



PRACTICE OF GINGIVAL RETRACTION TECHNIQUES FOR FIXED PARTIAL DENTURE IMPRESSIONS BY DENTAL PRACTITIONERS ACROSS SOUTH INDIA – A CROSS-SECTIONAL STUDY

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Abstract:

Background: Complete coverage restorations frequently need margins along subgingival areas due to caries, aesthetic requirements, restorations that are already present, or as a prerequisite for more retention.

Aim: The purpose of the research was to assess the practice of gingival retraction techniques for FPD impressions by dental practitioners across South India through a questionnaire based cross-sectional survey.

Materials and methods: A cross sectional survey was conducted on 117 dental practitioners across south India. The questionnaire was designed in google forms and sent to dental practitioners for their response.

Results: The results revealed that dental professionals were of divided opinion regarding the treatment strategies for FPD. Among the professionals, majority preferred equi-gingival margins (70.9%), while 19.7% preferred supra-gingival and only 9.4% preferred sub-gingival margins for tooth preparation. Among the various gingival retraction techniques, the most preferred one was single cord technique (78.6%). 76.9% dentists preferred gingitage for exposing the margins, while the rest did not do it. 71.8% dentists agreed to have adequate training with the retracement procedure.

Conclusion: Dental practitioners are of mixed opinion about the treatment of FPD, with a majority preferring equi-gingival margins. There is a need to give training to dental professionals in gingival retraction procedures. Dental professionals need to be trained in different gingival retraction techniques.

Key words: Gingival retraction, retraction techniques, margins and cords, impression making

INTRODUCTION

The enduring success of fixed partial dentures mainly relies on the well-being and firmness of the adjacent periodontal structures. Complete coverage restorations frequently need margins along subgingival areas due to caries, aesthetic requirements, restorations that are already present, or as a prerequisite for more retention.¹ An accurate impression plays a crucial role in the final success and longevity of fixed prosthesis. Gingival retraction is considered as the procedure to guarantee the accuracy of impression, especially in the design of subgingival finishing lines for specific conditions. It acts by physically pushing the gingiva away from the finish line to make accurate impressions, but it cannot control sulcular fluid seepage.² To register the subgingival finish lines, the gingival tissue must be displaced during all impression procedures. For a successful subgingival impression, the sulcular environment must be effectively managed. It entails two major components: the force exerted on the gingival tissues and contaminants that may be present or generated in the sulcus. Gingival retraction, haemostasis, and sulcular cleansing are frequently combined and closely related procedures with distinct goals. Retraction techniques can be classified as mechanical, chemical or surgical and are often used in combination.³

Studies have shown that the commonest mistakes in making impressions is the lack of adequate detail in the cervical region of the tooth.⁴ A good knowledge of atraumatic gingival

retraction is paramount for accurate impressions. To our knowledge, currently there is no available data about the practice of gingival retraction techniques among dental practitioners across South India. There is a need to assess the barriers to implementing these techniques to formulate effective solutions that enable routine practice of gingival retraction techniques.

AIMS AND OBJECTIVES

The purpose of the research was to assess the practice of gingival retraction techniques for FPD impressions by dental practitioners across South India through a questionnaire based cross-sectional survey.

METHODOLOGY

Study design

A Cross sectional questionnaire study was conducted on Dental practitioners across south India. Using the Open-Source Epidemiologic Statistics for Public Health (Open Epi, V.3.01 updated 2013/04/06), the needed sample size was 100 respondents and random sampling technique was used. A questionnaire that has been validated with a pilot study was designed in google forms and sent to dental practitioners for their response. The online survey started on the 28th of September 2021 and the preliminary dataset (n = 117) was extracted on the 11th of October 2021.

Study participants, sample size and sampling:

The study sample included prosthodontists who are attached to dental institutions, prosthodontists who have their private practice and post graduate students of prosthodontics.

Inclusion criteria

Dental practitioners practising in South India.

Exclusion criteria

Dental practitioners not practising in South India.

Not willing to participate in the study.

The Questionnaire Design and content of the questionnaire

The questionnaire was designed in google forms, to evaluate the practitioners' preference of gingival retraction technique to carry out FPD impressions. The questionnaire was prepared about finish lines preferred, impression techniques and materials used and Gingival retraction techniques preferred. It was prepared to find out what sort of gingival finish line each practitioner preferred, which impression material they preferred to use and how perfect they wanted their impression to be. Details about retraction cord usage, techniques and medicaments and other gingival retraction techniques were asked. Marginal fit of the prosthesis, and steps followed in case of a misfit, were the various types of questions included in the questionnaire. (Figure 1)

Figure 1: Questionnaire utilized in the study

Q.NO.	Questions in the present research
1	How long have you been practicing crown and bridge?
2	Which gingival margin do you generally prefer for crowns and bridges?
3	Which impression material do you use for final impressions?
4	Do you verify finish margins in the final impressions prior to pouring the cast?
5	How often do you repeat final impressions because of inability to capture prepared finish lines?
6	Do you use retraction cord prior to final impression making?
7	Technique used?
8	Type of cord used?
9	Which type of medicament you use for dipping retraction cord?
10	You have never used retraction cord for the reason(s) cited below
11	Do you use gingitage for exposing prepared crown margins
12	Do you use electro surgery technique to achieve gingival retraction?

13	Does your lab ask for repeat impressions as they are unable locate prepared margins?
14	Do you verify marginal fit of the casting on the working cast
15	Do you verify adequate marginal fit of the casting clinically
16	If there is a misfit of the casting/ marginal defects/opening do you repeat procedures from impression making with gingival retraction?
17	Do you have adequate training in gingival retraction
18	Problems you face in gingival retraction if any?

Data Analysis

The data obtained was analysed by using descriptive statistical analysis like frequency percentage and mean value was carried out with the help of SPSS 20.0. Chi-square test was utilized to initiate a comparison between various variables.

RESULTS

117 South Indian dental practitioners participated in the survey. Among these participants, 62 were female and 55 were male, comprising of 98 practitioners qualified with Masters in Dental Surgery (MDS) and others being Bachelor of Dental Surgery (BDS). Among the MDS, majority of them were Prosthodontists. The results revealed that dental professionals were of divided opinion regarding the treatment strategies for FPD. Among the professionals, majority preferred equi-gingival margins (70.9%), while 19.7% preferred supra-gingival and only 9.4% preferred sub-gingival margins for tooth preparation.

The most preferred impression material of choice included 75.2% addition silicone. 97.4% of the practitioners agreed that the finish line was verified in the final impression before pouring the cast. Only 10.3% professionals reported that they repeated the impression, if the finish line was not captured in the impression, while 78.6% did it occasionally and 11.1% never did it. 35% dentists agreed on the frequent use of the retraction cord, 35% agreed on occasional use, 20.5% preferred to use it always, while 9.4% completely denied

using the retraction cord. Among the various techniques, the most preferred one was single cord technique (78.6%). There were various types of cords used, but the one widely used was the braided type (35%) and among the variety of medicaments, local anaesthetic solution was preferred by 39.3% of dentists. The most common reason for not using retraction cord was unanswered (59%). The answer that included most common reason was that it is technique sensitive. 76.9% dentists preferred gingivage for exposing the margins, while the rest did not do it. Only 6.8% dentists used electrosurgery for gingival retraction, while majority (93.2%) did not employ it. 94.9% professionals verified the marginal fit of the casting on the working cast, 96.6% checked clinically. Only 82.1% repeated the impression making with gingival retraction in case of misfit. 71.8% dentists agreed to have adequate training with the gingival retraction procedure.

DISCUSSION

One of the most challenging aspects of crown and bridges the management of the gingival tissues while making an impression. Tissue management includes placing the gingival tissues away from the preparation margins so that the margins can be recorded accurately. Across the globe, researches have been conducted on different methods of gingival displacement, their effects on gingival and periodontal health as well as the marginal adaptation after gingival displacement technique, but not many have evaluated the percentage of clinicians using this technique and also their preference of methods for gingival displacement.⁴

Moldi *et al.* in 2013, evaluated from his study that 60.3% of dentists indicate the use of mechano-chemical method and 24.8% dentists indicate the use of chemical method, 12.4% use of surgical method and 2.5% indicate the use of laser. That also indicated that most preferable was mechano-chemical method of gingival displacement. These results support the

study which showed that among all the prosthodontists in Vadodara city, 62% preferred the use of gingival displacement technique for successful clinical practice while 38% of them did not follow the procedure believing it does not make major difference in clinical practice. Out of those who perform gingival displacement technique, 83% prosthodontists use mechano-chemical method.⁵

Katreva *et al.* in 2015, concluded that 76.10% of the polyvinyl siloxane impressions obtained better results after the displacement with nasal decongestants. Their findings are similar to the result of this survey which showed that 57% of prosthodontists used nasal/eyedrops as a medicament of choice while performing mechano-chemical method. This is because these nasal decongestants consist of xylometazoline (0.05% xylometazoline hydrochloride) and visine (0.05% tetrahydrozoline hydrochloride) which have absence of cytotoxic effects on soft tissues and less hard tissue sensitivity, and many dentists also preferred its use as they are cheap and easily available.⁶

Chaudhari *et al.* in 2015, suggested that sympathomimetic amines such as oxymetazoline and tetrahydrozoline can also be used as a gingival displacement agent as pH of tetrahydrozoline is alkaline, so it causes less damage to the gingival tissues and also to the tooth structure.⁷ Out of the 30 cases studied, mild injury was noticed with the use of Expasyl, Magic Foam Cord, and impregnated retraction cord, of 6.67, 20, and 36.67%, respectively. Moderate injury was observed with the use of impregnated retraction cord in 20% of the cases. No severe injury was observed with the use of different retraction materials.⁸ According to the findings effect of gingival retraction with Expasyl paste were similar to plain cord, retraction using Expasyl paste produced less gingival recession and inflammation than aluminum chloride pre saturated cord.⁹

The present study did not include questions pertaining to the reasons for the use of a particular technique, type of cord, impression material or the particular type of medicament. Future studies could compare the different types of techniques used and what are the perceived benefits of using a particular technique, which type of retraction cord can be used and why, and a comparison of the types of medicaments available. Also, the focus area should be the types of impression materials available that can reproduce accurate and finer details. The importance of why the retraction system holds more importance than the ones where the particular technique is not utilised.

Many more studies have to be performed in the future to analyse various retraction systems that are commercially available and made explicitly for fixed partial impressions. Digital techniques could be used to make measurements than manual measurements. Every dentist must be adequately trained for the retraction process.

CONCLUSION

Within the limitations of the present study, dental professionals are of divided opinion of using retraction techniques. Adequate training must be given to the dental professionals regarding the retraction procedures as the proper fit of the prosthesis is essential for the compatibility with the tissues and the success of the prosthesis.

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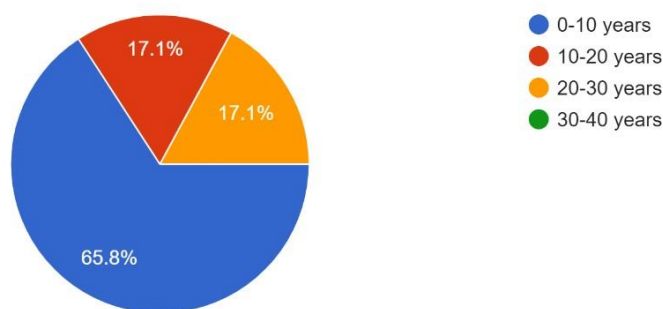
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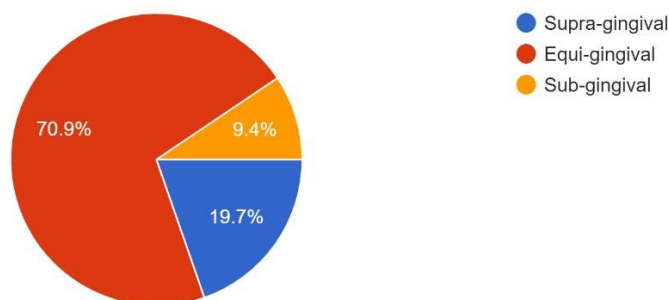
4. How long have you been practicing crown and bridge?

117 responses



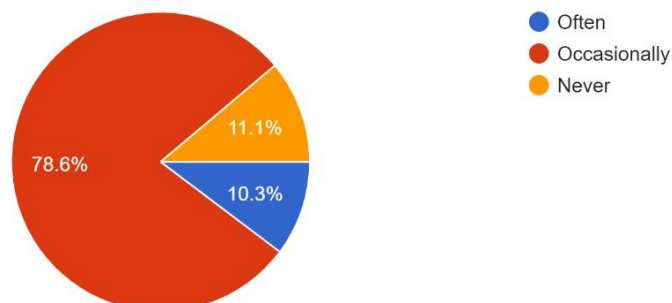
5. Which gingival margin do you generally prefer for crowns and bridges?

117 responses



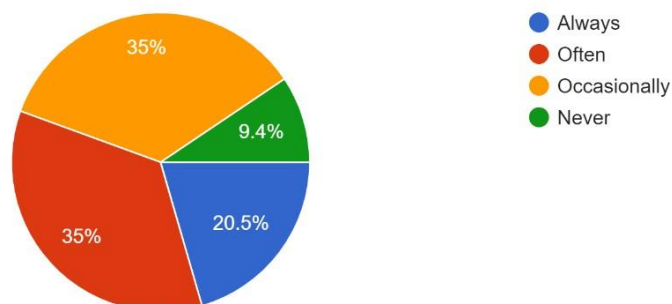
8. How often do you repeat final impressions because of inability to capture prepared finish lines?

117 responses



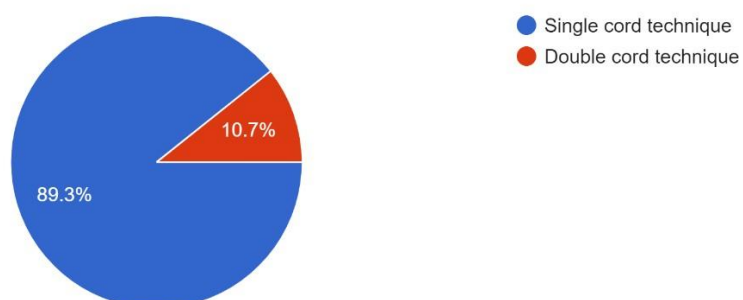
9. Do you use retraction cord prior to final impression making?

117 responses



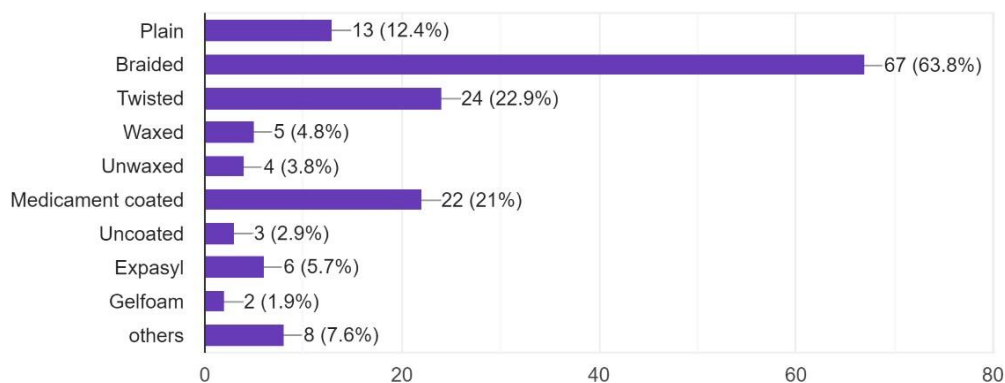
Technique

103 responses



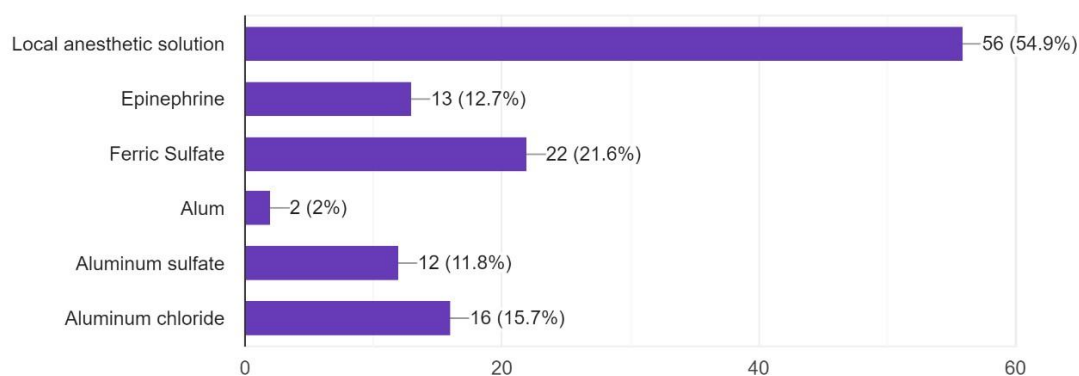
Type of cord

105 responses



Which type of medicament you use for dipping retraction cord?

102 responses



13. Do you use gingivage for exposing prepared crown margins?

117 responses

