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Contents

A Comparative study of tear strength between alginate and addition silicone impression material

SMS Hossain,[1] MM Rahman,[2] MM Rahman,[3] K Uddin,[4] ASMJA Sohan,[5] F Sirazee[6]

Abstract

Purpose: *Tear strength is an important property of an impression material. This study was performed to evaluate tear strength of alginate and addition silicone impression material.* ***Methods:*** *Specimens of alginate and addition silicone impression materials were prepared on the plexiglass molds, used as the samples of the study. Totally 100 samples were included in this study. Specimens were subjected to tensile load until tearing. The amount of load (maximum force) for each sample was recorded. Tear strength was measured by following equation: Tear strength = load (Maximum force) / thickness of the specimen. Specimens were tested on a universal testing machine at a cross head speed of 200mm/min. Data were collected from each and every specimen. Collected data were analyzed by using unpaired Student's t-test.* ***Results:*** *Addition silicone impression with 2mm thickness showed significantly greater tear strength than alginate impression material with 2mm thickness. Moreover addition silicone impression material with 3mm thickness showed significantly greater tear strength than alginate impression material with 3mm thickness. Tear strength value increased with increasing thickness of the material.* ***Conclusion:*** *It can be concluded that addition silicone material showed greater tear strength than alginate impression material.*

Key words: Tear strength, Tensile load, Plexiglass. ***(J Cont Dent Sci 2016;4(1):1-4)***

Introduction

Tear strength is an important property when dealing with impression materials used in interproximal and subgingival areas. Tear strength shows only the stress associated with the tearing process during impression removal. A tear strength test measures the resistance to fracture of an elastic impression materials, subjected to a tensile force acting on it.[1,2] Impression materials are more susceptible to tearing in gingival crevices and interproximal areas. Tearing in the impression causes defects, which affects the accuracy of the final restoration. Impressions should resist tearing when tensile stresses are applied during impression removal and cast separation from the set impression.[3-6] Impression material should have good tear strength to resist tearing in gingival crevices and interproximal areas. The purpose of this study was to evaluate tear strength of alginate and addition silicone materials.

Materials and methods

Plexiglass molds were fabricated with the following measurements: [100 mm (length) X 10 mm (width) X 2 mm (thick), 100 mm (length) X 10 mm (width) X 3 mm (thick)].Samples of alginate impression material were prepared by following procedure: required amount of water (18ml) was taken in clean, flexible rubber bowl and required amount of alginate powder (9gm) was sprinkled into water by broad bladed plastic spatula. Alginate powder was mixed by broad bladed plastic spatula in figure 8 motion against the wall of rubber bowl. The mixed alginate was loaded on to the plexiglass mold and vibrated on mechanical vibrator machine.The cover of the mold was placed on the top of the mold for 5 minutes to ensure uniform thickness of the alginate. When fully set to a rubber like consistency at room temperature, the alginate sample was removed from the mold. All alginate samples were prepared and thickness measured by using digitalized Vernier calipers. Samples were measured at five points. These measurements were averaged and used as the thickness of the samples. Samples of addition silicone impression material.

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Putty soft variety were prepared by following procedure: half spoon of base and half spoon of catalyst were taken and kneaded by fingers till uniform color appears and then was loaded into the plexiglass mold. The cover of the mold was applied with finger pressure and secured to the base. Excess material flowed out of the mold from two holes of the lid. The sample was removed from the mold after setting time of 6 minutes. All samples were prepared and thickness measured by digitalized Vernier caliper at five points. The measurements were averaged and used as the thickness of samples. Samples with uniform thickness as per measurement of the molds, were included in this study. Meanwhile any voids or any other defects in the samples were not included in this study. Total 100 samples were included in this study. These samples were divided into following groups:

Group A1- consisted of 25 samples, prepared with alginate impression material in a thickness of 2mm.

Group A2 - consisted of 25 samples, prepared with alginate impression material in a thickness of 3mm. Group B1-consisted of 25 samples, prepared with addition silicone impression material in a thickness of 2mm.

Group B2-consisted of 25 samples, prepared with addition silicone impression material in a thickness of 3mm. All the samples of different groups (group A1, group A2, group B1, group B2) were gripped between two metal jigs of Universal Testing machine. Samples were subjected to tensile load at load range-4000 N, displacement-2000mm, cross head speed of 200mm/min, approach speed -1mm/min. The load was directed along the long axis of the samples. Maximum force (Load) was required for the samples of alginate impression material (Group A1, Group A2) and addition silicone (Group B1, Group B2) until tearing of the samples were recorded on the monitor of Universal testing machine as Newton (N) and tear strength was calculated by using the following equation: Tear strength = Load (Maximum force) / Thickness of the specimen. Tear strength of the samples prepared from alginate impression material and addition silicone were measured and were compared.

Data were expressed as Mean ± SD. Figures in parentheses indicate ranges.

Statistical analysis was done by unpaired student t-test. The test of significance was calculated and p values < 0.05 was accepted as level of significance.

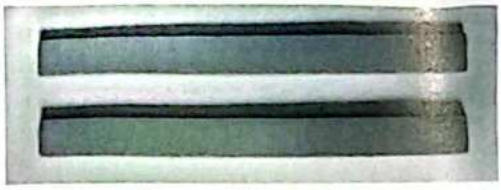

Figure-1: Samples of alginate impression material

Figure-2: Samples of addition silicone impression material

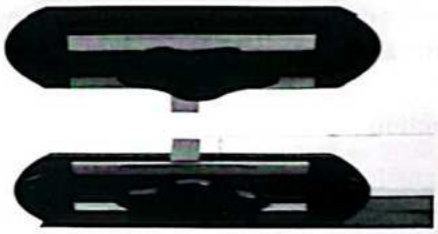

Figure-3: Tearing of the sample by Universal Testing Machine

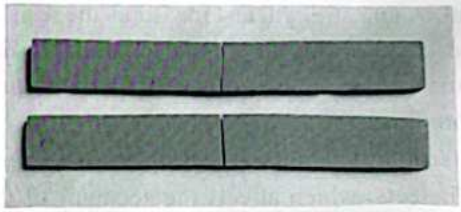

Figure-4: Samples of alginate impression material after tearing

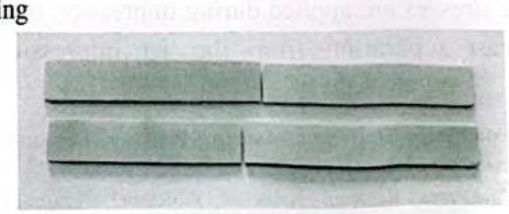

Figure-5: Samples of addition silicone impression material after tearing

Results:

Addition silicone impression material showed significantly higher tear strength than alginate impression material. The greater the thickness of

material produced significantly greater tear strength. Means and standard deviations (SDs)of tear strength values of each groups were provided in table-1.Means and standard deviations of tear strength values for Group A1-(3.17 ±1.12N/mm) and for Group B1-(30.42±2.03N/mm). Meanwhile means and standard deviations of tear strength value for Group A2 -(3.29±0.56N/mm) and Group B2- (35.69±3.30N/mm). The unpaired student t-test showed that a statistically significant ($p<0.001$) difference between alginate impression material and addition silicone (table-2).

Table-1: Distribution of impression material on the basis of tear strength (Newton/mm) among the study groups

Groups	N	Tear strength Newton/mm Mean±SD
Group A_1	25	3.17±1.12 (1.65-5.35)
Group A_2	25	3.29±0.56 (2.33-4.43)
Group B_1	25	30.42±2.03 (26.35-33.85)
Group B_2	25	35.69±3.30 (30.10-41.67)

Table-2: Comparison of impression material on the basis of tear strength (Newton/mm) among the study groups

Statistical analysis	
Groups	Newton/mm (p value)
Group A_1 vs Group B_1	<0.001**
Group A_2 vs Group B_2	<0.001**
Group A2 vs Group B1	<0.001**
Group A1 vs Group B2	<0.001**

(Group A1 (Samples of alginate impression material with 2mm thickness)
Group A2 (Samples of alginate impression material with 3mm thickness)
Group B1 (Samples of addition silicone material with 2mm thickness)
Group B2 (Samples of addition silicone material with 3mm thickness)
** = Significant at <0.01
N = Number of samples)

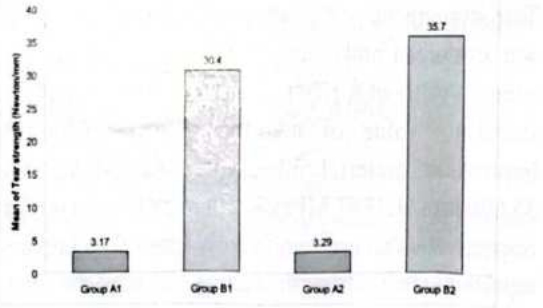

Figure-6: Bar diagram showing distribution of impression material on the basis of tear strength(Newton/mm) among study groups.

Discussion

Addition silicone is a popular category of impression material for fixed restorations. They have excellent accuracy, tear resistance, dimensional stability as well as natural odor and taste. Studies have shown the alginates are not dimensionally stable and accurate enough to be used as impression material for the fixed partial prosthesis. In this study regarding tear strength, the result showed that significant differences were found between alginate and addition silicone impression material. Tear strength of Group B1 (30.42±2.03N/mm) was significantly greater than that of Group A1 (3.17 ±1.12N/mm). Tear strength of Group B2 (35.69±3.30N/mm)was significantly greater than that of Group A2(3.29±0.56N/mm) (Table 1). Tear strength of addition silicone impression material was significantly greater than alginate impression material (Table 2). Tear strength value increases with increasing thickness of the material (Fig.6).

The tear and rupture of several elastomeric dental impression materials including alginate was performed and found that Jeltrate had a tear strength of 283.75 g/ cm (0.0254N/mm)4. In an earlier study by Dimensional accuracy of three alginate impression materials were investigated. Tare free alginate impression material compared favorably with other alginate impression material tested including Jeltrate, Identic and Kromopan. Results showed that Tare free alginate had greatest tear strength value 514.5 g/cm (0.046N/mm)3. In the present study tear strengthof alginate impression material (Lygin)-3.17N/mm and 3.29N/mm for 2mm and 3mm thickness respectively, that are significantly higher than the previously reported tear strength values. It may be due to advancement in the composition and properties of recent alginates.

Tear strength of five elastomeric impression materials was evaluated and found that Aquasil LB had a tear strength value of 8.12Mpa5. In the present study tear strength value of addition silicone (Charmflex) impression material 30.42N/mm (1.0141MPa) and 35.69n/mm (1.1897 MPa) for 2mm and 3mm thickness respectively, that are significantly lower than previously reported tear strength values. It may be due to materials of different manufacturers. A limitation of this study was that the exact cross-sectional area of the specimen during tearing could not be accurately determined. As the specimens were deformed, they experienced necking and cross sectional area decreased.

Conclusion

Within the limitations of this study, it can be concluded that addition silicone impression material showed greater tear strength property when compared with alginate impression material.

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Microleakage of Giomer restoration in class V cavities of teeth previously exposed to 17% carbamide peroxide: An in-vitro evaluation.

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Abstract

Purpose: *Teeth treated with bleaching agents can affect the retention of a restoration. Studies have indicated that peroxide containing bleaching agent exposed teeth produce significant microleakage and show reduced bond strength under a composite restoration. Giomer, a fluoride releasing light-cured resin containing restorative material has been introduced recently to minimize the microleakage under a pre-bleached restoration. The present experimental study was performed to evaluate microleakage of Giomer restoration in class V cavities on teeth previously exposed to 17% carbamide peroxide.* ***Methods:*** *The study was performed in BSMMU in the department of Conservative Dentistry and Endodontics from the period of July 2009 to June 2010. Thirty-two (N=32) extracted premolar teeth were divided into two groups, with group A (case) consisting of 16 teeth pre-exposed to 17% carbamide peroxide while the control group (Group B) consisting of 16 non-exposed premolars. Class V cavities were prepared by using a high speed handpiece on all the teeth without making bevels for the coronal enamel margins. All the prepared cavities were subjected to one step self etch adhesive and then cured for 10 seconds followed by light cured Giomer restoration. Samples were stored in 100% humidity at 370 C for 24h prior to the finishing procedures. For microleakage test, both the groups of restored teeth were coated with nail varnish except for 1 mm from the cavosurface margins, thermocycled for 400 cycles between 5 (±2) °C and 55 (±2)°C with a 1-min dwell time in each temperature, and immersed in 0.5 methylene blue dye solution for 24 hours. For evaluating degree of microleakage, samples from both groups were longitudinally sectioned to include tooth tissue and giomer restoration and dye penetration was measured under a stereomicroscope at 20x. For observation of the tooth tissue and giomer restoration interface, cut sections were then polished to high gloss and then observed by Scanning Electron Microscope (SEM) at Banbladesh Atomic Energy Commission Lab. Statistcal analysis was performed by using student t test.* ***Results:*** *Significant differences were found between the exposed and non exposed groups for microleakage ($p<0.05$) and dye penetration on cavity floor were found in 5 subjects (31.3%) in the case group compared to none in the control group.* ***Conclusion:*** *The findings of this in-vitro study suggest that pre-exposure of 17% carbamide peroxide increased the microleakage of giomer restorations.*

Key words: Microleakage, 17% carbamide peroxide, SEM, Giomer, Adhesive system ***(J Cont Dent Sci 2016;4(1):5-9)***

Introduction

The term 'microleakage' is defined as the infiltration of bacteria, fluids, molecules, ions, and even air from the oral environment along the various gap present in the cavity restoration interface.[1] In conservative dentistry, the majority of restorative materials show variable levels of marginal micro leakage due to changes in dimension and a lack of good adaptation to cavity walls.[2] Microleakage of a restoration is one of the main reasons to restorative failure in dentistry. Among the clinical consequences of marginal micro leakage are: secondary carious lesions, pulpal pathology, post-operative pain and sensitivity, and, consequently, potential failure of the restoration.[3]

Resin composite and adhesive materials have been rigorously investigated and upgraded since their introduction with an attempt to find an adequate alternative to dental amalgam.[2] Composite resin restoration is considered as having good bond strength due to excellent development of adhesive technology, but unfortunately microleakage remains. To solve the above problem, recently a new fluoride-releasing light-cured restorative material containing pre-reacted glass ionomer fillers has been introduced on the market with promising results.[4] This new material is called 'Giomer' and is based on the incorporation of surface

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pre-reacted glass-ionomer fillers (S-PRG) into a resin matrix. According to claims made by the manufacturers, the resultant effect is a restorative material that combines the advantages of composite and glass ionomer.[5]

It was found that giomers did not show the gel transition phase characteristic of glass-ionomer cements (GICs); however, the glass-ionomer phase is readily available in PRG particles.[5] The glass-ionomer phase is responsible for the fluoride release mechanism of GICs. Although the long-term fluoride release of giomers is questionable,[6] a recent research study reported that giomers have demineralization inhibition properties similar to glass-ionomers in vitro.[7] Like compomers, giomers are light polymerized and require the use of a bonding system for adhesion to tooth structure. Recently available self- etch do not require a separate acid conditioning step and they are less technique sensitiv.8 In contrast to total-etch they show no discrepancy between depth of demineralization and resin penetration, causes less post operative sensitivity and reduced technical sensitivity.[9]

Tooth whitening system is considered as one of the fastest growing areas of cosmetic dentistry and is very often followed by placement of esthetic restorations. However, increased microleakage and reduced bond strength has been reported when composite restoration done in bleached teeth.[1,5,10-13] The mechanism of this adverse effect is still unknown; it may be related to inhibition of the adhesive polymerization process due to residual oxygen and peroxides or as a consequence of enamel and dentin ultra-morphology alteration.[14-16] The aim of this study was to compare the microleakage of giomer restoration in class V cavities of 17% carbamide peroxide exposed and non-exposed teeth.

Materials and Methods

This experimental study was performed in BSMMU Bangabondhu Sheikh Mujib Medical University from the period of July 2009 to June 2010. Thirty-two extracted (N=32) non-carious human premolar teeth extracted for orthodontic and periodontal reasons were used for the study. Discolored teeth, wear of tooth such as, attrition, endodontically treated tooth, cracked teeth and developmentally malformed teeth were excluded from study.

The extracted premolar teeth were divided into two groups: Group A (Cases, n= 16): Giomer restoration in teeth which were previously exposed to 17% carbamide peroxide. Group B (Controls, n= 16): Giomer restoration in not exposed to 17% carbamide peroxide. Class V cavities (Cavity Depth: 2 mm, Cavity Diameter: 3 mm and 1 mm above the CEJ junction) were prepared on each tooth by using a # 4 round bur (Shofu Dental Corporation) with a high speed handpiece and sufficient water. No bevels were prepared for the coronal enamel margins. At first, cavities of Group- A and Group -B were subjected to one step self etch adhesive system (Beauti-Bond) according to manufacturer instruction. Adhesive systems were cured for 10 seconds and Giomer were condensed into the cavities and curing done 20 seconds. Samples were stored in 100% humidity at 370 C for 24h prior to the finishing procedures. For microleakage test, the restored two groups of teeth were coated with nail varnish except for 1 mm from the cavosurface margins and thermocycled for 400 cycles between 5 (±2) °C and 55 (±2) °C with a 1-min dwell time in each temperature, and then immersed into 0.5 methylene blue dye solution for 24 hours. For evaluating the degrees of microleakage, samples from both the groups were longitudinally sectioned to include tooth tissue and giomer restoration. Dye penetration was measured under a stereomicroscope at 20x by using a four grade-scale criteria (0 = no dye penetration; 1 = dye penetration through the cavity margin reaching the enamel tissue, 2 = dye penetration through the cavity margin reaching the dentin tissue; 3 = dye penetration through the cavity margin reaching cavity floor portion). For observation of the tooth-tissue and giomer restoration interface, cut sections were polished to high gloss and then observed by Scanning Electron Microscope (SEM) at the Lab of Bangladesh Atomic Energy Commission. Statistical analysis between Group - A and Group - B was performed by using Student's t-test and a value of $p<0.05$ was considered as statistically significant.

Results

Statistical analysis and SEM revealed the following results-

Table-1: Comparison of microleakage of both group (N=32)

Groups	N	Microleakage Mean±SD
*Group-A (Case)	16	1.50±1.21
*Group-B (Control)	16	0.686±0.704

*Group A vs Group B $0.02< p<0.05$

Table 1 shows Giomer restoration pre-exposed to carbamide peroxide (1.50 ± 1.21) showed higher microleakage than that of unexposed to Giomer (0.68 ±0.70). Significant differences were found between the exposed and non exposed groups ($p<0.05$).

Table-2: Distribution of dye penetration grade in both groups (n=16)

Dye penetration grade	Group A: Case (n=16) No. (%)	Group B: Control (n=16) No. (%)
No dye penetration (Score 0)	4(25.0%)	7(43.8%)
Dye penetration on only enamel (Score 1)	5(31.3%)	7(43.8%)
Dye penetration on dentin (Score 2)	2(12.5%)	2(12.5%)
Dye penetration on cavity floor (Score 3)	5(31.3%)	0(0%)

Table 2 represents the status of microleakage among the cases and controls. No microleakage (score 0) was detected in 4 (25%) of Group A and 7 (43.80%) of Group B.

However, the remaining samples were associated with score 1, 2 and 3 degree of microleakage. It was found that score 3 was not detected in any of Group B sample (0%) but in Group A, 5 of 16 samples (33%) were associated with score 3.

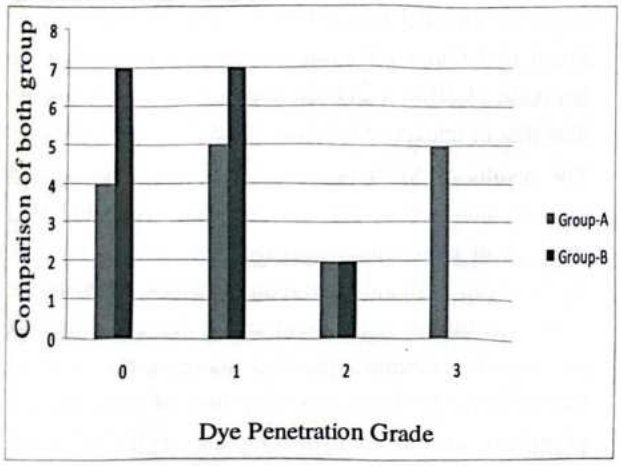

Fig 1: Graphical presentation of individual grading score in both groups.

Stereoscopic observation of Dye penetration grade 0 samples revealed good adaptation of the giomer with the tooth tissue. SEM observation also showed no gaps between the giomer and dental hard tissues (Fig. 2)

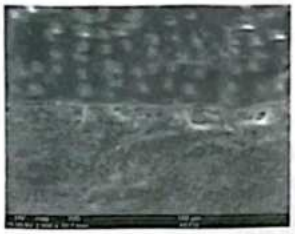

Fig 2: No gap found in sample control group (Grade 0) under SEM observation.

When these samples were further examined by the SEM, it was found that microleakage was due to a gap formation between the giomer and dental hard tissues as seen in (Fig. 3A). Furthermore, samples in which microleakage were greater, multiple cracks appeared in the teeth structure.(Fig. 3B). The results are suggest that teeth pre-exposed to carbamide peroxide might increase the risk of crack in the tooth tissue.

Fig 3A: Cracks found in case group under SME observation.

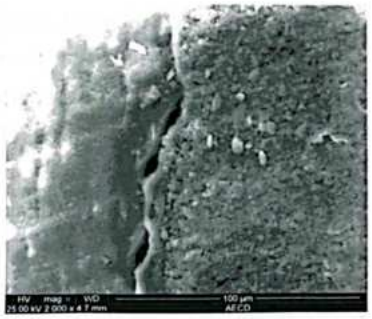

Fig 3B: Multiple gaps under SME observation

Discussion

Carbamide peroxide is used for whitening of discolored teeth in the field of conservative dentistry nowadays. The adverse potential effects of tooth whitening on bonding to both enamel and dentin have been reported, but data are missing on the interaction of giomer restorative materials with carbamide peroxide treated tooth structure. In most of the studies, reduction of bond strength of enamel was still present after an elapse of 7 days before application of tested materials to the bleached dentin specimens. The reduction of bond strength may also increase the microleakage of giomer as found in the present study.

Giomer restorative material used in the study was Beautifil II - a Giomer restorative material which is basically a hybrid of glass ionomer cement and composite. It is a fluoride releasing light cured restorative material containing pre-reacted glass ionomers fillers. It is based on incorporation of pre-reacted glass ionomers fillers (S-PRG) into resin matrix.It does not show the gel transition phase characteristic of glass ionomers cements (GIC); however, the glass ionomers phase is responsible for fluoride release mechanism of GICs. However, we consider that these new restorative material might be affected by peroxide exposure.

Because peroxide containing bleaching agent changes the structure of enamel and dentin as reported in a previous study,17 again it can be considered that these factors might also be responsible for higher microleakage in carbamide peroxide exposed giomer.

Another factor is the techniques of microleakage test. Various techniques have been used to assess dye penetration in microleakage studies. In this study, the evaluation of dye penetration was scored after the facio-lingual section and stereomicroscopic and SEM examination observation to assess microleakage along the entire length of the cavity preparation interface. Numerous studies utilize a single section through the centre of the restoration, resulting in in-vitro microleakge being underestimated. The dye penetration method is economical, safer and easily manipulated and this method does not require any special set up as the depth of dye penetration can be observed directly under the microscope.

The results of the present study confirmed that carbamide peroxide exposed samples showed significantly greater microleakage than that of unexposed samples.

Although there is no study of microleakage of giomer restoration exposed to carbamide peroxide, there are several studies on the effect of bleaching materials like hydrogen peroxide on restoration. Exposure to hydrogen peroxide increased the microleakage degree of giomer restoration.[8] Another study investigated whether or not hydrogen peroxide has effect on color stability and surface roughness of giomer restoration. The results of showed surface roughness were increased after exposure to hydrogen peroxide.[18]

A study on the effect of various concentration of carbamide peroxide bleaching agents on the pulp chambers restored with composite restoration was performed in the year 2000.[19] Hybrid composite resins were used, and carbamide peroxide in concentration of 10%, 15% & 35% were used. The results showed a higher amount of bleaching agent penetrated into pulp chamber in the restored teeth than in sound teeth. The probable reason given was due to the oxidization of the interprismatic organic matter by the hydrogen peroxide components.[19]

Carbamide peroxide produce adverse side effects on ormocer and hybrid composite resin; Microleakage of these materials was increased after exposure to carbamide peroxide.[20] Furthermore, carbamide peroxide bleaching gel may led to slight but statistically significantly surface roughness and amount of porosities of hybrid composite resin.[21-23]

Therefore, it can be considered that giomer restoration might be effected by carbamide peroxide too. It was found that Giomer restoration exposed to carbamide peroxide (1.50 ± 1.21) showed higher microleakage than that of unexposed giomer (0.68 ±0.70) (Table 1).

The results of SEM observation of tooth tissue and giomer interface in the present study revealed that samples in which microleakage was greater may be due to a gap formation and multiple crack found in the tooth structure in the present study. We consider that exposure to carbamide peroxide increase the crack in the tooth tissue. It may be due loss of calcium and phosphate ions from hydroxyapatie crystal of tooth structure.[1,17,24] As a result due to loss of these ions the tooth structure may become weak and brittle in nature. So, during cavity preparation of carbamide peroxide expose teeth, multiple cracks might occur.

Conclusion: It could be concluded that carbamide peroxide increased the degree of microleakage of giomer restoration.

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Pattern of Total Count of RBC and RBC Indices in Male Adult Smokers

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Abstract

Purpose: *Cigarette smoking is a preventable cause of cardiovascular morbidity and mortality. Smoking has been associated with two to fourfold increased risk of coronary heart disease. Total count of RBC (Red Blood Cells) and RBC indices like Mean Corpuscular Volume (MCV), Mean Corpuscular Hemoglobin (MCH) and Mean Corpuscular Hemoglobin Concentration (MCHC) are known to be affected by smoking and are altered in response to changes in smoking behavior. The purpose of the present study was to observe changes in total count of RBC and RBC Indices among non smokers and cigarette smokers.* ***Methods:*** *This observational case control study was carried out in the Department of Physiology of the Dhaka Medical College, Dhaka, during the period of July 2005 to June 2006. The study population consisted of 105 male adult non-smokers and smokers, aged between 20 to 40 years, and they belonged to different socio-economic classes. Thirty of them were apparently healthy non-smokers, taken as control group for the study, where as the remaining 75 were apparently healthy smokers, who were smoking one or more cigarette per day regularly for at least last one year, were considered as the experimental group of this study. Smokers were again divided according to the number of cigarettes they consume per day into 3 categories. History of smoking habit and clinical history were recorded by pretested questionnaire and laboratory tests were performed. Unpaired Student's 't' test was performed to find significant statistical difference in total count of RBC and RBC indices among the non-smokers and different smoker groups.* ***Results:*** *The MCV ($p < .001$) and MCH ($p < .01$) values significantly differ among the smokers as compared to the non- smokers where as the values for total count of RBC ($p > .05$) and MCHC ($p > .05$) among non-smokers and different categories of smokers were not significant.* ***Conclusion:*** *The findings in this study suggest that cigarette smoking changes some RBC indices but do not change total count of RBC among cigarette smokers.*

Key words: Cigarette Smoking, Adults, Total count of RBC and RBC Indices (MCV, MCH, MCHC). (J Cont Dent Sci 2016;4(1):10-13)

Introduction

Tobacco is the second major cause of death in the world. It is currently responsible for the death of one in ten adults worldwide (about 5 million deaths each year). If current smoking patterns continue, it will cause some 10 million deaths each year by 2020. Half of the people who smoke today, which is about 650 million people, will eventually be killed by tobacco.[1] The Expert Committee observed that tobacco related diseases are on the rise in developing countries.[2]

In 2003, the prevalence of smoking in Bangladesh among adults was 54.8% in males and 16.6% in females. According to WHO global infobase 2006, the prevalence rate of smoking among Bangladeshi males in the age groups of 18-29 yrs, 30-39 yrs, 40-49yrs were 36.3%, 64.2%, and 70.8% respectively.[3]

Hatsukami et al. demonstrated that certain biomarkers of cardiovascular disease risk factors (such as hemoglobin, hematocrit, RBC count, WBC count, mean corpuscular volume (MCV), mean corpuscular hemoglobin (MCH), lipoproteins concentrations, heart rate, respiratory symptoms) known to be affected by smoking, are relatively stable over time when amount of smoking is maintained at a constant rate but are altered in response to changes in smoking behavior. This suggests that some of these measures are likely to be sensitive to changes in tobacco toxin exposure.[4]

At all ages, Erythrocyte counts of men are higher in non-smokers than in smokers. Smokers have larger Erythrocytes than non-smokers in both sexes and at all ages.[5] In both genders, in comparison to non-smokers, smokers have higher values of mean corpuscular volume, hematocrit, hemoglobin, mean corpuscular hemoglobin, and platelet count.[6]

In this study, we hypothesized that cigarette smoking can alter the total count of RBC and RBC Indices and which might be associated with intensity of smoking.

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Materials and methods

This observational case control study was carried out in the department of Physiology of the Dhaka Medical College from July 2005 to June 2006. A total of 105 apparently healthy subjects age ranged from 20~40 years were selected. Thirty (30) participants were non smokers (control-Group A) while 75 were smokers (Cases- Group B) and smoked for at least last one year. The smokers were again sub-grouped into 3 categories accordingly to the number of cigarette smoked per day:

Group B1: Consisted of 25 smokers consuming 1~9 cigarettes / day

Group B2: Consisted of 25 smokers consuming 10~19 cigarettes/day

Group B3: Consisted of 25 smokers consuming more than 20 cigarettes/day).

The participants came from different areas of Dhaka city and belonged to different socioeconomic classes. Those who were suffering from an acute or chronic respiratory illness, hypertension, diabetes mellitus, angina, endocrine, hepatic, allergic disorders, any infectious or debilitating illness etc. and those who presented with a history of recent hospitalization and surgery were excluded. Persons taking the drugs such as antibiotic, steroids, thiazide diuretics, aspirin etc. or taking radiotherapy and subjects who drink alcohol were also excluded. Passive smokers were not included for control group.

All the subjects were explained about the aims and objectives of the study and the test procedure were briefed and written consent was taken before performing the test. A detailed history of smoking habit and health status of each subject was obtained by using a pre-tested questionnaire. Clinical examinations of these subjects were done on the first day of the visit. The subjects were advised for overnight fasting and not to engage in unusual physical exercise and smoking before reporting on the next morning.

On the reporting day all the blood samples were collected at morning between 8.00 to 9.00 am. With all aseptic (70% alcohol) precaution a venepuncture was done with a 3ml disposable syringe in the antecubital fossa applying a tourniquet, which was released when the actual blood sampling began. Two ((2ml) milliliters venous blood was drawn from each sample, in sitting position. After collection the sample of blood was mixed in a vial containing anticoagulant- EDTA and transported to the laboratory of Physiology Department of Dhaka Medical College in an air conditioned bus within one hour of collection. All the hematological analyses were done within 5 hours of sample collection.

With the collected samples total count of RBC was done by Manual method (Visual haemocytometer method) for each study subjects in the laboratory of Physiology Department of Dhaka Medical College and Hospital, Dhaka. RBC Indices were done indirectly by calculating the indices from PCV, hemoglobin and red cell count. PCV was done by Macro (Spell's Wintrobe) Method and hemoglobin estimation was done by Cyanmethaemoglobin Method.

After the collection of data these were checked, verified, edited for consistency to reduce error. All the results of laboratory investigations were analyzed by SPSS 12.0 programmer and significance tests were done by unpaired Student's 't' test.

Results

The results are shown in Table 1 and 2.

Table-1: Mean ±SD of Total Count of RBC, MCV, MCH, MCHC

Groups	N	Total Count of RBC millions/mm^3		(MCV) femtoliter		(MCH) picogram		(MCHC) (%)	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD
A	30	4.3500	± .26360	93.3000	± 7.86590	25.2667	± 3.21562	27.3333	± 4.43601
B	75	4.1653	± .53864	110.6400	± 26.61266	31.5067	± 10.82836	29.1733	± 7.93789
B_1	25	4.1560	± .42728	110.4400	± 27.46070	30.5200	± 10.03378	27.6000	± 5.13971
B_2	25	4.1320	± .64143	118.5200	± 29.26904	31.3600	± 12.01693	26.8800	± 8.56505
B_3	25	4.2080	± .54537	102.9600	± 21.13741	32.6400	± 10.68051	33.0400	± 8.41863

(** N= number of subject, Group A: 30 Non Smokers (Control group), Group B: 75 Smokers (Cases)

Subgroups: Group B1: Consisted of 25 smokers consuming 1~9 cigarettes / day, Group B2: Consisted of 25 smokers consuming 10~19 cigarettes/day, Group B3: Consisted of 25 smokers consuming ? 20 cigarettes/day).

Table 1 show that the means (SD) of total count of RBC were 4.35 .26, and 4.17 .54 millions / mm3 of blood in group A (non-smoker) and group B (smoker) respectively. Again the means (SD) total count of RBC were 4.16 .43, 4.13 .64, 4.21 .55 millions/mm3 of blood in B1, B2 and B3 groups respectively.

The means (SD) of MCV were 93.3 7.87 femtoliter and 111 26.6 femtoliter in group A and group B respectively. Again the means (SD) MCV were 110 27.5, 119 29.3, 103 21.1 femtoliter in B1, B2 and B3 groups respectively.

The means (SD) of MCH levels were 25.3 3.22 picogram and 31.5 10.8 picogram in group A and group B respectively. Again the means (SD) MCH levels were 30.5 10.0, 31.4 12.0, 32.6 10.7 picogram in B1, B2 and B3 groups respectively.

The means (SD) of MCH levels were 25.3 3.22 picogram and 31.5 10.8 picogram in group A and group B respectively. Again the means (SD) MCH levels were 30.5 10.0, 31.4 12.0, 32.6 10.7 picogram in B1, B2 and B3 groups respectively.

Table-2: Comparative 'p' values for Total count of RBC and RBC indices among non-smokers and different groups of smokers

GROUPS	TC of RBC p value	MCV p value	MCH p value	MCHC p value
A vs. B	$.076^{ns}$	$.0007^{***}$	$.0025^{**}$	$.23^{n}$
A vs. B_1	$.044^{*}$	$.0019^{**}$	$.0090^{**}$	$.84^{ns}$
A vs. B_2	$.095^{ns}$	$.0001^{***}$	$.010^{*}$	$.80^{ns}$
A vs. B_3	$.21^{ns}$	$.024^{*}$	$.0007^{***}$	$.0022^{**}$
B_2 vs. B_3	$.65^{ns}$	$.036^{*}$	$.69^{ns}$	$.014^{*}$
s. B_3	$.71^{ns}$	$.29^{ns}$	$.47^{ns}$	$.0082^{*}$
B_1 vs. B_2	$.88^{ns}$	$.32^{ns}$	$.79^{ns}$	$.72^{ns}$

*** = p<0.001; ** = p<0.01; * = p<0.05; ns = non significant (p>0.05);

Table 2 shows that the difference of means (SD) of total count of RBC were not significant (p >.05) between group A and B. But the results were significant between group A and smoker group B1 (p < .05).

The difference of means (SD) for MCV was significant (p < .001) between group A and B. The results were also significant between group A and smoker's group B1 (p <.01), B2 (p < .001), B3 (p < .05). The difference between B2 vs. B3 (p < .05) were also statistically significant.

The difference of means (SD) of MCH was significant (p < .01) between group A and B. The results were also significant between group A and smoker's group B1 (p < .01), B2 (p = .01), and B3 (p < .001). Again the differences of mean MCH among the smoker's groups B1 vs. B2 (p>.05), B1 vs. B3 (p > .05), and B2 vs. B3 (p > .05) were not statistically significant.

The difference of means (SD) of MCHC were not significant (p >.05) between group A and B. The results were also not significant between group A and smoker's group B1 (p >.05), and B2 (p > .05), but significant between group A and B3 (p < .01). Again the differences of mean of MCHC among the smoker's groups B1 vs. B2 (p>.05) was not significant, but were significant between B1 vs. B3 (p < .01), and B2 vs. B3 (p < .05).

Discussion

In the study, the mean (SD) of total RBC count did not significantly differ (p >.05) in non-smokers and smokers, but the mean of total RBC count in smokers and in individual smoker's sub- groups were rather less than the non-smokers. Our result is in agreement with what Van tile6 et al. and Helman5 found. They observed a lower RBC count in male smokers than non-smokers.

Smoking can produce absolute polycythaemia, relative polycythaemia, or a combination thereof.7 Smith and Landaw[7] found that most smokers with polycythaemia have a reduced plasma volume. The possible mechanism for the low plasma volume in smoker's relative polycythaemia is increased venous tone,8 which is induced by nicotine.[7]

Possible cause of slight lower total count of Erythrocyte in the present study perhaps, is a combination of effects. For example, carbon monoxide-induced hypoxia produces a demand for more erythrocytes. The demand cannot be met because of cyanide-induced diversion of vitamin B12 away from nucleoprotein synthesis. However, there is no impairment of hemoglobin synthesis. The result would be little change in erythrocyte number but increases in erythrocyte size and hemoglobin content. The similar suggestions were also stated by Van tile[6] et al.

In the present study mean (SD) MCV and MCH level were significantly (p < .001, p < .01)) higher in smokers than non-smokers. Intensity of smoking was not found in MCV but mean MCH was related to the intensity of smoking. The result is consistent with result found by Van Tile[6] et al. and Helman[5] et al.

But Tungtrongchitr[9] et al., observed slightly higher mean MCV and MCH level which were not statistically significant (p >.828, p > .855 respectively). There was no significant (p >.05) difference in MCHC between smokers and non-smokers.

Possibly higher MCV level is related to macrocytosis. Helman and Rubenstein[5] suggested that macrocytosis is usually a result of impaired desoxy nucleoprotein synthesis. However, it is not possible to choose an antagonist from 1,150 different identified chemical in tobacco smoke. One plausible candidate is the thiocyanate in cigarette smoke.[5] The thiocyanate levels in plasma and urine of smokers are higher than those in non-smokers, and are inversely related to the serum vitamin B12 concentrations.[10] It was suggested that the thiocyanate of tobacco smoke is detoxified by pathways involving vitamin B12, depleting the vitamin with subsequent alternate detoxification by production of thiocyanate. It was postulated that hydroxycobalamin is converted to cyanocobalamin, which may be physiologically inactive. Conceivably, this diversion of vitamin B12 could result in macrocytosis without anemia. However, cigarette smokers are not only anemic, but also generally have elevated hemoglobin concentrations.[5]

Perhaps carbon monoxide causes the erythrocytic changes. Lambert and Morris report that people who are intermittently exposed to carbon monoxide have enlarged erythrocytes; especially if they are cigarette smokers.[11] They suggested a possible link between carboxyhemoglobin levels and MCV.

So, in conclusion it is possible that higher MCV and MCH in smokers is due to conversion of vitamin B12 into cyanocobalamin and exposed to carbon monoxide.

The present study has been undertaken to evaluate the change in total count of RBC and RBC Indices to compare these hematological changes between apparently healthy male adult smokers and non-smokers. Smokers have slightly lower Erythrocyte count but higher MCV and MCH which might reflect as certain biomarkers of cardiovascular disease risk factors.

In the present study we had some potential limitations which arise primarily due to lack of scope and resources. The tests could not done on the spot of blood collection, which would give better results. The RBC count was done in traditional method rather than using an auto analyzer. Blood cells were more or less hemolysied during transport. The sample included in the study only on basis of questionnaire and clinical examination.

Conclusion

The findings in this study suggest that cigarette smoking changes some RBC indices but do not change the total count of RBC.

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A survey on patients' satisfaction regarding front desk and reception room services of private dental clinics in Dhaka city

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Abstract

Purpose: *Patient satisfaction is an important component of dental care. The front-desk or the reception room may reflect the overall environment of a dental care facility which could influence a patient's receptiveness to dental procedures. The purpose of this survey was to report the satisfaction of the patients about the reception services in different dental clinics.* ***Methods:*** *The survey was conducted in five selected dental clinics of Dhaka city. Total 96 patients were interviewed on their level of satisfaction using structured questionnaire.* ***Results:*** *More than eighty-four percent (84.4%) respondents were not satisfied regarding waiting time for consultation. Regarding the attitude of receptionists, 61.5% respondents were satisfied with the receptionists' behavior. Reporting on the other facilities available at the reception room, 60% had found safe drinking water provision in the dental clinics, 76% mentioned that there were display of health information like posters or others promotional materials, 79.2% respondents reported of finding adequate lighting & 91.7 % found presence of alternative power supply in the concerned clinics.* ***Conclusion:*** *The majority of the patients expressed dissatisfaction over waiting time at the reception but were satisfied by the receptionists' attitude and other facilities provided at those dental clinics.*

Key Words: ***Patient satisfaction, Reception room, front desk services*** ***J Cont Dent Sci 2016;4(1):14-17)***

Introduction

Patient satisfaction is an important component of dental care. It influences patients' compliance, their use of dental services, and their anxiety, and it is also associated with health outcomes and health status.[1] As the health care industry shifts towards a consumer-oriented approach in the delivery of care patient satisfaction surveys have become an increasingly important tool in measuring the quality of dental services.[2,3]

As physicians and hospitals experience growing pressure to increase the quality of their outcomes, enhance the safety of their patients and lower the cost of their care, analysts expect greater attention and scrutiny to be given to the accountability function of patient satisfaction scores, and to ways in which patient satisfaction measurement can be further integrated into an overall measure of clinical quality. [4]

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Patient satisfaction with dental services may be influenced by the socio-demographic characteristics of the individuals, such as sex, age, ethnicity, and socio-economic status. Various studies have reached differing conclusions with regard to these influences. Perceived health, the nature of the provider-patient interaction, and structure of the dental care delivery system are also significant factors, which determine the level of dental service satisfaction.[5]

Some authors describe four specific reasons for investigating patient satisfaction. First, satisfaction is an objective of care; second, satisfaction is also a consequence of that care, and therefore an outcome; third, satisfaction can contribute to the effects of care, as a satisfied patient is more likely to comply with advice; finally, satisfaction is also the patient's judgment on the care that has been provided[6]

As with every organization that is concerned with satisfying the users of its products or services, dental service providers are becoming more involved with patient satisfaction. This is due to increased evidence that the association between satisfaction, patient compliance and success of the treatment determines the quality of health care.[7] In recent reports, patient satisfaction is defined as a health care recipient's cognitively-based evaluation of, and affectively-based response to the important aspects of the structure, process and the result of their service experience. Newsome & Wright and Goedhart et al. have shown that health care is accepted as a complex mixture of the emotional, the physical, and the immaterial, and it

consumers are directly involved in quality assessment.[8] Thus, a marketing-oriented model is not appropriate for most medical services, and their consumption should be evaluated differently from that of a consumer product.[9]

Perceived health, the nature of the provider-patient interaction, and structure of the dental care delivery system are also significant factors, which determine the level of dental service satisfaction.[1,10-13] The front-desk or the reception room may reflect the overall environment of a dental care facility which could influence a patient's receptiveness to dental procedures. The purpose of this survey was to assess satisfaction level of the patients concerning the reception services in different dental clinics.

Methods and Materials

This survey was designed to report the level of satisfaction of patients regarding reception services in different dental clinics. The study was carried out in the month of January 2009 - June 2009 at five selected dental clinics in Dhaka city. A total of 96 patients were interviewed through structured questionnaire. Informed written consent was taken from the participants after explaining all the facts to the subjects. The participants were assured that the information acquired will be used for academic purposes only. Collected date were collated and reported in plain graphs and tables.

Results

Data were collected from five different private dental clinics at Dhaka city. A total number of 96 patients were interviewed for patient's satisfaction and socio-demographic information like age, sex, education, occupation, etc. The findings of the study were as follows:

Table-1. Distribution of the respondents by Age group

Age in group	Frequency	Percent
<20 years	12	12.5
21 to 30 years	18	18.8
31 to 40 years	33	34.4
41 to 50 years	23	24.0
>50 years	10	10.4
Total	**96**	**100.0**
Mean -36.54, SD±10.5, Minimum-18, Maximum-60		

The table shows that among the 96 respondents, majority (34.4%) belonged to the age group of 31 -40 yrs. Mean age of the respondents were 36.54±10.5.

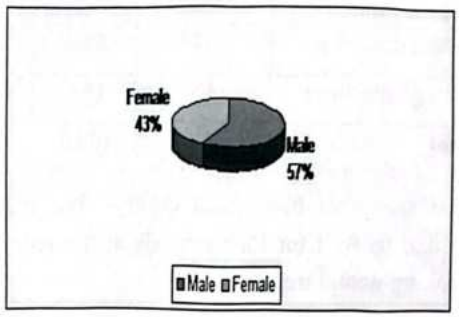

Fig-1. Distribution of the respondents by Gender

Figure 1 shows that 57% of respondents were male and 43% were female.

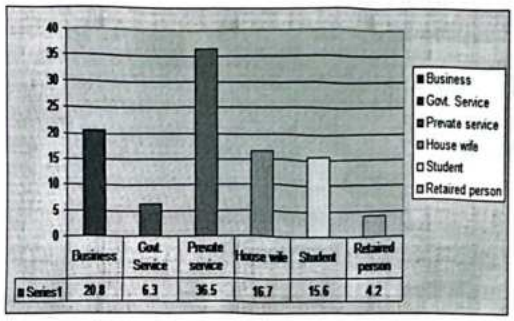

Fig-2. Distribution of the respondents by Occupation

According to figure 2 it is observed that majority of the respondents were private service holder (36.5%), while representation from business me n were 20.8%, followed by house wives (16.7%) , student (15.6%) Govt. service holder (6.3%) and retired person (4.2%) respectively.

Table-2. Distribution of the respondents by Attitude of the receptionist

Attitude of the receptionist	Frequency	Percent
Satisfactory	59	61.5
Not Satisfactory	37	38.5
Total	96	100.0

The table shows that 61.5% respondents were satisfied regarding the behavior of the receptionist and the rest (38.5%) were not satisfied.

Table 3. Distribution of the respondents by waiting time for consultation

Waiting time for consultation	Frequency	Percent
Waiting time long	81	84.4
Waiting time Short	15	15.6
Total	**96**	**100.0**

Table 3 shows that more than eighty- four percent (84.4%) had to wait for long periods at the reception while seeking dental treatment.

Table 4. Distribution of the respondents by Provision of safe water supply

Provision of safe drinking water	Frequency	Percent
Provision safe water	74	77.1
No provision safe water	22	22.9
Total	96	100.0

Seventy four percent respondents found safe drinking water in the dental clinics and 22.9% did not find safe drinking water.

Table 5. Distribution of the respondents by Visual health information

Display of health information related poster or others at the clinics	Frequency	Percent
Display poster present	76	79.2
Display poster absent	20	20.8
Total	**96**	**100.0**

Among the respondents, 76% mentioned that display of health information related posters were available at the dental clinics.

Table 6. Distribution of the respondents by Logistics

Logistics	Frequency	Percentage
Provision of adequate lighting		
Present	76	79.2
Absent	20	21.8
Alternative power supply		
Present	88	91.7
Absent	8	8.3

This table shows that 79.2% respondents found adequate lighting & 91.7 found alternative Power supply at the clinics.

Discussion

This survey was carried out in order to assess the level of satisfaction about reception services at private dental clinics in Dhaka city, which showed that overall 61.5% respondents have received well behavior from receptionist, 77.1% respondents have found safe drinking water in the dental clinics, 76% mentioned display of health promotional materials, 84.4% respondents found the time of waiting for consultation was long. The results were similar to the study by N. Nagappanin India (2014) which had found about 6.9% of patients were not satisfied with the courteousness of the reception staff, 57.6% of patients felt that they were satisfied regarding drinking water facilities and 31.9% of patients felt that they had a problem in scheduling appointments.[14] An another study by Hashim R. regarding patient satisfaction with dental services at Azman University, United Arab Emirates (2005), reported that 14.8% were not satisfied with the attitude of reception staff.[15] Our survey found 37% dissatisfied visitors.

Conclusion

Consumer opinion is an essential component and an important quality indicator in measuring the outcome of any medical service and thus assists health care providers in designing health management plans,[16] Regarded as an outcome of care and is one of the major factors that contribute towards better patient compliance and consequently to better clinical outcomes.[17] Patient satisfaction with dental care is a multidimensional concept reflecting patients' expectations, values and experiences.[18] The results of our survey indicated that majority of the patients were satisfied with the supporting facilities and the attitude of the receptionists, but they somewhat expressed dissatisfaction for long waiting time before seeing a doctor. A large scale study would help explore avenues for patients satisfaction and thus help in improvement service delivery system and quality assurance at all levels of dental practice.

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Antibiotic sensitivity pattern of bacterial isolates from urinary tract infection cases

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Abstract

Purpose: *Urinary tract infections (UTIs) remain a common infection diagnosed in outpatients and hospitalized patients. Resistance to antibiotic therapy prescribed for UTIs are reportedly on the rise in recent years. An up-to-date knowledge of local antibiotic sensitivity pattern of common uropathogens is essential for proper therapy of community acquired UTIs. The aim of the present study was to find out pyuria by direct microscopy, to isolate and identification of the organisms by culture and to know the susceptibility (C/S) pattern of organisms causing urinary tract infection.* ***Methods:*** *A total of 300 midstream urine samples were subjected to aerobic bacteriologic culture in the department of Microbiology, Kumudini Womens' Medical College, Mirzapur, Tangail, during the period of January, 2013 to December 2013. Specimens were collected from hospitalized and outdoor patients of different age and sex groups. All specimens were examined by routine microscopy to find out significant pyuria (>5 pus cells /HPF).* ***Results:*** *Out of 300 specimens, 59.33% cultures yielded significant growth of organism and (41.67%) yielded no growth. The isolated organisms were E.coli 73.03%, Klebsiella 12.36 %, Pseudomonas 11.23%, and Proteus species 3.37%. The highest sensitivity for E. coli was shown by Imipenem (100%) followed by Nitrofurantoin 84.62%, Ceftriaxone (69.23%), Ciprofloxacin (57.69%), Azithromycin (53.85%) and while Amoxicillin, Cotrimoxazole, Cephradine and Nalidixic acid showed sensitivity ranging from 15%-31%.* ***Conclusion:*** *The findings of the present study suggest that UTI should be treated by selective antibiotics after culture and sensitivity test to reduce increasing trend of antibiotic resistance.*

Key words: Antibiotic sensitivity, Urinary tract infections (UTIs), Pyuria ***(J Cont Dent Sci 2016;4(1):18-21***

Introduction

Urinary tract infection (UTI) is a major public health concern in terms of morbidity and financial costs.[1] An estimated 150 million people suffer from UTIs per year worldwide and it is one of the most common diseases encountered in medical practice today.[2] Although UTIs occur in both men and women, clinical studies suggest that the overall prevalence of UTI is higher in women.[3] Uncomplicated UTI in healthy women have an incidence of 50/1000/year.[4] An estimated 50% of women experience at least one episode of UTI in their lifetime and between 20%-40% have recurrent episodes.[4,5] Approximately 20% of all UTIs occur in men 6. Most UTIs are caused by E.coli (up to 85%) and Staph saprophyticus (up to 10%), while Klebsiella and Proteus spp. cause most of the remaining infections.[7]

Antibiotic therapy has contributed significantly to treat UTIs. However, the main problem with current antibiotic therapies is the rapid emergence of antibiotic resistance both in hospitals and in the community.[8] Ignorance, poverty, poor hygiene practices, misuse of drugs and availability of fake and spurious drugs have contributed to antibiotic resistance in the developing world.[9] Since most UTIs are treated empirically, the selection of antibiotics should be determined by culture and sensitivity test. The knowledge of local antibiotic sensitivity pattern of common uropathogens is essential for proper therapy of community acquired UTIs.

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Materials and Methods

The study was performed in the Microbiology department of Kumudini Womens Medical College & Hospital, Mirzapur, Tangail during period of January 2013 to December 2013. For this study, 300 clean catch mid-stream urine specimens were collected in sterile container for microscopy, culture and sensitivity test.

The urine samples were inoculated in blood agar and MacConkey's agar media and were incubated at 37^{o}c for 16-18 hours. Portions of the specimens were centrifuged and deposits were examined by direct microscopy to find out significant pyuria. Specimens showing growth were subjected for colony count according to standard method.[10] The isolated bacteria were identified by colony morphology, staining properties and other relevant biochemical tests.

All the isolates were tested for antimicrobial sensitivity using disc diffusion technique by 'Kirby-Bauer method'. Commercially available discs were used.

Procedure of sensitivity test: 3-5 colonies were picked up from the pure culture plates by a sterile inoculating wire loop and suspended in 5 ml of sterile normal saline in a test tube. The turbidity produced by growth of the organisms was then adjusted to a turbidity equivalent to that of one half of McFarland tube no.1 which corresponds to 1.5 X 108 organisms/ml.

Within 15 minutes of adjustment of density of the organism, a sterile cotton wool swab was dipped into bacterial suspension. The swab was then streaked on the dried surface of the Muller-Hinton plates in three planes rotating the plate each time to get a uniform distribution of the inoculums. Finally the edge of agar was encircled by the swab. The inoculated plate was left on flat level surface for 10-15 minutes with the lid closed for the absorption of excess moisture. Then with a flamed fine pointed forceps, the discs were placed on the surface of the inoculated plate with gentle pressure to ensure complete contact with agar surface. The discs were placed evenly in such a way that they were 15 mm away from the edge of the petri-dish and the distance between the centres of the two discs were approximately 24 mm. The plates were then incubated at 37°C for 16 -18 hours in inverted position and reading were taken on the next day.

Results

Table 1: Distribution of UTI pts according to direct microscopy (Pyuria positive) and growth culture in MacConkey's agar media

Total no. of UTI pts (%)	Total no. of Pyuria +ve (by Direct Microscopy) (%)	Total no. of Growth +ve (in MacConkey's agar media) (%)
Male 120 (40%)	75 (34%)	51 (28.6%)
Female 180 (60%)	140 (66%)	127 (71.34%)
Total 300 100%)	**215 (100%)**	**178 (100%)**

Table 1 shows that out of the 300 participants, pyuria was detected in 215 UTI pts, while 178 participants demonstrated positive growth of microbes in their urine. More women (66%) demonstrated pus in their specimen (pyuria and positive growth of microorganisms (71.34%) in comparison to their male counterparts (34% and 28.6% respectively).

Table 2: Distribution of different types of Bacteria isolated from UTI patients (n=178)

Isolated bacteria	Number of cases	Percentage (%)
E.coli	130	73.03
Klebsiella	22	12.36
Pseudomonas	20	11.23
Proteus	06	03.37
Total	**178**	**59.33**

Table 2 shows the distribution of isolated bacteria. Among the isolated bacteria, E.coli were isolated in 73.03% cases followed by klebsiella 12.36%, Pseudomonas 11.23% and Proteus 03.37% respectively.

Table 3: Antibiotic susceptibility pattern of isolated bacteria (n=178)

Antibiotic susceptibility	E.coli No.(%)	Klebsiella No.(%)	Pseudomonas No.(%)	Proteus Number (%)
Amoxicillin				
S	20(15.38)	5(22.73)	0	0
R	110(84.62)	17(77.27)	20(100)	6(100)
Cotrimoxazole				
S	15(11.54)	6(27.27)	0	0
R	115(88.46)	16(72.73)	20(100)	6(100)
Cephradine				
S	25(19.23)	5(22.73)	0	0
R	105(80.77)	17(77.27)	20(100)	6(100)
Nalidixicacid				
S	40(30.77)	6(27.27)	0	2(33.33)
R	90(69.23)	16(72.73)	20(100)	4(66.67)
Ceftriaxone				
S	80(61.54))	14(63.64)	10(50)	3(50)
R	50(38.46)	8(36.36)	10(50)	3(50)
Azithromycin				
S	70(53.85)	15(68.18)	7(35)	4(66.67)
R	60(46.15)	7(31.82)	13(65)	2(33.37)
Ciprofloxacin				
S	75(57.69)	14(63.64)	8(40)	2(33.33)
R	55(42.31)	8(36.36)	12(60)	4(66.67)
Nitrofurantoin			-	
S	110(84.62)	16(72.73)		4(66.67)
R	20(15.38)	6(27.27		2(33.33)
Imipenem				
S	130(100)	22(100)	20(100)	6(100)
R	0	0	0	0

Table 3 shows the antibiotic susceptibility pattern of individual bacteria. A hundred percent (100%) sensitivity for Imipenem was found in all bacterial isolates. Resistance for Amoxycillin was 84.62% for E coli, 77.28% for Klebsiella. Resistance for Cotrimoxazole was 88.46% for E coli, 72.73% for Klebsiella.

Resistance for Nalidixic acid was 69.23% for E coli, 72.73% for Klebsiella and 66.67% for Proteus. 100% resitance for amoxycillin, cotrimoxazole and cephradine was found both for Pseudomonas and Proteus. Sensitivity for nitrofurantoin, ciprofloxacin, ceftriaxone and azithromycin was higher than amoxycillin, cotrimoxazole and cephradine.

Discussion

This study demonstrates the distribution and antibiotic susceptibility pattern of bacteria isolated from patients of urinary tract infection. Out of the 300 participants, pyuria was detected in 215 male and female, while 178 participants from both gender demonstrated positive growth of microbes in their urine. Urine specimen of the female partcipants' had greater percentage of pus in their urine (66%) and positive microbial growth (71.34%) in comparison to their male counterparts. It has been extensively reported that adult women have a higher prevalence of UTI than men owing to anatomic and physical factors.[10-13]

The findings of this audit demonstrated that E. coli remain the leading uropathogen being responsible for 73.03 % of UTIs. This figure corresponds with findings of other studies [14-18]. Following E coli, our study found Klebsiella and Pseudomonas species as other common uropathogens respomsible for urine infection among both genders. Enterobacteriacae have several factors responsible for their attachment to uroepithelium. These gram-negative aerobic bacteria colonize the urogenital mucosa with pilli and P1 blood group phenotype receptor.[14]

Generally, uncomplicated UTIs are treated in the community with short courses of empirical antibiotics. In many cases, urine samples are only sent for microbiological evaluation following treatment failure, recurrent or relapsing infection. Although the levels of resistance we observed in the community isolates may therefore overestimate the true rate of resistance in the community, the high levels of resistance of gram-negative uropathogens to Aampicillin and Co-trimoxazole raise concerns over the use of these agents. Our findings thus suggest the empirical treatment with these drugs should no longer be appropriate. The high antibiotic resistance against Ampicillin and Co-trimoxazole could be due to their use for other indications.

The overall resistance of E coli to Nalidixic acid and Ciprofloxacin was 69.23% and 57.69% respectively. Fluroquinolones have a wide variety of indications and widely prescribed, accounting for the emergence of their resistance. Our findings indicate urgent strategies to counteract resistance to these drugs must be developed or their use in uncomplicated infections should be strictly restricted.

Nitrofurantoin has shown the least resistance (15.77%) for E.coli. Given the fact that Nitrofurantoin has no role in the treatment of other infections, it can be taken orally and remain highly concentrated in urine; it could be a more appropriate agent for empirical use in uncomplicated UTI.

Conclusion

The findings of the present audit suggest that UTI should be treated by selective antibiotics after culture and sensitivity test to reduce increasing trend of antibiotic resistance.

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Early detection and treatment of plaque type lichen planus: A clinical case report

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Abstract

Lichen planus (LP) is a chronic mucocutaneous disorder of stratified squamous epithelium that generally involves the mucosa of the oral cavity with or without skin. Oral lichen planus (OLP) is a relatively common lesion of the oral cavity with much importance in respect to its potential ability to transformation to malignancy. Thus, the objective of this study was to report a case of plaque type lichen planus of a male patient in relation to its clinical characteristic, early diagnosis and management. The 41-year-old Bangladeshi male patient came to the department of Oral Pathology and Medicine with the complaint of white patch on the tongue for 4-5 months and the lesion was symptom-free. Clinical examinations were carried out for diagnosis of oral lichen planus. Topical 0.05% Clobetasol propionate was prescribed for treatment with success. It was concluded that an accurate diagnosis is necessary so that the proper treatment can be established.

Key words: Oral lichen planus, Tongue, Diagnosis, Treatment ***(J Cont Dent Sci 2016;4(1):22-23***

Introduction

Oral lichen planus (OLP), the mucosal counter part of cuteneous lichen planus, presents variety of sub-types such as reticular (intertwined lace like pattern), erosive (surrounded by fine radiant keratinized striae with a network appearance), atrophic (similar to white striae of reticular type surrounded by an erythematous area), plaque like (whitish homogenous irregularities), papular (small white papules having fine striae in the periphery) and bullous (exhibiting blister which is ulcerated and painful while ruptured).[1] Reticular, atrophic and erosive forms of LP are usually common. However, reticular form is the most common.[2] OLP is a potentially malignant disorder which may transform to oral cancer. Therefore, early diagnosis and management is important.[3]

Case report

A 41-year-old Bangladeshi male patient came to the department of Oral Pathology and Medicine with the complaint of white patch on the tongue for 4-5 months and the lesion was symptoms free.

The patient had no past dental history and medical history was not contributory. He was worried about the white area of his tongue and came for a routine checkup.

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Fig 1: Plaque like white lesion on tongue.

Intraoral examination revealed a white area on anterior region of the dorsal surface of the tongue (fig-1). The white area was plaque- like irregular in shape, measuring about 2X3 cm area of the tongue. Surrounding area of the tongue was normal. On palpation the lesion was non-tender, and nonscrappable.

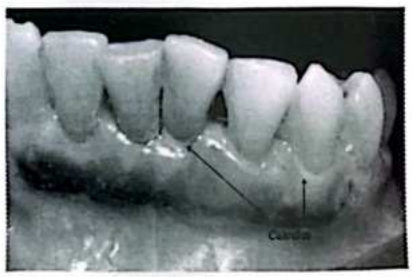

Fig 2: pigmented gingiva with calculus.

Gingiva was black pigmented with mild swelling, supra and sub-gingival plaque and calculus. There was bleeding on probing (fig-2).

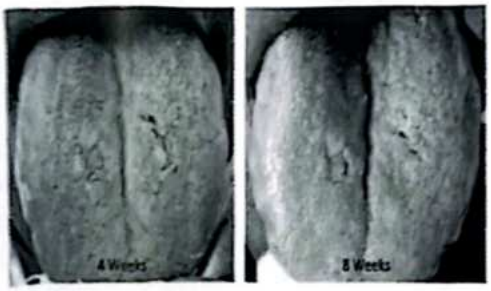

Fig 3: Post-treatment healed lesion of the tongue.

Considering the history and clinical features, the patient was diagnosed having plaque type oral lichen planus. Depending on the clinical conditions of the lesion, we decided not to take any biopsy and go for topical steroid treatment in order to see whether the condition improves or not.

He was treated with Clobetasol proprionate 0.05% ointment, twice daily for 8 weeks. Patient showed significant improvement after treating with topical steroid ointment (fig-3). Scaling and polishing was done on the first visit for plaque and calculus removal.

Discussion

Our study focused on the importance of routine clinical examination and early diagnosis of oral lichen planus for a successful management of the lesion. Lichen planus is a premalignant condition and there are several reports published on this regard. A clinical case with oral lichen planus in the lateral border of tongue associated with metallic restoration which was improved one year after replacement of that metallic crown with ceramic covering.[4] However, our case was not associated with any metallic restoration rather other unknown etiology may be responsible.

OLP may be diagnosed clinically, but histopathology is still required to see any dysplastic changes within the lesion. For a persistent case of lichen planus both histopathology and follow up is needed for early detection of any kind of neoplastic transformation particularly for plaque type of lichen planus involving dorsal surface of tongue.[5]

Studies revealed that there is a positive correlation between a stressful incident and onset of lichen planus. Hence, patient's psychoanalysis should be associated in support of managing such cases.[6]

Topical Tacrolimus 0.1% ointment is considered as more effective in curing LP than topical steroid ointments.[7] Application of 0.1% topical Tacrolimus ointment showed better curative action than 0.1% Traiamcinolone acetonide ointment. However, the lichen planus frequently recurs within 3-9 months after termination of treatment.[8] In our case, the patient was markedly improved in clinical condition with steroid application, whereas there are other topical agents that are used in lichen planus treatment.

Finally, the cause of OLP is yet to be elucidated and the prevalence fate for transforming to malignancy cannot be excluded. Patients having OLP is at high risk for oral cancer.[9] Hence, it should be monitored time to time for early detection and treatment of this potential malignant disorder.

Conclusion

OLP is a common mucosal lesion encountered by the dental practitioners. The lesion should be identified precisely and proper treatment must be administered at the earliest. Our result indicates that topical application of steroids is greatly effective in the treatment of plaque type of lichen planus.

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Restoration of a complicated fractured tooth with glass fiber post and composite resin: A case report

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Abstract

Restoration of a fractured tooth with glass fiber post and composite resin is one of the best treatment protocol regarding to aesthetics, function as well as patient acceptance. This case report presents a 30 years old male with an oblique complicated crown fracture of maxillary left central incisor tooth. The procedure used to repair the fracture was gingivectomy followed by endodontic treatment. The root canal was filled with a root canal sealer and gutta percha point. After root canal obturation, the tooth was restored with a glass fiber post and composite resin without additional crown coverage. The restoration made it possible to maintain the remaining tooth structure in a good occlusion and resulted in a high level of patient satisfaction.

Key Words: Crown fracture, Endodontic treatment, Glass fiber post, Composite resin restoration. ***(J Cont Dent Sci 2016;4(1):24-26***

Introduction

Aesthetic rehabilitation of crown fractures of the maxillary anterior teeth is one of the greatest challenges to the dental specialist.[1]The type and location of fracture depends upon age of patient, amount of force and direction of blow but an in vitro study concluded that most of the traumatized incisors fracture in an oblique fashion from the labial to lingual aspects with the fracture line proceeding in an apical direction.[2,3]Oblique coronal fractures that involve pulp and extend apically into the root (sub gingival) may also invade the critical area of biologic width. These fractures are particularly challenging.

Several factors influence the management of coronal tooth fractures, including extent of fracture, pattern of fracture and restorability of fractured teeth, secondary trauma, presence or absence of fractured tooth fragment, occlusion, esthetic, finances and prognosis.[4-6]

With the recent improvements in the dental materials, resin based restorative materials with the use of tooth colored fiber reinforced polymer posts are of choice because of several advantages such as esthetics, bonding to tooth structure, low modulus of elasticity similar to that of dentin.[7]

This case report presents a case of complicated crown fracture managed by glass fiber post and composite resin.

Case report

A 30 years old male patient came to the department of conservative dentistry and endodontics, BSMMU, with the complaint of mild pain and broken tooth on the maxillary anterior region. He had a history of trauma on that area one week back due to an accident. On extra-oral examination no abnormalities were detected, intra-orally revealed an oblique coronal fracture of maxillary left central incisor with involving pulp. The fracture line extended a little below the gingival level at the palatal surface of the tooth. Intra-oral periapical radiogragh revealed an intact periodontal ligament space with no root or alveolar bone fracture. The case was diagnosed as complicated crown fracture of maxillary left central incisor. After considering the above conditions, endodontic treatment followed by restoration with glass fiber post and direct composite crown build up was planned to perform.

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Treatment procedure

The consent of the patient was taken. Local anaesthesia was administered and gingivectomy was performed to expose the line of fracture palatally and haemostasis was achieved. Then, a straight line endodontic access cavity was made and pulpal remnants were removed. The working length was determined by working length measuring radiograph. Then the root canal was prepared as standardized technique at 18mm working length up to 60 K file and obturated with gutta percha point by lateral condensation technique.

On the next appointment, the gutta percha point was partially removed from the root canal using peeso reamer until it measured the estimated depth required for the post, leaving 5 mm of filling material at the apex to maintain a good seal. The glass ionomer luting cement (GC corporation) was applied with a lentulospiral into the post space and the glass fiber post (GLASSIX- 1.35 mm diameter) was inserted into the canal. Excess cement was removed with a clean instrument.

Then the shade was selected, the tooth was isolated with cotton roll and air dried. Uniform layer of 7th generation self etch adhesive bonding (Beauty Bond) was applied according to manufacturer's instruction. The adhesive layer was dried with gentle air blast for 5 sec. and light curing done for 10 sec. Then the crown was built up incrementally with Giomer (BEAUTIFIL II-# A2). Each increment was light cured for 20 sec. Then the tooth was finished and polished and occlusion was cheeked.

Discussion

Fracture of the tooth below the gingival attachment presents restorative problems due to difficulty of access.[8] In such cases, orthodontic or surgical exposure of the fracture is necessary to facilitate further treatment. Surgical exposure of the fracture margin can be achieved by gingivectomy with or without osteotomy. This technique is simple and allows restoration to be completed soon after injury. However, surgical exposure in aesthetic regions has unacceptable results and is best used only for the palatal surface of anterior teeth.[9,10] In the case presented here, the fragment margin was exposed by gingivectomy. This technique allowed sufficient exposure and further orthodontic or surgical extrusion was not deemed necessary.

The treatment options for this type of case include reattachment (if fracture fragment is available), post supported direct composite build up, prosthetic restoration or tooth extraction followed by rehabilitation.[11]In the presented case the patient was unable to retrieve the fracture fragment so restoration with glass fiber post and direct composite crown build up was planned. This technique has some major advantages-it eliminates the need for sacrificing any tooth structure, less time consuming, more economic and cheaper than indirect restorations that have additional laboratory cost.

The selection of post is important, because it may have an influence on the longevity of the tooth. Multiple factors may influence post selection which include amount of remaining coronal tooth structure, tooth anatomy, position of the tooth in the arch, root length, root width, canal configuration, stress, post design, post material, bonding ability, core retention and esthetics.[12]In this case, GLASSIX post (1.35 mm diameter) was used. It is cylindrical in shape with a gentle rounded cone ideal for the root canal and exactly matched by the calibrated reamers.

The length of the post ideally should be at least as long as the clinical crown, providing 4-5 mm of gutta percha apical seal. The diameter of the post should be minimal and not more than one third of the root diameter.[13]A number of techniques for removing gutta percha includes solvents, thermal and mechanical removal. Solvents are best avoided as they have the potential to damage the root canal filling material that remains. The thermal method of removing gutta-percha using heat pluggers is safer but more time-consuming. Mechanical removal of gutta percha point using Gates-Glidden drill or peeso reamer is efficient and probably the most commonly used technique, but it is associated with a higher risk of root perforation if carried out incorrectly.[14]To avoid this problem, in this case, peeso reamers were used on slow speed with continuous up and down motion along with cooling arrangement. The method used to place the cement into the canal before post placement has a significant effect on post retention. Lentulo-spiral is used in this case to fill the canal with the cement which has been shown to be the most effective method for cement placement.

Although some researchers believed in the past that posts could improve the fracture resistance in endodontically treated tooth, nowadays it is known that preparation of a post space may increase the chances of root fracture,[15] so that posts should only be used when other options were not available to retain a core.[16] Studies were performed comparing the fracture resistance of endodontically treated teeth when they were restored with or without posts. According to Grandini et al. fiber posts associated to direct resin restorations is a faster therapeutic option that conserves remaining tooth structure. These authors evaluated fiber post/ direct resin restoration longevity by 6, 12, 24 and 30-months recall and satisfactory results were found although any comparison with teeth without posts had been made.[17] In this case, restoration was done with glass fiber post and direct composite crown build up.

Improvements in composites and the development of dentine bonding systems have stimulated a trend toward more conservative techniques of tooth restoration, which afford increased opportunities to preserve badly broken permanent incisor teeth.[18] Currently used glass fiber post systems are designed to be corrosion resistant, are able to bond to tooth structure, are esthetically pleasing, and allow retrieval when the post core system fails.[19]

Recently, concepts of adhesive dentistry have been applied to the field of endodontics with a specific focus on obtaining a "MONOBLOCK" in which the core material, sealing agent and the root canal dentine form a single cohesive unit. Based on this monoblock concept, some new obturating materials have come up in the market which include Activ GP (Cone + Sealer), Realseal (Cone + Sealer), Filtek P90 (silorane based composite), Ketac N100 (nRMGIC).[20]

Conclusion

Based on the present case report it can be concluded that, a fractured tooth managed by glass fiber post and composite resin is a simple conservative approach to provide aesthetics and functional rehabilitation. Periodic follow up examinations and radiograph are essential to monitoring the restoration of teeth with complicated crown fracture.

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