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PERIODONTAL POCKET ASSOCIATED WITH FULL COVERAGE FIXED PROSTHESIS IN PATIENTS COMING TO REHMAT MEMORIAL DENTAL TEACHING HOSPITAL, ABBOTTABAD

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ABSTRACT

Objectives: *To determine the frequency of periodontal pocket associated with full coverage fixed prostheses in patients coming to Rehmat Memorial Dental Teaching Hospital, Abbottabad.*

Materials and Methods: *This cross-sectional study was conducted on 116 participants of both genders, age 30 to 60 years, systemically healthy, nonsmoker patients with root canal treated abutment teeth having full coverage fixed prostheses for at least one year. The probing pocket depth was measured at six sites per tooth (mesio-buccal, mid buccal, disto-buccal, disto-lingual, mid lingual and mesio-lingual) using the WHO probe. For stratification of pocket depth among age groups and genders chi-square test was applied.*

Results: *The mean age 40.68±7.98 years. The mean pocket depth was 2.746±0.257 mm. The males were 67(57.76%) and females were 49(42.24%). Most common abutment teeth were mandibular molars (n=46, 39.7%), followed by maxillary molars (n=16, 13.8%), and least were upper incisors (n=11, 9.5%). The periodontal pocket was present in 26(22.4%) participants. No statistical association between periodontal pocket with age and genders was found.*

Conclusion: *The periodontal pocket is not rare occurrence among fixed denture wearers with no genders and age predilection.*

Key words: *Periodontal pocket, fixed partial denture, abutment teeth*

INTRODUCTION

Among other documented complications, periodontal disease is the most common complication associated with fixed prostheses.[1,2] The periodontium serves a basic purpose in maintaining aesthetics and function of the natural dentition as well as future planned fixed partial denture (FPD) and full coverage restorations.[3] In cases where dental implant has a relative or an absolute contraindication, among the available treatment options FPD is the most common for the restoration of partially edentulous ridges.[4,5] In cases of endodontically treated teeth, where teeth tend to be weaker, restoring them with crowns or using as abutments in FPD has shown to lower the incidence of fracture when compared to conventional fillings or direct restorations.[6] While planning restorations for endodontically treated teeth another important aspect is to minimize the depth to 0.5 to 0.7 mm into the gingival crevice, as violation of the biological width may result in gingival inflammation or recession. This will lead to periodontal pocket formation ultimately leading to failure of the restoration.[7,8] Efforts should be made to reduce the factors that causes adverse inflammatory periodontal reactions during fabrication of full coverage restorations i.e. defective tooth-restoration interface, restoration over contouring, improper emergence profile and violation of Biological width.[9,10]

A number of investigators have tried to evaluate

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the relationship between periodontal pocket and full coverage fixed prosthesis. According to a study conducted by Ayoub W, all participants revealed an increase in the probing pocket depth, the average change being 0.77mm.[5] In the same study the abutment teeth had significantly greater mean probing depth than the non-abutment teeth (3.09 mm versus 2.3 mm; p value <0.05 mm). In another study conducted by Sharma R, 26% of teeth with FPD had periodontal disease associated with the abutment tooth.[1] One study conducted by Paniz G, periodontal probing depth increased at mesial and distal sites of abutment tooth covered by full coverage prosthesis while a decrease was noted at the facial (Mid-distance) site of the same tooth.[10]

So far no study has been conducted to assess the frequency of periodontal pocket in patients with full coverage fixed prosthesis. This study will be focused to assess the frequency of periodontal pocket in patients with full coverage and fixed prosthesis. The results will help the clinicians in future evaluation of risk factors associated with relationship between periodontal pocket and full coverage and fixed prosthesis.

MATERIALS AND METHODS

This cross-sectional study was conducted from August 2020 to April 2021 after taking ethical committee approval at Rehmat Memorial Dental Teaching Hospital, Abbottabad by non-Probability consecutive sampling technique. The sample size of 116 was calculated using WHO software at 95% confidence level, anticipated population proportion (FPD associated pocket) of 26%[1], and absolute precision of 8%.

Informed consent was obtained from all participants after explaining the purpose of the study. Patients of both genders, age 30 to 60 years, systemically healthy, nonsmoker having endodontically treated abutment teeth with full coverage fixed prostheses for at least one year were included in the study. Prior to the intra oral examination, eligible site, the abutment (crowned) tooth was selected from each subject in either the maxilla or the mandible. The probing pocket depth were measured at six sites per tooth (mesio-buccal, buccal, disto-buccal, disto-lingual, lingual and mesio-lingual) using the WHO probe. The score was averaged. The probing depth was recorded by a FCPS resident.

Data analysis was done in SPSS 22.0. Quantitative variables like age were computed as means and SD. Qualitative variables like gender and periodontal pocket were described in the terms of frequencies and percentages. Chi square test was run to compare the outcome variable among genders and age groups at P-value ≤0.05 significance level.

RESULT

The mean age was 40.68±7.98 years with range from 30 to 60 years. The males were 67(57.76%) and females 49(42.24%). The mean pocket depth was 2.746±0.257 mm. The most common age category of this study was 31-40 years (n=60, 51.72%) followed by 41-50 years (n=42, 36.21%) and least age group was 51-60 years having 14(12.07%) participants. (Fig 1)

Most common abutment teeth were mandibular molars (n=46, 39.7%), maxillary molars (n=16, 13.8%), maxillary premolars (n=15, 12.9%) and upper incisors (n=11, 9.5%). The least common tooth involved in abutment was lower canine (n=5, 4.3%). The pocket depth was present in 26(22.4%) participants. The details are shown in table 1.

Though the frequency of pocket depth in males (26.9%) was higher than females (16.3%) but the results were not statistically significant (P=0.179). The highest frequency of pocket depth was found in age group 31-40 years (28.3%) followed by 51-60 years (21.4%) and least was in 41-50 years (14.3%). But the frequency of pocket depth in full coverage FPD stratified by age group was not statistically significant (P=0.245). The results for pocket depth in full coverage FPD stratified by abutment tooth was statistically significant (P=0.018). Most common teeth involved in periodontal pocket were mandibular molars (n=17, 37%) followed maxillary molars (n=6, 37.5%). (Table 2)

DISCUSSION

This study was carried out to determine the frequency of periodontal pocket associated with full coverage fixed prostheses in patients coming to Rehmat Memorial Dental Teaching Hospital, Abbottabad. Our results showed that the periodontal pockets were present in 26(22.4%) participants. No significant association was found for frequency of periodontal pocket with age and gender.

The fixed partial dentures can adversely affect

the periodontal health, increase cariogenic insults and the stress concentration on natural teeth.[11] Research have shown that after insertion of fixed partial denture the periodontal health deteriorate with inflammation, gingival enlargement, pocket formation and more plaque accumulation.[12,13] Fixed prostheses can also lead to increased or altered oral bacterial flora and formation of dental plaque if patient hygiene is inadequate.[14] Patients education for oral hygiene maintenance leads to improved periodontal health.[7]

Previous studies shown that, sub-gingival margin placement, poor marginal adaptation and over-hanged crowns results in localized gingival inflammation.[15,16] The results of these studies alert clinicians to give attention to provide FPD with more adequate margins.[17,18]

Our study showed that the mean age was 40.68±7.98 years. We included in our study participants wearing fixed partial denture. These results that most our patients presenting for fixed prosthesis are in third decade. A previous study conducted on failures in fixed partial dentures in Brazil reported that the mean age of 47.40 years and standard deviation of 9.90.[18] These results are closer to our study.

Our findings showed that among the participant's males were more than females. This may be due more loss of teeth in males because of less

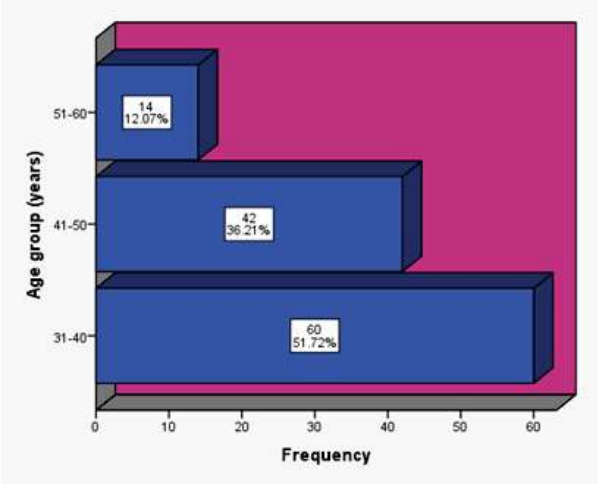

Fig 1: Age distribution of the study

Table 1: Frequency of abutment teeth, periodontal pocket and periodontitis

Variable	Characteristics	n (%)
Abutment tooth	Maxillary incisor	11 (9.5)
	Maxillary canine	6 (5.2)
	Maxillary premolar	15 (12.9)
	Maxillary molar	16 (13.8)
	Mandibular incisor	6 (5.2)
	Mandibular canine	5 (4.3)
	Mandibular premolar	11 (9.5)
	Mandibular molar	46 (39.7)
Pocket depth	Yes	26 (22.4)
	No	90 (77.6)

Table 4: Cross tabulation of nocturnal wear, epulis fissuratum and location of epulis fissuratum

variable	Characteristics	Pocket depth		P-Value**
		Yes	No	
		n(%)	n(%)	
Gender	Male	18(26.9)	49(73.1%)	0.179*
	Female	8(16.3)	41(83.7%)	
age group	31-40	17(28.3)	43(71.7)	0.245*
	41-50	6(14.3)	36(85.7)	
	51-60	3(21.4)	11(78.6)	
abutment	Maxillary incisor	1(9.1)	10(90.9)	.018**
	Maxillary canine	0(0.0)	6(100)	
	Maxillary premolar	1(6.7)	14(93.3)	
	Maxillary molar	6(37.5)	10(62.5)	
	Mandibular incisor	0(0.0)	6(100)	
	Mandibular canine	0(0.0)	5(100)	
	Mandibular premolar	1(9.1)	10(90.9)	
	Mandibular molar	17(37)	29(63)	

*chi-square test, **Fisher exact test

compliance with oral hygiene measures as compared to females.[19] Other reasons for male predominance may be more financial independence among males to present to fixed prosthodontic cares. A previous study conducted in Brazil showed that more females had fixed partial dentures as compared to males. The difference in results can be due to socioeconomic and educational level differences.[18]

Our study shows that most common abutment teeth were mandibular molars, maxillary molars and maxillary premolars. This finding showed that these teeth are commonly lost and replaced by fixed partial dentures. The mandibular molar as most common abutment can be due to the fact of susceptibility of mandibular first molar to dental caries. This tooth erupts at earlier age of 6 years. At this age the children are careless and due to lack of education in parents in our country; become affected by cariogenic insult.[20]

Our study found that the periodontal pocket was present in 26(22.4%) participants and mean pocket depth was 2.746±0.257 mm. Previous studies evaluated the relationship between periodontal pocket and full coverage fixed prostheses. According to a study conducted by Ayoub W, all participants revealed an increase in the probing pocket depth, the average change being +0.77mm. In the same study the abutment teeth had significantly greater mean probing depth than the non-abutment teeth (3.09 mm versus 2.3 mm; p value <0.05 mm).[5] In another study conducted by Sharma R, 26% of teeth with FPD had periodontal disease associated with the abutment tooth.[3] One study conducted by Paniz G et al, periodontal probing depth increased at mesial and distal sites of abutment tooth covered by full coverage prosthesis while a decrease was noted at the facial (Mid-distance) site of the same tooth.[5]

Our study showed that periodontal depth was higher in females than males. However this difference was not significant. Different genetic makeup, immunology and steroid hormones in both genders are responsible for variation. Periodontal pathologies is of chronic nature and immune mediated inflammatory condition affecting dentition and their supporting tissues, resulting in the destruction of alveolar bone, tooth mobility and loss.[21]

Association between gender and periodontal diseases are not established in literature. The prevalence of periodontal disease is higher among males than females of similar age groups. This can be attributed to poor oral hygiene among males.[21] The oral hygiene of females is more satisfactory, and females are more conscious about their dental health. Furthermore now the effect of androgen on periodontal health which increase gingival inflammation also reported.[22] But there is co-existed contrary literature reporting female sex hormone in puberty and pregnancy can also cause inflammatory gingival diseases.[23] So the existing literature is inconclusive regarding the gender role in periodontal disease prevalence, progression and severity of periodontal diseases.

CONCLUSION

The periodontal pocket was present in 22.4% participants. No significant association was found for frequency of periodontal pocket with age and gender.

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