

## Gingival Retraction Methods Used In Different Gingival Biotypes As Classified By Anon Ross And Seibert And Lindhe Classification

Research Article

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### Abstract

To access the prevalence of the gingival biotype as classified by Anon Ross and Seibert and Lindhe classification and to evaluate its correlations with the mode of mechanical retraction employed. 200 case sheets of patients who visited SDC with a requirement of fabrication of a fixed dental prosthesis were obtained from DIAS and evaluated. The gingival biotype of the patients were assessed and classified under the Anon Ross and Seibert and Lindhe classification and the mode of retraction used for the case was also noted. Results obtained were tabulated using an excel sheet. Descriptive statistics was performed to assess the prevalence and correlation was assessed using chi square test. The prevalence of “Scalloped and thin” according to Anon and Ross and “thin” according to Seibert and Lindhe were 55.5% and 54.1% respectively. Similarly for “flat and thick” and “thick” the prevalence was 44% and 45% of total sample size. There is a statistically significant association between the mechanical retraction method used in both the gingival biotypes. Gingival health is of paramount importance. The mechanical retraction method used should be in accordance with the gingival biotypes to prevent unwarranted trauma to the gingiva. This necessitates the need for a protocol to use a particular retraction method based on gingival biotypes.

**Keywords:** Anon Ross Classification; Gingival Biotype; Gingival Retraction; Seibert-Lindhe Classification.

### Introduction

The clinical success and longevity of any prosthetic restoration is dependent on accurate recording of the surface that receives the restoration [1-4]. In terms of the dental crowns the relationship between the health of the periodontium and the restoration of the teeth is inseparable [5-8]. As much as it is necessary to record the prepped tooth surface and the finish lines; it is equally important to maintain the health of the periodontium [9-11]. Hence before attempting to perform any gingival displacement technique in the process of impression making, it is important to assess the periodontal health of the tooth or teeth involved [12-14]. There are three major steps involved in the examination of the periodontium which includes [15].

1. Periapical/ Bitewing to assess crestal bone level .
2. Visual examination - color, contour, consistency, position, surface, texture.
3. Sulcus depth measurement.

Before choosing a displacement technique it is also important to evaluate the biotype of the gingival to be manipulated. The types of gingival biotypes were first described by Oschsenbien and Ross in 1969 into “Scalloped and thin” and “flat and thick” [16]. This was followed by Seibert and Lindhe who classified them as “Thick” which was > or equal to 2mm thickness and “Thin”, greater or equal to 1.5mm thickness [17, 18]. The “Thick and Flat” biotype consists of greater amounts of fibrous tissue [19]. They are better resistant due to underlying bone. The “Scalloped and thin” biotype is thin friable with limited masticatory mucosa and

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trauma to the gingiva could lead to inflammation and development of black triangles.

The most commonly used mechanical tissue displacement technique includes the single or double cord technique [20]. The double cord technique though takes additional time and could induce trauma; it comes handy when the finish line is subgingival. The cords used for a gingival sulcus should be such that the induced trauma should be reversible. Works of authors such as Wassell et al., [21] and Clyde S et al., [14] dictate the protocol of use of the double cord technique.

There is numerous literature individually on the biotype of gingival tissue such as the works of Sanavi F et al., [22], RG Shiva Manjunath et al., [23], and similar works on the different gingival retraction methods. But there is a sheer lack of studies describing a relation between the gingival biotype and the size of the cord that was used.

This study hence aims to assess the prevalence of the biotype of gingiva and to correlate the kind of mechanical retraction employed.

**Material And Method**

The study was designed to be a retrospective strictly; based on patient data. The study was conducted in Saveetha Dental College, Chennai during the period of March 2019 to March 2020.

200 case sheets were randomly selected from among the patients who had undergone fabrication of fixed dental prosthesis.

The case sheets were obtained from the institution’s record maintenance system (DIAS) which maintains all the patient related information, records of treatment done and the patient photographs.

The gingival biotype of the patient’s gingiva was recorded under two classification systems; Aron and Ross, and Seibert and Lindhe.

Following this, the details of mechanical retraction of gingiva was obtained. This included the combination of cords used in gingival retraction.

The obtained data was tabulated using Excel sheets and statistical analysis was performed using SPSS software version [23].

Descriptive analysis was done to assess the frequency and percentage of distribution. Followed by this the correlation between the combination of mechanical retraction was done against the gingival biotype using Chi square test.

**Results And Discussion**

The frequency distribution of gingival biotype showed the following results (Table 1);

The thinner gingival biotypes falling under “Scalloped and thin” in Anon Ross and “thin” were marginally more prevalent; 55.8% and 54.3% respectively as compared to the thicker biotypes of gingiva. There was increased association between thick biotype gingiva and the use of the combination of a 00 size and a 1 size cord. Similarly for the thin gingival biotype the use of combination of a 000 size with 1 size cord was more prevalent. The correlation between the gingival retraction method and the gingival biotype was also significant with p=0.006 for Anon Ross classification and p=0.002 for Seibert and Lindhe classification.

The current study evaluated the prevalence of the commonly occurring gingival biotypes in patients undergoing fabrication of fixed partial denture. The measured prevalence was based on the Anon- Ross and Seibert- Lindhe classification. The gingival biotype classifications are not limited to these, and the other classifications which are related to this includes; classifications by Becker et al [24] and De Rouck et al., [25-27].

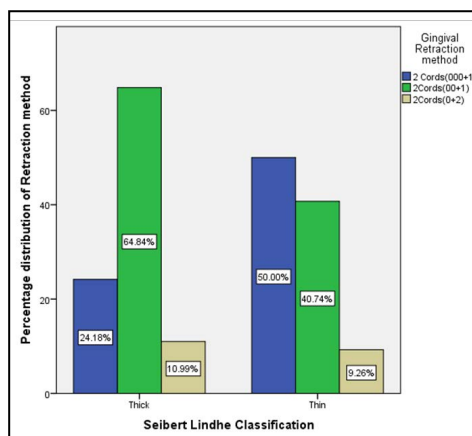
The prevalence of both the thick and thin variant was in a similar range, negating the possible error in the evaluation. Similar studies on prevalence of gingival biotype was done by KH Zawawi et al [28]; R shah et al., [29] and many other authors [30, 31].

The method of gingival retraction employed has direct influence on the gingival tissues. Gingival retraction may be mechanical, chemical or mechano-chemical. The combination of mechanical and chemical can lead to varying degrees of stripping or necrosis of the gingival sulcus. Mechanical retraction done with the application of proper techniques is unlikely to cause serious injury to the sulcus. The studies performed by Ameroth G; and Harrison J are testaments to the fact [33].

**Table 1. Depicting the frequency distribution of retraction method with respect to the gingival biotype; frequency distribution of the gingival biotypes; Chi-square and p value of association. The table shows that the thinner biotypes are marginally more prevalent than the thicker biotypes, and there exists a statistically significant association between gingival biotype and the choice of cords for mechanical retraction.**

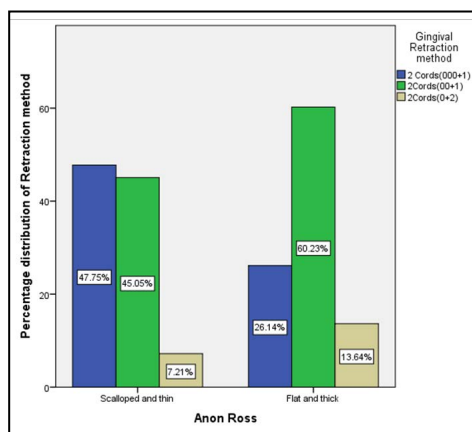
Gingival Biotype	Gingival Retraction Method			Frequency Distribution	Chi-square	P value
	2 Cords (000+1)	2 Cords (00+1)	2 Cords (0+1)			
Anon Ross Flat&Thick	26.10%	60.20%	13.60%	44.20%	10.208	0.006
Scalloped & Thin	47.70%	45.00%	7.20%	55.80%		
Seibert & Lindhe Thick	23.30%	65.50%	11.10%	45.20%	16.775	0.002
Thin	50.10%	40.70%	9.20%	54.30%		

**Figure 1.** Bar graph shows the association between gingival biotype classified by Seibert Lindhe classification (X-axis) and percentage distribution of the gingival retraction methods (Y-axis). The most commonly used combination of cords for mechanical retraction among Thick gingival biotypes is the 2 Cords (00+1) (Green) and for thin biotypes it is 2 Cords (000+1) (Blue). Chi-square value-16.775; p - 0.002; hence statistically significant.



**Figure 2.** Bar graph shows the association between gingival biotype classified by Anon Ross classification (X-axis) and the percentage distribution of the gingival retraction methods (Y-axis).

For the Scalloped and Thin biotype 2 Cords (000+1) (blue) was commonly used, and for Flat and thick 2 Cords (00+1) (Green) was commonly used. Chi-square-10.208; p value - 0.006; hence statistically significant.



The current study made use of a combination of two threads, one being smaller than the other. The smaller thread functions to prevent hemorrhage and seepage from the gingival sulcus. The larger cord is placed above this to displace the gingival tissue away from the margin. Study performed by Hansen et al showed the prevalence of choice for the two cord impression technique over the other [34]. Three combinations of cords were used in this study; (000+1) (00+1) and (0+1). The result of the study revealed that the combination (00+1) was commonly used. There was a statistically significant relation between the method of mechanical retraction and the gingival biotype. This signified the correct usage of combinations of cords for a particular gingival biotype. The current study compared only the prevalence of mechanical retraction methods and correlated it with the gingival biotype. Evaluation of different types of retraction methods; will yield a more comprehensive result and would provide more options for the practitioners. Study done on a large scale; with data from different centres could bring in more and varied information regarding the scenarios of gingival retraction.

Gingival retraction is an important aspect of impression making and plays a vital role in dividing its quality [30-33]. Further research, incorporating the elements of pressure exerted by the

cord and the tissue retraction of the gingiva to this pressure could be correlated with the selection of method of retraction. This could also enable us to lay down a protocol with standardised techniques for retraction based on gingival biotypes.

### Conclusion

As observed from the current study, the thinner gingival biotypes as classified by both Seibert and Lindhe and Anon Ross classification were marginally more prevalent than the thicker biotypes. There was a significant association with the choice of cords used in mechanical retraction in terms with the gingival biotypes. A combination of 000+1 size cords were used in thinner gingival biotypes and 00+1 were used in thicker biotypes. Careful examination of gingival biotype is necessary for appropriate treatment planning and also in monitoring the outcome measures. Use of the correct method of gingival retractions could guarantee an accurate impression and a better fitting prosthesis. Further research on this will only improve the existing protocol and thus be encouraged.

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