

The Prevalence of Overhanging Margins in Posterior Restorations and Associated Periodontal Attachment Loss in Jammu

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ABSTRACT

Aim: The aim of the study is to find the prevalence of overhanging margins in posterior restorations and associated periodontal attachment loss in Jammu.

Materials and Methods: A total of 139 subjects were selected based on the inclusion criteria. The selected subjects were evaluated for the overhanging margins of the restorations radiographically with the help of radiovisiography. The subjects with overhanging restorations were evaluated for the periodontal attachment loss with the help of WHO probe.

Results: About 57.6% of the restored teeth had overhanging margins in comparison to the 42.4% of the posterior teeth without overhangs. The prevalence of restorations with overhanging margins on the distal aspect of the tooth was more in maxillary posterior teeth (65.3%), and molars (51.02%) are more commonly involved than premolars. However, the results were statistically insignificant. The mesial overhangs were associated with periodontal attachment loss <3 mm, whereas majority of distal overhangs showed a periodontal attachment loss of more than 3 mm, and the results were found to be statistically highly significant.

Conclusion: The maxillary posterior teeth had more overhanging restorative margins which can be attributed to lack of accessibility and clinicians negligence toward the use of matrix bands and wedges.

Key words: Cavity, Gingiva, Overhang restoration, Proximal

INTRODUCTION

The main cause of gingival inflammation is due to bacterial plaque along with predisposing factors such as calculus, overhang, orthodontic therapy, smokeless tobacco, radiation therapy, iatrogenic factors, and the materials used in restoration.^[1]

The most commonly encountered local factor causing periodontal disease in adults is the overhanging dental restorations. Overhanging dental restoration refers to the extension of the restorative material beyond the Corner of the prepared cavity.^[2]

Overhanging interproximal restorations have long been viewed as a contributing factor toward gingivitis and possible periodontal attachment loss. Overhanging restorations pose a significant concern, as their prevalence has been estimated at

25–76% for all restored surfaces.^[3] It is generally accepted that overhanging restorations contribute to gingival inflammation due to their retentive capacity for bacterial plaque. Gilmore and Sheiham demonstrated interproximal radiographic bone loss in posterior teeth associated with overhanging restorations.^[4] Jeffcoat and Howell conducted a study on 100 teeth with overhangs and 100 without overhangs; they concluded greater bone loss around teeth with large overhangs. However, small overhangs were not associated with bone loss.^[5]

In a literature review of overhang dental restorations and the effect on the periodontium, researchers reported a prevalence range of interproximal overhang from 25% to 76% dependent on the importance of appropriate restoration in tooth supporting tissues.^[3]

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Alizadeoskoe *et al.* surveyed the overhang of amalgam restorations of dental students in Tabriz and concluded that the overall prevalence of this problem was 25.7%, 23.5% was related to Mesio-occlusal-distal (MOD) proximal cavities, and 23% to MOD cavities. In total, 29% was also related to amalgam crown buildup.^[6]

The relationship of overhang restoration to periodontal disease has been explored by three different methods.^[4,5,7-10] The commonly employed one is to compare the periodontal status of teeth with overhang restoration with homologous teeth without overhang restoration.^[5,11]

Another approach utilized extracted teeth to directly measure the attachment on tooth surface with and without overhang restoration.^[10,12] By the third method, intentionally placed overhang restoration was studied in humans for their effects on the subgingival microflora and periodontal tissue.^[13]

The present study is conducted to find the prevalence of overhanging margins in posterior restorations and associated periodontal attachment loss in Jammu region.

MATERIALS AND METHODS

Of a total of 193 patients visiting the Department of Conservative Dentistry, Indira Gandhi Government Dental College, Jammu, 139 subjects were selected based on the inclusion criteria.

Inclusion Criteria

- Patients without any periodontal disease.
- Presence of posterior teeth.
- Class II restorations.

Exclusion Criteria

- Missing posterior teeth.
- Systemic disease.

The selected subjects were evaluated for the overhanging margins of the restorations radiographically with the help of radiovisiography. The subjects with overhanging restorations were evaluated for the periodontal attachment loss with the help of WHO probe. A single examiner trained for the specific study performed all the clinical evaluations and also evaluated the radiographic images.

The evaluated data were subjected to statistical analysis using SPSS software version 20. Chi-square test was used to assess the relationship between the location and prevalence of overhanging margins.

RESULTS

Table 1 summarizes that 57.6% of the restored teeth had overhanging margins in comparison to the 42.4% of the posterior teeth without overhangs.

Table 2 summarizes that the prevalence of restorations with overhanging margins on the distal aspect of the tooth was more in maxillary posterior teeth (65.3%), and molars (51.02%) are more commonly involved than premolars. However, the results were statistically insignificant ($P = 0.8228^{NS}$ and 0.3684^{NS} , respectively).

Table 3 summarizes that the mesial overhangs were associated with periodontal attachment loss <3 mm, whereas majority of distal overhangs showed a periodontal attachment loss of more than 3 mm, and the results were found to be statistically highly significant ($P = 0.0000^{***}$).

Table 1: Incidence of overhanging margins among total restored teeth.

Status of Restoration	n(%)		Total
	Premolar	Molar	
With overhang	36 (25.9)	44 (31.6)	80 (57.6)
Without overhang	25 (17.9)	34 (24.5)	59 (42.4)
Total	61 (43.9)	78 (56.1)	139 (100)

Table 2: Distribution of overhanging margins among different teeth

Tooth involved	Number (%)		P (significant)
	Distal overhang	Mesial overhang	
Maxillary posterior tooth	32 (65.3)	21 (67.7)	0.8228
Mandibular posterior tooth	17 (34.7)	10 (32.3)	
Premolar	24 (48.97)	12 (38.7)	0.3684
Molar	25 (51.02)	19 (61.3)	

Table 3: Distribution of associated periodontal attachment loss

Location of overhanging margin	Periodontal attachment loss	
	<3 mm	>3 mm
Mesial overhang	26	05
Distal overhang	13	36

$$\chi^2=24.987, df=1, \chi^2/df=24.99, P(\chi^2>24.987)=0.0000$$

DISCUSSION

The present study was conducted in 80 subjects coming to the Department of Conservative Dentistry in Indira Gandhi Government Dental College, Jammu, to find the prevalence of overhanging margins in posterior restorations and associated periodontal attachment loss.

It has been proven by several authors in the past that overhanging margins of restorations promote plaque accumulation and increase the level of periodontal pathogens, which cause destruction to the periodontium as well as to the tooth substance.^[11,14-20]

The findings of the present study showed that 57.6% of posterior teeth have restorations with overhanging margins indicating their higher prevalence. These results were in agreement with the results obtained from other studies.^[11,12,14,15,21,22]

In this study, it was shown that the incidence of distal overhangs was more in maxilla and molars. However, the findings were insignificant. These results are in accordance with the results of Talabani *et al.*^[23]

This study also showed that the periodontal attachment loss occurred more significantly adjacent to overhanging margin. Deeper pockets more than 3 mm were found adjacent to distal overhangs and these results are in agreement with other studies in this respect.^[24,25]

CONCLUSION

It can be concluded that maxillary posterior teeth had more overhanging restorative margins which can be attributed to lack of accessibility and clinicians negligence toward the use of matrix bands and wedges. The overhanging restorative margins

lead to the increase in accumulation of dental plaque, which further leads to periodontal attachment loss. Thus, care should be taken while restoring posterior teeth to avoid the associated complications.

REFERENCES

- Hinrichs JE. The role of dental calculus and other local predisposing factor. In: Newman MG, Takei H, Klokkevold PR, Carranza FA, editors. Carranza's Clinical Periodontology. 11th ed. USA: Elsevier; 2012. p. 222.
- Sikri VK, Sikri P. Overhanging interproximal silver amalgam restorations. Prevalence and side-effects. Indian J Dent Res 1993;4:13-6.
- Brunsvold MA, Lane JJ. The prevalence of overhanging dental restorations and their relationship to periodontal disease. J Clin Periodontol 1990;17:67-72.
- Gilmore N, Sheiham A. Overhanging dental restorations and periodontal disease. J Periodontol 1971;42:8-12.
- Jeffcoat MK, Howell TH. Alveolar bone destruction due to overhanging amalgam in periodontal disease. J Periodontol 1980;51:599-602.
- Alizadeoskoe P, Kimiyai S, Savadioskoe S, Asdagh S. Prevalence of proximal overhanging margins in posterior amalgam restoration performed by Tabriz dental faculty student. Med J Tabriz Univ Med Sci 2009;31:53-6.
- Gorzo I, Newman HN, Strahan JD. Amalgam restorations, plaque removal and periodontal health. J Clin Periodontol 1979;6:98-105.
- Hakkarainen H, Ainamo J. Influence of overhanging posterior restoration on alveolar bone height in adults. J Clin Periodontol 1980;7:114-20.
- Kesathelyi G, Szabo I. Influence of class two amalgam fillings on attachment loss. J Clin Periodontol 1980;11:81-6.
- Kesathelyi G, Szabo I, Strahan JD. Loss of attachment adjacent to class two carious lesions. J Clin Periodontol 1980;11:120-3.
- Trott JR, Sherkat A. Effect of class two amalgam restoration on the health of gingival, clinical survey. J Can Dent Assoc 1964;30:766-70.
- Than A, Duguid R, Mckendrick A. Relationship between restorations and the level of periodontal attachment. J Clin Periodontol 1982;9:193-202.
- Lang NP, Kiel RA, Anderhalden K. Clinical and microbiological effects of subgingival restorations with overhanging or clinically perfect margins. J Clin Periodontol 1983;10:563-78.
- Waerhaug J. Effect of rough surfaces upon gingival tissue. J Dent Res 1956;35:323-5.
- Wright WH. Local factors in periodontal disease. J Periodontol 1963;1:163.
- Gilmore N, Sheiham A. Overhanging dental restoration and periodontal disease. J Periodontol 1997;72:82.
- Zander HA. Effect of silicate cement and amalgam on the gingival. J Am Dent Assoc 1975;55:11-5.
- Zander HA. Tissue reaction to dental calculus and to filling materials. J Dent Med 1958;13:101-4.
- Pack A, Coxhead L, McDonalad B. The prevalence of overhang margins in posterior amalgam restorations and periodontal consequences. J Clin Periodontol 1996;23:112.
- Roderiques HJ, Stroham JD, Newman HN. Effect on gingival health of removing overhanging margins of interproximal subgingival amalgam restorations. J Clin Periodontol 1999;70:457.
- Lervick T, Riordan T, Haugejorden D. Periodontal disease and proximal overhangs on amalgam restorations in Norwegian 21year old. Community Dent Oral Epidemiol 1984;12:264-8.
- Pack RC, Coxhead LJ, Mcdonald BW. The prevalence of overhanging margins in posterior amalgam restoration and periodontal consequences. J Clin Periodontol 1990;17:146-52.
- Talabani RM, Hamaghariv DS, Khursheed DA, Saeed HM, Saeed KM. The prevalence of overhanging margins in posterior amalgam restoration. J Dent Med Sci 2015;14:63-5.
- Chen J, Burch J, Beck F, Horton J. Periodontal attachment loss associated with proximal tooth restorations. J Prosthet Dent 1987;57:416-20.
- Clamen L, Koidis P, Burch J. Proximal tooth surface quality and periodontal probing depth. J Am Dent Assoc 1986;113:890-3.

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