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SURVIVAL OF TEETH WITH GRADE II MOBILITY AFTER PERIODONTAL THERAPY - A RETROSPECTIVE COHORT STUDY

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ABSTRACT

Assessment of tooth mobility is considered as an integral part of periodontal evaluation because it is one of the important factors that determine the prognosis of periodontal diseases.The main purpose of the study was to evaluate the survival rate of teeth with grade II mobility after periodontal therapy.This study was designed as a retrospective cohort study, conducted among patients who reported to the university dental hospital. Subjects above 18 years of age, subjects who underwent periodontal therapy in tooth with grade II mobility, and completed at least a six month followup evaluation were included in this study. Smokers, medically compromised patients were excluded from this study. Data was collected and analyzed using IBM SPSS Statistical Analyzer (23.0 version).93.8% teeth with Grade II mobility were retained while remaining 6.2% teeth were lostduring the six month followup after periodontal therapy among the study population.Within the limitations of the study, it can be concluded that periodontal management with proper maintenance, results in higher survival rate of grade II mobile teeth.

INTRODUCTION

Periodontitis which is an advanced form of plaque induced periodontal disease, results in destruction of both soft and hard tissue components of the tooth supporting structures leading to tooth mobility[1,2].There are various reasons for tooth mobility which include traumatic injuries, bone diseases like osteoporosis, parafunctional habits such as bruxism, cysts and tumors of jaws and during pregnancy due to increased inflammation as a result of hormonal fluctuation.[3,4]But the most commonest reason for tooth mobility is plaque induced periodontal disease. Periodontal prognostic outcomes depend on various factors such as age, gender, genetics, systemic diseases and number of local factors such as probing depth, mobility, furcation involvement, tooth morphology, crown-root ratio etc. Among these local factors, mobility plays a significant role in determining the prognosis.[5,6]There are various classifications for determining prognosis, the one most widely used is McGuire and Nunn classification system. It consists of five categories that include good, fair, poor, questionable and hopeless.These categories are based on the disease etiology, clinical attachment loss, furcation involvement, crown-root ratio and degree of tooth mobility.Assessment of tooth mobility is considered as an integral part of periodontal evaluation because it is one of the important factors to determine the prognosis of periodontal diseases.[7,8]There are several indices and clinical examination methods available to assess the severity of tooth mobility such as Miller tooth mobility index, Glickman tooth mobility index, Waterman et al index , Lindhe index , Parfitt's electronic instrument, Picton's method.But Miller tooth mobility index is the most commonly used clinical method in which the tooth to be examined is held firmly between two instruments and moved back and forth.Tooth mobility is graded from 0 to 3 for no detectable movement when force is applied, a distinguishable tooth movement with in 1 mm in horizontal plane, tooth moves more than 1mm in horizontal plane and movement of tooth in both horizontal and vertical plane irrespective of distance of displacement respectively.[9–11]The mechanism through which periodontitis cause tooth mobility include inflammatory destruction of periodontal tissues, widening of the periodontal ligament, attachment loss, alveolar bone loss and trauma from occlusion.[12–14]The continued movement of the mobile tooth during oral function further damages the periodontium accelerating the disease process thereby leading to tooth loss.[15–17]The initial tooth mobility is often neglected by the patients due to various reasons like no pain or lack of awareness and most of the times, the patients report to the dentists when the mobility has gone to the advanced stage.[18,19]Treatment of periodontal disease is a therapeutic process with the aim of preserving the natural dentition and also preventing further periodontal destruction.Reduction of tooth mobility is one of the primary objectives of periodontal therapy.[20–22]There are numerous treatment approaches available for the management of periodontally diseased teeth with mobility such as non-surgical management including scaling, root planing, splinting and occlusal adjustments and surgical management including flap surgery, bone grafts, Guided tissue regeneration (GTR) and extraction.[23–25]The adoption of proper and adequate steps in the management of tooth mobility will help in increasing the long activity of the tooth,thereby preventing edentulism.[26–28]Even though several treatments are practiced, the outcome of these modalities in terms of

reduction of tooth mobility or stabilisation of mobile tooth is not well reported or documented.Especially the fate of the teeth after periodontal therapy is not evidenced in the literature adequately.Only when the outcome of the therapy is known, the appropriate treatment plan can be designed for the mobile teeth. Thus this study was conducted to evaluate the survival rate of teeth with grade II mobility after periodontal therapy.

MATERIALS AND METHODS

This study was designed as a retrospective cohort study, conducted in a group of subjects reported to the university dental hospital. After obtaining approval from the institutional ethical committee, the dental records of patients who reported to the dental hospital between June 2019 to March 2020 were assessed for eligibility to be included in the study. A total of 860000 patient records were screened for eligibility by the principal investigator based on the following inclusion and exclusion criteria.

Inclusion criteria:

- Subjects above 18 years of age
- Subjects who reported between June 2019 to March 2020
- Subjects diagnosed with periodontitis exhibiting at least one tooth with grade II mobility, who underwent any of the following periodontal therapy such as scaling, root planing, flap surgeryand splinting
- Subjects who completed the followup and maintenance visits for a minimum of 6 months.
- Subjects whose records have complete data regarding the preoperative mobility and other periodontal parameter records, details of periodontal therapy performed, clinical examination details during the followup and maintenance visits.

Exclusion criteria:

- Smokers
- Medically compromised patients
- Patients records with incomplete data

A total of 65 records which satisfied the inclusion and exclusion criteria were included in the study.All the procedures were performed by the post graduate students specialising in periodontics.The age range of patients included for this study was 18-60 years.From the pre operative and post operative records of the study population, data such as age, gender, tooth with grade II mobility, post operative findings and observations were obtained.The primary outcome of this studywas the survival rate of grade II mobile teeth and the secondary outcome was the correlation between age, gender, tooth affected, periodontal therapy and survival of the teeth.The data was analysed by IBM SPSS Statistical Analyzer(23.0 version). Frequency distribution for categorical variables and descriptive analysis for quantitative variables were carried out.The association between the variables were analysed and assessed using Pearson Chi-square test. p value less than or equal to 0.05 was considered to be statistically significant.

RESULTS AND DISCUSSION

Out of the 65 periodontally diseased teeth with grade II mobility which underwent periodontal management the results showed after a minimum of 6 months evaluation that 93.8%of teeth were retained, while only 6.2% of teeth were lost after periodontal therapy(Figure1).This is contradicting to the results obtained in the study conducted by Chace et al where 78% of teeth were lost over a period of eight years after periodontal therapy.This contradiction in results may be due to the variation in the follow up periods, where a longer follow up of eight years was done in the later study but only a 6 month follow up was documented in the present study [29].Considering the gender distribution,gender did not influence the treatment outcome as shown in the results(Figure 2).This is in agreement with the study conducted by Grbic JT et al. where no statistically significant correlation was observed between gender and teeth survival.[30]With regard to age, patients of age group 41-50 years showed more loss of teeth followed by patients of age group 51-60 years than other age groups. Patients of age groups 18-30 years and 31-40 years showed no loss of teeth after periodontal therapy(Figure 3). This can be attributed towards cognitive or motor impairment in elderly patients which makes it difficult for them to maintain oral hygiene and for the patients who do not have easy access to dental care, proper oral hygiene maintenance becomes a problem. In terms of the tooth region, 4.62% of mandibularposterior teeth followed by 1.54% of maxillary posterior teeth were lost after periodontal therapy(Figure 4).One aspect that all the authors emphasise is that tooth type has been shown to be a factor in the survival of the tooth.[31]The results of this present study showed that survival rate of anterior teeth was higher than that of posterior teeth in response to periodontal therapy.This is in consistent with the results of the study conducted by McGuire in which he stated that that anterior teeth respond better to periodontal treatment and are less likely to be lost due to periodontal reasons.[32]Ramfjord et al found that response of anterior teeth to periodontal treatment was marginally better than posterior teeth.[33]In this present study, majority of the teeth were retained after flap surgery and splinting in comparison to scaling and root planing.This is in consistent with the results of the study conducted by Azodo et al.,in which periodontal management of teeth with grade II mobility results in improved oral functions and patient comfort, especially with splinting , which is a well accepted integral part of holistic periodontal treatment.[34]The limitations of this study include small study population, follow up of only six months, since it is a retrospective study, patients were not examined directly leading to subjective bias.Thus future studies with prospective study design, larger sample size and longer follow up are needed to confirm the results.

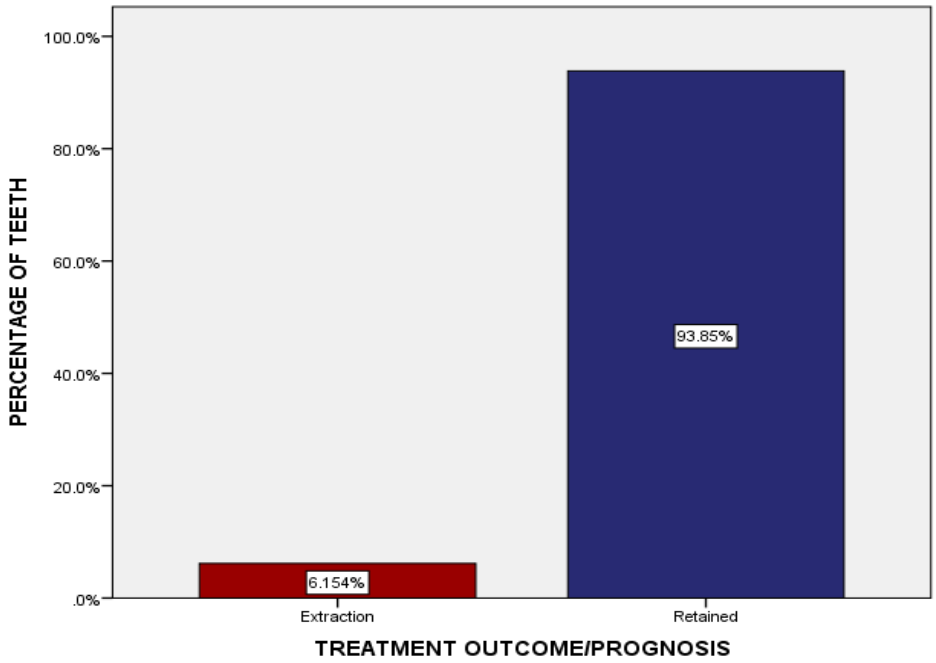

Figure 1- This bar graph represents the percentage of survival of teeth with Grade II mobility after periodontal management. X-axis represents the treatment outcome. Y-axis represents the total number of patients. Majority of the teeth with Grade II mobility have been retained (Blue bar) after periodontal management i.e; 93.8% and only 6.2% of the teeth were lost (Red bar) after periodontal therapy.

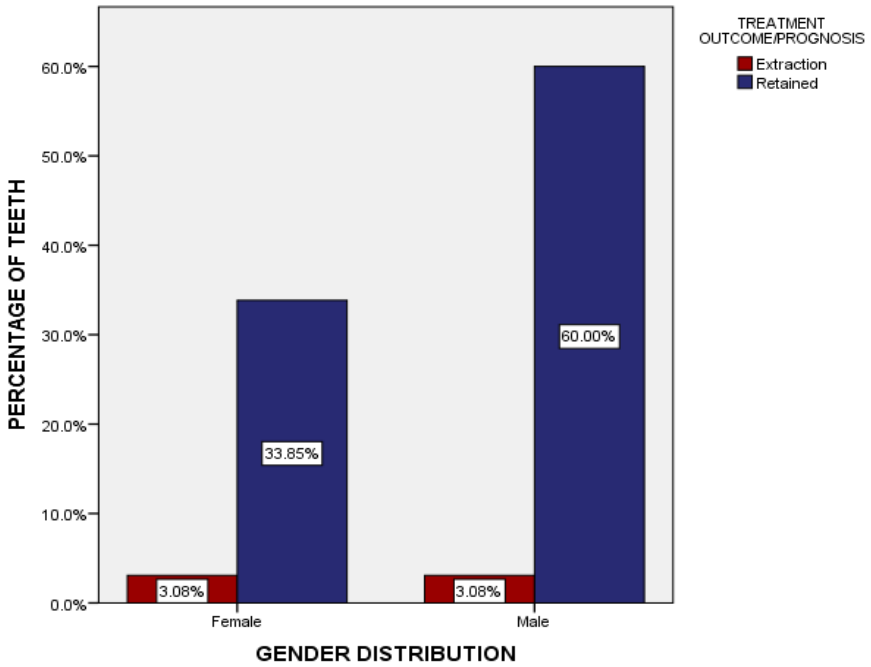

Figure 2:This bar graph represents the association between gender and treatment outcome after periodontal management of Grade II mobile teeth.X-axis represents the Gender distribution and Y-axis represents the total number of patients who underwent periodontal management.Chi-square test was done and association was found to be not statistically significant.Pearson's Chi

square value: 0.313, df : 1, p value: 0.069(>0.05) Hence it is not statistically significant, proving gender did not influence the treatment outcome.

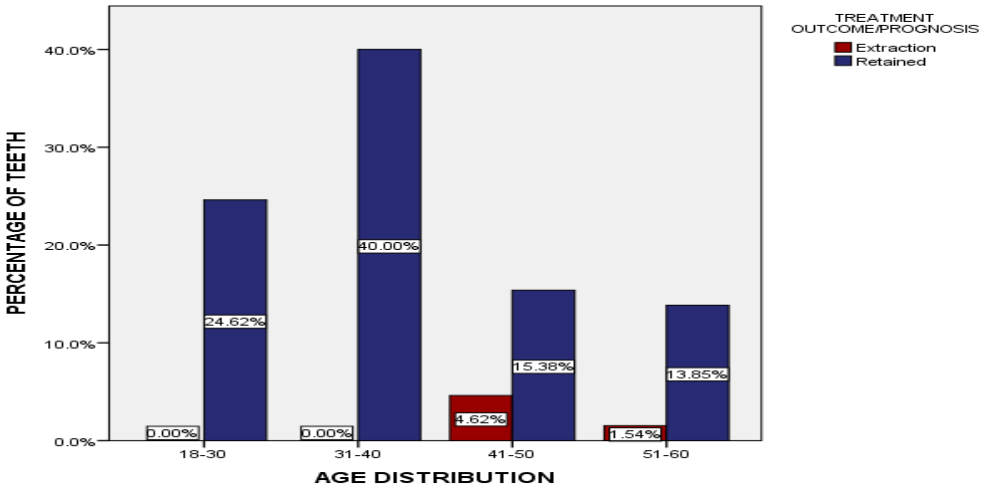

Figure 3: This bar graph represents the association between age and treatment outcome after periodontal management of Grade II mobile teeth.X-axis represents the age distribution and Y-axis represents the total number of patients who underwent periodontal management.Chi-square test was done and association was found to be statistically significant .Pearson's Chi square value: 9.457, df: 3, p value: 0.024(<0.05) Hence statistically significant , proving age influences the treatment outcome.Patients belonging to age groups 41-50 years and 51-60 years lost their teeth after periodontal management.

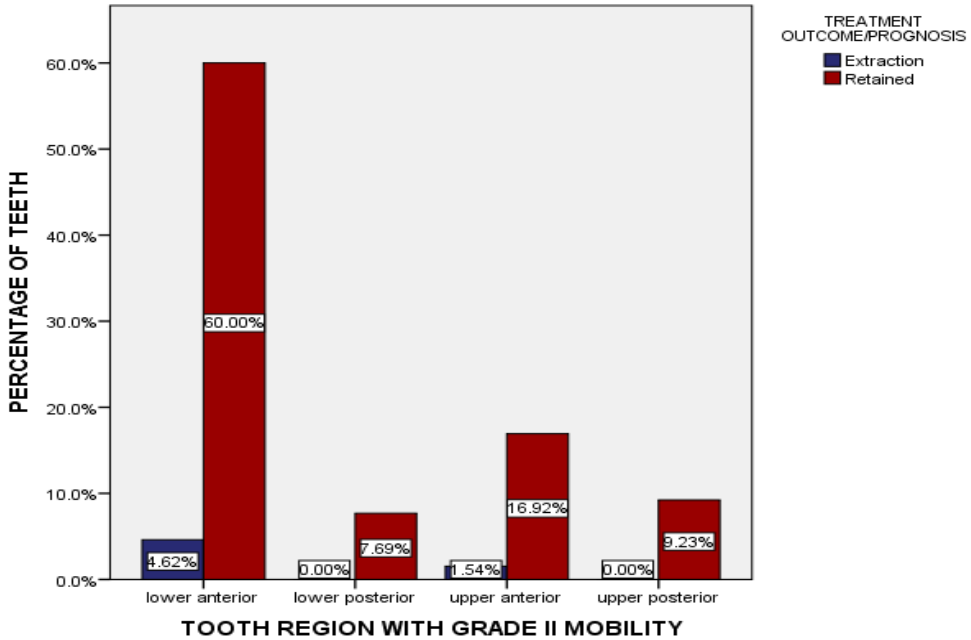

Figure 4: This bar graph represents the association between tooth region and treatment outcome after periodontal management of Grade II mobile teeth. X-axis represents the tooth number and Y-axis represents the total number of

patients who underwent periodontal management.Chi-square test was done and association was found to be statistically significant . Pearson's Chi square value: 0.000, df: 3, p value: 0.000(<0.05) Hence statistically significant , proving the toothregion influences the treatment outcome.Patients lost their lower posteriors and upper posteriors after periodontal management.

CONCLUSION

Within the limitations of this study, it can be concluded that periodontal therapy- combination of both non-surgical and surgical management results in higher survival rate of grade II mobile teeth.

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CONFLICT OF INTEREST

None

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