

The Effect of Finish Lines on Gingival Tissue in Fixed Partial Denture – A Clinical Study

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Abstract

Background: This study aims to evaluate the gingival tissue health when the margins of fixed restoration are located at three different levels in relation to the gingival crest, namely, supragingival, equigingival, and subgingival. **Materials and Methods:** This clinicomicrobiological study was carried out in private dental clinics in Patna. The study consisted of 25 patients of either sex between 30 and 50 years who had received treatment for replacement of his/her missing teeth. **Results:** The evaluation was made clinically and microbiologically. Clinical assessment was done using Loe and Silness index for gingival inflammation and microbiological study was done by counting colony-forming units. The results were tabulated and statistical analysis was done using the Statistical Package for the Social Sciences software package *t*-test applied to get the comparison. **Conclusion:** Supragingival margins were least harmful, subgingival margins were most harmful to the gingival tissue when compared to supragingival margin and equigingival margin when compared microbiologically.

Keywords: Gingival tissue, Equigingival, Subgingival, Supragingival.

INTRODUCTION

The literature is replete with articles dealing with the location of the margins of full crowns and their relationship to gingival health. Subgingival, equigingival, and supragingival positions have been suggested for the placement of crown margins with each having advantages and disadvantages.^[1] There is also general agreement that placing the margins of restorations subgingivally causes an increase in gingivitis and should be avoided wherever possible. Such increased inflammation is due to bacterial rather than mechanical irritation.^[2,3] Subgingival margins were also shown to have a greater degree of inflammation than margins located coronal to the gingival crest.^[4] Another study suggested that crown margins located at the gingival crest cause less inflammation than margins placed supragingivally or subgingivally, while an in-depth investigation found inflammation to be more severe as the crown margin approached the apical portion of the intracrevicular space. This author recommended that subgingival margins be placed at or just into the gingival crevice. However, a study by Richter and Ueno revealed no difference between subgingival and supragingival

margin placement. The crowns were prepared and inserted by one dentist. Other studies of artificial crown contour concluded that over contoured crowns contribute to gingival inflammation. A similar study demonstrated that temporary crowns constructed 1 mm from the original contour did not create gingival inflammation. These conflicting reports reveal the complex relationship between extensive restorations and gingival inflammation.^[5]

MATERIALS AND METHODS

This clinicomicrobiological study was carried out in private dental clinics in Patna. The study consisted of 25 patients of either sex between 30 and 50 years who had received treatment in the department for replacement of his/her

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Received: 21 Jul, 2021; **Accepted:** 12 Aug, 2021; **Published:** 04 Sep, 2021

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How to cite this article: Kumar B, Ranjan R, Sinha NR, Deshbakht IB, Sunil. The Effect of Finish Lines on Gingival Tissue in Fixed Partial Denture – A Clinical Study. J Res Adv Dent 2021;12(6):316-318.

Access this article online

Website:
www.jrad.co.in

DOI:
<https://doi.org/10.53064/jrad.2021.12.6.69>

missing teeth. Patients with systemic disease, any form of tobacco use, drug therapy, and pregnant and lactating mother were excluded from the study. Patients were divided into four groups:

GROUP-A – crown/bridge having supragingival finish line.
GROUP-B – crown/bridge having equigingival finish line.
GROUP-C – crown/bridge having subgingival finish line.
GROUP-D – unrestored contralateral tooth as control.

Clinical parameters were evaluated using modified gingival index (Loe and Silness, 1967).

For sample taking, a sterile fine endodontic paper point was gently inserted into the gingival sulcus and was left undisturbed for 30 s. The portion of the paper point that had been located subgingivally was cut off with sterile scissors and then transferred immediately to a sterile container containing Robertson cook meat media. This was then transported immediately to the laboratory for microbiological observations. The sample was mixed with 20 ml liquid broth and vortex mixed. Twenty milliliters of suspension were cultured in selective (neomycin) blood agar and incubated anaerobically with use of GasPak system.

RESULTS

Clinical assessment was done using Loe and Silness index for gingival inflammation and microbiological study was done by counting colony-forming units. The results were tabulated and statistical analysis was done using the Statistical Package for the Social Sciences software package *t*-test applied to get the comparison.

On comparing supragingival margin with control, we found that *P*-value is significant (0.012) of bacteroids and highly significant (0.001 and 0.002) of *Fusobacterium* and *Streptococcus* for supragingival (Table 1).

When equigingival margin compared with control, we found that *P*-value is highly significantly (0.005, 0.003, and 0.001) of *Fusobacterium*, *Bacteroides*, and *Streptococcus* in equigingival (Table 2).

Moreover, when subgingival margin compared with control, we found that *P*-value is significant (0.330 and 0.016) of *Klebsiella* and *Streptococcus*, and highly significant (0.001 and 0.005) of *Fusobacterium* and *Bacteroides* for subgingival (Table 3).

Mean value by counting colony-forming unit, we found least colony formation of all organism in control group and highest colony formation of *Klebsiella*, *Fusobacterium*, and *Bacteroides* in subgingival margin and *Streptococcus* was found highest in number in supragingival (Graph 1).

DISCUSSION

One of the important steps during fabrication of fixed partial denture is planning and placing the margins. Many factors have to be considered such as caries, retention, previous

Table 1: Comparison of supragingival v/s control

Organisms	Group	No.	Mean	SD	P-value
<i>Klebsiella</i>	Supragingival	25	1480.00	1828.478	0.369
	Control	25	1040.00	1593.738	
<i>Fusobacterium</i>	Supragingival	25	2520.00	1917.464	0.001
	Control	25	800.00	1384.437	
<i>Bacteroides</i>	Supragingival	25	1760.00	2402.776	0.012
	Control	25	440.00	820.569	
<i>Streptococcus</i>	Supragingival	25	3360.00	1890.326	0.002
	Control	25	1920.00	1187.434	

Table 2: Comparison of equigingival v/s control

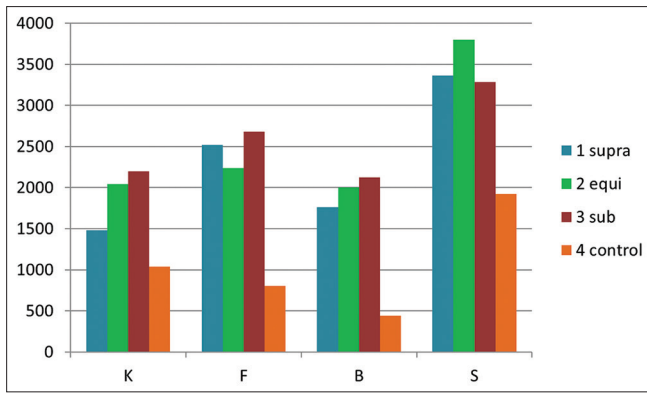
Organisms	Group	No.	Mean	SD	P-value
<i>Klebsiella</i>	Equigingival	25	2040.00	2030.599	0.059
	Control	25	1040.00	1593.738	
<i>Fusobacterium</i>	Equigingival	25	2240.00	2026.491	0.005
	Control	25	800.00	1384.437	
<i>Bacteroides</i>	Equigingival	25	2000.00	2309.401	0.003
	Control	25	440.00	820.569	
<i>Streptococcus</i>	Equigingival	25	3800.00	2309.401	0.001
	Control	25	1920.00	1187.434	

Table 3: Comparison of subgingival v/s control

Organisms	Group	No.	Mean	SD	P-value
<i>Klebsiella</i>	Subgingival	25	2200.00	2101.587	0.033
	Control	25	1040.00	1593.738	
<i>Fusobacterium</i>	Subgingival	25	2680.00	2357.965	0.001
	Control	25	800.00	1384.437	
<i>Bacteroides</i>	Subgingival	25	2120.00	2697.530	0.005
	Control	25	440.00	820.569	
<i>Streptococcus</i>	Subgingival	25	3280.00	2458.319	0.016
	Control	25	1920.00	1187.434	

restorations, and esthetic demands of patient. Marcum^[6] said that equigingival margins are least harmful than supragingival and subgingival margins, but it was based on histological examination of dog's gingival and not of human being. Ritcher and Ueno^[7] conducted a study to see the effect of supragingival and subgingival margin in a single tooth. They said that there was no difference in sulcus depth, but here it is important that gingival sulcus is a common channel and gingiva associated with it is also connected in center. At the same time, Valderhaug and Birkeland^[8] had reported that there was improvement in health of gingiva, where the margins were located supragingivally.

Müller^[9] in his microbiological study found that the composition of microflora was similar to the time of cementation but after 1 year the mean percentage of motile bacteria amounted to 2.8% for supragingival and 4.2% for equigingival, hence he established the microbiological significance in gingival inflammation associated with margins of fixed partial crown and bridges.



Graph 1: Mean value of colony formation

The present study was designed to evaluate the effect of crown margin location to the gingiva, clinically, as well as microbiologically.

CONCLUSION

All types of margin locations affect the health of gingival tissue in varying degree. Supragingival margins were least harmful to the gingival tissue when compared to equigingival margin and subgingival margin. Equigingival margins are comparable with subgingival margins as far as the effect on the gingival tissue is concerned. Subgingival margins were most harmful to the gingival tissue when compared to

supragingival margin and equigingival margin when compared microbiologically.

CONFLICTS OF INTEREST

The authors declare that they have no potential conflicts of interest regarding this article.

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