

A RETROSPECTIVE TIME DEPENDENT ANALYSIS ON TYPE OF CAVITY DESIGN MOST FREQUENTLY REPORTED FOR REPLACEMENT - A RETROSPECTIVE STUDY IN UNIVERSITY SETUP

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ABSTRACT:

Introduction: Restoration failures occur mainly due to caries recurrence and restoration fractures. Longevity of restoration predominantly depends on the individual's oral hygiene maintenance and risk of caries. Important factor that contributes to the failure of cavity design is the inability to withstand occlusal forces. Posterior teeth were the most commonly reported for replacement.

Aim: To analyze the cavity design which was frequently reported for replacement.

Materials and methods: The study was carried out from June 2020 to March 2021 on 624 patients (301 males and 323 females) who visited Saveetha dental College and Hospitals, Chennai. Data collection included age, gender, type of tooth, type of cavity design and association between these were obtained using Pearson's chi-square test.

Results: In this study we observed that the majority of females (51.76%) reported for replacement of restoration compared to that of males. Based on the age categorisation, 47.9% patients belonged to the age group of 31-40 years which was the highest. The most common tooth reported for replacement was found to be the lower right first molar. (50.48%). The most common cavity design reported for replacement was found to be class 2 restoration (64.2%)

Conclusion: In this study it is seen that patients with dislodged class 2 MO restoration in the left lower first molar frequently reported for replacement. Dental caries play a fundamental role in the quality of restorations. Low risk dental caries and patients who had received guidance on how to maintain oral hygiene were less likely to suffer restoration failure and improved the restorative longevity.

KEYWORDS: Cavity design, Lower first molar, Restoration, Dental innovation

INTRODUCTION:

Dental caries is considered as a public health problem on a global scale as it affects the individuals worldwide. Therefore, the demand for dental restorative treatments is high. (1)

The most common choice for restorative treatment is direct restoration. Amalgam was the most commonly used restorative material, however in recent times an alternative restorative material used is the composite resin. Reduction on the use of amalgam is because of environmental contamination by mercury in amalgam restorations which affects the people's health.(2) However failure of direct restoration was common irrespective of the material used for restoration. (3)

Restoration failures occur mainly due to caries recurrence and restoration fractures.

Longevity of restoration predominantly depends on the individual's oral hygiene maintenance and risk of caries. (4)The individual's oral hygiene not only leads to restoration failure but also acts as a risk and provides an environment for caries progression to tooth adjacent to the restoration. (5)

Mechanical properties of the restorations have improved a lot in recent years. However fracture of the restoration stands as a most common failure.

Aversive sensations like bruxism, occlusal hypervigilance tends to increase the activity of masticatory muscles but are less likely to be noticed. These factors tend to generate abnormal mechanical stress because of occlusal overload. (6)(7)

Important factor that contributes to the failure of cavity design is the inability to withstand occlusal forces. For posterior teeth, metal framework is indicated to compensate for the lack in fracture resistance. (8)

Posterior restorations were more susceptible to failure compared to that of anterior restorations due to greater occlusal load.(9)

Our team has extensive knowledge and research experience that has translate into high quality publications(10–19),(20–23),(24–28)(29)

This study aimed to assess the type of cavity design reported frequently for replacement.

MATERIALS AND METHOD:

Study designs and Study setting

The present study was conducted in a university setting (Saveetha dental college and hospitals, Chennai, India). Thus the data available is of patients from a similar geographic location and ethnicity. The retrospective study was carried out with the help of digital case records of 624 patients who reported to the hospital. Ethical clearance to conduct this study was obtained from the Scientific Review Board of the hospital.

Sampling

Data of 624 patients (301 males and 323 females) were reviewed and then extracted. Patients who reported with dislodgement of restoration in lower first molars in the given duration of time period were evaluated. To minimise the sampling bias only relevant data was included. Simple random sampling method was carried out. Data was cross verified with photographic evaluation by presence of additional reviewers. Incomplete data collection was excluded from the study.

Data Collection

A single calibrated examiner evaluated the digital case records of patients who reported to Saveetha Dental College from June 2020 to March 2021. For the present study, inclusion criteria was data of patients with dislodged restoration in the lower first molar. Data obtained were age, gender, tooth number and type of cavity design. All obtained data were tabulated into Microsoft excel documents.

Statistical analysis

The collected data was tabulated and analysed with Statistical Package for Social Sciences for Windows, version 20.0 (SPSS Inc., Vancouver style) and results were obtained. Categorical variables were expressed in frequency and percentage. Association between categorical variables was assessed using the chi-square test. Chi square tests were carried out using age, gender as independent variables and dependent variables. The statistical analysis was done using the Pearson chi square test. P value < 0.05 was considered statistically significant.

RESULTS AND DISCUSSION:

Distribution of patients who reported with dislodged restoration in lower first molars based on age group (Figure 1). 190 of the patients belonged to age group of 21-30 years (30.4%), 299 of the patients belonged to the age group of 31-40 years (47.9%), 135 of the patients belonged to the age group of 41-50 years (21.6%). Distribution of patients who reported with dislodged restoration in lower first molars based on gender (Figure 2). Out of 624 patients, 323 patients were females (51.8%) and 301 patients were males (48.2%). Females were higher compared to that of males. Distribution of patients who reported with dislodged restoration in lower first molars based on lower first molar tooth. (Figure 3). Based on the tooth, 315 reported with dislodged restoration in lower right first molars (50.5%) and 309 patients reported with dislodged restoration in lower left first molars (49.5%). Distribution of patients who reported with dislodged restoration in lower first molars based on type of cavity design.(Figure 4). Based on type of cavity design, 223 patients reported with dislodged class 1 restoration (35.7%) followed by 190 patients with dislodged Class 2 MO (30.4%), 156 patients with dislodged Class 2 DO (25%), 55 patients with dislodged Class 2 MOD (8.8%).

Association of tooth number and cavity design is shown in Figure 5. In the lower left first molar, 110 patients reported with dislodged class 1 restoration, 77 patients with class 2 DO, 97 patients with Class 2 MO and 25 patients with Class 2 MOD. In the lower right first molar, 113 patients

reported with dislodged class 1 restoration, 79 patients with class 2 DO, 93 patients with Class 2 MO and 30 patients with Class 2 MOD.

In this study it was seen that females reported frequent dislodged restoration compared to that of males (51.5%). This correlates with the study by (30) which states that dislodged restoration was more common in females. This is in contrast with the study by (31) which states that males reported with dislodged restoration more compared to that of females.

In this study it is seen that class 2 dislodged restoration was more common. To be more specific, class 2 MO in the left lower first molar was more common. This correlates with the study by (30)(31) which states that class 2 restoration were frequently reported for replacement.

Limitations of this study are of short sample size including only lower first molar with restricted geography. Therefore, further research related to cavity design frequently reported for replacement may contribute additional information to the field of forensic medicine.

CONCLUSION:

In this study it is seen that patients with dislodged class 2 MO restoration in the left lower first molar frequently reported for replacement. Dental caries play a fundamental role in the quality of restorations. Low risk dental caries and patients who had received guidance on how to maintain oral hygiene were less likely to suffer restoration failure and improved the restorative longevity.

AUTHOR CONTRIBUTIONS:

Priyadharshini.S :Literature search, data collection, analysis, manuscript drafting.

Dr. Kavalipurapu Venkata teja: Data verification, manuscript drafting.

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CONFLICT OF INTEREST:

All the authors declare that there was no conflict of interest in present study.

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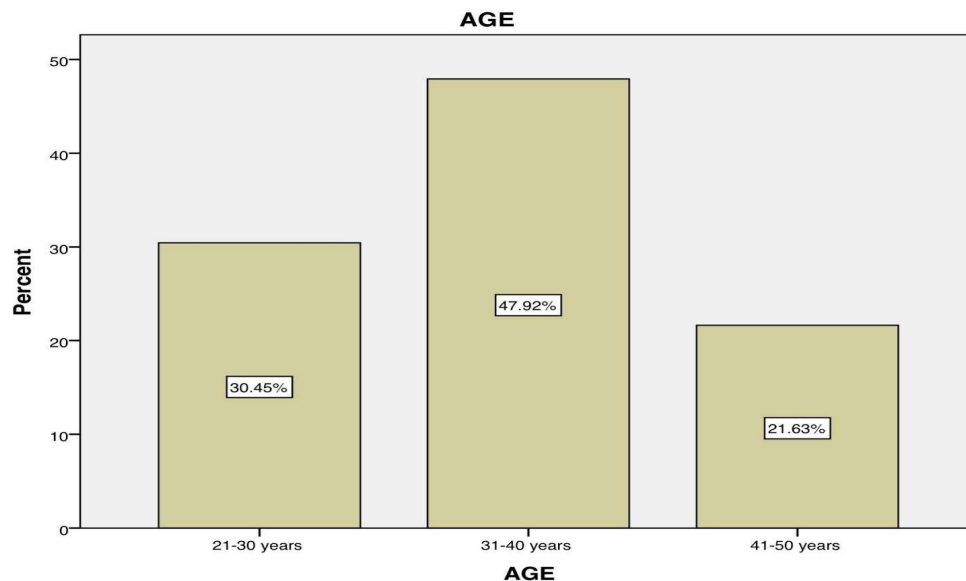


Figure 1 : Bar graph shows frequency distribution of age group of patients who reported with dislodged restoration in lower first molars. X-axis denotes the age group of patients. Y-axis denotes the number of patients who reported with dislodged restoration in lower first molars. Highest prevalence was among the age group of 31-40 years. (47.9%)

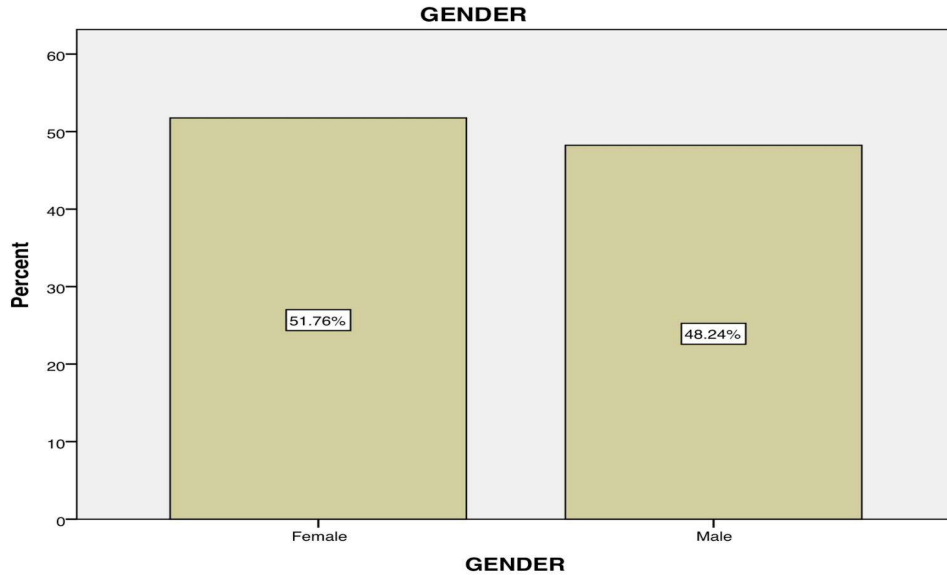


Figure 2: Bar graph shows frequency of gender distribution of patients who reported with dislodged restoration in lower first molars. X-axis denotes the gender of patients. Y-axis denotes the number of patients who reported with dislodged restoration in lower first molars. Highest prevalence was among the females. (51.8%)

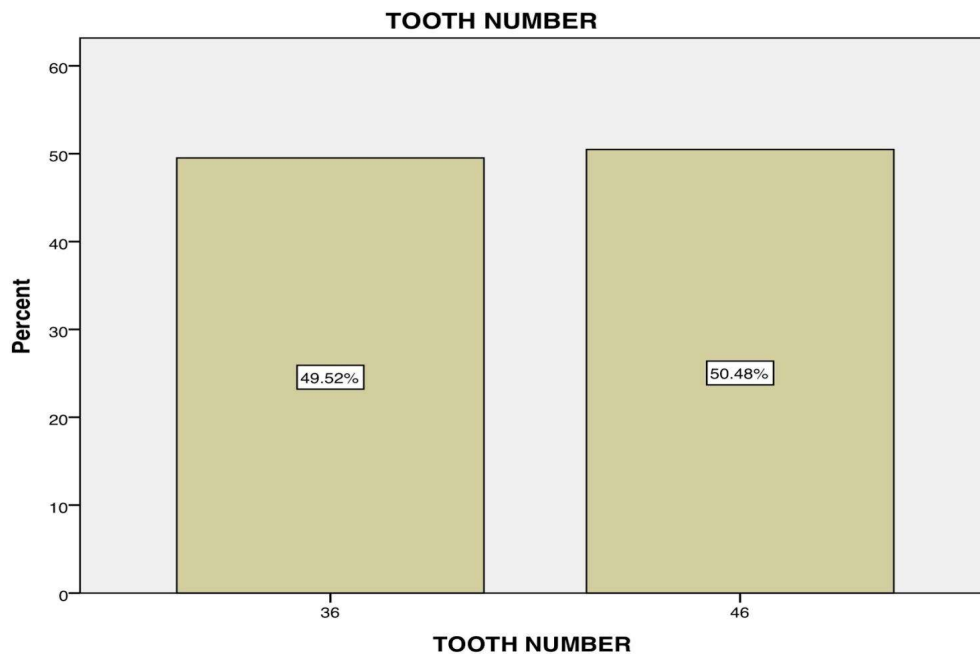


Figure 3: Bar graph shows frequency distribution of dislodged tooth of patients who reported with dislodged restoration in lower first molars. X-axis denotes the dislodged tooth. Y-axis denotes the number of patients who reported with dislodged restoration in lower first molars. Highest prevalence was in the right lower first molar. (50.5%)

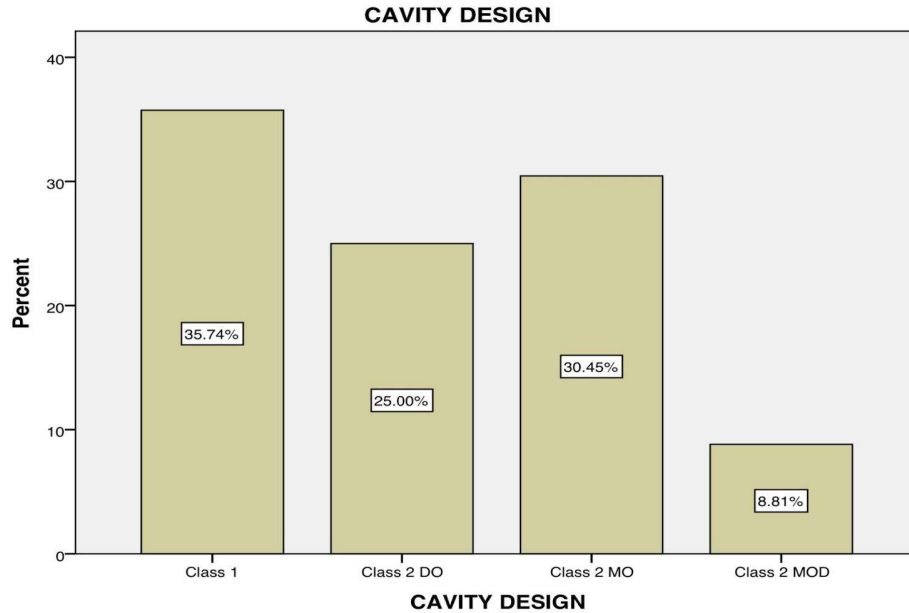


Figure 4: Bar graph shows frequency distribution of cavity design of dislodged tooth of patients who reported with dislodged restoration in lower first molars. X-axis denotes the type of cavity design in dislodged teeth. Y-axis denotes the number of patients who reported with dislodged restoration in lower first molars. Highest prevalence was in class 2 cavity design (64.2%).

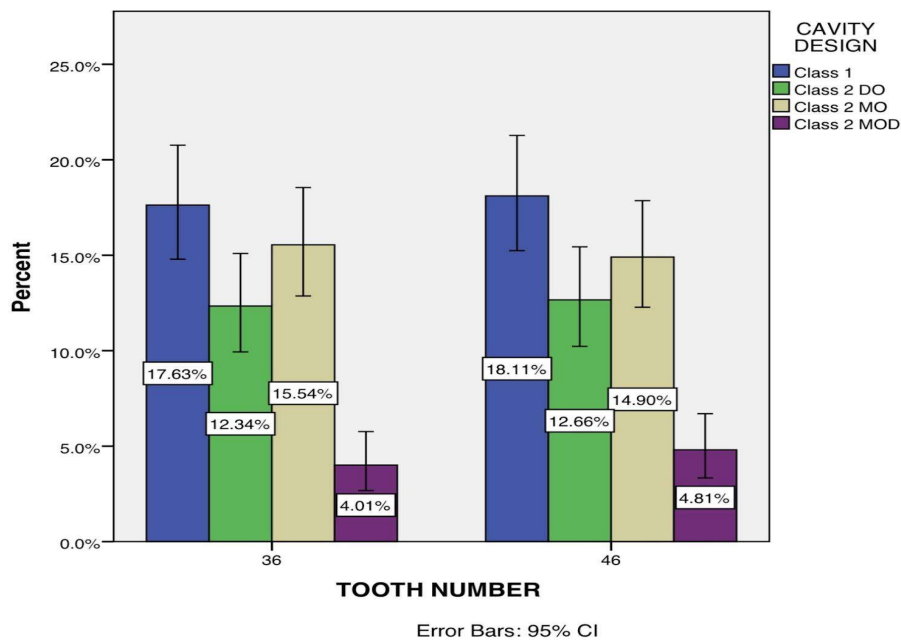


Figure 5 : Bar graph shows the association of patients who reported with dislodged restoration in lower first molars and tooth number based on cavity design. X-axis denotes the lower first molar. Y-axis denotes number of patients who reported with dislodged restoration in lower first molars based on cavity design. Class 1 cavity denoted in blue, Class 2 DO in green, Class 2 MO in yellow, Class 2 MOD in violet. Majority of the patients reported with dislodged class 2 restoration in 46.