

Association of age and gender with turns of composite in class IV restorations.

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Abstract

Background: The use of composite resins for class IV restorations is a procedure that demands the dentists to commit, from planning to execution using a minimal invasive approach that allows more tissue preservation with optimal aesthetic and functional outcome.

Aim of the study: The aim of the present study was to analyse the association between the age and gender and the number of turns of composite used in class IV restorations.

Materials and method: Retrospective analysis of all the cases class IV restorations (both mesial and distal surfaces) was retrieved among the overall data of patients visiting Saveetha Dental College. The data was entered in Excel Spreadsheets. And the collected data was analysed using SPSS software version 19. Chi square test was used to statistically evaluate the results.

Results: In the present study, it was seen that higher rates of one turn composite was being used nearly about 56.3% when compared to the two turn and three turns of composite. In comparison with age and turns of composite in the present study, p value was found to be 0.00, less than 0.05 which is statistically significant. In comparison with gender and the turns of composite used in class IV restoration p value was found to be 0.161 which is statistically not significant.

Conclusion: From the present study, it can be concluded that higher rates of one turn composite was used when compared to two and three turn's use of composite in class IV restorations.

Keywords: Class IV dental caries, Ellis class I and II fractures, Composite resin, One turn, Two turn, Three turn, Esthetic concerns, Innovative technique.

Introduction

Dental caries and trauma including tooth fractures, avulsion as well as non carious lesions are the common reasons thereby leading to pulpal inflammation [1]. Dental caries is defined as an infectious microbiological disease of the teeth that results in localised dissolution and destruction of the calcified tissues of the teeth [2]. Simon added a new class to the GV Blacks classification of dental caries. According to Simon's classification, Class VI lesions were described as those occurring at the incisal edge or occlusal cusps due to attrition, abrasion or erosion [3]. Class VI lesion was also referred to as "Simon's modification" [4].

Class VI enamel defects of enamel are usually seen in the older, worn out teeth in which the enamel layer has been lost resulting in exposure of low mineralized dentin (Figure 1). Class VI caries of the posterior teeth usually tend to occur on the cusp tips which are usually sites due to the absence of obvious patencies like pits and fissures that serve as areas for biofilm formation and plaque accumulation. Therefore the

exact etiology of class IV caries remains unknown [5]. Few authors believe that microscopic porosities develop at the cusp tips or the incisal edges naturally or mostly due to the masticatory stresses, which thereby promotes microbial colonization and caries progression (Figure 2 & 3). As the caries lesion develops, the area gets further demineralised and results in breakdown of the tooth structure [2]. So far, various materials like gold foil, silver amalgam, resin based composites and ceramics have been used to restore Class IV defects [6-16].

Materials and method

Study design: Institutional based Retrospective study

Study setting: Private dental institution in Chennai

Study size: 21,000 patients who have undergone treatment for ellis class I or class II fractures from June 2020 to July 2021.

Sampling and Scheduling: Owing to the nature of the study design and setting, a convenience sampling method was used, and the data was collected from April 2020 to February 2021.

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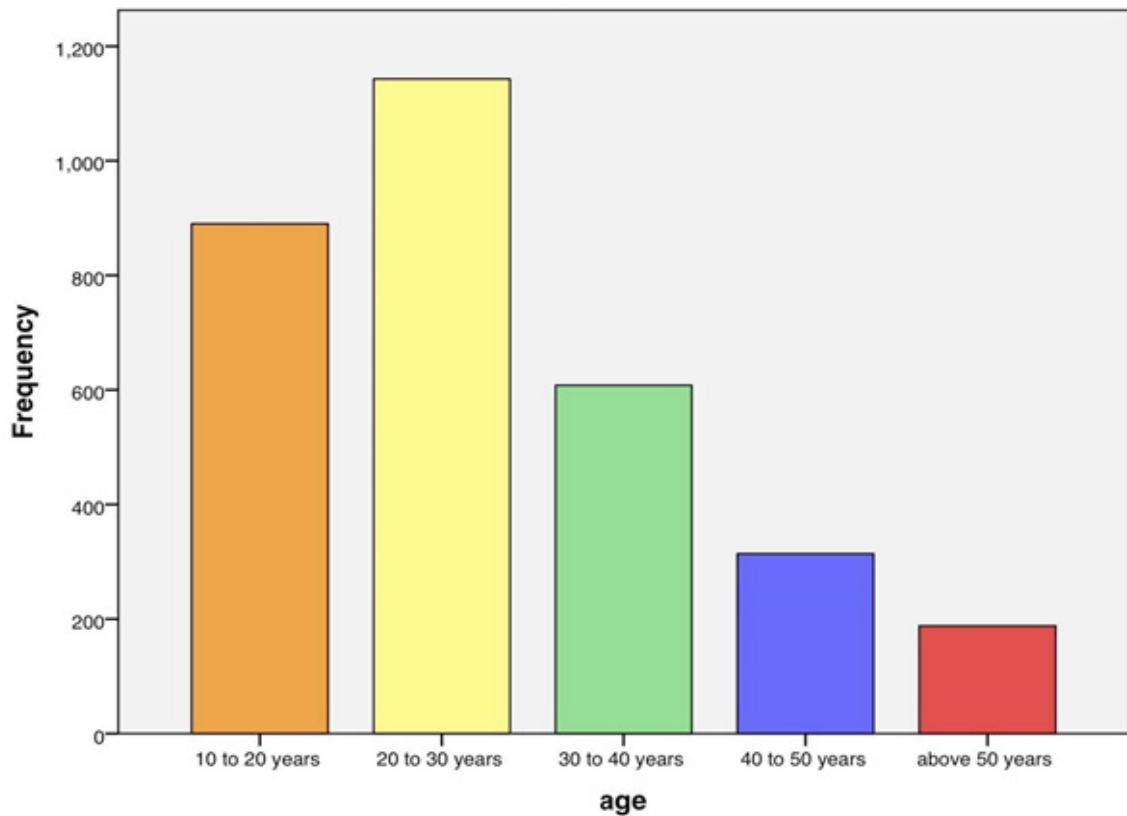


Figure 1: Bar chart depicting the age groups of individuals taken for the present study. X axis denotes the age groups and Y axis represents the percentage of patients under each age group. 36.4% belonged to the 20-30 years of age group, 28.3% to the 10-20 years of age, 19.3% to the 30-40 years, 10% to the 40-50 years of age and the remaining 6% were found in 50-60 years of age (above 50).

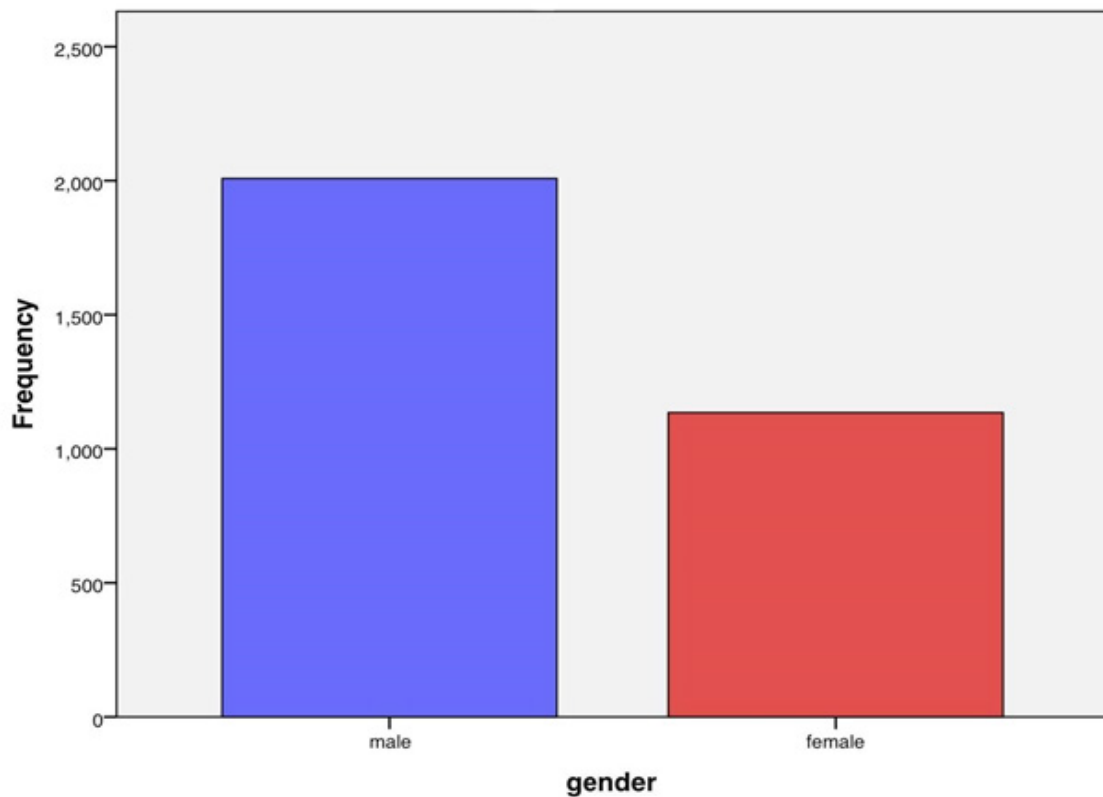


Figure 2: Bar chart depicting the percentage of males and females in the present study. The X axis denotes the gender in the present study and the Y axis denotes the frequency or the percentage of females and males in the present study. It was seen that 63.9% were males and the remaining 36.1% were females in the study.

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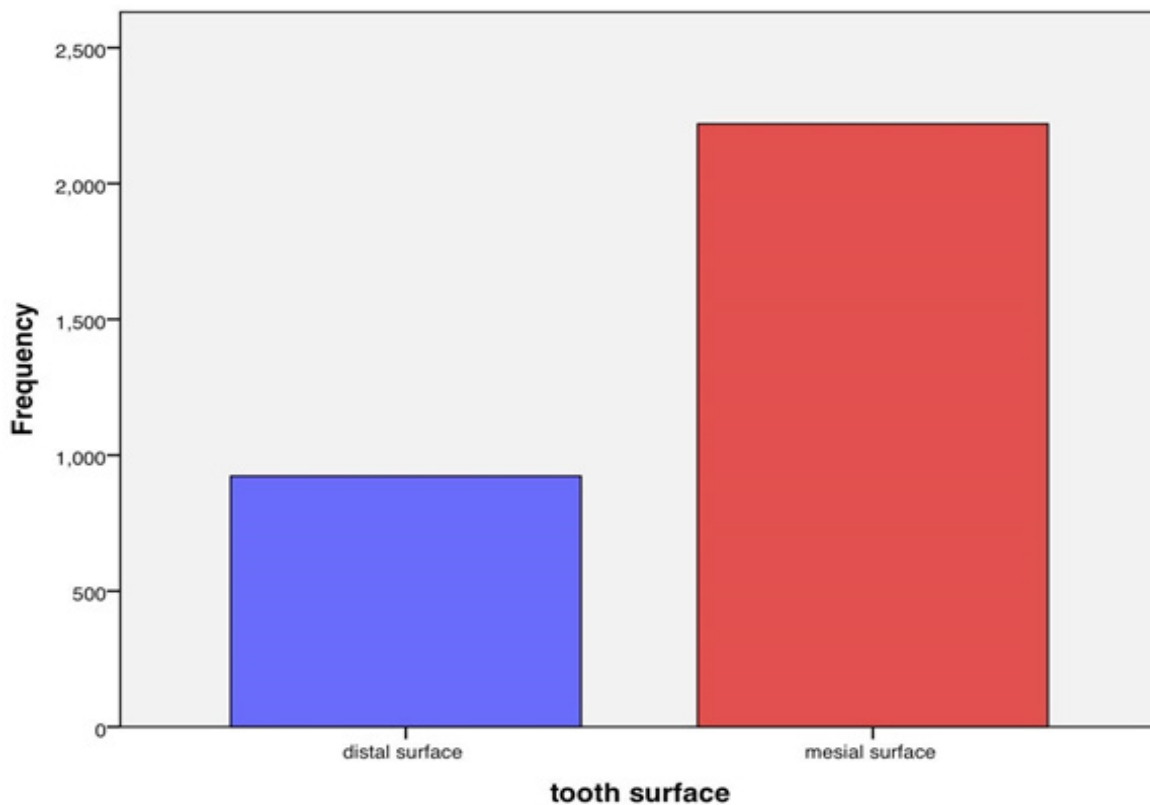


Figure 2: Bar chart depicting the percentage of males and females in the present study. The X axis denotes the gender in the present study and the Y axis denotes the frequency or the percentage of females and males in the present study. It was seen that 63.9% were males and the remaining 36.1% were females in the study.

Survey instrument: Data collection was done using patient management software which has all the patient's records.

Inclusion and Exclusion criteria: Inclusion criteria includes patients undergoing treatment for Ellis class I or Ellis class II fractures. Exclusion criteria include age, gender, systemic diseases, occupation, etc.

Ethical clearance: Prior to the start of the study, ethical clearance was obtained from the institution ethical committee of Saveetha University.

Statistical analysis: The data from the patient management software was transferred into excel and was then imported to SPSS software by IBM, version 25. Descriptive statistics were done using frequency and percentage. Inferential statistics were done using the Chi-square test. Interpretation was based on the p value less than 0.05 which is statistically significant [17-26].

Results

From the results of the present study it was seen that, higher percentage of one turn composite was being used, nearly about 56.3% when compared to the two turn and three turns of composite. In comparison with age and turns of composite in the present study, p value was found to be 0.00, less than 0.05 which is statistically significant. In comparison with gender and the turns of composite used in class IV restoration p value was found to be 0.161 which is statistically not significant.

Discussion

The parameters assessed in this study were age, gender and turns of composite used for Class IV restorations. The retrieved data had 3500 cases of Class IV composite restoration in one turn, two turns and three turns. Association was done between age, gender and type of restoration using chi square test which showed statistical significant difference between age and Class IV composite restorations.[p value<0.05 (chi square test)] .

In this study association of age and gender with Class IV composite restorations was evaluated by associating age and gender of the study groups with the type of restoration used for Class IV cases. When the frequency of placement of Class IV restorations was studied, it showed that most of the cases belonged to the age group of 20 to 30 years and below and most of them involved the teeth of sextant 2 and sextant 1 where a conservative design of carious removal was followed prior to composite restoration. When association was done between age and turns of turns of composite in class IV restorations a statistical significant difference was seen with most of the individuals aged 20-30 years and below. When association was done between the gender and turns of turns of composite in class IV restorations statistical significant difference was not seen with most of the individuals aged 20-30 years and below (Figure 4 & 5).

Other studies proved a lesser count of class IV restoration done above the age group of 30 years because of the excessive attrition leading to fracture to cusp or development of Class

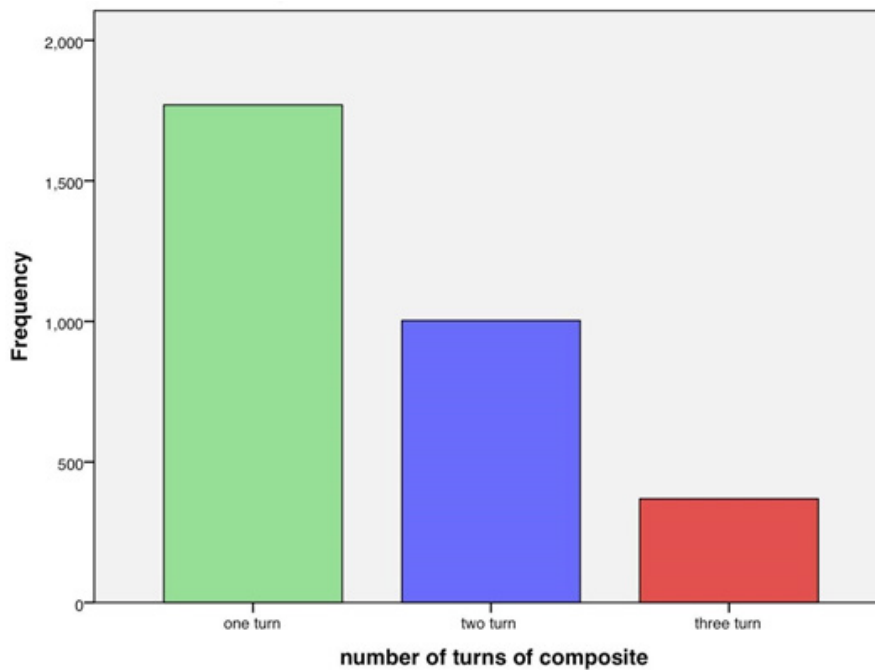


Figure 4: Bar chart depicting the number of turns of composite used in class IV restorations among the study groups taken for the current study. X axis denotes the turns of composite used in class IV restoration and the Y axis denotes the frequency of the number of turns of composite used in the class IV restorations. It was found that nearly about 56.3% were one turn composite, 31.9% were two turn and the remaining 11.7% were three turn composite.

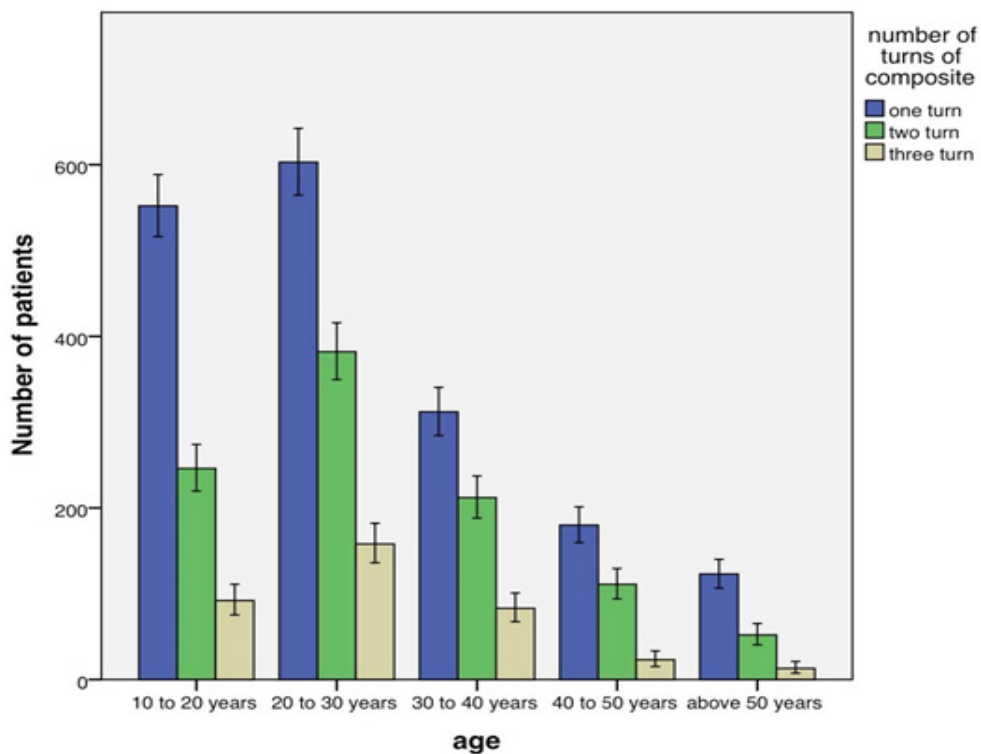


Figure 5: Error graph depicting the comparison between the age and the number of turns of composite used in Class IV restorations for the present study. X axis denotes the age groups in the study and the Y axis denotes the number of patients who have under class IV restorations (based on the turns of composite). In the 10-20 years of age group 17.5% were one turn of composite, 7.82% were two turn composite and about 2.92% were three turns of composite used. In the age groups 20-30 years of age about 19.19% were one turn of composite, 12.15% were two turns of composite and the remaining 5.02% were three turns of composite. In the age groups 30-40 years of age about 9.92% were one turn composite, 6.74% were two turn composite and about 2.64% were three turns of composite. In the age group 40-50 years of age 5.72% were one turn composite, 3.53% were two turn composite and about 0.73% were three turn composite. And in the age groups above 50 years (50-60years) about 3.91% were one turn composite, 1.65% were two turn composite and the remaining 0.41% were three turns of composite used in class IV restorations for the present study. The p value on comparison was found to be about 0.00, less than 0.05 which is statistically significant.

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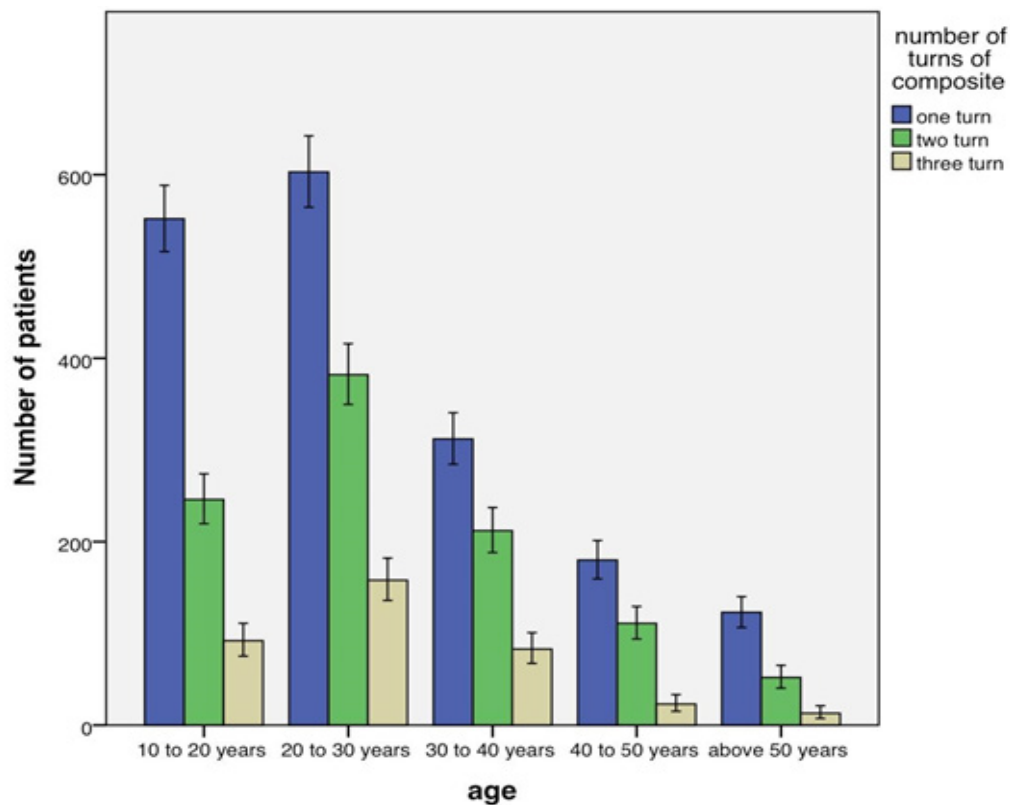


Figure 6: Error graph depicting the comparison between the gender and the number of turns of composite used in class IV restoration for the present study. The X axis denotes the gender in the present study and the Y axis denotes the number of patients who have undergone class IV restorations (based on the turns of composite used). Among the males about 35.5% were one turn of composite used, 21.2% were two turn composite and the remaining 7.19% were three turn composite. And among the female population about 20.7% were one turn composite, 10.8% were two turn composite and the remaining 4.55% were three turns of composite used in class IV restorations. And the p value on comparison was found to be 0.161, greater than 0.05 which is statically not significant.

IV lesion. The conservative approach was followed more among younger individuals as localized caries lesion was seen [27]. On correlating tooth number and turns of composite in class IV restorations, no significant difference was seen. Sextant 2 and sextant 1 was seen to be commonly involved with Class IV lesions and both caries removal and cusp build up was equally practiced prior to composite restoration. On associating age and turns of composite in class IV restoration, higher restorations were seen among the 20 to 30 years of age. And on comparison with the gender and the turns of composite used in class IV restorations higher percentage of one turn composite was used both among the male and female population.

Direct restoration technique was more commonly followed in younger and older age groups with bilayered restoration being practiced more among the middle age group. The association between age and tooth number showed no significant difference with both direct restoration and bilayered restorations being practiced almost equally among all teeth. The practice of direct restoration is more commonly seen in young age groups as they are aware and conscious about dental esthetics which makes them approach the dentist during early stages of caries which can be managed without pulp protection [28]. In older individuals, presence of increased sclerotic dentin, dead tracts, formation of reparative and reactive dentin would all protect the pulp from the progressing dental caries. This

makes restorations possible without pulp protection in most of the older individuals [29]. With the developing dental awareness, tooth structure loss these days is caused more due to physiologic changes in the tooth than dental caries. Advancements in restorative dentistry have led to the use of additive techniques over subtractive approaches for restoring lost tooth structures (Figure 6).

Occlusal loss of tooth structure resulting in wearing away or fracture of the cusps can also be considered as a Class IV lesion. Such cases, resulting in minimal loss of tooth structure can be restored using composite resins. Direct composite build ups for the restoration of moderate to large Class IV defects and for cusp buildup of posterior teeth have shown deterioration in shape, fit and surface texture of restorations [29]. With the position of the tooth being unfavorable in case of molars, direct restoration of moderate to large tooth structure loss has shown poor survival rates and in such cases, for re-establishment of tooth structure indirect restorations with on lays have been proposed. These indirect restorations along with minimal reduction of hard tissue, provides a stable and physiologic occlusion along with optimal form and esthetics [30]. Therefore, prior to restoring any Class IV defect, a thorough clinical examination and assessment of the defect is necessary which would further dictate the type of preparation and the restorative technique.

Conclusion

This study showed higher rates of one turn composite was used when compared to two and three turns use of composite in class IV restorations. And in comparison with the age and gender with the turns of composite used in class IV restorations, higher rates of one turn composite was used among both the male and female population and also among the 20-30 years of age and less than 20 years.

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Conflict of Interest

The authors declare that there were no conflicts of interest in the present study.

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