Original Research Paper

Volume-8 | Issue-3 | March-2018 | PRINT ISSN No 2249-555X

Dental Science

ASSESSMENT OF SUPRACRESTAL GINGIVAL TISSUE DIMENSIONS AMONG DIFFERENT TOOTH IN HEALTHY HUMAN PERIODONTIUM.

Dr Rajat Dubey* Dental officer Govt. Distt. Hospital, Ratlam (M.P.) *Corresponding Author

Dr Pradeep S. Anand Department of Dentistry, ESIC, Gulbarga, Karnataka

Dr. Nikita Dubey Consultant dentist at Lions International dental unit, Ratlam (m.p.) Pin 457001

ABSTRACT

Objective- The objective of the study is to measure and assess the dimensions of supracrestal gingival tissue among different tooth in same arch in healthy human periodontium.

Materials and methods- In this study 30 dental students with clinically healthy periodontium were examined by doing sulcular probing, from the gingival margin to the top of the alveolar crest, using a UNC-15probe, at maxillary and mandibular incisors, canines, and premolars and first molars unilaterally.

Results- Comparison of mean SGT of individual tooth types in maxillary and mandibular arch showed significant difference with p value of 0.005 and 0.000 respectively. Maxillary and mandibular SGT dimensions were lesser for the central incisors compared to the other teeth in the arch which were measured. Also, significant difference is observed on comparing SGT dimension among different tooth in same arch.

Conclusion- There is significant difference in the SGT dimensions in the different tooth in the same arch. Maxillary and mandibular SGT dimensions were lesser for the central incisors compared to the other teeth in the arch which were measured. Thus, indicating more bone reduction as we move posteriorly from anterior.

KEYWORDS : supracrestal, dimensions

INTRODUCTION

The biologic width and its principles have been discussed sufficiently in the literature and have been used as clinical guidelines during the evaluation of periodontal and restorative, interrelationships. The average measurements of the gingival sulcus depth (0.69 mm), the epithelial attachment (0.97 mm), and the connective tissue attachment (1.07 mm) were studied by Gargiulo et al[1] in 1961.These measurements may vary at each tooth or at different sites on the same tooth. The term supracrestal gingival tissue (SGT) was introduced by *Smukler and Chaibi*[2] in 1997 as the tissue coronal to the alveolar crest up to the gingival margin. Amongst the different causes for SGT violation the common ones are root fracture or perforation, dental resorption, prosthetic preparation, and caries. Any faulty restoration or prosthesis may lead to inflammation of marginal soft tissue[3,4] which gradually migrates to underlying bone causing resorption and necrosis. Thus, for any prosthetic and restorative treatment to be successful integrity of biologic width is very important. There are different treatment options available for the treatment of violated tooth involving tooth extraction, crown lengthening and sometimes forced eruption. Crown lengthening procedure basically involves removal of marginal bone and apical positioning of soft tissue so as to obtain new SGT complex[5,6,7]. Based upon the literature available[7,8] it is found that sufficient bone should be resected to permit 3.0 mm of sound tooth structure above the crest of bone to house the supracrestal fibers, junctional epithelium, and gingival sulcus. However, such standardized measurements are based on necroscopic or empiric observations, with no individualized data. The purpose of this study was to measure and compare contralaterally the dimensions of SGT in healthy human periodontium.

MATERIALS AND METHODS

In this study 30 dental students aged between 18 to 26 years with clinically healthy periodontium were recruited from People's College of Dental Sciences, Bhanpur, Bhopal (M.P.).All students voluntarily signed an informed consent document, which was approved by the Ethical Committee of the People's College of Dental Sciences, Bhopal (M.P.).Students who participated in the study were systemically healthy subjects with full complement of fully erupted teeth from central incisors to second molars in all 4 quadrants and having high level of oral hygiene and without any history of orthodontic/restorative treatment or extraction. Whereas, students having gingival/ periodontal disease, malocclusion or malalignment of teeth, tobacco-related habits and if on any medications were excluded from the study.

Sulcular probing from the gingival margin to the top of the alveolar crest, using a UNC-15 probe, was performed at maxillary and mandibular incisors, canines, and premolars and first molars unilaterally under local anesthesia with the objective of measuring the dimensions of the supra crestal gingival tissue. Probing was performed at six sites on each tooth (distobuccal [DB], mid-buccal [B], mesiobuccal [MB], mid-lingual [L], distolingual [DL], mesiolingual [ML]).

One-way ANOVA with post-hoc analysis to compare the SGT measurements between different teeth in the maxilla and mandible

RESULTS

Statistically significant results were observed on comparing mean SGT of individual tooth types in maxillary and mandibular arch with p = 0.005 and 0.000 respectively (table 1and 2). Maxillary and mandibular SGT dimensions were lesser for the central incisors compared to the other teeth in the arch which were measured. Thus, to maintain adequate gingival tissue complex more bone reduction is required as we move posteriorly from anterior. Also, results of post – hoc analysis showed significant difference in the SGT dimensions among different tooth in the same arch (table 3 and 4).

Table 1 Comparison of mean SGT (supracrestal gingival tissue) of individual tooth types in maxillary arch

TOOTH TYPE	MEAN SD	RANGE
Central Incisor	2.61(0.45)	1.92-3.42
Lateral Incisor	2.93(0.46)	2.08-3.92
Canine	2.99(0.41)	2.08-3.67
First Premolar	2.85(0.33)	2.17-3.67
Second Premolar	2.94(0.4)	2.2-3.9
First Molar	2.98(0.46)	1.9-3.75
P value	0.005	

Table 2 Comparison of mean SGT (supracrestal gingival tissue) of individual tooth types in mandibular arch

TOOTH TYPE	MEAN SD	RANGE
Central Incisor	2.41(0.31)	1.67-3
Lateral Incisor	2.53(0.43)	1.33-3.42
Canine	2.74(0.51)	1.67-3.67
First Premolar	2.66(0.45)	1.33-3.58
Second Premolar	2.98(0.41)	2-3.75
First Molar	2.96(0.46)	2-4
P value	0.000	

Table 3 Results of post hoc analysis maxillary arch

Tooth type	Central incisor	Lateral incisor	Canine	First premolar	Second premolar	First molar
Central incisor		.039	.007	.241	.036	.009
Lateral incisor	.039		.993	.972	1	.997
Canine	.007	.993		.766	.995	1.000
First premolar	.241	.972	.766		.968	.821
Second premolar	.036	1	.995	.968		.998
First molar	.009	.997	1.000	.821	.998	

Table 4 Results of post-hoc analysis- mandibular arch

Tooth type	Central incisors	Lateral incisors	Canine	First premolar	Second premolar	First molar
Central incisors		.883	.035	.215	.000	.000
Lateral incisors	.883		.397	.851	.001	.002
Canine	.035	.397		.976	.285	.353
First premolars	.215	.851	.976		.053	.074
Second premolar	.000	.001	.285	.053		1.000
First molar	.000	.002	.353	.074	1.000	

DISCUSSION

The term biologic width, first mentioned by Cohen in 1962 and based on the study of Gargiulo et al[1], includes the junctional epithelium and the connective tissue fibers and has been widely discussed in the literature. The term supracrestal gingival tissue has been suggested for the sum of the supracrestal fibers, the junctional epithelium, and the gingival sulcus. It has been stated that this entity occupies approximately at least 3.0 mm supracrestally. In the absence of periodontal disease, sulcular probing, via the crevice to the crest of the alveolar bone, may be used to determine the dimension of the SGT at any specific site prior to crown-lengthening surgery. Although sulcular probing has been mentioned in the literature since the 1950s, it was not until 1989 that Ursell[9] developed a study to evaluate this clinical measurement method Nevertheless, there is a paucity of studies in the literature regarding sulcular probing as a method to identify the SGT values in individuals. The present study evaluated the clinical SGT in healthy human periodontium by sulcular probing. In this study, 30 dental students(out of which there were 21 males and 9 females) 360 teeth, and 2160 sites were probed to perform unilateral comparisons of the SGT measurements in each individual. The contra lateral comparisons were not done in this study as it was done by Barboza et al in 2008 where the results showed no statistical difference. In this study the mean supra crestal gingival tissue measurements in the maxillary and mandibular arch are highly significant with $p = 0.005$ and $p = 0.000$ respectively. Also, the clinical overall (facial and palatal) maxillary and mandibular SGT dimensions were lesser for the central incisors compared to the other teeth in the arch which were measured. Thus, indicating more bone reduction for housing the new SGT components as we move posteriorly from anterior. This particular result is in resemblance with the previous study done by Perez et al.[10] If the dimension of the SGT for a given situation is known, it is possible to reliably predict the final position of the gingival margin. Thus, the final preparation is extremely important and should respect the period needed for the SGT to heal.

CONCLUSION

There is significant difference in the SGT dimensions in the different tooth in the same arch, Maxillary and mandibular SGT dimensions were lesser for the central incisors compared to the other teeth in the arch which were measured. Thus, indicating more bone reduction as we move posteriorly from anterior. The standard 3.0 mm of bone removal for crown-lengthening procedures or 0.5 mm for tooth preparation into the sulcus should be reviewed and more studies with larger population groups are warranted.

REFERENCE

1. Gargiulo AW, Wentz FM, Orban B. Dimensions and relations of the dentogingival junction in human. J Periodontol 1961;32:261–267.
2. Smukler H, Chaibi M. Periodontal and dental considerations in clinical crown extension: A rational basis for treatment. Int J Periodontics Restorative Dent 1997;17: 464–477. 4
3. Parma-Benfenati S, Fugazzotto PA, Ruben MP. The effect of restorative margins on the post-surgical development and the nature of the periodontium. Int J Periodontics Restorative Dent 1985;5:30–51.
4. Silvers JE, Johnson GK. Periodontal and restorative considerations for crown lengthening. Quintessence Int 1985;12: 833–836.
5. Ingber JS. Forced eruption: Part I. A method of treating isolated one- and two-wall infrabony osseous defects—Rationale and case report. J Periodontol 1974;45: 199–206.
6. Ingber JS. Forced eruption: Part II. A method of treating nonrestorable teeth—Periodontal and restorative considerations. J Periodontol 1976;47:203–216.
7. Ingber JS, Rose LF, Coslet JG. The "biologic width": A concept in periodontics and restorative dentistry. Alpha Omegan 1977;70:62–65.
8. Cohen DW. Periodontal preparation of the mouth for restorative dentistry. Presented at the Walter Reed Army Medical Center, Washington, June 1962.
9. Ursell MJ. Relationships between alveolar bone levels measured at surgery, estimated by transgingival probing and clinical attachment level measurements. J Clin Periodontol 1989;16:81–86.
10. Perez JR, Smukler H, Nunn ME. Clinical Dimensions of the Supraosseous Gingivae in Healthy Periodontium.