



Knowledge, attitude, practice, and use of retraction cords in fixed partial dentures among the dentists of Madurai district in Tamil Nadu

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ABSTRACT

Precision and accuracy are involved in every step and form an important aspect of fixed prosthodontic treatment. The marginal borders of impression materials should have adequate thickness to prevent distortion and achieve an accurate record of the margins. This can be achieved by proper retraction of the gingiva. The study aimed to assess the knowledge, attitude, practice, and use of gingival retraction cords during fixed partial denture fabrication among dentists of Madurai district Tamil Nadu, India. Hundred (n=100) dentists were included in our study. Dentists who are not willing to participate in the study and non-practitioners were not considered for our study. The clinicians elaborated on the study and consent was taken. Data was collected using a questionnaire for dentists regarding knowledge, attitude, practice, and use of gingival retraction cords. The study had been carried out for 3 months. The attitude score was (68.7%) indicating a positive attitude. The knowledge score was (58.9%) indicating positive knowledge. The practice score was (43%) indicating willingness to practice the gingival retraction cord. Within the constraints of the study, there is an average level of knowledge about the retraction cords among dental practitioners. However, they exhibit a positive attitude and low interest in practicing with gingival retraction cords for a fixed partial prosthesis.

Keywords: Gingival retraction cords, dental practitioners, prosthesis

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INTRODUCTION

The term 'Gingival retraction' refers to the isolation of the marginal gingiva apart from its tooth surface [1]. The aesthetic appearance and shelf life of the restorative filling are highly based on gingival and periodontal factors. The restoration should always be in harmony with the surrounding soft tissues so that all the methods carried out should consider the good condition of the gingiva and surrounding tissues [2]. Moisture contamination plays a crucial role while performing both direct and indirect restorative procedures. Moisture control should be achieved by effective isolation procedures. The commonly used technique of isolation is gingival retraction. It helps in the achievement of ample control and proper access to the prepared tooth surface.

Placement of retraction cords in subgingival margins in prepared tooth helps dental practitioners to get an idea of effective margin achievement, the proximity of restorations to the finish line, esthetic purpose, to obtain the finish line in impressions and also to control the crevicular fluid and blood. Keeping the margins supra gingivally helps in maintaining periodontal health, but lacks aesthetics. Hence, when there is an esthetic requirement, the margin of the restoration should be sub-gingivally placed [3]. For placing the margins sub-gingivally, there is a necessity of sufficient soft tissue retraction which allows adequate

penetration of the impression compound to flow and replicate the details of tooth preparation and margins, along with unprepared apical tooth structure [4]].

Finish lines are generally placed at the border of the marginal gingiva where gingival retraction is usually not necessary while taking an impression[5].The gingival retraction agents should be safe and effective, can be administered easily, and the cause should be immediately reversible, and provide temporary displacement [6].Before the application of any gingival retraction and before planning any sub-gingival restoration, it is necessary to evaluate the gingival status and surrounding supporting structures. It is necessary as the subgingival placement of restoration margins can harm the thin and soft gingiva.

Various gingival retraction methods were available such as mechanical, chemo-mechanical, rotary gingival curettage (gingitage), electrosurgical, and laser. When a gingival retraction procedure is performed, it creates a force in all directions throughout the gingiva which included retractive, displacing, collapsing, and relapsing forces [7,8].

Retraction cords are generally used for displacing gingival tissue. Based on fabrication, they can be knitted, twisted, or braided [9]. They are also impregnated or non-impregnated. The cords can be used as per the preference of the clinician since they do not have size standardization.

Tissue management before taking an impression has not become mandatory in the Indian scene but slowly it is becoming popular. Even though many practitioners deny the importance of gingival retraction, many of them do advocate for it to their junior colleagues. The unrealistic perception of success and handling difficulties might be forcing the practitioners to dispense with gingival retraction which no doubt is an essential clinical practice.

Our study assessed the knowledge, attitude, practice, and use of gingival retraction cords during FPD therapy among dentists of Madurai district in Tamil Nadu, India.

MATERIALS AND METHODS

The study was performed among dental practitioners who are practicing in the Madurai district, Tamil Nadu. Ethical clearance was obtained from the Institutional Ethical Committee (VDCW/IEC/251/2021). Dentists who are not willing to participate in the study and non-practitioners were not considered for the study. The clinicians were explained about the study and consent was obtained. Data was collected using a questionnaire for dentists regarding knowledge, attitude, practice, and use of gingival retraction cords[10,11]. The study had been carried out for 3 months.

Questionnaires were distributed personally to the practicing dentists in their dental offices by a single investigator and answered questionnaires were collected after two days. The questionnaire allowed respondents to select any one option for a question. Eligible participants were issued with a questionnaire (15 questions). It had seven questions concerning knowledge, 3 questions regarding attitude, and 4 questions concerning the use of the gingival retraction cord. Knowledge items concentrated on the retraction cord's choice for each prosthetic technique. Attitude items covered domains like the importance of the retraction cord's requirements. Practice items covered gingival retraction cords placed in the gingival tissue and making impressions. The data were entered in a Microsoft Excel sheet. Descriptive statistics were used.

RESULTS

The attitude score was (68.7%) indicating a positive attitude. The knowledge score was (58.9%) indicating positive knowledge. The practice score was (43%) indicating willingness to practice the gingival retraction cord. Table 1 tabulates the scores concerning attitude, knowledge, and practice. Graph-1 pictorially represents the scores of attitude, knowledge, and practice.

Variable	Frequency
Attitude	68.7%
Knowledge	58.9%
Practice	43%

Table 1: Frequency of attitude and knowledge among study subjects

DISCUSSION

Taking an impression is crucial to achieve a replica. The goal of an ideal impression should be a replication of a dimensionally stable cast that can serve as a mold. The impression materials should be chosen according to the subjective preference of the clinician based on their idea, handling method, and technique used. Recently, clinicians have started the application of PVS and polyether due to their effective physical and mechanical properties, But in this study dental practitioners tended to use Irreversible hydrocolloid.

The retraction cord is the isolation of the marginal gingiva apart from the tooth surface. It has wide applications in fixed prosthodontics and operative dentistry to visualize the finish line placed sub gingivally, in a conservative approach for the treatment of root caries, cervical abrasion, and root sensitivity where it helps in isolating the gingival tissue away from the tooth marginal area to achieve the proper replica of the teeth. They are most commonly used for displacing the gingival tissue.

Practitioners of fixed prosthodontics prefer to use a retraction cord, which is forcibly placed to enlarge the gingival sulcus. Before the application of any gingival retraction and before planning any sub-gingival restoration, it should be necessary to evaluate the gingival status and surrounding supporting structures. It is necessary as the subgingival placement of restoration margins can harm the thin and soft gingiva. The finish line area should be recorded during impression making which permits the necessary flow of the impression material near them. The exact impression is generally obtained with a 0.15-0.20 mm width of the sulcus. If there is less width of the sulcus, then the impression material cannot withstand the deformation and may rupture which decreases the marginal efficacy of the impression.

When a gingival retraction procedure is performed, it creates a force in all directions throughout the gingiva which included retractive, displacing, collapsing, and relapsing forces. Retractive force is the downward and outward force developed on the gingival tissues due to the technique used. Displacing force is the downward force produced due to excess pressure while retraction. Relapsing force is produced when the gingiva gets back to its earlier position. Collapsing force is produced when the gingival tissues are pressed alongside the tooth surface due to tight fit trays.

There are different types of gingiva retraction cords, materials, and techniques for gingival displacement to achieve a proper replica of the finish line. The cords can be used as per the preference of the clinician since they do not have size standardization. Based on fabrication, they can be knitted, twisted, or braided and can be impregnated or non-impregnated. Cords have color codes and are available in several diameters. They are available as pre-cut or can be dispensed from a container. The essential features of retraction cords should be biocompatibility and nontoxic to the gingival tissues, the ability to imbibe blood, gingival crevicular fluid, and medicaments, easy to handle, presented as various color-coded and gentle and non-damaging to the tissues.

Braided cords contain tight weaves so that they can be placed easily and effectively into the gingival sulcus avoiding any damage. They have an efficient absorptive capacity of medicaments. They can be pushed out of the sulcus easily from one point with a gentle application of pressure. Knitted cords are effective and contain interlocking loops that enable the shaping and bending of cords during their placement into the gingiva. This further prevents the unnecessary removal of the cord once it is placed into the sulcus. Twisted cords are more likely to untwist and distort during sulcus placement. They are not favored over braided and knitted cords.

Every dental practitioner should know about the causes of over-extension and under-extension of restorations. Overextension of restoration causes an increase in plaque accumulation, gingival inflammation, periodontal tissue damage, secondary caries that can cause pulp infection, and a decrease in alveolar bone height. Under-extension may lead to cavities, and inadequate retention that can cause crown displacement, crown fracture, gum disease,

Van der Velden and De Vries [12] proved that the gingival epithelium can bear damage at about 1 N/mm², whereas it fractures at 2.5 N/mm². The cord placement needs 2.5 N/mm². The retraction cord assists inessential retraction but its placement is not easy at all.[6] It requires physical application on the tissue, which causes bleeding. Ahmed and Donovan[13] showed dentists using retraction cords were 92% which included braided cords at 61%, knitted cords at 20% and 18% not known. A significant amount of dentists about 28% used cordless gingival retraction. The findings are by Azza et al[14] study which showed gingival retraction used by 82% of dentists during the impression. Similar results were obtained by McCracken and col [15] proved 35% of dentists used single cord and dual cord techniques and injectable retraction was used by 16%.

According to our study reports, the dentist's performance and response rate were considered in terms of the results achieved. As the response rate was 100% for this study and the sample was of the entire practitioners in Madurai district, the results should exactly depict the representation of teaching practices throughout Madurai, Tamil Nadu.

CONCLUSION

Within the constraints of the study, there is an average level of knowledge about the gingival retraction cords among dental practitioners. However, they exhibit a positive attitude and low interest in practicing with gingival retraction cords for the fixed partial prosthesis.

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