

Prevalence of furcation-involved molars in population of Greater Noida- A clinical and radiographic epidemiological study

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Abstracts: Introduction: Furcation involvement is a feature of advanced periodontal disease, which increases risk for future loss of attachment and destruction of bone. Furcation involved teeth were considered to have poor prognosis and were recommended for extraction until recently. With advancements in Periodontology early diagnosis and timely intervention has increased the long term survival of involved teeth. Early involvement can be treated successfully with non surgical periodontal therapy whereas for advanced cases regenerative and resective surgeries are choice of treatment. Aim: The aim of the study was to find out prevalence of furcation involvement of molars in Greater Noida population. Methodology : Patients selected were in the age group of 25-34, 35-44, 45-54, 55-64. The present study was performed using IOPA of 100 subjects and clinical assessment was done based on Hamp's classification (1975) using UNC 15 probe. Results: The study results revealed that the overall prevalence of furcation involvement of molars is 22% and it increased with increase in age. Furcation involvement was positively correlated with plaque score, attachment loss, pocket depth and gingival bleeding sites. Conclusion: Age, plaque, gingival inflammation, periodontal pockets, clinical attachment loss are risk factors for furcation involvement. [Kumar R Natl J Integr Res Med, 2018; 9(6):18-22]

Key Words: Age, clinical attachment level, furcation, gender, plaque, pocket depth

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Introduction: Periodontal diseases and dental caries are the leading cause of tooth loss.¹ Numerous epidemiological studies have reported increasing incidence of bone loss and attachment loss of molars in untreated periodontal diseases.² Tooth loss especially of molars results in less efficient chewing causing impact on nutrition of patients and overall diminishing of quality of life.³ Pathologic tooth migration further has impact on overall esthetics. Furcation is an area of complex anatomic morphology, that once involved is difficult to treat and maintain by routine periodontal therapy.^{4,5} The presence of furcation involvement is one clinical finding that can lead to a diagnosis of advanced periodontitis. Early diagnosis and timely intervention increases the long term survival of involved teeth.⁶

Early involvement can be treated successfully with non surgical periodontal therapy whereas for advanced cases regenerative and resective surgeries are choice of treatment.⁷ However, with recent advances in periodontal therapy and with good patient compliance, many teeth with furcation involvements can now be restored to normal function. Many studies have been reported on the incidence, distribution and treatment of furcation involvement.⁸ Furcation involvement presents both diagnostic and

therapeutic dilemmas. But early diagnosis and intervention has favourable outcomes. The aim of this observational and study was to find out prevalence and incidence of furcation involvement in various age group of Greater Noida population.

Materials And Method: Source of the data: A total number of 100 patients were selected from outpatient department of Periodontics ITS Dental College Hospital & Research centre, Greater Noida, Uttar Pradesh. Patients selected were distributed in the age group of 25-34, 35-44, 45-54, 55-64. The present study was performed using IOPA of 100 subjects and clinical assessment was done based on Hamp's classification (1975)⁹ using UNC 15 probe.

Inclusion Criteria

1. All molars except wisdom teeth.
2. Individuals in the age groups 25-34, 35-44, 45-54, 55-64.

Exclusion criteria

1. Untreatable molars and roots remnants have been considered as missing.
2. Dental implants have also been excluded.
3. Smokers (current or smoking within last 5 years)

In order to correlate furcation involvement and to insure presence or absence of furcation

involvement UNC 15 probe was used to check furcation involvement. In the areas where furcation involvement was present IOPA was advised. Following which furcation involvement grading was done on basis of Hamp's classification (1975)⁹ as follows

Hamp's classification (1975)⁹

Degree I (Horizontal loss \leq 3 mm.)

Degree II (Horizontal loss of support > 3mm)

Degree III (Horizontal through and through destruction)

To correlate furcation involvement with clinical parameters: Plaque index¹⁰ (Sillness and Loe 1964), Clinical attachment level,¹¹ Gingival bleeding index¹² (Ainamo and Bay 1975) were recorded.

Ethical consideration: The original study protocol was reviewed and approved by ITS Dental College Ethical Committee.

Statistical analysis : The analysis was carried out using software Version 20 and Chi square test were used for statistical analysis and clinical records development.

Results: 100 Patient, out of which 69 males, 31 females were enrolled in this study with the age group 25 to 65 years. Results of the present study revealed that overall prevalence of furcation involvement was 22% in population of Greater Noida, District- Gautam Budh Nagar. (Table. 1) In our study the prevalence of furcation involvement in age group 25-45 was 17.5% whereas in the age group of 45-65 years it was 40%. (Table. 2) The prevalence of furcation involvement was positively correlated with Gingival bleeding index. (Table. 3) There was increase in furcation involvement with increase in Pocket probing depth and Clinical attachment level. 10.1% of cases with mild and 48.4% cases with moderate pocket probing depth had furcation involvement. (Table 4) Similarly 10.8% cases with mild CAL and 24% of cases with moderate CAL and 75% with severe CAL had furcation involvement. This study confounds that there is similar prevalence of furcation involvements is seen (males 21.7% and females 22.6%) in both genders. In patients with good, fair and poor oral hygiene the prevalence of furcation involvement was 0, 17.1 and 40% respectively.

Table. 1: Demographic Distribution of Age with furcation involvement.

			Furcation				Total
			No Furcation	Grade 1	Grade 2	Grade 3	
Age	25-45 years	Count	66	6	6	2	80
		% within Age	82.5%	7.5%	7.5%	2.5%	100.0%
	45-65 years	Count	12	2	4	2	20
		% within Age	60.0%	10.0%	20.0%	10.0%	100.0%
Total	Count	78	8	10	4	100	
	% within Age	78.0%	8.0%	10.0%	4.0%	100.0%	

p- 0.116 (NS) (p<0.05)

Table. 2: Correlation of Gingival bleeding index with furcation involvement

			Furcation				Total
			No Furcation	Grade 1	Grade 2	Grade 3	
GBI	Negative	Count	18	0	0	0	18
		% within GBI	100.0%	.0%	.0%	.0%	100.0%
	Positive	Count	60	8	10	4	82
		% within GBI	73.2%	9.8%	12.2%	4.9%	100.0%
Total	Count	78	8	10	4	100	
	% within GBI	78.0%	8.0%	10.0%	4.0%	100.0%	

p- 0.103 (NS) (p<0.05)

Table.3: Correlation of Pocket depth with furcation involvement

			Furcation				Total
			No Furcation	Grade 1	Grade 2	Grade 3	
PD	Mild	Count	62	3	3	1	69
		% within PD	89.9%	4.3%	4.3%	1.4%	100.0%
	Moderate	Count	16	5	7	3	31
		% within PD	51.6%	16.1%	22.6%	9.7%	100.0%
Total		Count	78	8	10	4	100
		% within PD	78.0%	8.0%	10.0%	4.0%	100.0%

p - 0.001 (S) (p<0.05)

Table.4: Correlation of Clinical attachment level with furcation involvement

			Furcation				Total
			No Furcation	Grade 1	Grade 2	Grade 3	
CAL	Mild	Count	41	2	2	1	46
		% within CAL	89.1%	4.3%	4.3%	2.2%	100.0%
	Moderate	Count	35	5	5	1	46
		% within CAL	76.1%	10.9%	10.9%	2.2%	100.0%
	Advanced	Count	2	1	3	2	8
		% within CAL	25.0%	12.5%	37.5%	25.0%	100.0%
Total		Count	78	8	10	4	100
		% within CAL	78.0%	8.0%	10.0%	4.0%	100.0%

p - 0.001 (S) (p<0.05)

Discussion: This study was designed to find out the prevalence of furcation involvement in a randomly assigned population of Greater Noida District-Gautam Budh Nagar. In our study the prevalence of furcation was 22% in the age group 45-65 years as compared to the age group 25-45 years where 17.5% prevalence was seen reflecting a trend of increase in furcation involvement with ageing. Overall prevalence of furcation involvement was 40% whereas maxillary molars showed higher prevalence of furcation involvement as compared to mandibular molars. Similar study designed by Lorato (1981) analysed that there is an increase in furcation involvement with age. Furcation involvement is seen higher in the patients who are suffering from some systemic conditions like diabetes mellitus, hyperparathyroidism, osteoporosis, furthermore, these conditions are seen higher in old patients.¹³

Similar study done by Larato¹⁴ which determined the prevalence of furcation involvement of molars in 305 dry adult skulls and reported that the prevalence of furcation involvement is

significantly higher in maxillary molars than mandibular molars. He found that the maxillary first molar (buccal aspects due to complex root anatomy) most frequently displayed furcation involvement and mandibular second molars displayed least furcation involvement. Age, smoking, and presence of periodontal pockets are significantly associated with increased risk of furcation involvement.

Albandar et al¹⁵ and Gamonal et al¹⁶ the prevalence of furcation involvement is higher in males as compared to females because periodontitis has been found to be significantly higher in men than in women due to the presence of deleterious habits like smoking and alcohol consumption which affects the periodontal health. Studies have reported that clinical attachment loss of all levels of severity is generally more prevalent in males than in females, and this difference was statistically significant.

In this study almost similar predilection of furcation involvement was seen in males (21.7%) and females (22.6%). The reasons for

these gender differences have not been explored in detail, but are thought to be related to the similar awareness and attitude for the dental health as previously reported by Norderyd et al¹⁷ in 1999.

Association of quality of plaque and gingival inflammation is proved beyond doubt long back. Studies have reported that teeth with gingival inflammation showed significantly higher attachment loss than teeth without inflammation^{18,19}. Thus increased plaque scores eventually leads to gingival inflammation and might increase the risk of furcation involvement. This assumption is confirmed by our study.

The study suggested that prevalence of furcation involvement increased with increase in gingival bleeding index scores. The results are in accordance with previous studies as in the cases with positive BOP. Some grade of furcation involvement was found. In present study furcation involvements in the patients who had good oral hygiene, fair oral hygiene and poor oral hygiene was 0, 17.1% and 40% respectively.

Bleeding on probing is an indicator for gingival inflammation that plays a pivotal role in clinical attachment initiation in adults²⁰. The absence of bleeding on probing is an excellent predictor for periodontal stability (Lang NP 1990)²¹. The results of this study are consistent which showed less periodontal destruction in adult with lower bleeding on probing. Thus, adults which has lower bleeding on probing showed a lower plaque levels, low mean clinical attachment level, pocket depth less furcation involvement.

This study also suggested that there is statistically significant increase in pocket probing depth and also the loss of clinical attachment either furcation affected sites. In patients with good, fair and poor oral hygiene the prevalence of furcation involvement was (0, 17.1 and 40%) respectively.

Several studies have reported that there is an increase in pocket probing depth and loss of attachment with increase age. Epidemiological study carried out in USA by (Albandar et al 1999)¹⁵ showed that pocket probing depth and loss of attachment is found to be higher with increase age. Okamoto et al (1988)²² in a study found that there is increase in pocket probing depth and loss of attachment level around molars with increasing age.

Our study also revealed that there is statistically significant increase in pocket probing depth and also the loss of clinical attachment with furcation affected sites. Okamoto et al (1988)²² did a study in which they found that there was increase in pocket probing depth and loss of attachment level around molars with increasing age. Studies have suggested that periodontal disease is more severe in elderly people because of cumulative tissue destruction over a lifetime rather than an age related intrinsic deficiency or abnormality which affects periodontal susceptibility. It may be that in older age a generally alteration in immune function and tissue integrity may increase susceptibility to periodontal destruction²³.

Conclusion: Furcation involvement was positively associated with age, plaque score, pocket depth, clinical attachment level and gingival inflammation and these results are in accordance with the previous studies. The presence of furcation involvement is one clinical finding that can lead to a diagnosis of periodontitis. Age, plaque, gingival inflammation, periodontal pockets, clinical attachment loss are risk factors for furcation involvement. Thus risk factors should be kept in mind while diagnosis, treatment and maintenance of periodontitis patients. More studies with a larger sample size are required to confirm these evidence which will further help in diagnosis and treatment plan.

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