

## Association Of Age And Gender In Patients Undergoing Class II Composite Restoration In Mesial And Distal Surfaces Of Mandibular Molars

Research Article

Harrita.S<sup>1</sup>, Pradeep S<sup>2</sup>, Senthil Murugan P<sup>3</sup>

<sup>1</sup> Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Science, (SIMATS), Saveetha University, Chennai, Tamilnadu, India.

<sup>2</sup> Reader, Department of Conservative Dentistry and Endodontics, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai-77, India.

<sup>3</sup> Associate Professor, Department of Oral and Maxillofacial Surgery, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai-77, India.

### Abstract

**Background:** A class II dental caries involves the proximal surface of posterior teeth. During removal of the caries in a class II defect the dentist has the opportunity to either extend the cervical outline of the tooth preparation to caries free dentino enamel junction or retain it to sound enamel. With the increasing demand for aesthetic dentistry and concerns regarding mercury toxicity, the popularity of posterior composite restoration has increased. Current composite restorations have proved to be successful in small Class I and II cavities. The use of new flowable composite restoration with the flow characteristic differing from that of hybrid composites, flowable composites can be easily placed and adapted to cavity surfaces by the injection technique. Since we are advancing towards esthetic and conservative dentistry the use of composite resin for even posterior restorations are preferred by the patients.

**Aim:** The aim of the study was to evaluate the association between age and gender among patients undergoing class II composite restoration in mandibular molars.

**Materials and Methods:** A retrospective study done under university setup, where 86000 case sheets were reviewed from the record management system of the college, out of which 50 case sheets satisfied the inclusion criteria of this study. Thus, collected data was compiled and statistically analysed.

**Result:** From this study we can interpret that out of 50 patients who had undergone class II composite restoration, the age group of 18 to 30 years have undergone maximum class II composite restoration Disto occlusal (14) and Mesio Occlusal (7), however there was no significant difference seen between age groups and surface of restoration ( $p > 0.05$ ) and male patient had undergone maximum class II composite restoration, out of 50 patients 28 patients were males in which Mesio Occlusal (10) and Disto Occlusal (18), however there was no significant difference seen between gender and surface of restoration ( $p > 0.05$ ).

**Conclusion:** Within the limitations of the study on the basis of age group, 18 to 30 years have undergone more class II restorations. When comparison was done based on gender, males have undergone more class II restorations. This may be due to the increasing aesthetic concern among patients and thus patients prefer composite over other restorative materials available.

**Keywords:** Class II Cavity; Composite Restorations; Disto-Occlusal; Mandibular Molars; Mesio-Occlusal.

### Introduction

When a tooth is restored for the first time an adhesive restoration can preserve sound tooth structures when compared to conventional amalgam. This is true when a tooth is initially restored. Composite resin comprises of three phases: the matrix, the cou-

pling agents and the fillers. The most commonly used components in the organic resin Matrix are BIS-GMA modified BIS-GMA, urethane dimethacrylate and a number of diluents [21].

Bi polar molecules such as organosilanes are usually used as coupling agents to connect to organic as well as inorganic fillers, the

#### \*Corresponding Author:

Pradeep S,  
Reader, Department of Conservative Dentistry and Endodontics, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai-77, India.  
Tel: +91 9710404482  
E-mail: pradeeps@saveetha.com

**Received:** October 19, 2020

**Accepted:** November 09, 2020

**Published:** November 13, 2020

**Citation:** Harrita.S, Pradeep S, Senthil Murugan P. Association Of Age And Gender In Patients Undergoing Class II Composite Restoration In Mesial And Distal Surfaces Of Mandibular Molars. *Int J Dentistry Oral Sci.* 2020;S9:02:003:12-15. doi: <http://dx.doi.org/10.19070/2377-8075-S102-09003>

**Copyright:** Pradeep S<sup>©</sup>2020. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original author and source are credited.

bond is polymeric in nature if the organic filler particles are pre-polymerised. Beveling is also one of the most important steps in class II restorations. The traditional retention form of cavity preparations lost its relevance when the acid-etch technique was found to bind composite materials effectively to enamel. The surface size and pattern of etched enamel surrounding cavity preparations (and recently dentin) became dominant factors influencing retention of restorative composite materials, rather than convergence of cavity walls. As a result, new conservative cavity preparations were designed preserving sound tooth structure and involving a wide area of beveled enamel, intending to reduce marginal. However, the cavosurface finish of the enamel wall at the cervical margins of class 2 cavity preparations gained only little attention. Beveling the enamel and restoring the tooth with a composite material may present excellent results in vitro. cervical margin of the approximal box and restore the tooth in the clinical setting: the interdental papilla may become injured by the high-speed bur and bleed; the etching agent may leak and harm the gingiva; the gingival fluid may contaminate and dilute the acid, thereby reducing its chelating effect; the cervical sulcular fluids and blood may contaminate the etched enamel, compromising the retention of the composite and increasing marginal leakage; tight adaptation of the matrix band to the etched enamel may damage the tags; and, in addition, the attached matrix band may interfere with application of the bonding agent and composite material [13]. Therefore small carious lesions in the proximal surface of premolars and molars should conserve sound tooth structure [13, 25].

The box type restoration has been difficult to control because of limited access to the cavity And poor clinic performances [5]. Also some studies state that box type restoration satisfies the required condition [5, 2, 6]. Composite resin are subjected to wear under oral conditions and in time undergo other physical and chemical alterations [11]. Class II decays have become very common because patients fail to use interdental cleaning aids to clean the proximal surfaces of posterior teeth.

Thus this study aims to evaluate age and gender association among patients undergoing class two composite restoration in mandibular molars.

## Materials and Methods

### Study setting

This study was done in a university setting conducted in Saveetha Dental College, Chennai. Approval from the ethical committee was obtained. Two examiners are involved in this study.

### Sampling

In this retrospective study, a total of 86000 case sheets were reviewed, out of which 50 case records were collected from June 2019 and March 2020. Cross verification of data for errors were analysed using photographs by another examiner. Simple random sampling was done to minimize sampling bias. Study was generalised to the South Indian population.

### Data collection

Data of patients who underwent class II composite restoration

in mandibular molars was collected from the record management system of the college. Data was entered in excel in a methodological manner and imported to SPSS. Incomplete data was excluded from study.

### Analysis

IBM SPSS 23.0 software was used for data analysis. Independent variables include age, gender, tooth. Dependent variable is surface of class II composite restoration. The surfaces involved are Mesio occlusal (MO), Disto occlusal (DO). Both descriptive and inferential statistics were done. Frequency distribution was done for age and gender in which class II composite restoration in mandibular molars was performed. Chi square test was done to find the association.

## Results And Discussion

Total of 50 patients underwent Class 2 composite restoration in mandibular molars, 28 were male patients and 22 were female patients. Amongst male patients 10 had undergone composite restoration in MO and 18 had undergone composite restoration in DO. Amongst female patients 8 had undergone composite restoration in MO and 14 had undergone composite restoration in DO. Chi square test was done to evaluate the association between gender and the surface of class II composite restoration, which was found to be statistically not significant, p value was 0.962 ( $p > 0.05$ ) (Figure 1).

On analysing the age groups: In 18-30 years, 7 had undergone composite restoration in MO and 14 had undergone composite restoration in DO. In 31-40 years, 2 had undergone composite restoration in MO and 10 had undergone composite restoration in DO. In 41-50 years 6 had undergone composite restoration in MO and 3 had undergone composite restoration in DO. In 51 years and above 3 had undergone composite restoration in MO and 5 had undergone composite restoration in DO. Chi square test was done to evaluate the correlation and p value was 0.128 which was not statistically significant ( $p > 0.05$ ) (Figure 2).

A restorative material to be used in these heavily loaded restorations should have a sufficiently high strength and wear resistance. Clinical studies performed in a general practice environment have shown that composite resin performs well in normal and large sized restorations in all kinds of patients. Apparently, current dental composites have adequate mechanical properties for use in all areas of the mouth [12].

Greater demand for aesthetic restorations has revolutionised modern dentistry and brought about the widespread use of resin composites. In accordance with respective clinical indications, resin composite materials are suitable to be used for both direct and indirect restorations. The rehabilitation of decayed or fractured posterior teeth using an indirect technique was introduced to overcome some of the problems associated with direct restorative techniques, amongst others, polymerization shrinkage and insufficient wear resistance or mechanical properties of directly placed filling materials. Moreover, the achievement of proper interproximal contact and occlusal morphology and the complete cure of composite resins in the deepest regions of a cavity are other challenges related to direct composite restorations [14].

Figure 1. The above depicted graph shows correlation between gender and count of patients who had undergone class II composite restoration. The X-axis denotes the gender and Y-axis denotes the number of Class II composite restorations done. Analysis in gender showed, Disto occlusal (DO) restorations (Green color) was more when compared to Mesio occlusal (MO) restorations (Blue) in both the genders. However, Pearson Chi square p value- 0.962, ( $p > 0.05$ ) which was not statistically significant seen amongst gender.

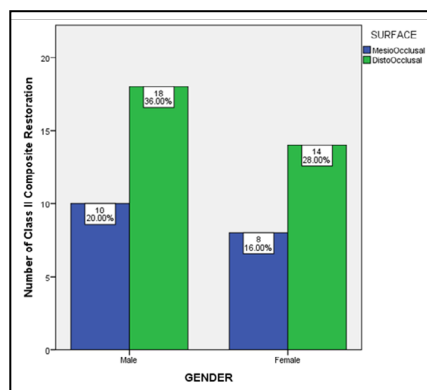
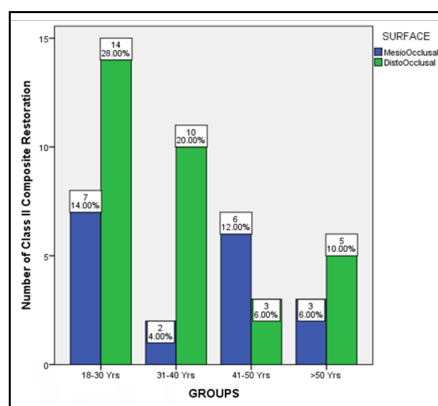


Figure 2. The above depicted graph shows correlation between age and count of patients who had undergone class II composite restoration. The X-axis denotes the age groups and Y-axis denotes number of class II composite restoration of patients. In all the age groups, Disto occlusal (DO) restorations (Green color) was more when compared to Mesio occlusal (MO) restorations (Blue), except in 41-50 years. However, Pearson Chi square p value- 0.128, ( $p > 0.05$ ) which was not statistically significant seen amongst all age groups.



In this study male population had more prevalence of class II dental caries and this can be attributed to poor usage of interdental brush and other cleaning aids a study by Yamamoto et al states that interdental brushes or other interdental cleaning aids can reduce plaque accumulation and thus reduce Caries incidence in the proximal surface of teeth [26]. In this study the age group of 18 to 30 years had more class II caries and have undergone class II composite restoration. This can be overcome by the usage of proper cleaning technique. Imai et al. states that interdental brush is easy to use and has high patient compliance.

This study can be used as a base and the cons in the study are the small sample size limitation of population group to south Indian population this can be altered and done in large-scale. The *in-vitro* studies conducted at our university were [20, 23], the *in vivo* studies include [15, 22], molecular study includes [7]. The reviews and systematic review published are [18, 24]. The surveys conducted were [17, 8]. The clinical trials about root canal were [16, 9]. Currently we are analysing retrospective studies and in this study we have evaluated the frequency of class II composite restorations in mandibular molars amongst different age groups and gender.

Aesthetics are as valuable in the posterior region as they are in

the anterior. While the former is sometimes overlooked due to the limited visibility of posterior teeth, it is important that the clinician follow guidelines to ensure a high-quality restoration in this region. Restoring posterior teeth with direct resin can be accomplished through conservative and aesthetic treatment; however, it can also be challenging and time consuming to achieve exceptional aesthetics [1, 10, 3, 19, 4]. The increase in demand for aesthetics paves the way for dentists to opt for composite restorations for posterior class II cavities.

This study is of a shorter time frame with a limited population. So to ascertain the findings of our study, we have to do further studies in the future with larger sample size and longer duration. This can be helpful to find more information regarding the frequency of class II composite restoration in mandibular molars done and its efficacy based on age and gender.

## Conclusion

Within the limitations of the study on the basis of age group 18 to 30 years have undergone more class II restorations. When comparison was done based on gender, males have undergone more class II restorations. This may be due to the increasing aesthetic concern among patients and thus patients prefer composite

over other restorative materials available.

## References

- [1]. Banerji S, Mehta SB. The Finishing and Polishing of Resin Composite Restorations. *Practical Procedures in Aesthetic Dentistry*. 2017 Feb 2:134.
- [2]. Chadwick RG, Woolford MJ. A comparison of the shear bond strengths to a resin composite of two conventional and two resin-modified glass polyalkenoate (ionomer) cements. *J Dent*. 1993 Apr;21(2):111-6. Pubmed PMID: 8473591.
- [3]. Deliperi S, Bardwell DN. Clinical evaluation of direct cuspal coverage with posterior composite resin restorations. *J Esthet Restor Dent*. 2006;18(5):256-65; discussion 266-7. Pubmed PMID: 16987320.
- [4]. 'Direct resin restorations for posterior teeth' (2016) *Dental Abstracts*, pp. e61-e62. doi: 10.1016/j.denabs.2015.08.050.
- [5]. 'Editorial' (1993) *Cement and Concrete Research*, p. iii. doi: 10.1016/0008-8846(93)90159-7.
- [6]. Foster LV. 'Effects of the removal of composite resin restorations on Class II cavities'. *Br Dent J*. 1992 Dec 5-19;173(10):331. Pubmed PMID: 1467003.
- [7]. Hussainy SN, Nasim I, Thomas T, Ranjan M. Clinical performance of resin-modified glass ionomer cement, flowable composite, and polyacid-modified resin composite in noncarious cervical lesions: One-year follow-up. *J Conserv Dent*. 2018 Sep-Oct;21(5):510-515. Pubmed PMID: 30294112.
- [8]. Janani K, Palanivelu A, Sandhya R. Diagnostic accuracy of dental pulse oximeter with customized sensor holder, thermal test and electric pulp test for the evaluation of pulp vitality: an in vivo study. *Brazilian Dental Science*. 2020 Jan 31;23(1):8-p.
- [9]. Jose J, Subbaiyan H. Different treatment modalities followed by dental practitioners for Ellis class 2 fracture—A questionnaire-based survey. *The Open Dentistry Journal*. 2020 Feb 18;14(1).
- [10]. Liebenberg, W. H. (2004) 'DIRECT COMPOSITE RESIN RESTORATIONS: A REVIEW OF SOME CLINICAL PROCEDURES TO ACHIEVE PREDICTABLE RESULTS IN POSTERIOR TEETH', *Journal of Esthetic and Restorative Dentistry*, pp. 32-32. doi: 10.1111/j.1708-8240.2004.tb00447.x.
- [11]. Lutz F, Imfeld T, Phillips RW. P-10--its potential as a posterior composite. *Dent Mater*. 1985 Apr;1(2):61-5. Pubmed PMID: 3891477.
- [12]. Miletic, V. (2017) *Dental Composite Materials for Direct Restorations*. Springer.
- [13]. Opdam NJ, Roeters JJ, Kuijss R, Burgersdijk RC. Necessity of bevels for box only Class II composite restorations. *J Prosthet Dent*. 1998 Sep;80(3):274-9. Pubmed PMID: 9760359.
- [14]. Opdam NJ, Bronkhorst EM, Roeters JM, Loomans BA. A retrospective clinical study on longevity of posterior composite and amalgam restorations. *Dent Mater*. 2007 Jan;23(1):2-8. Pubmed PMID: 16417916.
- [15]. Rajendran R, Kunjusankaran RN, Sandhya R, Anilkumar A, Santhosh R, Patil SR. Comparative evaluation of remineralizing potential of a paste containing bioactive glass and a topical cream containing casein phosphopeptide-amorphous calcium phosphate: An in vitro study. *Pesquisa brasileira em odontopediatria e clinica integrada*. 2019;19.
- [16]. Ramamoorthi S, Nivedhitha MS, Divyanand MJ. Comparative evaluation of postoperative pain after using endodontic needle and EndoActivator during root canal irrigation: A randomised controlled trial. *Aust Endod J*. 2015 Aug;41(2):78-87. Pubmed PMID: 25195661.
- [17]. Ramanathan S, Solete P. Cone-beam Computed Tomography Evaluation of Root Canal Preparation using Various Rotary Instruments: An in vitro Study. *J Contemp Dent Pract*. 2015 Nov 1;16(11):869-72. Pubmed PMID: 26718293.
- [18]. Ravinthar K. Recent advancements in laminates and veneers in dentistry. *Research Journal of Pharmacy and Technology*. 2018 Feb 1;11(2):785-7.
- [19]. Scott, D. A. (2006) 'Direct Posterior Resin Composite Restorations: Considerations on Finishing/Polishing. *Clinical Procedures*', *Yearbook of Dentistry*, pp. 7-8. doi: 10.1016/s0084-3717(08)70008-4.
- [20]. Siddique R, Sureshbabu NM, Somasundaram J, Jacob B, Selvam D. Qualitative and quantitative analysis of precipitate formation following interaction of chlorhexidine with sodium hypochlorite, neem, and tulsi. *J Conserv Dent*. 2019 Jan-Feb;22(1):40-47. Pubmed PMID: 30820081.
- [21]. Sterman S, Marsden JG. The effect of silane coupling agents in improving the properties of filled or reinforced thermoplastics. *Polymer Engineering & Science*. 1966 Apr;6(2):97-112.
- [22]. Teja KV, Ramesh S. Shape optimal and clean more. *Saudi Endodontic Journal*. 2019 Sep 1;9(3):235.
- [23]. Teja KV, Ramesh S, Priya V. Regulation of matrix metalloproteinase-3 gene expression in inflammation: A molecular study. *J Conserv Dent*. 2018 Nov-Dec;21(6):592-596. Pubmed PMID: 30546201.
- [24]. Gajjela RS, Satish RK, Sajjan GS, Varma KM, Rambabu T, Vijaya Lakshmi BH. Comparative evaluation of chlorhexidine, grape seed extract, riboflavin/chitosan modification on microtensile bond strength of composite resin to dentin after polymerase chain reaction thermocycling: An in vitro study. *J Conserv Dent*. 2017 Mar-Apr;20(2):120-124. Pubmed PMID: 28855760.
- [25]. Walls AW, Murray JJ, McCabe JF. The management of occlusal caries in permanent molars. A clinical trial comparing a minimal composite restoration with an occlusal amalgam restoration. *Br Dent J*. 1988 May 7;164(9):288-92. Pubmed PMID: 3164204.
- [26]. Yamamoto N, Hasegawa K, Sueda T, Kinoshita S. [The effects of interdental brush and dental floss in the reduction of interdental plaque (author's transl)]. *Nihon Shishubyo Gakkai Kaishi*. 1975 Sep;17(2):258-64. Japanese. Pubmed PMID: 1075047.