Assessment of Most Common Furcation Site among Smokers with Chronic Periodontitis

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Abstract

It is generally accepted that the primary cause of periodontitis is bacterial infection of long duration. In addition there are several risk factors that may increase the probability and severity of periodontitis, one of which is smoking. This is a retrospective clinical study carried out at Saveetha Dental College, Chennai. This study involves the analysis of the most common furcation site among smokers with chronic periodontitis. The data were taken over a period of one year from over June 2019 to March 2020. The sample/data were retrieved and 265 male smokers with periodontitis were examined for grade of furcation involvement based on Glickman's classification. In this study, the most commonest site of furcation among smokers with chronic periodontitis are maxillary molars. Grade 1 furcation > Grade 2 furcation > Grade 3 furcation > Grade 4 furcation. On comparing (Chi square analysis) the grade 1, grade 3 and grade 4 furcation with different age groups, grade 1, grade 3 and grade 4 furcation was mostly seen in maxillary molars of smokers with chronic periodontitis of age group 41- 50 years. However, it was statistically not significant(p-value >0.05). On comparing the grade 2 furcation with different age groups, Grade 2 furcation was mostly seen in maxillary molars of smokers with chronic periodontitis of the age group 51-60 years and it was statistically significant. Within the limits of the study the most common site of furcation among smokers with chronic periodontitis is maxillary molars.

Keywords:*Periodontitis, molars, smokers, furcations, periodontal health.*

Introduction

Nowadays oral health and oral hygiene is one of the biggest concerns. It is generally accepted that the primary cause of periodontitis is bacterial infection of long duration. Periodontitis is a chronic inflammatory disease which results in the destruction of supporting structures of the teeth [1–3]. In addition, there are several risk factors that may increase the probability and severity of periodontitis, one of which is smoking. Tumor necrosis factor (TNF) is one such pro-inflammatory cytokine that causes periodontal tissue destruction [4]. Cigarette smokers are more likely to exhibit clinical signs of periodontitis than comparable [5].

Cigarette smoking is a major environmental factor associated with periodontal diseases [6,7]. Cigarette smoking has a deleterious effect on the periodontal tissues which is independent of plaque and causes inflammatory reactions. Interleukins comprise a large group of cytokines that are naturally occurring glycoproteins produced by the body. They help in recruitment of neutrophils and macrophages to participate and amplify the inflammatory immune reaction [8–10]. Moreover smokers are more likely to be referred for specialised periodontal treatment than non smokers [11]. Smoking adversely affects both local and systemic host systems, which may account for its deleterious effects on

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periodontal health [12,13].

Smoking cessation may restore the normal periodontal healing response[14]. At a practical level, it appears important to quantify to what extent periodontal treatment of smokers is likely to be more complex than that of non-smokers [15,16]. One measure of the severity of periodontal disease is the involvement of the molar furcations [17]. It appears considerably more difficult to stabilise the periodontal condition when it involves the molar furcation [18].The fate of molars is determined by the following factors: grade of furcation involvement, bone level, and smoking [19,20].

The morphology of the furcation region provides an environment favorable to bacterial plaque retention, which makes the professional and personal dental plaque control difficult and affects positively on periodontal health destruction [21–23]. For those reasons, teeth with furcation involvement in periodontal disease have been shown to have a poorer prognosis than teeth without furcation involvement [24,25]. Regardless of the degree of the furcation, the therapeutic approach always begins with the initial phase of periodontal treatment, which includes all the necessary guidelines for proper self-performed oral hygiene, cessation of smoking, extraction of hopeless teeth, supragingival and sub gingival debridement [(26,27)]. Moreover, furcation involvements are common in patients with periodontitis and smoking habits. The aim of this study is to analyse the most common furcation site among smokers with chronic periodontitis.

Material and Methods

This is a retrospective clinical study, carried out at Saveetha Dental College. This study involves the analysis of most common furcation sites among smokers with periodontitis visiting Saveetha Dental College that were taken over a period of one year, from June 2019 to March 2020. Ethical Approval was obtained from the Institutional Review Board (ethical approval number- SDC/ SIHEC/ 2020/ DIASDATA/ 0619-0320). The data was cross verified by 2 examiners. The data were retrieved and examined to analyse most common furcation sites among smokers with periodontitis visiting Saveetha Dental College.

Inclusion Criteria **:**

- Male patients
- Age : 30 -70 years
- Smoking habits and presence of chronic periodontitis

EXCLUSION CRITERIA **:**

- Systemic disease or conditions
- History of periodontal treatment for the past 6 months

A total of 265 patient data were collected and assessed for age, gender, smoking habits, periodontitis. The identification of furcation was carried out according to Glickman's classification and tabulated as Grade 1, Grade 2, Grade 3, Grade 4. Collected data was tabulated in the excel sheet. The data was imported and transcribed in the statistical analyses package for social sciences version 20(SPSS) IBM corporation. Chi square test was done. Analysis was based on quantitative variables and frequencies for categorical variables. P value less than 0.05 was considered to be statistically significant.

Results and Discussion

TABLE 1: Table shows the percentage distribution of various grades of furcation involvement in molars

	Maxillary molars	Mandibular molars	Both maxillary and mandibular molars
Grade 1 furcation	81.75%	17.52%	0.73%
Grade 2 furcation	74.39%	20.73%	4.88%
Grade 3 furcation	80%	20%	-
Grade 4 furcation	66.67%	33.33%	-

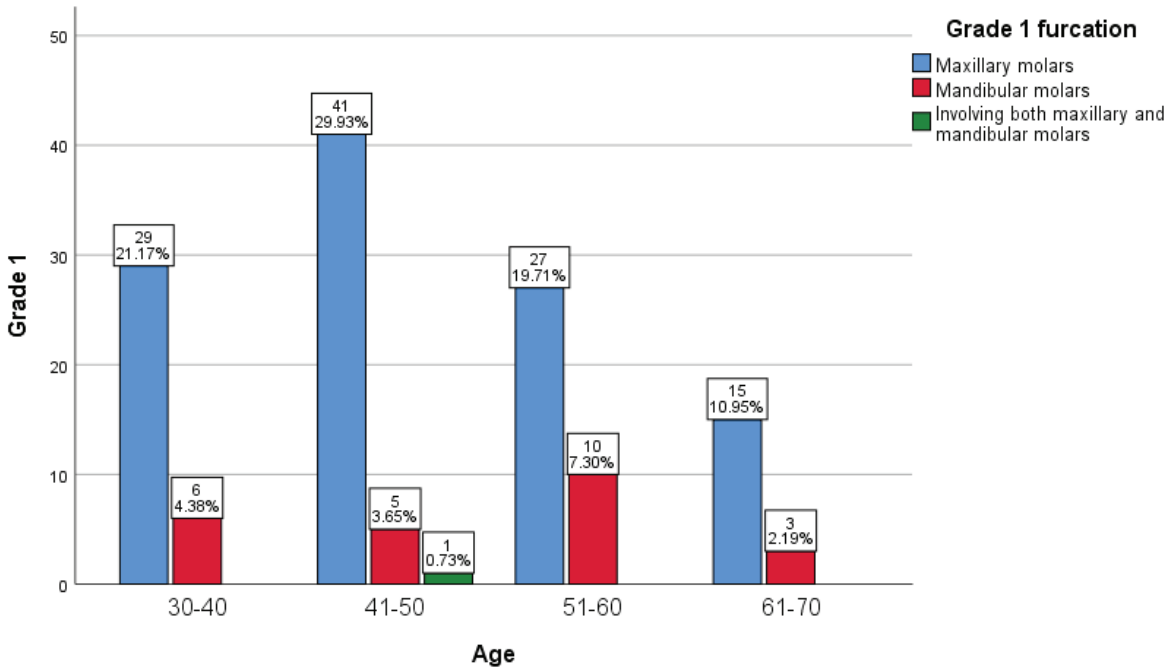

Figure 1: The graph represents the association of age and grade 1 furcation where blue denotes maxillary molars, red denotes mandibular molars and green denotes both maxillary and mandibular molars involvement. X axis denotes age and Y axis denotes count of grade 1 furcation. Grade 1 furcation is mostly seen in maxillary molars of smokers with chronic periodontitis of age group 41- 50 years (29.93%). Chi-square value = 5.637; P-value = 0.465 (> 0.05), hence statistically not significant.

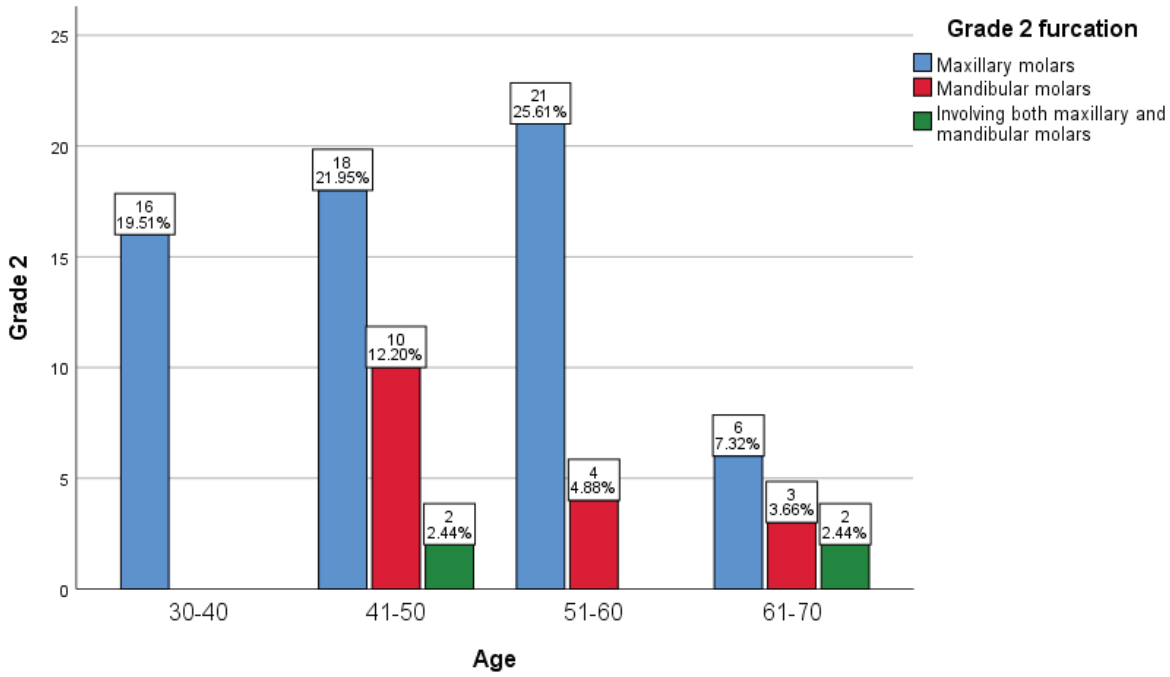

Figure 2: The graph represents the association of age and grade 2 furcation where blue denotes maxillary molars, red denotes mandibular molars and green denotes both maxillary and mandibular molars involvement. X axis denotes age and Y axis denotes count of grade 2 furcation. On comparing the grade 2 furcation with different age groups, Grade 2 furcation is mostly seen in maxillary molars of smokers with chronic periodontitis of the age group 51-60 years (25.61%) than the other age group. Chi-square value = 15.438; P-value = 0.017 (0.05), hence statistically significant.

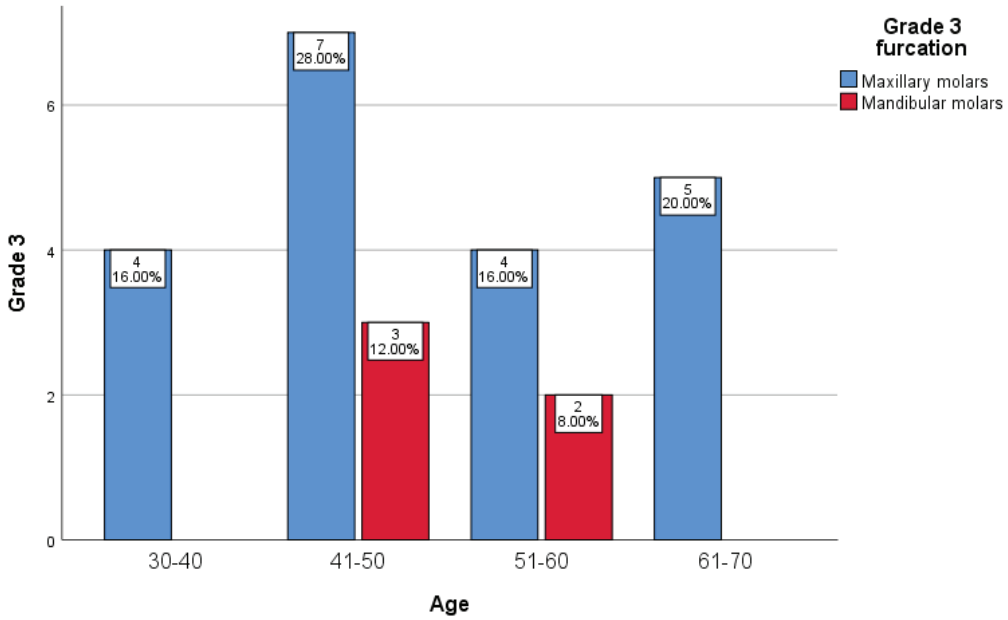

Figure 3: The graph represents the association of age and grade 3 furcation where blue denotes maxillary molars and red denotes mandibular molars. X axis denotes age and Y axis denotes count of grade 3 furcation. On comparing the grade 3 furcation with different age groups, grade 3 furcation is mostly seen in maxillary molars of smokers with chronic periodontitis of the age group 41-50 years (28%). Chi-square value = 3.542; P- value = 0.315 (> 0.05), hence statistically not significant.

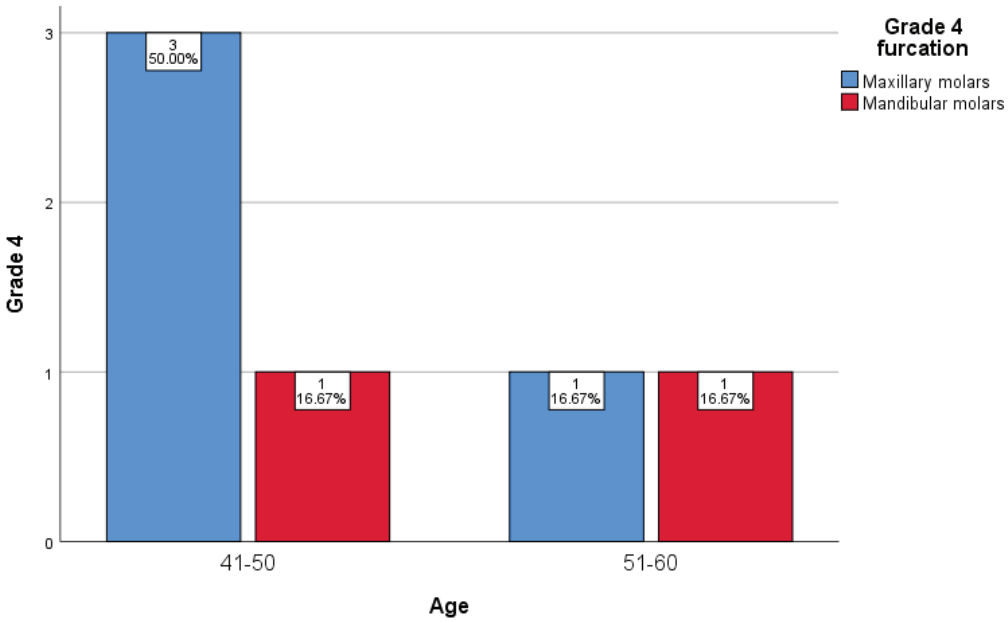

Figure 4: The graph represents the association of age and grade 4 furcation where blue denotes maxillary molars and red denotes mandibular molars. X axis denotes age and Y axis denotes count of grade 4 furcation. On comparing the grade 4 furcation with different age groups, grade 4 furcation is mostly seen in maxillary molars of smokers with chronic periodontitis of the age group 41-50 years (50%). Chi-square value = .375; P- value = 0.540 (> 0.05), hence statistically not significant.

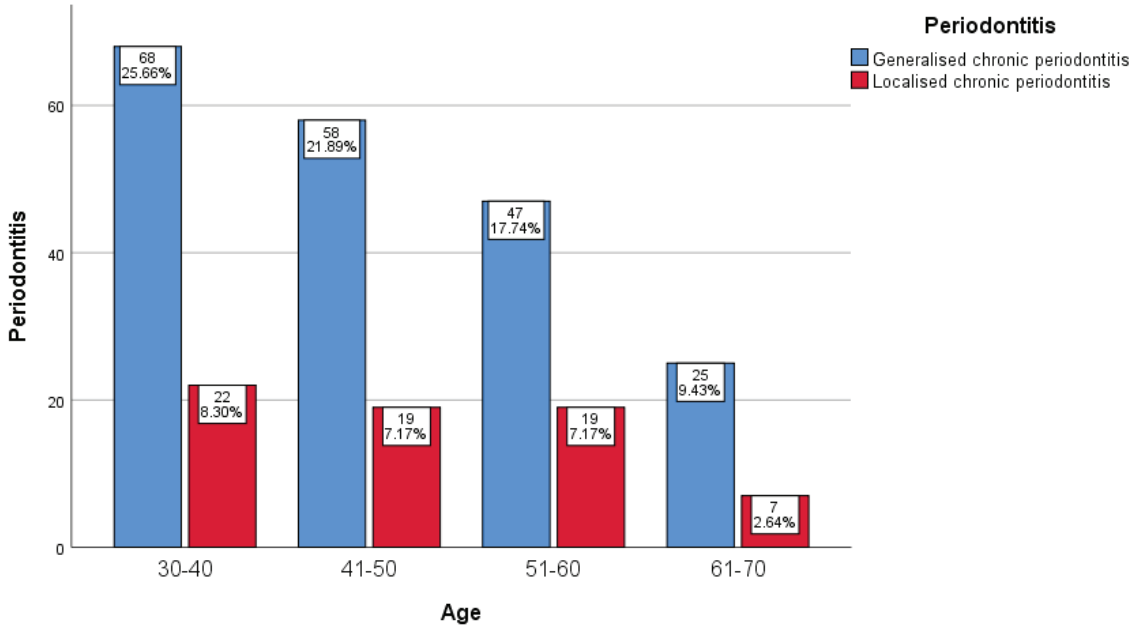

Figure 5: This graph represents association of age and periodontitis where blue colour denotes generalised chronic periodontitis and the red colour denotes localised chronic periodontitis. X axis denotes age and Y axis denotes count of periodontitis. Majority of the persons with age between 30-40 years have more prevalence of generalised chronic periodontitis than the other age groups. However, there is no significant difference between prevalence of both generalised chronic periodontitis and localised chronic periodontitis among the different age groups. Chi-square value = 0.674; P-value = 0.879 (> 0.05), hence statistically not significant.

Periodontitis disease is the leading cause of tooth loss. Periodontitis is a chronic inflammatory condition which was initiated by gram-negative organisms present in the tooth supporting structures. Disease progression occurs as a result of host-immune response to bacteria, leading to destruction of connective tissue and alveolar bone [28,29]. The pathogens present in the subgingival flora produce various endotoxins which are a prerequisite for periodontal disease. In this study, we observed that the prevalence of furcation involved molars was higher in the maxilla than in the mandible in all the smoker patients (Table 1) which is consistent with various other clinical studies [30–33]. In contrast some previous literature shows that the most common site of furcation is mandibular molars. This variation is seen due to variation in morphology of the patients, oral habits and various environment factors affecting the periodontal health.

In this study, we observed that the prevalence of furcation involved molars was higher in the maxilla than in the mandible in all the age groups (Figure 1, Figure 2, Figure 3, Figure 4) which is consistent with another study [30–33]. In the study we observed that smoking is the risk factor for furcation in the molars which is consistent with another study [34], which shows that cigarette smoking is a major environmental factor associated with periodontal diseases. Cigarette smoking has a deleterious effect on the periodontal tissues which is independent of plaque [35,36]. According to the present study generalised chronic periodontitis commonly seen in all age groups (Figure 5) which is consistent with previous study in which periodontitis is found to be common in all age groups [37,38]. On comparing the grade 1, grade 3 and grade 4 furcation with different age groups, grade 1, grade 3 and grade 4 furcation was mostly seen in maxillary molars of smokers with chronic periodontitis of age group 41-50 years. However, it was statistically not significant. On comparing the grade 2 furcation with different age

groups, Grade 2 furcation was mostly seen in maxillary molars of smokers with chronic periodontitis of the age group 51-60 years (25.61%) and it was statistically significant.

According to the present study the most common age group with furcation is 41 -50 years (Figure 1, Figure 3, Figure 4) which is consistent with another study [33,39]. Young smokers diagnosed with aggressive forms of periodontitis were shown to have more affected teeth and higher mean loss of periodontal attachment than non smokers [37,40] .

The uniqueness of this study is that it helps us to understand the most common site of furaction among the smokers. The limitations of the present study are that it cannot be generalised to a larger population and the influence of systemic disease affecting the severity of furcation was not taken underconsideration. The future scope includes study of larger populations, study of furcation involving individual teeth.

Conclusion

Within the limits of the study the most common site of furcation among smokers with chronic periodontitis is maxillary molars. Grade 1, grade 3 and grade 4 furcation was mostly seen in maxillary molars of smokers with chronic periodontitis of age group 41- 50 years. Grade 2 furcation was mostly seen in maxillary molars of smokers with chronic periodontitis of the age group 51-60 years. Smoking cessation may restore the normal periodontal healing response. At a practical level, it is important to educate the patients or the individual about the adverse effects of smoking on oral cavity which affects the periodontal health.

Acknowledgement: The authors would like to acknowledge the help and support rendered by the department of Periodontology and Department of Information Technology of Saveetha Dental College and Hospital and the management for their constant assistance.

Conflict of Interest: None declared.

Source of Funding: Nil

Ethical Clearance: It is taken from "Saveetha Institute Human Ethical Committee" (Ethical Approval Number- SDC/SIHEC/2020/DIASDATA/0619-0320)

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