

# KNOWLEDGE, ATTITUDE AND PRACTICE BASED SURVEY OF GINGIVAL RETRACTION AND ITS METHOD AMONG DENTAL PRACTITIONERS

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## Abstract

**Introduction:** The long-term success of indirect restorations like inlays, veneers and full coverage crown depends on the marginal adaptation between the prepared teeth and the crown. The margin of the crown is placed equigingival or subgingival based on the caries and esthetic needs. The success of the indirect restorations also depends on the accurate impression of the finish line for the snap marginal fit. The elastomeric impression materials such as the hydrocolloids and the rubber base impression materials, used in the construction of inlays, crowns, and bridges, do not displace the gingival tissues and necessitate gingival retraction to expose the gingival margins of the tooth preparations. The role of gingival retraction is to temporarily displace the gingiva for flow of impression material into the sulcus and to record the finish line. **Objective:** The objective of this present study was to assess the knowledge, attitude & practice of gingival retraction and its method among dental practitioners in Chennai. **Materials and method:** A questionnaire-based survey consisting of 15 questions was conducted between February to March 2023. **Results:** This study showed that 41.7% the clinicians used combination of methods for gingival retraction and 43% used advanced gingival retraction like expasyl material. **Conclusion:** The increased level of knowledge and information about gingival displacement materials and methods shall definitely improve the periodontal health and increase clinical longevity of the indirect restorations.

**Keywords:** Gingival Retraction, Gingival Retraction Methods.

## INTRODUCTION

The long-term success of indirect restorations like inlays, veneers and full coverage crown depends on the marginal adaptation between the prepared teeth and the crown. (1) The margin of the crown is placed equigingival or subgingival based on the caries and esthetic needs. The accurate impression of the finish line for the snap marginal fit is also critical to the success of the indirect restorations. The elastomeric impression materials such as the hydrocolloids and the rubber base impression materials, used in the construction of inlays, crowns, and bridges, do not displace the gingival tissues and necessitate gingival retraction to expose the gingival margins of the tooth preparations. (2) The role of gingival retraction is to temporarily displace the gingiva for flow of impression material into the sulcus and to record the finish line. The placement of any restoration placed in close proximity to the gingival tissues requires adequate access and isolation as well. (3) The gingival retraction is done by various

method like mechanical, chemo-mechanical and surgical, or combination of the three. The chemo-mechanical method uses retraction cord impregnated in various chemicals like epinephrine, aluminium chloride, ferric sulphate, alum. These chemicals achieve hemostasis and cord displaces gingiva. Practitioners may find it daunting to adapt cord and it might be uncomfortable for the patient as well. (4) Shortcomings of the cord retraction method led to the development of cordless techniques. Lasers, electrosurgery and rotary curettage are good for removal of excess tissue but the risk of potential epithelium damage needs to be considered. (5)

### **Aim and Objective**

The aim and objective of this questionnaire-based survey is to assess the knowledge, attitude & practice of gingival retraction among dental practitioners, endodontists & post-graduate students.

### **METHODOLOGY**

A questionnaire-based survey consisting of 15 multiple choice questions was conducted between February to March 2023. The questionnaire was adapted from a study by Raja and Nair. (6) It was electronically distributed as a google form to dental practitioners, endodontists & post-graduate students in Chennai.

### **Demographic Details**

Type of practice

- a. Post graduate student   b. Clinical practice   c. Clinical practice and academics

Year of experience

- a. < 3 years   b. 3 – 6 years   c. 7 – 10 years   d. > 10 years

### **Questionnaire**

1. Do you think gingival retraction is necessary?
  - a. Yes
  - b. No
2. If your answer is yes, the reason is because:
  - a. Impression with good margin is obtained
  - b. Visibility of finish line
  - c. Subgingival preparation of finish line
3. If your answer is no, the reason is because:
  - a. Handling the cord is difficult
  - b. Time consuming
  - c. No clinical advantages
4. Do you think that you can get good successful preparation and impression without using the retraction cord?
  - a. Yes
  - b. No

5. What type of gingival retraction do you routinely use?
  - a. Retraction cord
  - b. Chemical method
  - c. Surgical method
  - d. Combination
6. Specify the type of retraction cord that you use?
  - a. Braided
  - b. Knitted
  - c. Twisted
  - d. Or any other specify
7. Which retraction cord technique do you use routinely?
  - a) Single cord technique
  - b) Double cord technique
  - c) Or any other technique
8. If chemical is used, please specify which one is used?
  - a. Aluminum Chloride
  - b. Ferric Sulfate
  - c. 2% epinephrine
  - d. Zinc sulphate
  - e. Aluminum chloride
  - f. Or any other
9. Do you use any of the advanced gingival retraction material?
  - a. Magic foam
  - b. Expasyl
  - c. Stayput
  - d. Traxodent Or any other, please specify then
10. In case surgical method is used, then mention which one?
  - a. Electro surgery
  - b. LASER
  - c. Rotary curettage
11. How long you leave the retraction inside the gingiva?
  - a. 5 min
  - b. 10 min
  - c. 20 min
  - d. 30 min
12. Do you think that retraction procedure will cause gingival recession?
  - a. Yes
  - b. No
13. In your opinion, what is the minimum width of gingival sulcus that's required to be copied in the impression?
  - a. 0.2 mm
  - b. 0.4 mm
  - c. 0.6 mm
  - d. 0.8 mm
  - e. No idea
14. Which size of retraction cord do you use in most of the cases?
  - a. 000
  - b. 00
  - c. 0
  - d. 1
  - e. 2
  - f. 3
15. Which instrument do you use to pack the cord?
  - a. Cord packer
  - b. Plastic instrument
  - c. Periodontal probe
  - d. Dental explorer

## RESULTS

Among 115 responses, 48.7% were general practitioners, 20.9% post graduates and 30.4% specialists. 29.6% had 3 years of clinical experience, 28.7% had 3-6 years, 27% had 6 – 10 years and 14.8% had more then 10 years of clinical experience.

Most of dental practitioners (90.4%) believed gingival retraction is necessary for successful clinical outcome and the reason being impression with good margin is obtained (75%), visibility of finish line (16.3%) and subgingival preparation of finish line (8.7%). Among the practitioners (9.6%) who believed gingival retraction was not necessary, 56.5% considered it time consuming, 30.4% found handling of the cord difficult and 13% assumed it had no clinical advantages.

Among the gingival retraction methods, 40.8% used retraction cord, 15.5% used chemical method, 1.7% used surgical method and 41.7% used combination of methods. Braided retraction cord type was used by 47.1% of the practitioners, 44.8% used knitted cord and 7% twisted cord type. Almost 92% of the practitioners used single cord technique, 4% double cord technique and 2% decided technique based on clinical situations. Most of the practitioners (87%) used cord packer to pack cord while 9% used plastic instrument and 4% used periodontal probe. Among the 6 sizes available, 49% used Size 00, 31% used size 000, 12% used size 0, 6% used size 1 and 2% used Size 2. If chemical was used, 70.10% used aluminium chloride, 14.3% ferric sulfate, 7% used epinephrine and 0.2% used zinc sulfate. Among advanced retraction material, 42.9% used expasyl retraction paste, 19% used traxodent, 13% used stayput, 8% used retraction gel. 73.7% of the practitioners placed retraction cord for 5 minutes, 22.1% placed for 10 minutes while 2.6% placed for 20 minutes.

Among the surgical method, 62.1% preferred LASER, 33.3% preferred rotary curettage and 2.6% preferred electrocautery. The minimum width of gingival sulcus that's required to be copied in the impression - 51.9% believed 0.2mm, 27.2% thought about 0.4mm, 3.5% assumed 0.6mm and 15.5% had no idea. 79.6% believed retraction causes gingival recession while 20.4% practitioners thought retraction does not cause in gingival recession.

## DISCUSSION

Gingival retraction is essential to isolate cavities close to gingival margin, to control haemorrhage and crevicular fluid during restoration. Gingival retraction is also crucial to protect the gingiva while the tooth is being prepared for a direct or indirect restoration with subgingival margins; helps in better visualisation and impression of margins.(7) In this survey, 90.4% of the practitioners believed gingival retraction is necessary for successful clinical outcome. The practitioners who opted gingival retraction is unnecessary found the procedure time consuming and difficult to handle the cord while few assumed it had no clinical advantages. 34.8% of the practitioners alleged that successful preparation and good impression is possible without the use of cord.

The various methods in gingival retraction are mechanical, chemo-mechanical, surgical or combination of three. Mechanical method involves the use of retraction cord to displace gingiva while chemo-mechanical method involves the use of cord impregnated in chemicals like aluminium chloride, ferric sulphate, epinephrine, alum.(8) Combination or chemo-mechanical were the choice of method used by most of the practitioners. Among the chemicals, 70.10% used aluminium chloride, 14.3%

ferric sulfate, 7% used epinephrine and 0.2% used zinc sulfate. Epinephrine has systemic effects; ferric sulfate discolours tooth while alum and zinc sulfate are less effective in controlling haemorrhage and crevicular exudate. Aluminium chloride causes least irritation to the gingival tissue among the chemicals used in impregnated retraction cord.(9)

The retraction cord is available as braided, knitted and twisted variety. Braided cords have tight weave and are easier to place. But it has a tendency to come out of sulcus when pressure is applied at one segment. Knitted cords having interlocking loops, bend passively and prevents displacement during placement. Twisted cord tends to fray and untwist during placement inside sulcus. 47.1% of the practitioners preferred braided type, 44.8% preferred knitted type while only 7% used twisted type cord.(3) The retraction cord is available in six different sizes and are colour coded. The diameter ranges from 0.75 to 1.45mm.(10) 49% used Size 00, 31% used size 000, 12% used size 0, 6% used size 1 and 2% used Size 2.

Laufer et al in 1997 suggested that the cord should remain in the gingival crevice for an optimum time of 6 min prior to impression making to achieve a crevicular width of 0.2mm. (11) In this study, about 73.7% of the practitioners placed retraction cord for 5 minutes, 22.1% placed for 10 minutes while 2.6% placed for 20 minutes. Placing cord for a longer time and excessive pressure during placement damage the attachment apparatus. 20.4% of the practitioners believed that gingival retraction will result in gingival recession. According to Huang et al in 2017, gingival retraction results in reversible and self-limited gingival injury and an average postoperative gingival recession of  $0.2 \pm 0.1$  mm.(7)

Single cord technique is indicated when making impressions of one to three prepared teeth with healthy gingival tissues. It is simple and most commonly used method. In this study, 92% of the practitioners used single cord technique. The double cord technique is routinely used when making impressions of multiple prepared teeth and when making impressions when tissue health is compromised and it is impossible to delay the procedure. About 4% used double cord while 2% of the practitioners decided the technique based on sulcus depth. Most of the practitioners (87%) used cord packer to pack cord while 9% used plastic instrument and 4% used periodontal probe.

Advanced gingival retraction material like magic foam, expasyl retraction paste, stayput cord, traxodent are also available.(12) In this survey, 42.9% used expasyl retraction paste, 19% used traxodent, 13% used stayput, 8% used retraction gel.

Surgical methods include rotary curettage, electrocautery and LASER. This method is more invasive and should only be used in case where there is adequate attached gingiva. In rotary curettage, tapered fissure sharp diamond bur is used slightly apical to prepared margin. Electrocautery and LASER are used in case of gingival hyperplasia, excessive haemorrhage and deep subgingival margins. Electrocautery should be used in caution near metallic filling and is contraindicated in patients with cardiac pacemakers and defibrillators. Gingival tissue displacement with lasers is less painful and can even be used without anaesthesia in selected case.(3) In this survey, 62.1% practitioners preferred LASER, 33.3% preferred rotary curettage and 2.6% preferred electrocautery.

An impression with good margin is required for proper fit of an indirect restoration. To avoid the impression material from tearing or distorting when it is removed from the sulcus, the sulcular width should be at least 0.2mm and a minimum of 0.5mm below

the margin should be exposed to capture the emergence profile.(13) In this survey, for the minimum width of gingival sulcus that's required to be copied in the impression - 51.9% believed 0.2mm, 27.2% thought about 0.4mm, 3.5% assumed 0.6mm and 15.5% had no idea. According to Tabassum et al in 2017, amount of gingival retraction achieved with mechanical method is 0.19 to 0.23 mm, chemo mechanical method is 0.02 to 0.46 mm and with surgical method its 0.03 to 0.45 mm.(14)

## CONCLUSION

The increased level of knowledge and information about gingival displacement materials and methods shall definitely improve the periodontal health and increase clinical longevity of the indirect restorations.

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