

ORIGINAL RESEARCH

Gingival Displacement Methods used by Dental Professionals - A Survey

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ABSTRACT

Introduction: Gingival tissue management is one of the most important but commonly neglected aspect in crown and bridge impression procedures. Gingival displacement includes displacing the gingival tissues away from preparation margins so as to provide homeostasis and record the tooth structure below the finish line. Proper gingival retraction assures an excellent marginal fit thereby reducing the chair side time required for fitting the indirect restoration. The aim of the present study was to identify the methods used by dental professionals for gingival displacement before making impressions for fixed prostheses.

Materials & Method: A printed questionnaire was distributed to over six hundred dentists at a national dental conference held in Hyderabad. The questionnaire was designed to know the preferred method of gingival displacement, medication used, frequency of performing gingival displacement etc. The results were analyzed and represented in the form of percentage. This method of survey distribution was selected in order to reach dental professionals in wide range.

Results: Out of six hundred dentists who received the questionnaire, 63.3% returned properly filled forms. Sixty eight percent of respondents advocate gingival displacement for all fixed prostheses cases, twenty three percent use for long span fixed prostheses cases and nine percent of respondents use gingival displacement only for selected cases. Among the respondents sixty nine percent preferred to use chemico-mechanical method, sixteen percent surgical method, nine percent of respondents preferred to use mechanical method.

Conclusion: There are a variety of techniques and materials that allow the clinician to manage the gingival tissues during when making an impression. Gingival retraction provides a solution to various problems like poor marginal fit, poor emergence profile that occurs during cementation of indirect. With rapid advance in technology there are a lot of technique and materials available in the market starting from retraction cord to use of lasers. Practitioner's choice of material and technique used depends on his own choice and his judgment of clinical situation.

Keywords: Gingival displacement, retraction cord, gingival retraction.

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INTRODUCTION

Displacement of the gingival tissue is essential for obtaining accurate impressions for the fabrication of fixed prostheses, particularly when the finish line is at or within the gingival sulcus.^{1,2} Finish lines are frequently placed at or just below the crest of the gingival margin, meaning that gingival retraction is usually necessary when impressions are taken.³ Gingival retraction is the displacement of gingival tissue to gain access to the tooth surface below the finish line. Gingival retraction is done to provide sufficient space between sulcular epithelium and tooth structure below the finish line so as to accommodate sufficient bulk of impression material into the expanded sulcus.⁴ Various studies have documented the dimension of sulcus at the finish line as 0.2 mm, impressions taken without gingival retraction have been reported to have higher incidence of voids and tearing of impression material due to poor tear strength in thin sections.^{5,6} The techniques used to accomplish gingival deflection can be classified as mechanical, chemico-mechanical, surgical. The surgical techniques can be further broken down into rotary curettage and electro surgery.⁷

The mechanical method of gingival displacement using plain retraction cord has been a standard for several years. It acts by physically pushing the gingiva away from the finish line, but its effectiveness is limited be-

cause of its inability to control the sulcular fluid seepage.^{8,9} The chemicomechanical method using retraction cords impregnated with haemostatic agents and astringents is the most commonly used method. Enlargement of gingival sulcus as well as control of fluids seeping from the walls of gingival sulcus is readily accomplished by combining chemical action with pressure packing.¹⁰ The chemicals used along with retraction cords can be broadly classified into vasoconstrictors and astringents. Vasoconstrictors are epinephrine. Astringents are aluminum potassium sulfate, aluminum chloride, ferric sulfate etc. Surgical retraction methods are rapid but destructive and involve excision of tissue. Gingival displacement paste (Expasyl, Pierre Rolland, France), which contains Kaolin and Aluminum chloride, has been recently introduced.

The aim of this survey was to determine the frequency of using gingival displacement, preferred method of gingival displacement and medicaments used by dental professionals.

MATERIALS AND METHOD

Printed closed & open-ended questionnaires were distributed to six hundred dental professionals (Post graduates, Staff & Practitioners) at a National Dental Conference held in Hyderabad. The questionnaires were distributed at the reception counter in the morning and the delegates were requested to hand over the filled forms at the same counter later in the evening. The data collected and analyzed. The questionnaire contained the following questions.

1. How often do you perform gingival retraction procedure before making impressions for fixed prostheses?
 - a. For all fixed prostheses cases
 - b. For long span fixed prostheses
 - c. For only selected cases
 - d. Never
 - e. Others (specify)
2. Your preferred method of choice for gingival displacement.
 - a. Mechanical
 - b. Chemicomechanical
 - c. Surgical
 - d. Combination of the above.
 - e. Others (specify)
3. If you prefer chemicomechanical method which chemical do you prefer to use?
 - a. Epinephrine
 - b. Aluminum chloride
 - c. Ferric sulfate

- d. Aluminum potassium sulfate
 - e. Tannic acid
 - f. Others
4. Do you wet the retraction cord before removal from the gingival sulcus?
 - a. Yes
 - b. No
 5. Do you ask for medical history?
 - a. Routinely
 - b. Occasionally
 - c. Never
 6. Do you check pulse rate & Blood pressure?
 - a. Routinely
 - b. Occasionally
 - c. Never
 7. Have you ever had a patient complaining of any systemic manifestations as a result of gingival displacement?
 - a. Yes
 - b. No

STATISTICAL ANALYSIS

Tables were generated with the help of SPSS version 21. Descriptive statistics was used to generate results.

RESULTS

A total three hundred and eighty out of six hundred questionnaires were returned and response rate was 63.3%. The data was presented in tables and the frequency was represented in terms of percentage. The data was discussed as follows.

In the present survey majority 68% of the respondents perform gingival displacement procedure for all fixed prostheses cases, 23% of respondents only for long span fixed prostheses cases and 9% only for selected cases. In the present survey chemicomechanical method was preferred by majority (69%) of the dentists. Mechanical method of gingival displacement was preferred by 9% of the respondents and 16% of respondents preferred to use surgical method of gingival displacement. In the present survey twenty four percent of respondents preferred to use epinephrine, Aluminum potassium sulfate, Ferric sulfate and Tannic acid were preferred by 11%, 9% and 5% respondents respectively. In the present study majority of the respondents check the medical condition of the patient occasionally.

DISCUSSION

There are a variety of techniques and materials that al-

low the clinician to manage the gingival tissues during restoration and when making the impression. No scientific evidence has established the superiority of one technique over the other. The selection of any one of the various methods of soft tissue management to control the operative site depends on the clinical situation and the preference of the operator. In the present survey majority of the respondents perform gingival displacement procedure for all fixed prostheses cases. Twenty three percent of respondents only for long span fixed prostheses cases and nine percent only for selected cases (table-1).

In the present survey chemicomechanical method was preferred by majority (69%) of the dentists. This could be due to the marketing and availability of various medicaments more than before. Mechanical method of gingival displacement was preferred by nine percent of the respondents (table 2). Donovan et al reported 16.97% dentists using plain cords for mechanical method of gingival retraction. In the present study sixteen percent of respondents preferred to use surgical method of gingival displacement. This was also shown by Azza Al- Ani et al¹¹ that a relatively high number of participants using surgical method for gingival displacement. In the present study survey chemicomechanical method was preferred by majority (69%) of the dentists (table-3). On the other hand Donovan et al reported only 19.39% dentists using Aluminum chloride. In the present survey majority of the respondents preferred to use Aluminum chloride. This could be due to the increased level of awareness regarding the side effects of epinephrine.

In the present survey twenty four percent of respondents preferred to use epinephrine. Donovan et al reported 79.3% of dentists using epinephrine. David H. Shaw et al¹² reported that epinephrine impregnated cord was used by 55% dentists as the method of first choice for gingival retraction.

In the present study Aluminum potassium sulfate, Ferric sulfate and Tannic acid were preferred by 11%, 9% and 5% respondents respectively. Very less number of respondents using Tannic acid. This could be because of the fact that it has a minimum effectiveness as a gingival displacement medicament.

In this study majority of the respondents check the medical condition of the patients only occasionally (table 4). Donovan et al (1985)¹⁰ reported a much higher percentage of dentists checking the medical condition of the patients.

Removing a dry cord from the gingival crevice can cause injury to the delicate epithelial lining.¹³ In the

Frequency of performing gingival displacement	Percentage of respondents n (%)
For all fixed prostheses cases	258(68)
For long span fixed prostheses cases	86(23)
For only selected cases	36(9)
Total	380(100)

Table-1: Shows the frequency of performing gingival displacement procedure.

Method of Gingival displacement	Percentage of respondents n (%)
Mechanical	34(9)
Chemicomechanical	262(69)
Surgical	61(16)
Combination of the above	4(1)
Others	19(5)
Total	380(100)

Table-2: Percentage of respondents using various gingival displacement methods.

Medicament used	Percentage of respondents n (%)
Epinephrine	63(24)
Aluminum chloride	133(51)
Aluminum potassium sulfate	29(11)
Ferric sulfate	24(9)
Tannic acid	13(5)
Total	262(100)

Table-3: Percentage of respondents using various medicaments.

Frequency of checking medical history	Pulse rate & Blood pressure n (%)	Medical history n (%)
Routinely	120	160
Occasionally	196	193
Never	64	27
Total	380(100)	380(100)

Table-4: Percentage of respondents checking medical history.

present study 69.2% respondents wet the retraction cord before removal from the gingival sulcus. Donovan et al reported that only 33.94% of respondents wetting the cords before removal from the sulcus.

In this study only 2.8% of respondents reporting systemic reactions in the form of increased pulse rate, increased blood pressure, palpitations and syncope as a result of gingival displacement procedure. Donovan et al¹⁰ reported a much higher percent of dentists who reported patients that experienced some systemic manifestations to gingival displacement procedures.

CONCLUSION

Within the limitations of the survey, the following conclusions were drawn. Majority of the respondents advocate the gingival displacement procedure for all the fixed prostheses cases. Majority of the respondents (approximately 69%) prefer to use chemicochemical method for gingival displacement. Aluminum chloride was preferred by a higher percentage of respondents than other medicaments. Majority of the respondents check the medical condition of the patient occasionally. 69.2% respondents wet the retraction cord before removal from the gingival sulcus.

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