CORRELATION OF GINGIVAL BIOTYPE WITH GINGIVAL WIDTH, PROBING DEPTH AND PAPILLARY FILL IN DIFFERENT TOOTH TYPES AND GENDER

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DOI: http://dx.doi.org/10.24327/ijrsr.2019.1008.3887

ABSTRACT

The gingival biotype is of prime importance when considering anterior teeth. There are various factors which affect the biotype of gingiva. Aims: The aim of this study was to correlate the GT with gingival width (GW), probing depth (PD), and papillary fill (PF) based on tooth type and gender. Settings and Design: Dental students and interns of a dental college in Navi Mumbai were enrolled in the study. Six teeth per subject were examined; a total of 2178 maxillary anterior teeth were assessed. Subjects and Methods: Measurement was done for GT, GW, PF and PD. The data obtained was tabulated and subjected to statistical analysis. Statistical Analysis Used: two way ANOVA test was performed to find the correlation of GT with GW, PD, and PF. Results: statistically significant effect of GT and tooth types was found on PD, PF and GW. Conclusion: The result of the study showed significant effect of biotype on various anatomical characteristics of periodontium. Diagnosis and treatment plan of esthetic zone will be highly influenced if the biotype of the surrounding mucosa is being ignored.

INTRODUCTION

Healthy periodontium tends to have a varied phenotypic appearance clinically from person to person. Gingival morphology was described in 1969 by Ochsen and Ross as “scalloped and thin gingiva” and “flat and thick gingiva”. Some authors concluded that difference in form and shape of the tooth attribute to different phenotype of gingiva. Eghbali termed it as gingival biotype. The term periodontal biotype was given by Siebert. Lindhe differentiate the two between “thick flat” and “thick scalloped”.

Gingival biotype not only varies from subject to subject but also influence other characteristics like gingival width, probing depth and papillary fill.

Hence the aim of this study is to correlate the gingival biotype with gingival width, probing depth and papillary fill for each tooth types and gender.

MATERIALS AND METHODS

The study was conducted in a dental college in Navi Mumbai. Undergraduate dental students were examined and enrolled for the study based on the following inclusion criteria. Subject of 18 years and above with all maxillary anterior teeth were present were enrolled.

ARTICLE INFO

Article History:
Received 13th May, 2019
Received in revised form 11th June, 2019
Accepted 8th July, 2019
Published online 28th August, 2019

Key Words:
Gingival biotype, gingival width, probe transparency method, papillary fill, implant dentistry, esthetics

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Subjects having masochistic habits, crown or restoration or high frenal attachment in maxillary anteriors are excluded from the study. Also orthodontic patients and history of periodontal surgery or any medication having direct effect on gingiva, were also excluded. Subjects were examined from all five years students having total strength of 450.

Measurements

Gingival thickness (GT) was measured by probe transparency method with score 0 as thin and 1 as thick. Gingival width (GW) was measured midfacially using a periodontal probe. Probing depth (PD) was also measured midfacially using UNC 15 probe. Papillary Fill (PF) was assigned score of 0 as incomplete fill and 1 as complete fill.

Statistical Analysis: It was done using Two way ANOVA test.

RESULT

Probing Depth in Teeth with Different Gingival Thickness

From the table I: we observed that gingival thickness has an effect on probing depth and at the same time tooth type also have an effect on probing depth (p < 0.05) (Graph I). Even the interaction between GT and tooth type also have an effect on PD (Table I)
Effect on gender: Both in male and female, the probing depth was more in thin gingiva as compared to thick gingiva. (Graph II)

Gingival Width in Teeth with Different Gingival Thickness

From table II: we found that GT has an effect on GW and at the same time tooth type also have an effect on GW (p<0.05) (Graph III.). Even the interaction between GT and tooth type also have an effect on GW (Table II)

Effect on gender: Both in male and female, the gingival width was more in thick gingiva as compared to thin gingiva. (Graph IV)

Table I Two way ANOVA for GT and tooth type on PD

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<tr>
<th>Source</th>
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<th>Mean Square</th>
<th>F</th>
<th>P</th>
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Graph I Estimated marginal means of PD in different tooth types

Graph II Effect of Gingival thickness on Probing depth on of male and female

Graph III Estimated marginal means of GW in different tooth types

Graph IV Effect of Gingival thickness GW on Probing depth on of male and female

Papillary Fill in Teeth with Different Gingival Thickness

From table III: we found that PF has no effect on GW (p=0.552) but tooth type also have an effect on PF (p=0.047) (Graph V.). Even the interaction between GT and tooth type also have an effect on PF. (p=0.015) (Table III)

Effect on gender: In male thin gingiva has more papillary fill whereas in female thicker gingiva has more papillary fill (Graph VI)

Table III Two way ANOVA for GT and tooth type on PF

<table>
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</table>

Graph V Estimated marginal means of PF in different tooth types
DISCUSSION

Gingival biotype defines the phenotype of the soft tissue surrounding the tooth. Various factors influence the biotype which further determines the treatment plan in various field of dentistry when working in esthetic zone.

In this study we have observed that gingival width with the gingival width, probing depth and papillary fill on the basis of different tooth types and gender. The method of evaluating gingival thickness was probe transparency method introduced by Kan JY et al in 2003. Being a non invasive method it is preferred in large sample size.

There are various other method to evaluate gingival biotype. These are transgingival probing, ultrasonic devices, CBCT scan, injection needles, and histology on cadavers. De Rouck et al. in 2009 stated that this method has a high reproducibility. We have observed that gingival thickness have significant effect on probing depth. Also biotype and different tooth types (Central Incisor, Lateral Incisor and Canine) interaction also have effect on Probing depth having p value <0.05. A study done by Muller et al in 2000 states that subject with thicker gingiva had significantly higher probing depth. We got a negative correlation between GT and PD. De Rouck et al. in 2009 observed that significant difference in pocket depth with biotype could not be found because periodontally sound subjects were included, which was also the case in our study. The results of our study were in consistent with the study of De Rouck et al.

Olsson et al. in 1993 found a strong relationship between GT and GW. In our study, we found correlation between GT and GW which was statistically significant (P < 0.0001). Also the interaction between tooth type and gingival thickness has effect on gingival width. When gender was evaluated it was found that gingival width was more in thick gingiva than thin gingiva. In our study we have observed that tooth type and gingival thickness interaction showed effect on papillary fill with p<0.05.

Romeo et al conducted a study in which the papillary fill between implant and tooth was significantly correlated with thick peri-implant mucosa.

CONCLUSION

Gingival biotype is being affected by a many factors, it is an overall process. We have to plan in a multidirection when working in esthetic zone. The clinical implication of this study will be helpful in periodontal surgeries and implant dentistry. More and more emphasis can be given to thin biotype as they are more prone to recession.

Reference


How to cite this article:

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