energy dispersive X-ray (EDS) on longitudinal sections of WSEL

Conclusion:

Ca and P elements equally get dissolved from the prism rods and produce similar architectural landmark on the demineralized enamel and some of the element particles get trapped in mesh of crystallites at the edge below biofilms.

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Socio-demographic Factors Associated with Dentition Status among the Geriatric People living in three selected Old Homes of Bangladesh

G Mohammad¹, F Jerin², MM Rahman³, MS Hossain⁴

Abstract

A descriptive cross-sectional study was carried out among the geriatric people aged 60 years and above in three selected old age homes of Bangladesh to assess the association of socio demographic variables with dentition status. 87 respondents were selected by convenient sampling technique and data were collected through a structured questionnaire and a checklist of World Health Organization (WHO). For dentition status, decayed, missing, filled teeth (DMFT) were examined and total DMFT were counted for individual respondent. Higher DMFT score was considered as poor dentition status and lower DMFT score was considered as good or fair dentition status. The study revealed that, among the participants 47.1% were males and 52.9% participants were females, mean decayed, missing and filled teeth (DMFT) index of the geriatric people was 15.65(SD±9.72). For association between socio-demographic variables and dentition status, it was found that, higher DMFT score (25-32) was >75 years older group in highest percentage (94.1%) which indicates, dentition status decreases with age. About level of education, lower DMFT scores were seen in Graduate and above group in highest percentage (45.5%) and higher DMFT scores were seen in illiterate group in highest percentage (24.9%). Good dentition status was more in elderly people who came from towns. Gender and marital status did not influence the dentition status in this study. So, oral health education and services in illiterate persons and village people in old homes need to be strengthened to improve their dentition status.

Key words: Dentition status, Geriatric people, Old age home.

Introduction:

The 20th century can be labelled as the century of increasing human longevity. Improvement in the health status of the population has resulted in an increase in the number of elderly surviving to an advanced age. This phenomenon is more striking in the developing countries where both the percentage of elderly as well as the absolute numbers is increasing.¹ In Bangladesh by 2005, the total number of people aged 60 years and above was 5.64 million (about 5 % of the total population). This number is expected to increase to 14.6 million (about 9% of the total population) by the year 2025.² Although the majority of the elderly live independently in the community in Bangladesh, a growing number of older people live in different old homes situated at different locations of Bangladesh

because the population is aging and at the same time joint families are breaking and the culture of old homes is developing in our country. Oral health status plays an import role in patient quality of life, affecting mental, physical and psychological well being and complete social development by interfering with word pronunciation, social life and alimentary function.³ The earlier belief that loss of teeth was a natural phenomenon with age is no longer true. More and more elderly persons are entering their old age with a partially or fully dentate mouth.⁴ Longer retention of teeth will naturally result in increased prevalence of dental caries. The reasons for this increased susceptibility to carious attacks are many. Dental caries is the second most common cause of tooth loss after periodontal diseases. Chronic caries in the elderly, being a slow insidious process, is painless in the initial stages. Even when it progresses to involve deeper layers of dentine and causes pain, it is likely that elderly patients would not report early for treatment. Brody⁵ documented that elderly patients often underreported their symptoms. Therefore, they usually seek treatment only when acute pulpitis or abscess develops. The general trend is to extract the painful or abscessed teeth, especially in this group. There is a lack of awareness about the importance of saving natural teeth amongst dental professionals as well as elderly patients themselves. There is lethargy amongst professionals to

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carry out advanced restorative procedures on the teeth of elderly patients or there may be unwillingness on the part of the elderly patient or his/her carer to incur expenses on restorative/ endodontic treatment. This is even helped by the prevalent myth that loss of teeth is natural part of ageing process.⁶ Treatment of dental caries is not only expensive but may simply be inaccessible to the majority of the elderly population. It is the time to know the factors associated with dentition status (decayed, missing, filled teeth) of the elderly in old age homes. No comprehensive epidemiological data is available for dentition status in the geriatric people living in old age homes in Bangladesh. Therefore, a study was planned to assess the association of socio-demographic variables with dentition status of the geriatric people living in three selected old age homes of Bangladesh.

Materials and Methods:

This descriptive cross-sectional study was carried out among the geriatric people aged 60 years and above in three residential old age homes in and around Dhaka city, the capital of Bangladesh in May 2010. The old homes were, The Probin Hitoishi Kendra (BAAIGM), Agargaon, Dhaka, Boyoshko Punorbashon Kendra (BOPUK), Gazipur and The Belasheshe Old Home, Mirpur, Dhaka. 87 respondents were selected for this study, of these, 25 were from Agargaon, 54 from Gazipur and 08 from Mirpur old home. Convenient sampling technique was followed for the selection of respondents on the basis of agreement to give interview. Informed consent was obtained from all residents who were willing to participate in the study. The subjects were interviewed using a structured questionnaire and were clinically examined according to World Health Organization (WHO) criteria.⁷ For dentition status, decayed, missing, filled teeth (DMFT) were examined and total DMFT were counted for individual respondent. Higher DMFT score was considered as poor dentition status and lower DMFT score was considered as good or fair dentition status in this study. Finally DMFT score was categorized to find the association with independent variables. The data were analyzed by using SPSS 17.0 statistical package program and reported by univariate and bivariate analysis in contingency tables. Association between dependent and independent variables were measured by chi-square test.

Results:

Among the 87 geriatric people in 3 old age homes, the minimum age was 60 and maximum was 100 years. Mean age was 71.30 years with a standard deviation of 7.69 years. Among the participants, 47.1% were males and 52.9% participants were females. Most of the participants (37.9%) were in the age group of 66-70 years. Majority of the participants, 64.4% were widows and 27.6% were currently married. In regard to education level, 32.2% Geriatric people in the old homes were graduate and above, 18.4% were educated up to higher secondary level, and 21.8% were illiterate. Among all the participants, 62.1% spent most of their life in town and 37.9% in village. (Table-I)

Table-1 Socio-demographic characteristics of the geriatric people in three old homes. (n=87)

Socio-demographic Characteristics	Number	Percent (%)
Sex		
Male	41	47.1
Female	46	52.9
Age		
<65	23	26.4
66-70	33	37.9
71-75	12	13.8
76-80	10	11.5
81-85	5	5.7
>86	4	4.6
Level of Education		
Illiterate	19	21.8
Primary	14	16.1
Secondary	10	11.5
Higher secondary	16	18.4
Graduate and above	28	32.2
Marital Status		
Married	24	27.6
Widow	56	64.4
Divorced	6	6.9
Never married	1	1.1
Most of the life spent in		
Town	54	62.1
Village	33	37.9
Total	87	100.0

Dentition status revealed that, the mean DMFT (decayed, missing, filled teeth) index was 15.65(SD±9.72), where the mean number of decayed teeth was 1.33 (SD±2.31), mean number of filled teeth was 0.29(SD±0.66) and mean number of missed teeth was 14.03 (SD±10.18). The mean sound teeth in was 16.32(SD±9.70). (Table-II)

Table-II: Mean (±SD) number of sound, decayed, missing, filled teeth and total DMFT of the respondents. (n=87)

<i>Dentition Status</i>	<i>Mean</i>	<i>Standard Deviation</i>
Sound teeth	16.32	±9.70
Decayed teeth	1.33	±2.31
Missed teeth	14.03	±10.18
Filled teeth	0.29	±0.66
DMFT	15.65	±9.72

About DMFT and sex, higher percentages of elderly was females (63.6%) who have DMFT score of 0-8. On the other hand, 25-32 DMFT score was also more (52.9%) in females. It indicates fair and poor dentition statuses both were high in females. There was no statistically significant difference between DMFT and sex (p value > 0.05). (Table-III)

Table-III: Distribution of DMFT by sex of the geriatric people (n=87).

<i>DMFT Score</i>	<i>Sex</i>		<i>Total</i>
	<i>Male</i>	<i>Female</i>	
0-8	8(36.4)	14(63.6)	22(100.0)
9-16	17(53.1)	15(46.9)	32(100.0)
17-24	8(50.0)	8(50.0)	16(100.0)
25-32	8(47.1)	9(52.9)	17(100.0)

*P =>0.05 *(Values in parentheses are percentages)

With regard to age group of the geriatric people, higher DMFT score (25-32) was >75 years older group in highest percentage (94.1%). On the other hand, lower DMFT score (0-8) was 100% on 60-57 years older group. It indicates, dentition status decreases with age. Statistically significant association was found in between DMFT and age group of the geriatric people. (p value < 0.001). (Table-IV)

Table-IV: Distribution of DMFT by age group (n=87).

<i>DMFT Score</i>	<i>Age group</i>		<i>Total</i>
	<i>60-75 years</i>	<i>>75 years</i>	
0-8	22(100.0)	0(0.0)	22(100.0)
9-16	31(96.9)	1(3.1)	32(100.0)
17-24	14(87.5)	2(12.5)	16(100.0)
25-32	1(5.9)	16(94.1)	17(100.0)

*P =<0.001 *(Values in parentheses are percentages)

In relation to marital status, highest percentage (82.4%) were widows who had poor dentition status, and good dentition status was also presented by widows in higher percentage (59.1%). This is because of majority of the respondents included in this study were widows. No association was found between dentition status and marital status of the geriatric people (p value>0.05). (Table-V)

Table-V: Distribution of DMFT by marital status of the geriatric people (n=87).

<i>DMFT Score</i>	<i>Marital Status</i>				<i>Total</i>
	<i>married</i>	<i>widow</i>	<i>divorced</i>	<i>never married</i>	
0-8	5(22.7)	13(59.1)	4(18.2)	0(0.0)	22(100.0)
9-16	11(34.4)	20(62.5)	1(3.1)	0(0.0)	32(100.0)
17-24	6(37.5)	9(56.3)	1(6.3)	0(0.0)	16(100.0)
25-32	2(11.8)	14(82.4)	0(0.0)	1(5.9)	17(100.0)

*P =>0.05 *(Values in parentheses are percentages)

About level of education, lower DMFT score was found in Graduate and above group in highest percentage (45.5%). Higher DMFT score was found in illiterate group in highest percentage (24.9%). It indicates good dentition status was more in educated group of geriatric people. But statistically significant association was not found between level of education and DMFT score (p value>0.05). (Table-VI)

Table-VI: Distribution of DMFT by level of education of the geriatric people (n=87).

<i>DMFT Score</i>	<i>Level of Education</i>					<i>Total</i>
	<i>Illiterate</i>	<i>Primary</i>	<i>Secondary</i>	<i>Higher Secondary</i>	<i>Graduate and above</i>	
0-8	4(18.2)	2(9.1)	2(9.1)	4(18.2)	10(45.5)	22(100.0)
9-16	7(21.9)	4(12.5)	3(9.4)	7(21.9)	11(34.4)	32(100.0)
17-24	3(18.8)	3(18.8)	4(25.0)	2(12.5)	4(25.0)	16(100.0)
25-32	5(24.9)	5(24.9)	1(5.9)	3(17.6)	3(17.6)	17(100.0)

*P =>0.05 *(Values in parentheses are percentages)

Geriatric people who most of their life in town got lower DMFT scores in highest percentage (77.3%). On the other hand, who spent most of their life in village got higher DMFT score in highest percentage (58.8%). It indicates good dentition status was more in elderly people who came from towns. But the association was statistically insignificant (P value >0.05). (Table-VII)

Table-VII: Distribution of DMFT by most of the life spent in (n=87).

DMFT Score	Most of the life spent in		Total
	Town	Village	
0-8	17(77.3)	5(22.7)	22(100.0)
9-16	22(68.8)	10(31.3)	32(100.0)
17-24	8(50.0)	8(50.0)	16(100.0)
25-32	7(41.2)	10(58.8)	17(100.0)

* $P \Rightarrow 0.05$ *(Values in parentheses are percentages)

Discussion:

In the three old age homes, mean age of the geriatric people was 71.30 years with a standard deviation of 7.69 years. Another study in an old age home in Gazipur, Bangladesh found mean age 70.78 ± 7.168 years.⁸ The percentage of females was higher in the current study which is similar to that study.

The DMFT index was found 15.65 ± 9.72 in current study, where the mean number of decayed teeth was 1.33 ($SD \pm 2.31$), which is lower in comparison to data from the study done in institutionalized elderly in Spain 2005 (DMFT was 27.02, mean decayed teeth was 1.45).⁹ The mean number of decayed teeth was 3.66 in old age homes in India,¹⁰ and $2.01(SD \pm 4.17)$ in an old age home in Gazipur, Bangladesh.⁸ This situation is better in current study. Mean number of filled teeth was 0.29 ($SD \pm 0.66$) and mean number of missing teeth was 14.03 ($SD \pm 10.18$) in this study, but higher number of filled teeth (1.15 ± 2.78) was found by Iglesias-Corcheró AM et al. in centres of aged in Spain,⁹ on the other hand mean number of missing teeth was 12.49 ± 12.03 in another study in Bangladesh.⁸

To compare the results of association, unfortunately, data were not found for socio-demographic factors associated with dentition status of the elderly in any study.

In present study, higher percentage of elderly was females (63.6%) who have DMFT score of 0-8. On the other hand, 25-32 DMFT score was also more (52.9%) in females. There was no statistically significant relation between DMFT and sex (p value >0.05). In a study among elderly in Turkey found higher number of females with high DMFT and statistically no association was found.¹¹

Higher DMFT score was found more in older age group, which indicates dentition status decreases with age. Statistically significant association was found between dentition status and age of the geriatric people.

In the present study, marital status revealed that, highest percentage (82.4%) was widows who had poor dentition status, and good dentition status was also present in widows in higher percentage (59.1%). This is because majority of the respondents included in this study were widows. No association was found between dentition status and marital status of the geriatric people. In a study about impact of socio-demographic factors in dentition status, it was found association between marital status and dentition status.⁶

About the level of education, lower DMFT score was found in graduate and above group in highest percentage, which indicates good dentition status was more in educated geriatric people. In India, high literacy group was found with low dentition status, which has dissimilarity with the present study.⁶

Geriatric people who spent most of their life in town got lower DMFT score in higher percentage and who spent most of their life in village got higher DMFT score in higher percentage. It indicates good dentition status was more in elderly people who came from towns. But the association was statistically insignificant. In India, a slightly higher percentage of urban elderly had decayed teeth in comparison with rural elderly, indicating poor dentition status in urban elderly.⁶

Conclusion:

From the present study, it was observed that, dentition status of the geriatric people in three old homes were associated with age. Dentition status decreased with the increase in age. Other socio-demographic factors which influence the dentition status of geriatric people were level of education and place of stay for most of the life. Higher educated people had better dentition status than

illiterate people. Poor dentition status was more in geriatric people who spent most of their life in villages. So, oral health education and services in illiterate village people need to be strengthened to improve their dentition status.

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Disease pattern of patients attending at the out patient department of Pioneer Dental College, Dhaka

MS Hossain¹, S Akter², I Zerin³, S Jerin⁴

Abstract:

The purpose of this study was to collect information on disease pattern for further research and evaluation in outpatient practice. The study was carried out from January 2010 to June 2010 and the diseases have been classified in five groups. i.e., caries, periodontal disease, bdr/bdc, attrition/abrasion/erosion and miscellaneous. The miscellaneous group includes missing tooth and Impaction. This was a retrospective study of all treatments done in the out patients department of Pioneer Dental College and hospital. Information was collected from the registers maintained in the department. 1646 patients visited at the out patient department of Pioneer Dental College and Hospital Of these 53% were male and 47% were female. Caries was the prime causative agent for extraction accounting for 33% of all extraction. Periodontal disease was the next common cause accounting for 31% extractions. Broken down root/ crown were 10% of all cases. Attrition/Abrasion/Erosion were 11% among all patients. 15% were miscellaneous where impaction and missing teeth were included.

Introduction

To organize and implement adequate strategies for the prevention and the treatment of oral diseases, more information is required about the reasons of extraction of permanent teeth¹. Tooth mortality provides some of the necessary information not only on the prevalence of dental disease, it also provides crucial information on availability of resources and it is considered to be very important for planning of dental health services³.

The study was done from January 2010 to June 2010 and the diseases have been classified in five groups. i.e., caries, periodontal disease, bdr/bdc, attrition/abrasion/erosion and miscellaneous. The miscellaneous group includes missing tooth and impaction.

For the past few decades it was generally accepted that, the prime cause of tooth mortality before the age of 40 years was caries and after that periodontal disease was the predominant cause⁴. Epidemiological data now show that caries and its complications continue to be the prime cause of extraction throughout life².

The purpose of this study was to collect information on disease pattern for further research and evaluation of outpatient practice.

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Materials and Methods

This was a retrospective study of all treatments done in the out patient department of Pioneer Dental College and hospital, Dhaka from January 2010 to June 2010. Information was collected from the registers maintained in the department. This information included age, sex of the patient, disease and the tooth involved and the procedure done. Children who have had their deciduous teeth extracted were excluded from the study.

Results

1646 patients visited at the out patient department of Pioneer Dental College and Hospital for one or more treatments from January 2010 to June 2010. Of these 53% were male and 47% were female.

Caries was the prime causative agent for extraction accounting for 33% of all extractions. Periodontal disease was the next common cause accounting for 31% extractions. Broken down root/ crown were 10% of all cases. Attrition/Abrasion/Erosion were 11% among all patients. 15% were miscellaneous where impaction and missing teeth were included. Impacted wisdom teeth were removed and teeth were extracted where missing shows.

N= 1646

Table 01: Distribution of patients by sex:

Sex	Frequency	Percentage
Male	871	53
Female	775	47
Total	1646	100

Table 01: shows the distribution of patients according to their sex. It was observed that 53% of the patients was male. Followed by 47% female.

Table 02: Distribution of patients by Disease.

Disease pattern	Frequency	Percentage
Caries	1163	33
Periodontal disease	1119	31
BDR/BDC	359	10
Attrition, Abrasion, Erosion	395	11
Miscellaneous	542	15
Total	3574	100

Table 02, shows the disease pattern of patients. It was observed that highest percentage 33% of the patients was with caries followed by 31% periodontal disease. It was found that the percentage of BDR/BDC was 10%. Attrition, abrasion, erosion was 11%. In miscellaneous group was 15%.

Table 03: Distribution of patients by age.

Sl. No.	Age	Frequency	Percentage
01	16-20	380	23
02	21-30	498	30
03	31-40	482	29
04	41-50	182	11
05	51-60	75	5
06	61 & above	29	2

Table 03, shows the age pattern of patients. It was observed that highest percentage 30% of the patients was in 21-30 age group followed by 29% in 31-40 age group. It was found that the percentage of patients in 15-20 age group was 23%. 41-50 age group was 11% and 51-60 age group was 5%, rest 2% was in 61-above age group.

Table 04: Distribution of patients by month.

Month	Frequency	Percentage
January	221	13
February	243	15
March	309	19
April	261	16
May	297	18
June	315	19
Total	1646	100

Table 04, shows the frequency of patient attending month wise. Gradually attendance of patients increased from January to June, 2010.

Discussion

This study represents the first available data on reasons of extractions/other treatments in Pioneer Dental College and Hospital out patient department Dhaka, Bangladesh. Compared to other studies⁴ caries was the leading cause of tooth extraction, percentage of extractions due to caries was 33%, due to periodontal disease 31%, due to attrition/abrasion/erosion was

11%, due to bdr/bdc was 10%, and miscellaneous was 15% in our sample population.

The data must be interpreted carefully, as caries prevalence is high in Bangladesh and therefore this probably is the only treatment being offered to the population by the public sector or is the only accepted remedy for a toothache⁶. However, the availability of restorative and preventive dental services in the area, the cultural and educational background of the patients, the attitude of the dental surgeon is determining the criteria for extraction, all could be postulated as other reasons for high proportion of extractions due to caries⁹.

Previous studies have also highlighted the extent of untreated caries in the country. There is a need to conduct similar studies to find out causes of extractions in other parts of the country¹⁰. It is envisaged that similar ratios will be found elsewhere in the country, which strengthens the need to promote health education, so that patients seek early treatment of dental caries and demand restoration of their diseased teeth rather than accept extraction as a natural sequel to dental caries.

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Tooth Length Variation of Maxillary central incisor - An analytical study in Bangladesh

SM Zakaria¹, S Rahman², A Rahman³

Abstract

100 maxillary central incisors during course of endodontic treatment were studied for determination of anatomical tooth length. The main objective of this study was to assess the variation in tooth length of maxillary central incisors in Bangladeshi population irrespective of sex. Radiographic interpretation & Mathematical calculation proposed by Messing were used to observe and measure the length of individual root canal for tooth length. My study revealed that the average tooth length for the maxillary central incisor was 22.10 mm. The study also showed the maximum length at 25 mm and minimum length at 10 mm. The result indicates that the tooth length of Bangladeshi people is shorter than their caucasoid counter part. The studies previously performed by different researchers and those given in different textbooks of Endodontics showed that the tooth length of Caucasian is longer than this study.

Introduction

During endodontic treatment, instrumentation should be up to the optimal depth since any error in the steps follows failure or root canal treatment. Preoperative tooth length is considered important in endodontic surgery during osseous entry, root resection and even in post preparation. Tooth length is also considered as an important part in the treatment of endodontic implantology, maxillofacial surgery and also for tooth movement and traction in orthodontics. For the determination of the tooth length, root canal length has to be found out. The measurement of root canal length up to apical foramen is still the tough tasks and the subject for several controversies but is the basis for a successful endodontic treatment. Ingle used the pretreatment radiograph is mathematical procedure for determining root length. From them most of the dental practitioners were following the method proposed by Ingle. But radiographic distortion can be corrected with a pre-measured endodontic instrument, is used during taking a working length measuring X-ray of incisor during course of endodontic treatment, to calculate the tooth length.

Materials & Methods:

A total of 100 were studied out of which 60 were male and 40 were female. Teeth with broken/ fracture crown, severely attrited teeth and patients under 16 years and over 55 years were excluded from this study.

Preoperative radiograph was taken initially. The radiolucent line of pulp canal on the radiograph was studied with the help of magnifying X-ray viewer & the pre operative tooth length was estimated. The purpose of magnification was to enhance visualization of radiograph. Pulp chamber was then opened and access cavity was prepared. After removal of debris and pulp tissue, small numbered reamer/ file (10/15) was selected the selected reamer/ file introduced up to estimated length assuring that instrument did not across the anatomical apex of the tooth. The favorable was selected for coronal reference point and fixed by rubber stopper of reamer/ file. The length of the reamer between the coronal reference point and tip of the reamer having been noted, the working length measuring X-ray was then taken with careful inclination of X-ray beam with the examined tooth.

When the film has been processed, the image of the reamer is measured and, if the length of the reamer on the radiograph is the same length as the length of the reamer inserted into the canal during working length measure; the distance between the point of the reamer and the apex can be measured directly from the radiograph and added with the length of the reamer introduced, in order to ascertain the correct length of the tooth.

If due to mal-angulation of the central ray, the reamer is foreshortened or elongated on the radiography, the correct length of the tooth may be calculated according to the mathematical calculation⁵.

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LT = (LRxLTX) LRX.

$$\text{i.e. Length of the tooth} = \frac{\text{Length of the Reamer} \times \text{Length of the tooth on radiograph}}{\text{Length of the Reamer or radiograph}}$$

Due to the reason of minor and major diameter,⁶ 0.5-2 mm is added according to the age of patient. As proposed by Kuttler, re-diagnostic radiography was taken when reamer/file was long or short by more than 1-5.5 mm from minor diameter (apical constriction).

Results:

The average tooth length of Maxillary central incisor was 22.10 mm. In the same way, the Maximum tooth length was 24.0 mm & minimum tooth length was 9.00 mm whereas the tooth length that was found in maximum number of teeth (mode) 21.0 mm.

Table: 1: Tooth length of studies population

Tooth Central Incisor	Criteria	Length in mm
	Average	22.1
Maxillary	Minimum	9.0
	Maximum	24.0
	Mode	21.0
	Standard Deviation	3.0

Table: 2: Comparative study between the tooth length of Bangladeshi people & the length found by various researchers

Variable	Tooth length of the Bangladeshi People	Harty	Ingle	Grossman
Maxillary Central Incisor	22.1	23.0	23.7	21.7

Discussion:

Due to density of tooth, canal preoperative tooth length In 1900, it was proposed that cementum dentinal junction is the ideal place to finish instrumentation and endodontic obturation³. Since cemento- dentinal Junction is the histological structure and not viewed in radiograph, difficult to find in X-rays. By the study of palmer 50% extend 1 mm or more through apical foramen when instrumentation is limited to short of radiographic apex⁶. Instrumentation should be up the minor diameter, apical constriction short of radiographic

apex. Apex locator is another device that can detect the apex of tooth. However, there are number of controversies, as it deals upon its electric charge and ionic phase of media in the canal. As apex locator can help in determining the canal length during the root canal treatment, but it cannot replace periapical radiography, there is chance of missing the extra canal present in the tooth. When diagnostic x-ray was taken an apex locator was also used and instrument was limited to short radiographic apex.

The subject of this study were selected from regularly attended patients in Pioneer Dental College and all the division, of the country and referred from different thana health complexes, district hospitals and private dental clinics and therefore the average tooth length in this study represents the average of Bangladeshi people.

Conclusion:

Average central incisor length in Bangladeshi people, will help the dental practitioners in endodontic treatment and will reduce the failure of treatment.

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Facial Bone Fracture: Study On Etiological Factors And Management By Fixation With Miniplate Osteosynthesis And Short Term Inter Maxillary Fixation

MM Hasan¹, MM Islam², KR Islam³, M Ahmed⁴

Abstract

The study investigated the causes, pattern and management of maxillofacial fracture with Open reduction and internal fixation with or without Inter Maxillary Fixation (IMF) along with the common complications in their management outcome. Study included 59 maxillofacial fracture patients who had surgical intervention for the fracture in the Department of Oral and Maxillofacial Surgery, Dhaka Dental College and Hospital. Thirty six of the patients underwent open reduction with miniplate fixation and no Inter Maxillary Fixation (IMF) was given and 23 patients were treated with the similar surgical management with short term (4-7 days) inter maxillary fixation. Comparison of outcome was made between the groups. Road traffic accident is the primary cause of facial bone fracture in our country beside this assault, violence and fall from height also contribute. Cause of trauma might be little different in the developing world than the industrial world. Occlusion has been the key variable for measuring the outcome and comparison of treatment modalities. Five of the components, molar relation, canine relation, anterior open bite, posterior open bite and cross bite were taken in to account for assessing the occlusion as the out come of treatment. Any derangement of the above relation is termed Malocclusion. Malocclusion was found to be significantly low among the patients treated with IMF but does not influence the chance of occurrence of complication. Considering the findings of the study short term IMF may be recommended as an essential part after open reduction of facial bone fracture for better outcome. A larger scale study with larger randomized sample with greater logistic support is hereby recommended.

Introduction

The face provides not only anterior protection to the cranium but also associated with many important function of the daily life. Disruption of these structures due to any reason such as trauma severely affects those functions and life style of the patients. So it is important to consider the etiology of the injury, diagnosis and the type of management in order to give the patient acceptable function and aesthetic.¹ in developing countries like Bangladesh, Road Traffic Accident (RTA) remains the commonest causes of maxillofacial

trauma^{2,3,4,5,6}. But in western countries assault replaces RTA. This difference is due to overcrowding, insecure road, violation of traffic rules and unskilled driving⁷. In RTA's those who are injured fatally have 24% encounter trauma in Brain. Over 50% in chest and 24% in face⁸. In poly trauma RTA patients facial bone fractures are about 61% in mandible, 46% in maxilla, 27% in zygoma, and 19.5% in nasal bone⁹.

Clinically the maxillofacial injured patient may present soft tissue injury with or without fracture, anterior openbite, unilateral malocclusion, deviation of the occlusion, haematoma formation and/or swelling in the buccal or labial sulcus, missing or fractured teeth, step deformity, involvement of the brain and cranial nerves, involvement of the orbit, involvement of the paranasal sinuses, rupture of the blood vessel etc¹⁰.

In the definitive care of the maxillofacial fracture management, the two general techniques of treatment followed are - (a) closed reduction and (b) open reduction. In the open reduction system now a days mini and microplating system have been used and those are cost effective and less hazardous because no application of long term intermaxillary fixation. But inspite of that malocclusion may occur as a postoperative complication due to the micromovements of the fracture fragments.

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In this study open reduction and internal fixation with miniplate without IMF was compared to short term IMF with a view to overcome the malocclusion due to micromovements of the fracture fragments postoperatively. As because occlusion is the prime concern for the management of facial bone fracture, obtaining satisfactory occlusion is the sign of success of maxillofacial fracture management.

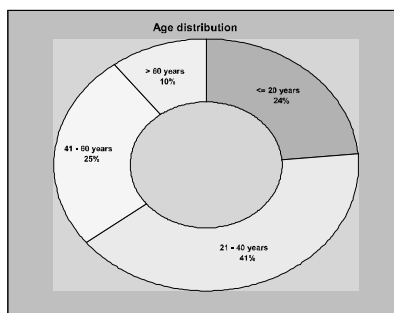
Materials and method:

This observational comparative study was performed in the department of OMS, Dhaka Dental College and Hospital in the period of Jan 2004 to July 2005. 59 patients were selected and causes of fracture were noted. They were divided into group A-23 (Miniplate and IMF group) and group B-36 (Only miniplate). In group A patients fracture fragments were reduced and fixed with miniplate at previous anatomic occlusion. Arch bar or eyelet was fixed in upper and lower jaw. Short term intermaxillary fixation was given after 1st POD for up to 7th POD. In group B patients fracture fragments were reduced and fixed with miniplate at previous anatomic occlusion. No archbar or eyelet was given in this group. Patients functional evaluation was done by assessing occlusal status and jaw movement. Assessment of occlusal status was done using parameters like, molar relationship, canine relationship, anterior open bite, posterior open bite and cross bite. Jaw movement was assessed measuring the interincisal gap in mm.

Result:

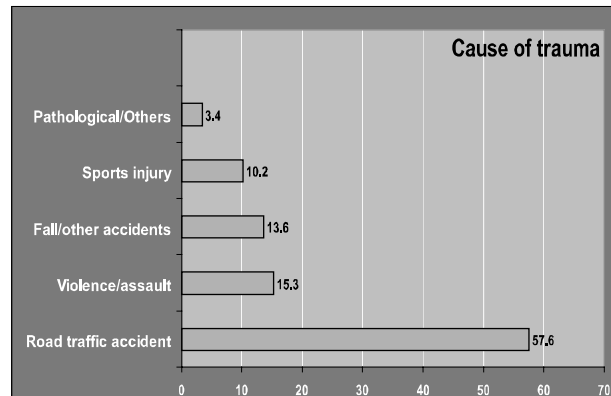
The study was conducted among 59 facial bone fracture patients who had surgical intervention for the fracture at Dhaka Dental College and Hospital. Thirty six of the patients underwent open reduction with miniplate fixation only and 23 patients were treated with the similar surgical management with short term Inter Maxillary Fixation. Comparison of outcome was made between the groups.

Figure: I Age distribution of the Subjects



shows the distribution of the respondents by age. Around 24% of the respondents were aged below 20 years and around 10% were elderly patient (>60 years). Most traumas were found among patients aged between 20 -40 years, the most physically active group.

Figure: II Causes of trauma



shows distribution of the respondents by cause of trauma. RTA accounts the majority (57.65%) of the respondents.

Table I: Distribution of the respondents by site of fracture

Site of fracture	Frequency	Percent
Body of Mandible	19	32.2
Angle of mandible	13	22.0
Symphyseal fracture	8	13.6
Parasymphysis	10	16.9
Zygomatic complex	9	15.3
Total	59	100.0

shows distribution of the respondent by the site of fracture. Fracture in the body of the mandible accounts most (32.2%), then comes angle of the mandible (22.0%), parasymphysis (16.9%), zygomatico complex (15.3%), symphyseal fracture (13.6%).

Table II: Distribution of the respondents by occlusion

In the present series Malocclusion was found among 22.2% (8) control subjects and only 4.3% (1) study subjects. Quite the opposite, 77.8% (28) of control subjects and 95.7% (22) of study subjects achieved satisfactory occlusion. The difference in occlusion between the groups was found to be statistically significant following Chi square test ($P < .05$)

Occlusion	Treatment type		Total
	Control group	Study group	
Malocclusion	8 22.2%	1 4.3%	9 15.3%
Satisfactory Occlusion	28 77.8%	22 95.7%	50 84.7%
Total	36 100.0%	23 100.0%	59 100.0%
Pearson Chi-Square	$\chi^2 = 4.031$	df 1	P = .045

Figure III: Distribution of the respondents by Complication

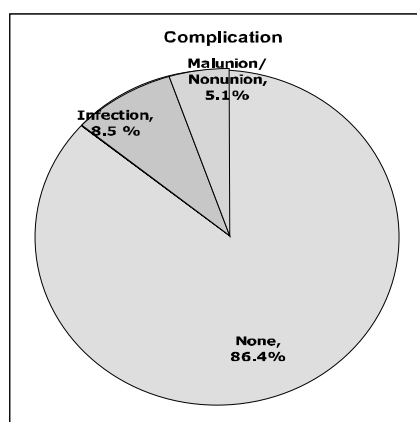
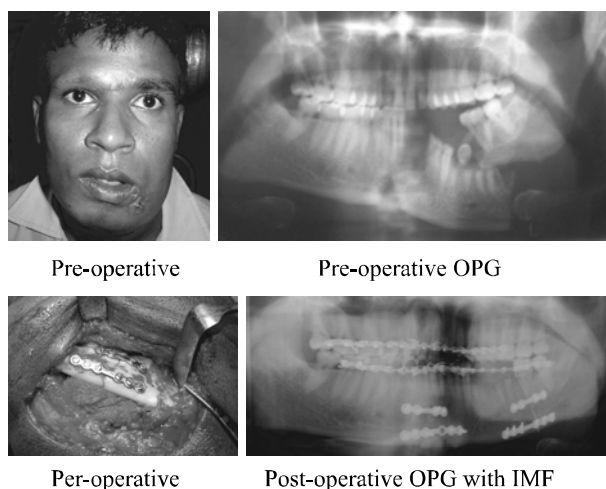


Figure: III shows distribution of respondents by complication. 86.4% of the patients did not experience any complication. Among the complications 8.5% had postoperative infection and 5.1% had either non union or malunion.



Discussion

Current study investigated the pattern, causes and management of maxillofacial fractures along with the

common complications in maxillofacial trauma. Current study was conducted among 59 maxillofacial fracture patients who had surgical intervention for the fracture at Dhaka Dental College. Thirty six of the patients underwent open reduction with miniplate fixation only and they were considered as control and 23 patients were treated with the similar surgical management with short time intermaxillary fixation, they were the study subjects. Comparison of outcome was made between the groups.

Majority of the respondents (57.6%) were the casualty of Road traffic accident. Among others, 15.3% were the victim of assault or any sort of violence, 13.6% hurt due to fall from height or any other type of accident excepting Road traffic accident. Sport contributed 10.2% trauma cases. Cause of trauma might be little different in the developing world then the industrial world. In the western country, assault and industrial accidents are taking place of RTA.^{1,12} In developing country like Bangladesh Road traffic accident is the commonest etiological factor.^{5,6}

Regarding pattern of fracture shows fracture in the body of the mandible accounts most (32.2%), then comes angle of the mandible (22.0%), parasymphysis (16.9%), zygomatico complex (15.3%), symphyseal fracture (13.6%). Another study showed In poly trauma RTA patients facial bone fractures are about 61% in mandible, 46% in maxilla, 27% in zygoma, and 19.5% in nasal bone.⁹

In the current study occlusion has been evaluated as satisfactory occlusion and mal occlusion. Occlusion has been the key variable for measuring the outcome and comparison of treatment modalities. Five of the components, Molar relation, Canine relation, anterior open bite, posterior open bite and cross bite were taken in to account for assessing the occlusion as the outcome of treatment.

Malocclusion was found among 22.2% control subjects and only 4.3% study subjects. Quite the opposite, 77.8% of control subjects and 95.7% of study subjects achieved satisfactory occlusion. The difference in occlusion between the groups was found to be statistically significant following Chi square test ($P < .05$). In terms of malocclusion the study subjects who were treated with short term inter maxillary fixation

were found to show better outcome, which provides the ground for post operative intermaxillary fixation.

Conclusion

Current study studied the effect of IMF added to internal fixation with miniplate for management of maxillofacial fracture, the study hereby concludes:

- Road traffic accident is the primary cause of facial bone fracture beside this assault; violence and fall from height also contribute.
- Malocclusion was found to be significantly low among the patients treated with IMF but does not influence the chance of occurrence of complication.

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Aesthetic And Functional Rehabilitation of fractured Anterior Teeth: A Multidisciplinary approach - A Case Report.

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Abstract:

Restoration of teeth becomes more complex when the involved teeth have previously undergone trauma, fractures, endodontic-access preparation, canal instrumentation and other idiopathic causes. Excessive loss of dental hard tissues create difficulties for the esthetic outcome of subsequent prosthetic restorations. In such instances, an interdisciplinary approach is necessary to evaluate, diagnose and resolve esthetic problems using a combination of endodontic, periodontic and prosthetic treatments. This case report describes the interdisciplinary approach to restore function and esthetics of severely damaged treated teeth by means of metal ceramic restorations after glass fibre post and core build up composite and crown lengthening procedure. Coordinated prosthetic, endodontic and periodontal treatments with careful consideration of patient's expectations and requests were critical for a successful outcome and patient satisfaction. Therefore the importance of the preprosthetic surgical and endodontic interventions is emphasized.

Keywords: endodontic treatment, crown lengthening, fibre glass post, composite core, esthetic, metal fused ceramic crowns.

Introduction:

Contemporary dentistry aims at conservation of remaining tooth structure. Excessive loss of dental hard tissues poses difficulties for the esthetic outcome of subsequent prosthetic restorations. In such instances, an interdisciplinary approach is necessary to evaluate, diagnose and resolve esthetic problems using a combination of endodontic, periodontic and prosthodontic treatments. This case report describes the interdisciplinary approach to restore function and esthetics of maxillary right central and lateral incisor with severe coronal destruction. The crown lengthening procedure was done after the endodontic treatment and the teeth were restored using glass fibre post and composite core build up which was later rehabilitated using metal fused ceramic restorations.

Clinical Report:

A 23-year-old male came to our clinic with the history of trauma to face and fractured maxillary right central and lateral incisors involving pulp. The chief complaint was masticatory difficulty, loss of esthetics and wanted immediate restoration and preservation of his teeth. Treatment planning was done after a thorough clinical

examination. The patient was in good general health and the medical and dental histories were non-contributory.



Fig. 1. Fractured 11 and 12

Irreversible hydrocolloid impressions by dust free Alginate (Lygin) were made and diagnostic casts were obtained. Evaluation was done after analysing the mounted diagnostic casts and radiographs (periapical). A multidisciplinary treatment plan was devised that consisted of endodontic treatment, crown lengthening and custom made metallic post core fixed up and final restoration by metal fused porcelain crowns with the help of resin modified adhesive cement.

First of all Root canal treatment for teeth 11, 12 was planned under Local anaesthesia. Following isolation by cotton roll, aforementioned teeth were prepared for root canal treatment. Gates Glidden drills (Densply, Maillefer, Switzerland) in sizes 2, 3 and 4 were used to obtain straight access in the middle and the coronal third of the root canals. The root canals then were prepared using Protaper X Smart following step down techniques. Canal preparation were done using Flex R file 6, 8, 10, 15, 20 Union Broach, York Protaper X Smart Niti File .06% taper (S1, S2, SX, F1, F2). Silicone

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stoppers were placed around the file shaft to control the working length of the files and the accuracy of the internal canal dimensions were ensured. After intermittent rinsing with 2.5 % sodium hypochloride sol.n, the canals were dried with paper points (Union Broach) and the roots were obturated using .06% taper Master cone of gutta percha (Red) and AH-26 eugenol-free sealer (De Trey, Konstanz, Germany). The master gutta percha point was coated with sealer and seated in the canals to the working length. A finger spreader (Kerr, Romulus, Mich) was inserted into the canal to a level approximately 1 mm short of the working length was performed until all canals were obturated at the following appointments.



Fig. 2a. Endodontic treatment done with 11&12.



Fig. 2b. Intraoral and Radiograph

The prognosis of these teeth and the retention of the definitive restorations would have been questionable without the support provided by dowel and core foundations. Several investigators have reported that dowels placed in endodontically treated teeth with severe coronal destruction increase fracture resistance. 17,18,19,20 Patient's concern for esthetics was the primary factor in the decision to restore maxillary anterior teeth. Fabrication of metal-free ceramic crowns over ceramic dowel-core systems was a treatment option but not selected due to higher cost and edge-to-edge incisal relationship might be a risk for the long-term prognosis of the restorations. 21,22 Glassix fibre post (Nordin dental Co. Switzerland) and composite core foundations were chosen to support metal ceramic restorations. Glass fiber post with the lower Young's modulus exhibited the lowest stress concentration in the root around the end of the post, thereby indicating a lower possibility of root fracture

Two-thirds of the total canal length of 11 was used for the post. A calibrated reamer of low-speed hand piece was applied along the entire length. A proper-sized Glassix Fiber Post was selected according to canal thickness and then cut at the required length. The post was adjusted into the canal. The preferred adhesive

technique is dual-cure resin cementation [Calibra Esthetic Resin Cement, Dentsply] of the post and the composite core construction because of the similarity of the physical properties. The working field was isolated. The root canal surface was etched with 37% phosphoric acid solution for 15 seconds, rinsed thoroughly, and dried with paper points. Equal parts of dual-curing, Hydrophilic Bond and Activator were mixed and applied into the root canal with an endodontic instrument. A thin, uniform coat of bonding resin was applied over the post. Equal parts of translucent [allows maximum light transmission] shade, Base paste and Catalyst of the dual-cure resin cement were mixed and was spread on the surface of the fiber post and then into the post preparation with lentulo spiral. The post was carefully seated immediately, a 10 second light exposure "pre-cure" of excess cement was done and the "gel" cement was removed with the help of blunt instrument. The post was stabilized for approximately 6 minutes from the beginning of the mixing for the self cure to set. Once the posts were stabilized, all the accessible areas of the post for 20 seconds each, were light cured with visible light curing unit (470nm) (Fig. 3). Coronal part was built-up with composite core (Multicore HB, Ivoclar/Vivadent AG, Liechtenstein) material. (Fig. 4, 5).



Fig. 3. Glassix fibre post with 11



Fig. 4. Crown lengthening of 12

Periodontal surgery was performed along tooth 12 to expose additional tooth structure for retention of the final restorations. 24 After local anesthesia infiltration in labial sulcus and palate, internal bevel incision was given 1mm from the crest of the gingiva of 12 using #15 blade . A #12 blade was used to make secondary incision from the gingival sulcus to alveolar crest. Care was taken to maintain the biological width. A third incision was made with an Orban interdental knife, following the morphology of alveolar crest and the collar of tissue was removed as one mass. Palatally, a scalloped inverse bevel incision using a number 15 blade was made, again following a scalloped pattern. Slight rounding of interdental bone was done on mesial and distal aspect with round bur without disturbing the supporting bone .This osteoplasty was sufficient for

exposing 3 mm of the sound tooth structure coronal from the alveolar crest along the tooth circumference. (Fig4) The operated site was sutured and periodontal dressing was given . Patient was recalled after a week and sutures and coe pac was removed. The root canals of teeth 12 were prepared for glass fibre post and composite core built up with the same procedure as mentioned above. Both the maxillary teeth were prepared with a 1.5mm ferrule in order to ensure long term post and core permance beneath the crown restoration,²⁵ (Fig. 6) without sharp line angles for the planned metal-ceramic restoration (Fig. 5).



Fig. 5. Composite core built-up



Fig. 6. Ferrule with both the preparations with 11&12 prepared abutments

The color of the definitive restorations was already defined. After the teeth preparations, gingival retraction was done with #00 size [Ultra Dent Product, Utah, USA] ; and an impression with polyvinyl siloxanes (Aquasil soft putty and Aquasil LV, Dentsply Intl) was made using putty wash technique in a rim lock impression tray. Impression was poured and master cast fabricated. impression was made with polyvinyl siloxane [Aquasil , Dentsply Caulk]. Provisional restoration was fabricated and luted using eugenol-free zinc oxide cement [Rely X Temp NE, 3M ESPE]. Impression was poured and master cast fabricated. A quick-setting rigid vinyl polysiloxane interocclusion registration material (Regidur-i; Bielefelder Dentsilicone, GmbH & Co, KG) was used to record the maxillomandibular relationship. Casts were mounted on a semi-adjustable articulator using a face-bow transfer. Three coats of Tru-Fit [Taub Tru-Fit Die Spacer Kit USA.Geo. taub Prod.]were applied on the dies to provide relief to provide space for cementation and improve the seating of casting. Wax pattern for the retainers were fabricated with blue casting wax[Harvard Dental GmbH, Germany].The pattern was invested in the phosphate-bonded investment (Bellawest T;BEGO) and cast in a base metal alloy (Wiron 99; BEGO).The metal framework for the fit, occlusion and positioning of crowns was tried .Porcelain (Vita WMK 68; VITA Zahnfabrik, Bad Sackingen, Germany) was

fired according to the manufacturers recommendations.Bisque trial was done and patients approval was taken prior to the final cementation of the fixed partial denture.

Masticatory function and optimal esthetics were obtained and maxillomandibular relationship enhanced to a certain degree by fabrication of definitive metal ceramic restorations. Definitive treatment outcomes in terms of function and esthetics satisfied the expectations of both the patient and the interdisciplinary team.



Fig. 7. Intraoral view of the crowns

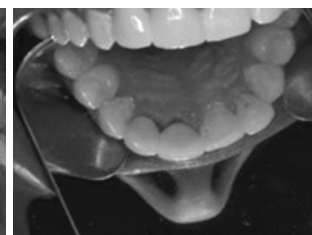


Fig. 8. Intraoral view of the crowns

Summary

Undoubtedly, root fracture is one undesirable incident to patients and dentists alike. The probability of root fracture in endodontically treated teeth is higher than that of vital teeth. One cause to the root fracture of endodontically treated teeth is stress concentration around the end of the post.^{26,27,28} For cast posts and cores, it is vertical root fracture which then leads to the extraction of teeth. ²⁹On the other hand, it has been suggested in many researches that composite resin cores with prefabricated posts have significantly lower fracture strength than cast posts and cores.^{30,31}Compromised clinical crown status of the patient was improved and sufficient clinical crown length was obtained by means of crown lengthening procedures and cast metallic restorations. Teeth with severe coronal destruction and insufficient clinical crown length limit the success of the final prosthetic restorations. The prosthetic treatment usually includes complete coverage metal ceramic crowns for functional and esthetic rehabilitation and protection of the remaining teeth. Coordinated prosthetic, endodontic and periodontal treatments with careful consideration of patient expectations and requests were critical for a successful outcome and patient satisfaction. Therefore the importance of the Preprosthetic surgical and endodontic interventions was emphasized.

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Teaching With Style

MSR Pavel¹, AKMT Hasan², MSA Farzan³

Introduction: There is no single satisfactory way of defining teaching style. One way to approach the issue is to define it in terms of elements of style that appear in the words of various authors in the literature. An examination of prominent approaches in this review paper included:

General Modes of Classroom Behavior Webster's dictionary defines style as "a manner or mode of acting or performing, a distinctive or characteristic manner, or a manner or tone assumed in discourse." The idea that style represents those personal dispositions people publicly display also as is evident in the education literature.

Characteristic Associated with a Popular Instructor Typically such individuals have characteristic that colleagues and students judge to be unique and interesting.

Discussion: The style we display at any given moment in time contains the elements of several of the perspectives shown above. It is multidimensional construct and the remainder of this section examines **General modes of classroom behavior and Characteristic associated with a popular Instructor** dimensions in more detail. The paper will explore the unique characteristics of the approaches, its implications for the practice of teaching and their effects on faculty and students.⁶ In a study of the teacher behavior mentioned in 500 nomination letters for teaching awards at the University of North Carolina, Joseph Lowman^{3,4} found that the descriptions used fit into two categories: intellectual excitement and interpersonal rapport. Trained judges summarized the themes in the written descriptions into one word descriptors and those associated with each category in

Lowman's study are shown in Table 1. Teachers who are strong on both dimensions are generally excellent for any group of students and teaching situation.² Those who are deficient on both dimensions tend to be ineffective and unable to present material or to motivate students. Those teachers with moderate levels of interpersonal rapport and who exhibit a high degree of intellectual excitement are generally skilled at teaching large introductory class.

To teach smaller, more advanced courses, Lowman argue that teachers need at least moderate levels of intellectual excitement and must be strong in the area of interpersonal rapport.

Every campus has several professors whose styles as instructors earn them respect, admiration, and popularity. It is also true that there are people whose styles have just the opposite effects on students and colleagues. Consider the synopsis below of two individuals who were both respected and popular on their campuses and the quality that made them so.

Table 1: A classification of Descriptors of Classroom Behavior

Intellectual Excitement	
Enthusiastic	Exciting
Knowledgeable	Engaging
Inspiring	Prepared
Humorous	Energetic
Interesting	Fun
Clear	Stimulating
Organized	Eloquent
Creative	Communicative
Interpersonal Rapport	
Interpersonal Concern	Effective Motivation
Concerned	Helpful
Caring	Encouraging
Available	Challenging
Friendly	Fair
Accessible	Demanding
Approachable	Patient
Interested	Motivating
Respectful	
Understanding	
Personable	

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- Giovanni Costigan. This great teacher watches himself, with 'other eyes,' from literature in the classroom he lectures, and he adjusts his delivery as he deems necessary, readily and fluidly. His greatness never departed completely from a species of highbrow entertainment: not entertainment in the usual sense, but, rather, impassioned engagement with ideas that stirs an audience, he looks at student often, continually beckoning their tacit participation and inviting their judgments, his teaching modeled a commitment to interdisciplinary reach as well as disciplinary depth.⁵
- Margaret. Her relationships with students were both personal and professional, and much of the satisfaction that she gained from teaching came from personal connections. By offering structured assignments and specific suggestions for revision, Margaret sought to instill in her students discipline, listening skills, and, ultimately, independence. Another goal was to give her students a positive experiences such as becoming acquainted with students, Knowing the instructor cared about you-motivated students to stay in school.¹

Such qualities are not always easy for others to duplicate. They are integrated into the personal makeup of the individuals involved and thus are difficult to copy. Yet elements of what they do are often instructive and informative. Also, it is possible to select aspects of their qualities that we might admire for our own use. We also could provide more structure for students. Doing such things would not magically transform us into a Giovanni Costigan or a Margaret. Such actions only would add something to the qualities we already possess.

Conclusion

An exploration of the distinctive general modes of classroom behavior. Such things as the teacher's ability to generate intellectual excitement and to develop interpersonal rapport with students appear to be pervasive qualities of style. The characteristics associated with respected and popular teachers. The qualities identified vary among individuals designated as models of good teaching. It appears that some people are able to put together combinations of personal characteristics and instructional practices that work exceedingly well in the classroom and that develop reputations for them as outstanding teachers.

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Oral Health Care During Pregnancy: Recommendations for Oral Health Professionals

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Abstract

Pregnancy is a unique time in a woman's life and is characterized by complex physiological changes. These changes can adversely affect oral health. Pregnancy is also an opportune time to educate women about preventing dental caries in young children, a common childhood problem. Although multiple studies have shown an association between periodontal infection and adverse pregnancy outcomes, such as premature delivery and low birth weight, recent randomized clinical trials conducted in the United States failed to show that treatment of periodontal disease during pregnancy improved birth outcomes. However, the studies confirmed the safety and effectiveness of providing oral health care during pregnancy. Pregnancy by itself is not a reason to defer routine dental care and necessary treatment for oral health problems. Diagnosis and treatment, including needed dental X-rays, can be undertaken safely during the first trimester of pregnancy. Needed treatment can be provided throughout the remainder of the pregnancy; however, the time period between the 14th and 20th week is considered ideal. HEALTH CARE PROFESSIONALS should recognize the importance of good oral health and make certain that the need for dental care during pregnancy and early childhood is met. Evidence suggests that most young children acquire caries-causing bacteria from their mothers. Improving the oral health of expectant and new mothers and providing oral health counseling may reduce the transmission of such bacteria from mothers to children, thereby delaying the onset of caries. Although multiple studies have shown an association between periodontal infection and adverse pregnancy outcomes, such as premature delivery and low birth weight, two recent multi-center randomized trials in the United States failed to show that treatment of periodontal disease during pregnancy decreased the rate of premature delivery.² However, most importantly, the studies confirmed the safety and effectiveness of providing oral health care during pregnancy, including prophylaxis, restorations, extractions and periodontal treatment. It should be noted that these studies excluded women who had the most severe periodontal disease. Diagnosis and treatment during the first trimester, including dental X-rays, can be undertaken safely. Needed treatment can be provided throughout the remainder of the pregnancy; however, the time period between the 14th and 20th week is ideal.

ORAL HEALTH CARE FOR PREGNANT WOMEN

Role of Oral Health Professional

Oral health professionals should render all needed services to pregnant women because:

- Pregnancy by itself is not a reason to defer routine dental care and necessary treatment for oral health problems.

- Diagnosis, oral prophylaxis and treatment, including needed dental X-rays, can be undertaken safely during first trimester.

- Needed treatment can be provided throughout the remainder of the pregnancy; however, the time period between the 14th and 20th week is ideal.

What Should Happen at Oral Health Care Visit?

The oral health professional is encouraged to:

- Consider the following when planning definitive treatment:

- Chief complaint and medical history.
- History of tobacco, alcohol and other substance use.
- Clinical evaluation.
- Radiographs when needed.
- Develop and discuss a comprehensive treatment plan that includes preventive and maintenance care.
- Educate pregnant women about care that will improve their oral health:
- Brush teeth twice daily with a fluoride toothpaste and floss daily.

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- Limit foods containing sugar to mealtimes only.
- Choose water or low fat milk as a beverage. Avoid carbonated beverages during pregnancy.
- Choose fruit rather than fruit juice to meet the recommended daily fruit intake.
- Obtain necessary dental treatment before delivery.

Management of Oral Health Problems in Pregnant Women

The oral health professional is encouraged to:

- Implement best practices in the assessment of caries risk and management of caries in pregnant women.
- Perform a comprehensive gingival and periodontal examination, which includes a periodontal probing depth record.
- Consider the following as strategies to decrease maternal cariogenic bacterial load:
 - Suggest fluoride toothpaste, along with fluoride mouthrinses, depending on the fluoridation status of water.
 - Restore untreated caries.
 - Recommend chlorhexidine mouthrinses and fluoride varnish as appropriate.
 - Recommend the use of xylitol-containing chewing gum.
 - Use the following when clinically indicated :
 - Local anesthetic with epinephrine.
 - Analgesics, such as acetaminophen and/or codeine; antibiotics, including penicillins, erythromycin other than estolate form, cephalosporins and clindamycin.
 - Radiographs with thyroid collar and abdominal apron.
 - Non-steroidal anti-inflammatory drugs for 48 to 72 hours. Avoid aspirin, aspirin-containing products, erythromycin estolate and tetracycline.
 - Discuss the benefits, risks and alternatives to treatments prior to 14 weeks gestation, including prophylaxis, root planing and scaling.
 - Complete restorations with permanent materials, if possible, during pregnancy.
 - Complete all necessary dental procedures prior to delivery.
 - Consult with the prenatal care provider when considering:
 - Deferring treatment because of pregnancy.

● Co-morbid conditions that may affect management of dental problems, such as diabetes, hypertension or heparin-treated thrombophilia.

● Anesthesia other than a local block, such as intravenous sedation or general anesthesia to complete the dental procedure.

Pregnancy and Treatment Considerations

Hypertensive Disorders

Oral health professionals should consult with the prenatal care provider before initiating dental procedures in women with uncontrolled severe hypertension. Blood pressure values of greater than or equal to 140/90 mmHg are considered mild hypertension; values greater than or equal to 180/110 mmHg are considered severe hypertension. Preeclampsia is a syndrome defined by hypertension and proteinuria during pregnancy. Eclampsia is defined as the new onset of grand mal seizures in a woman with preeclampsia.

Diabetes

Gestational diabetes, or Type III diabetes, occurs in 2% to 5% of pregnant women in the United States.⁹ Ongoing control of diabetes during pregnancy further decreases the risk of adverse pregnancy outcomes, such as preeclampsia and large-for-gestational age (macrosomic) newborns.

Heparin

A small number of pregnant women with a diagnosis of thrombophilia may be given one or two injections of heparin daily to improve pregnancy outcome. Heparin increases the risk for bleeding complications during dental procedures.¹⁰ Many pregnant women can stop the use of heparin 24 hours prior to any dental procedures. However, consultation with the prenatal provider is recommended.

Risk of Aspiration

Pregnant women have delayed gastric emptying due to hormonal changes and an incompetent esophageal valve. As a result, pregnant women are considered to always have a “full stomach” and, thus, are at increased risk for aspiration.^{1,11}

Approximately 15% of pregnancies are lost during the first trimester, most commonly because of karyotypic abnormalities. Organogenesis takes place during the first 12 weeks of gestation. In order for a treatment and/or environmental exposure to be considered

teratogenic, this exposure must occur prior to the 12th week of pregnancy. Malformations are present in 2% to 3% of live full-term newborn babies.^{1,4,5} Performing dental procedures during early pregnancy has never been reported to increase the rate of malformations or pregnancy loss. Many women suffer with morning sickness, which usually resolves after the first trimester. It is for these reasons that non-emergent treatments are deferred until the early second trimester. The pregnant uterus is below the umbilicus until 20 weeks gestation and the woman is generally more comfortable then than she will be as the pregnancy progresses. Therefore, oral health professionals should be aware of the gestational age of the pregnancy and certain physiological changes that occur during pregnancy. In the third trimester, particularly when the woman is supine, the uterus may obstruct the inferior vena cava and pelvic veins, which impedes venous return to the heart. This decrease in venous return can cause a decrease in the amount of oxygen delivered to the brain and uterus. Women who are supine may have nausea or vomiting when hypotension is present. Oral health professionals play a significant role in counseling patients concerning the harmful effects of tobacco, alcohol and recreational drugs. Multiple studies have demonstrated a clear association between maternal smoking and perinatal morbidity and mortality.⁶⁻⁸ There is no known safe amount of alcohol consumption during pregnancy and, therefore, it is better to avoid all alcoholic beverages, including alcohol-containing mouthrinses.

TABLE 1: Acceptable and Unacceptable Drugs for Pregnant Women

	These drugs may be used during pregnancy	FDA Category	These drugs should NOT be used during pregnancy	FDA category
ANTIBIOTICS	Penicillin	B	Tetracyclines	D
	Amoxicillin	B	Erythromycin in the estolate form	B
	Cephalosporins	B		C
	Clindamycin	B	Quinolones	C
	Erythromycin (except for estolate form)	B	Clarithromycin	
ANALGESICS	Acetaminophen	B	Aspirin	c
	Acetaminophen with codeine	C		
	Hydrocodone	B		
	Morphine	B		
	After 1st trimester and for 24-72 hrs. only	B		
	Ibuprofen			
	Naprosyn			

FDA Use-in-Pregnancy Ratings for Drugs

Although a few agents have been shown to be teratogenic in humans, the teratogenic potential of many of these agents is not known.^{1,12} Most medications prescribed for common diseases can be used with relative safety because there have been few adverse drug reports. Moreover, the untreated disease or condition itself may pose more serious risks to both mother and fetus than any unsubstantiated risks from the medications. Please note that a new FDA drug classification is available for public comment and can be accessed at www.fda.gov/Drugs/DevelopmentApprovalProcess/DevelopmentResources/labeling/ucm093307.htm.

Nitrous Oxide Use in Dental Office

The use of nitrous oxide should be limited to cases where topical and local anesthetics are inadequate. In such situations, consultation with the prenatal care provider would be prudent. Adequate precautions must be taken to prevent hypoxia, hypotension and aspiration.¹¹

Maintaining a semi-seated position and avoiding excessive sedation are required to prevent aspiration. Conscious sedation should be the last possible alternative in the third trimester. These women may be best treated with general anesthesia in a hospital setting.

Diagnostic X-rays

According to the American College of Radiology, no single diagnostic procedure results in a radiation dose significant enough to threaten the well-being of the developing embryo and fetus.¹³ Current evidence suggests that there is no increased risk to the fetus with regard to congenital malformation, growth retardation, or abortion from ionizing radiation at a dose of less than five rad.^{14,15} The goal is to minimize X-ray exposure to the fetus. FDA guidelines recommend the use of health history and clinical judgment to determine the need for and type of radiographic images for diagnosis.¹⁶ Every precaution should be taken to minimize radiation exposure—using protective thyroid collars and aprons whenever possible. While dental X-rays necessary for optimal treatment are recommended during pregnancy, full-mouth series, panoramic and cephalograms may be postponed until the postpartum period.

Mercury Fillings and Human Health Problems

At present, there is no evidence that exposure of the fetus to mercury released from the mother's existing

amalgam fillings causes any adverse effect.¹⁷⁻²² There is international agreement that the scientific data do not confirm the presence of a significant health hazard from use of dental amalgam. Nevertheless, Germany, Austria and Canada have restricted the use of amalgams in certain populations, including pregnant women. In addition, Sweden and Denmark are phasing out all mercury-containing materials because of environmental concerns.¹⁷ Mercury vapor (elemental mercury, a form of inorganic mercury) is released during amalgam removal or placement and may be inhaled and absorbed into the bloodstream, through which it crosses the placental barrier. This procedure may temporarily increase the mercury level in blood. However, use of a rubber dam and high-speed evacuation (suction) can markedly reduce such vapor inhalation. According to a recent systematic review, there is insufficient evidence to support or refute the hypothesis that mercury exposure from dental amalgam restorations contributes to adverse pregnancy outcomes.¹⁷ A study conducted by Hujoel et al. found that placement of dental amalgams during pregnancy did not increase the risk for low birth weight babies.¹⁹ The elemental mercury found in dental amalgams is different from methylmercury, a form of organic mercury. The consumption of fish and seafood is the major source of organic mercury.^{17,20} The ingestion of methylmercury during pregnancy is a major public health concern, while evidence of the adverse effect of mercury released from dental amalgams during pregnancy is lacking. All health professionals should educate women about the potential harm that can accrue from untreated caries during pregnancy. The oral health professional and the pregnant woman should determine the best treatment options based on an evaluation of the benefits, risks and alternatives of using dental amalgams.

Prophylactic Antibiotics During Pregnancy

Pregnancy in and of itself is not an indication for prophylactic antibiotics during dental procedures, although bacteremia can occur as a result of dental procedures. Transient bacteremia is well documented following such procedures as tooth extractions, gingivectomy, supra and subgingival scaling, ultrasonic scaling and subgingival irrigation.²³ The recommendations for preventing subacute bacterial endocarditis should be followed when such patients are encountered.

Xylitol-containing Chewing Gum

The role of sucrose and other fermentable carbohydrates in the causation of dental caries is well known.²⁴⁻²⁶ Xylitol, a naturally occurring sweetener, has been added to chewing gums, candy, toothpastes and chewable fluoride tablets because of its potential to reduce dental caries. A National Institutes of Health consensus development conference on the diagnosis and management of dental caries identified xylitol-containing products as effective caries-preventive agents.²⁶

Position in Dental Chair

When a pregnant woman lies flat on her back in the third trimester, the uterus may press on the inferior vena cava and impede venous return to the heart. This decrease in venous return can cause decreased oxygen to the brain and uterus. The pregnant woman may complain of dizziness and/or nausea. Placing a small pillow under the woman's right hip, so called left uterine displacement, or having the woman lean on her left side moves the uterus off the vena cava.¹ This intervention can easily be done in the dental chair. In addition, it is recommended that a pregnant woman's head not be lower than her feet while performing dental procedures.

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Halitosis : An Analysis Of Oral Malodour

MA Kabir¹

Introduction

Halitosis or most commonly known as foul breath or oral malodour are terms used to describe unpleasant odours exhaled during breathing. A number of patients usually attend dental clinic to get rid of this botheration of foul breath in their social life.

Many of these patients will adopt behavior to minimize their foul breath problem by covering the mouth when talking, avoiding or keeping a distance from other people, using chewing gum, mints, mouth washes or sprays designed to reduce malodour and in some cases excessively cleaning their tongue or mouth.

Oral malodour is common in morning breath and is usually due to low salivary flow and consequently inadequate natural oral cleansing during sleep. This condition is not so significant as this can be readily rectified by eating, oral cleansing and rinsing their mouth with fresh water.

Malodour can also occur due to eating various food items such as garlic, onion or spices and habits like smoking or drinking alcohol. These sort of malodour can be simply prevented by avoiding those foods and habits.

Foul breath or malodour particularly occur due to certain oral diseases and in some oral conditions. Here different types of anaerobic bacteria take shelter and multiply. These micro-organisms produce different kind of foul smelling chemical substances and are mainly responsible for foul breath.

Oral diseases: Gingivitis particularly ulcerative necrotizing gingivitis which can usually damage gingival & periodontal tissue. The bacteria responsible are a complex of spirochetes and fusiforms ulcers spread along with gingival margin creating gingival soreness and bleeding along with foul smell.

Periodontitis: Normally persistence gingival infection leads to progressive inflammation leading to destruction of periodontal ligament, resorption of alveolar bone, formation of pockets around the teeth etc.

Bacteria associated with periodontitis are usually anaerobic bacteria such as *Fusibacterium nucleatum*, *Porphyromonas gingivalis*, *Prevotella intermedia*, *Treponemas* and other *Spirochaetes* etc. Periodontitis is a potent cause of foul smelling breath.

Pericoronitis: Wisdom teeth produces a large partially erupted stagnation area under the pericoronal tissue and easily become infected leading to *pericoronitis*. It is caused by mixed infection and various pathogens particularly anaerobic bacteria as stated before and as usually producing foul smelling substance.

Debris under bridges or appliances: Debris usually accumulate in case of faulty bridge prosthesis and dental restorations that become suitable place for bacterial growth and become a factor for foul breath.

Poor oral hygiene ulcers and dry mouth are also potential factors causing malodour in the mouth.

The anaerobic bacteria so far discussed produce chemicals and are mainly responsible for malodour in many instances. The chemicals are:

- Volatile sulphur compounds such as hydrogen sulphide, methyl mercaptan and dimethyl sulphide.
- Polyamines such as cadaverine, putrescine.
- Short chain fatty acids such as butyric, valeric and propionic acids.

The tongue usually harbour bacteria mainly enteric bacteria at the root of the tongue and if it is not cleaned properly bacteria proliferate freely and produce foul smell.

Systemic Diseases: Oral malodour can also occur in few cases in certain systemic diseases:

- Diabetic ketosis: the breath may smell of acetone.
- Respiratory diseases, nasal sepsis, infection of the Para nasal sinuses or respiratory tract infections such as tonsillitis, bronchitis, bronchiectasis and tumor etc. may become responsible for oral malodour.
- Gastrointestinal disease, Hepatic and Renal failure are also considered to cause offensive oral odour.

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Drugs

It has been observed that patients taking certain drugs may become the victim of oral malodors and the usual drugs are :

- amphetamines
- cyto toxic agents
- disaffirm
- chloral hydrate
- dimethyl sulphoxide
- nitrates of nitrites etc

Control of Foul Breath

Foul breathing is an unpleasant condition and requires careful understanding of the situation and to clinically find out the cause and management should follow according to detected cause of foul breath.

Avoiding odiferous foods such as onions, garlic and spices and habits that may worsen breath odors such as alcohol, smoking etc.

Brushing your tongue before going to bed and you can use a tongue scraper in this respect.

Keeping your mouth as moist as possible by using sugar free chewing gums and diabetic sweets.

Eating fresh fruits regularly: pineapple has an enzyme that help clean the mouth.

Maintaining good oral health by

- a. tooth brushing regularly after every meals and before going to bed.
- b. flossing to remove food particles and bacterial plaque trapped in between teeth.
- c. using tooth pick to clean teeth where tooth brush cannot reach.
- d. rinsing mouth at least twice daily with mouth wash preparation.

Analytic points:

- Anaerobic bacteria present in oro-dental diseases , debris under bridge prosthesis, dental restoration, poor oral hygiene etc are commonly responsible for foul breath.
- Foul smelling odour usually originate from bacterial chemical in certain oral condition and these relevant condition should be promptly eliminated so as to get rid of oral malodors.

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Oral precancerous lesion: leukoplakia

ME Islam¹

Introduction: Oral cancer develops from a series of stepwise genetic mutations that ultimately transform normal epithelium into invasive neoplasms. Many oral cancers are preceded by preinvasive states that may be clinically detectable as distinct lesions. The ability to reduce morbidity and mortality from oral cancer depends upon improved understanding and more effective management of such precancerous lesions.¹

Leukoplakia is considered to be a common oral precancerous lesion.^{2,3} The management of oral leukoplakia though, is considered problematic, as the majority of lesions tend to be asymptomatic but have a propensity for malignant transformation.⁴

Definition: The World Health Organization classifies oral precancerous/potentially malignant disorders into 2 general groups, as follows:

A precancerous lesion is “a morphologically altered tissue in which oral cancer is more likely to occur than its apparently normal counterpart.” These precancerous lesions include leukoplakia, erythroplasia, and the palatal lesions of reverse smokers.

A precancerous condition is “a generalized state associated with significantly increased risk of cancer.” The precancerous conditions include submucous fibrosis, lichen planus, epidermolysis bullosa, and discoid lupus erythematosus.⁵

Leukoplakia is a clinical diagnosis describing a keratotic white plaque that cannot be scraped off and cannot be given a specific diagnosis.⁶ It is a clinical term indicating a white patch or plaque of oral mucosa that cannot be rubbed off and cannot be characterized clinically as any other disease.⁷

The term leukoplakia was first used by Schwimmer in 1877 to describe a white lesion of the tongue which

probably represented a syphilitic glossitis.⁸ Sir James Paget had recognized the lesion's cancer-transforming potential and its relationship to pipe smoking, reporting on “leukokeratosis” and “smoker's patch” as early as 1851. One hundred and forty years later oral leukoplakia is well established as one of the very best examples of premalignancy in man.⁹

The definition of leukoplakia has often been confusing and controversial—so much so, that some clinicians now avoid using this term in their lexicon. As defined by the World Health Organization, leukoplakia is “a white patch or plaque that cannot be characterized clinically or pathologically as any other disease.” As such, leukoplakia should be used only as a clinical term; it has no specific histopathological connotation and should never be used as a microscopic diagnosis. In the evaluation of the patient, leukoplakia is a clinical diagnosis of exclusion.⁸

The usage of the term leukoplakia continues to undergo refinement as oral white patches are seen secondary to identifiable local irritation. Thickened hyperkeratotic changes are frequently found on the edentulous areas of the alveolar ridges, especially in patients who do not wear an overlying dental prosthesis. Because these exposed edentulous sites receive more irritation during mastication, there is a natural tendency for the epithelium to become more hyperkeratotic as a protective phenomenon, similar to a callus developing on one's hand. Because such “ridge keratoses” rarely ever show any dysplastic changes or transform into carcinoma, most experts prefer placing them into a separate category “frictional keratoses”, rather than considering them to be leukoplakias.¹⁰ Likewise, hyperkeratotic changes that develop secondary to chronic cheek chewing “morsicatio buccarum” or tongue chewing “morsicatio linguarum” should not be classified as leukoplakia; such lesions are not premalignant and they are readily reversible if the irritation is avoided.⁸

Epidemiology: Leukoplakia is the most common precancerous lesion.^{2, 3, 4} It represents about 85% of such oral lesions.¹¹ A recent prevalence study showed rates of oral leukoplakia to be 0.6% for provisional and

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0.2% for definitive diagnosis.¹ Geographic differences as well as in the location and prevalence of leukoplakia is likely related to the differences in tobacco habits in various part of the world.⁷

Etiopathogenesis: The etiology in most cases of leukoplakia is unknown (idiopathic). The initiation of the condition may depend on extrinsic local factors and/or intrinsic predisposing factors.¹² It can be associated with smokeless tobacco, cigarette smoking, other combustible smoking products, alcohol, betel nut, chronic frictional trauma and nutritional factors as suggested by the Plummer-Vinson syndrome.^{13, 14} The evidence for a tobacco smoking etiology for leukoplakia, however, is quite strong. Not only do 70-90% of leukoplakia patients have such a habit, but 78% of lesions either completely disappear (58%) or regress within 12 months after smoking cessation. Ironically, leukoplakias remaining after habit cessation or in persons who have never smoked may have a higher risk of malignant transformation than leukoplakias in smokers.¹¹ Many leukoplakias develop unassociated with any known stimulus, and these are the most risky of all, having the highest incidence of being malignant at the time of biopsy and of evolving into a malignancy later.¹³

Presentation: Leukoplakia has a varied clinical appearance and its appearance frequently changes over time. Change or progression over time accounts for yet another unique aspect of leukoplakia: it is one of the few diseases in which long duration is not evidence of harmless future behavior. Lesions of long duration have a greater risk of malignant transformation than those of short duration, and the older a leukoplakia the worse is its prognosis.¹¹

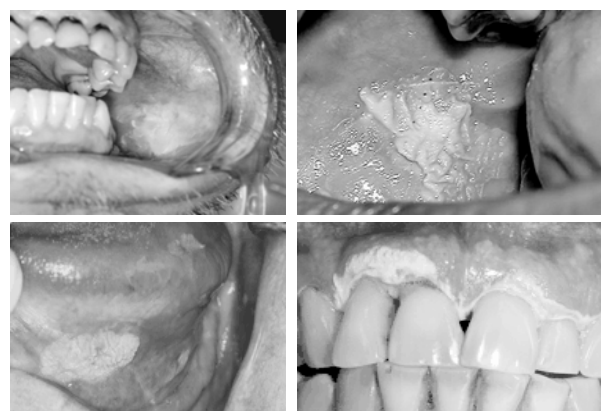
Leukoplakia is a condition associated with a middle-aged and older population. The vast majority of cases occur after the age of 40 years.⁷ What was primarily a male-associated entity now has an equal sex distribution presumable due to the increased number of women who smoke.¹³ Lesions can occur anywhere on the oral mucosa, but, in order of frequency, are seen most often on the buccal mucosa, mandibular buccal vestibule, maxillary and mandibular gingival, tongue and floor of the mouth.¹³ Sites at which leukoplakias are most likely to be associated with malignancy are, however, somewhat different: the tongue, lip vermilion and floor of the mouth. The latter three sites, in fact, account for

93% of all oral leukoplakias with dysplasia or carcinoma.⁹

Table 1: Prevalence of site of leukoplakia according to occurrence and malignant transformation

Occurrence	Probability of dysplasia
1. Buccal mucosa	1. Floor of the mouth
2. Mandibular vestibule	2. Tongue
3. Maxillary gingiva	3. Lower lip
4. Mandibular gingiva	4. Mandibular gingiva
5. Tongue	5. Buccal mucosa
6. Floor of the mouth	6. Mandibular vestibule
7. Lower lip	7. Maxillary gingiva

Early or thin leukoplakia appears as a slightly elevated grayish-white plaque that may be either well defined or may gradually blend into the surrounding normal mucosa. As the lesion progresses, it becomes thicker and whiter, sometimes developing a leathery appearance with surface fissures (homogeneous or thick leukoplakia). Some leukoplakias develop surface irregularities and are referred to as granular or nodular leukoplakias. Other lesions develop a papillary surface and are known as verrucous or verruciform leukoplakia. One uncommon variant, known as proliferative verrucous leukoplakia, is characterized by wide spread, multifocal sites of involvement, often in patients without known risk factors. The condition begins with conventional flat white patches that, over time, tend to become much thicker and papillary in nature.



Leukoplakia

This papillary proliferation may progress to the point where the lesion can be categorized microscopically as a verrucous carcinoma.⁸ Red zones may also be seen in

some leukoplakias, prompting use of the term speckled leukoplakia (erythroleukoplakia). On palpation, some lesions may be soft, smooth or finely granular, while, others may be roughened, nodular or indurated.⁷

Malignant transformation: The majority of leukoplakia lesions are benign. It should be noted that leukoplakia is a lesion that can remit spontaneously. However, there is a significant risk of malignant transformation. The degree of risk depends on the histologic type of leukoplakia, although all types of leukoplakia are at risk for malignant transformation. Nodular, speckled, and exophytic types of leukoplakia and erythroplasia, though less common, carry a higher risk of malignant transformation.¹⁵ In addition, patient education regarding risk factors such as tobacco, betel nut, and alcohol intake is essential. Betel nut chewing is considered to increase the risk of malignant transformation. Cessation of betel nut chewing may therefore lead to a decrease in the occurrence of oral leukoplakia and also may help to reduce the rate of malignant transformation.⁶ Transformation rates from 6.6% to 36.4% has been quoted for mean follow up periods ranging between 1.5–8.5 years.¹ Five clinical criteria demonstrate a particularly high risk of malignant change; the verrucous type, erosion or ulceration within the lesion, presence of a nodule, a lesion that is hard in its periphery, leukoplakia of the anterior floor of the mouth and undersurface of the tongue. In all cases, the relative risk of malignant potential is determined by the presence of epithelial dysplasia upon histological examination.¹²

Histopathology: Lesions demonstrate a spectrum of histological change within stratified squamous epithelium, ranging from simple hyperkeratosis to hyperparakeratosis and/or acanthosis to defective maturation. The latter changes may be minimal (mild epithelial dysplasia), moderate or extensive (carcinoma in situ). The term carcinoma in situ has usually been reserved for lesion in which the epithelial changes occur throughout their entire thickness, but without violation of the basement membrane. The clinical significance of the different categories of dysplasia is also debatable. The usual implication is that mild dysplasias are most likely reversible. However, when there is change from moderate to severe dysplasia, progression to carcinoma is increasingly likely. It has been shown that carcinoma is not the inevitable outcome of a severe dysplasia, nor

is there any assurance that a mild epithelial dysplasia will not advance to carcinoma.¹³

Table 2: Features of dysplasia

Epithelial Architecture	Cytological Atypia
1. Drop shaped rete pegs	1. Nuclear pleomorphism and hyperchromatism
2. Basal cell crowding	2. Increased nuclear-cytoplasmic ratio
3. Irregular stratification	3. Increased abnormal mitoses
4. Deep cell keratinization	
5. Loss of intercellular adherence	

Diagnosis: The first step is to determine whether the lesion can be removed with a gauze square or tongue blade. If the lesion can be removed, it represents a pseudomembrane, fungus colony or debris. Then, if there is evidence of bilateral buccal mucosa involvement, hereditary conditions, cheek chewing, lichen planus and lupus erythematosus should be considered. Concomitant cutaneous lesion would give weight to the latter two. If either chronic trauma or tobacco use is elicited, frictional or tobacco associated hyperkeratosis should be considered. If the lesion in question is not removable and is not clinically diagnostic, it should be considered an idiopathic leukoplakia and a biopsy should be performed.⁷ It is not always easy to select a representative site for biopsy. Incisional biopsy of the lesion may not always be representative with regard to the possible presence of dysplasia, so ideally multiple biopsies are to be recommended.⁶ Vital iodine stain (3% Lugol solution) can be used prior to biopsy and resection and is useful in the determination of the best incision area.¹⁵ Toluidine Blue (also known as toloum chloride) has been effectively used in nuclear staining because of its binding to DNA nucleus acid. It has been used for decades as an aid in epithelium dysplasia identification and appears to improve precancerous lesion visualization by showing high-risk areas therefore guiding biopsy.^{13, 16} Exfoliative cytology is performed with cytobrushes so as to obtain good-quality smear that includes cells from deeper layers of epithelium, especially of squamous intraepithelial lesions.¹⁶ The computer assisted oral brush biopsy (CDX) may allow a quick and convenient means of accomplishing a screening biopsy of multiple sites in a large surface lesion. This technique, while a much more accurate

screening tool than exfoliative cytology, should not replace an incisional biopsy.¹³ Recent advancements like Chemiluminescence technique and Light Emission Technique has also been demonstrated.¹⁶

Treatment: In the absence of dysplastic or atypical epithelial changes, periodic examinations and rebiopsy of new suspicious areas are recommended. If a lesion is mildly dysplastic, some clinical judgment should be exercised in patient management. Potential etiologic factors should be considered. Conservative surgical excision remains the treatment of choice for small leukoplakias.⁷ Mild dysplasias are believed to be reversible and may be treated with isotretinoin 20mg three times daily or beta-carotene 30mg three times daily.¹³ Electrocautery, cryosurgery and laser ablation appear to be equally effective, although thermal excision tends to hinder a pathologist's ability to evaluate extension and degree of dysplasia.⁹ Patients with leukoerythroplakia should be treated in a more aggressive fashion, as there may well be an element of severe dysplasia or carcinoma in situ in these lesions. The entire affected area should be removed and submitted for careful histologic examination.⁶ The excisional depth should extend into the submucosa, maximizing the possibility of removing a lesion before invasion occurs. This improves the eventual prognosis and could obviate the need of much more disfiguring and complex surgery or radiotherapy later. The resultant wound should be closed primarily by reasonable advancement of tissues. If it cannot be closed, then a split thickness skin graft for cover may be needed, or the wound may need to be allowed to granulate and then covered by secondary epithelialization.¹³ Removal of the lesions using the carbon dioxide and neodymium yttrium–aluminum garnet laser has been shown to be an effective method offering good control of the lesions with low morbidity. However, recurrence after local excision is common and it is essential to follow up patients carefully.⁶

Conclusion: Oral premalignant lesions are common and are associated with alcohol, tobacco, and betel nut chewing. In addition to being a premalignant lesion, oral leukoplakia is a marker for increased cancer risk. The ability to identify patients with oral leukoplakia at an increased risk of cancer development would be very useful as these individuals could be offered more aggressive therapy to improve the control of oral cancer at an early stage. The ability to control oral leukoplakia will depend on two cornerstones: prevention and early diagnosis. Continuing educational campaigns are needed on the local, state, and national level in order to

educate the public about the risk factors and early symptoms associated with this disease.

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INVITATION

Dear Dental Surgeons,

‘Bangladesh Academy of Dentistry International’ (BADI) is the national honor society for dental professionals dedicated to sharing knowledge in order to serve the dental-health needs and to improve the quality of life of people throughout Bangladesh.

Convened by Dr. Md. Jahangir Kabir (President, BADI) & Dr. Chowdhury Moin Jan (General Secretary, BADI), we will be organizing the celebration of the **Golden Jubilee of Bangladesh Dentistry** and ‘**South Asian Dental Congress & Int. Dental Trade Fair**’ on **5th, 6th & 7th January 2012** at BIAM auditorium, Eskaton, Dhaka.

There will be Scientific seminars, Hands-on-courses, Rally, Dental Trade Fair & Cultural shows. Promising new dental interventions will be presented by eminent speakers & latest techniques will be simulated by expert professionals on Scientific seminars & Hands-on-courses. Leading manufacturers & exporters of dental equipments & materials will represent their latest innovations & future ideas throughout the trade fair.

Your cordial co-operation is expected & relevant contribution will be highly appreciated.

With Thanks



Dr. Md. Jahangir Kabir
President



Dr. Chowdhury Moin Jan
General Secretary



Bangladesh Academy of Dentistry International (BADI)

E-mail : info@badi-bd.org, Website : www.badi-bd.org

ANNOUNCEMENT

‘Bangladesh Academy of Dentistry International’ (BADI) is going to organize **Continuous Dental Education Program (CDEP)** From the beginning of February 2012 at CDEP Centre, BADI, 140-141 Shantinagar, Al-Amin Tower- 3, Dhaka 1217. CDEP is a 3 months course which includes 28 classes with Hands-on-course with live surgery on Dental Implant, Minor Oral Surgery, Orthodontics, Prosthodontics, Endodontics, Preventive Dentistry & Use of Laser Dentistry. These courses will be conducted by renowned professional experts.

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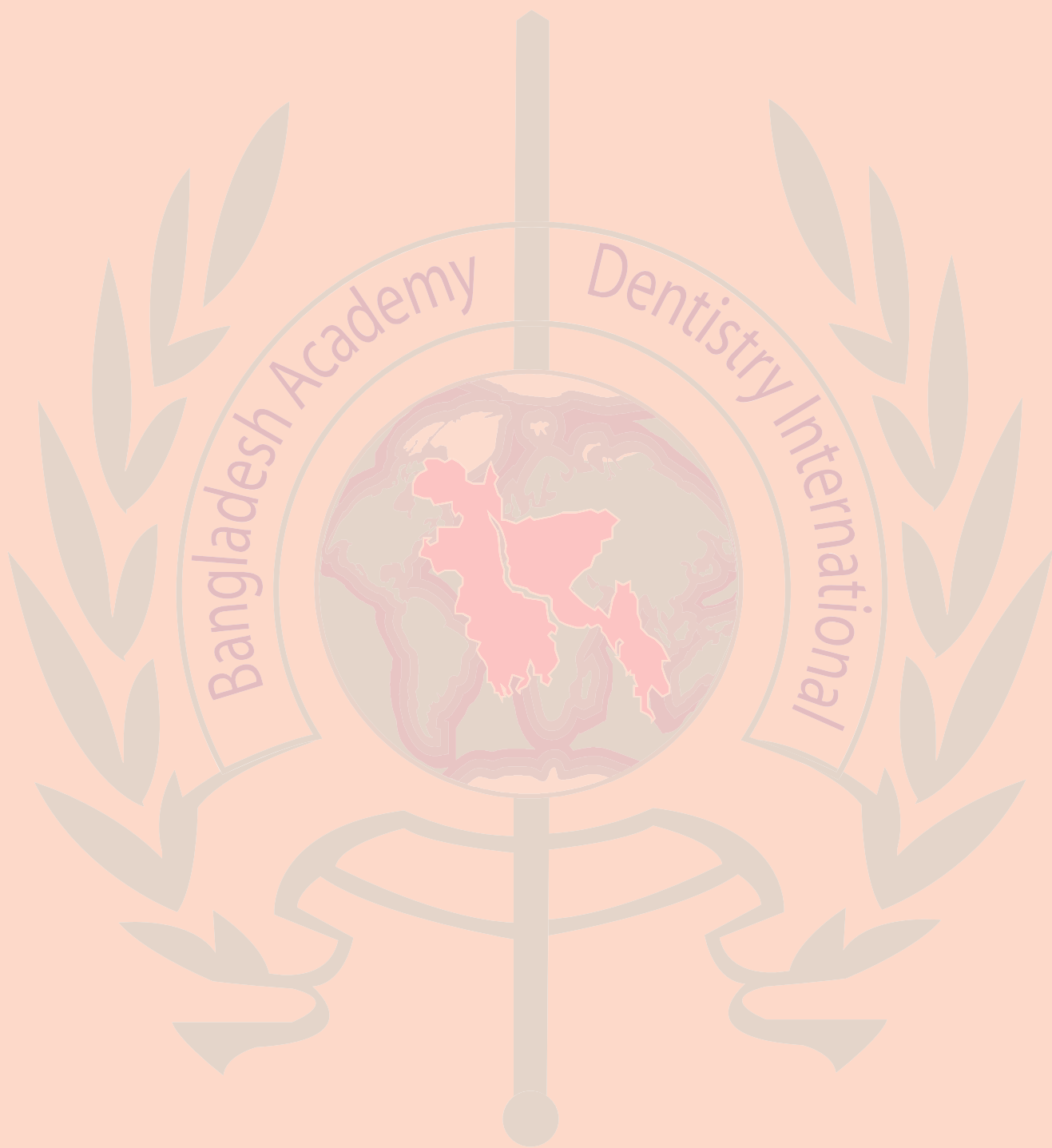
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