

Gingival Displacement Methods Practiced by Dental Professionals in Ahmedabad City: A Survey

Shachi Patel¹ Ina Patel² Kinjal Solanki³ Ronak Choksi⁴ Rahul Patel⁵ Pooja Poonia⁶

¹PG Student, Department of Prosthodontics and Crown and Bridge, AMC Dental College and Hospital, Ahmedabad, Gujarat, India.

²Professor and Head, Department of Prosthodontics and Crown and Bridge, AMC Dental College and Hospital, Ahmedabad, Gujarat, India.

³Reader, Department of Prosthodontics and Crown and Bridge, AMC Dental College and Hospital, Ahmedabad, Gujarat, India.

⁴Senior Lecturer, Department of Prosthodontics and Crown and Bridge, AMC Dental College and Hospital, Ahmedabad, Gujarat, India.

⁵PG Student, Department of Prosthodontics and Crown and Bridge, AMC Dental College and Hospital, Ahmedabad, Gujarat, India.

⁶PG Student, Department of Prosthodontics and Crown and Bridge, AMC Dental College and Hospital, Ahmedabad, Gujarat, India.

ABSTRACT

Background: To evaluate the use of various gingival displacement techniques in the treatment of fixed dental prostheses practiced by the dentists in Ahmedabad city.

Materials and Methods: A self-made validated Questionnaire containing 16 questions regarding the usage of gingival displacement techniques was made. The private dental practitioners and those in academic institutes in Ahmedabad City, Gujarat, were surveyed through verbal and digital medium. A total of 244 dentists participated in the survey. The results were analysed through descriptive statistical analysis.

Results: Amongst those who participated 72% preferred the use of gingival displacement technique for successful clinical practice while 28 % of them do not follow the procedure believing it to be very time consuming. 31.51% of those who practiced Gingival displacement used chemo mechanical method while 32.88% used combination of techniques. 51.02% of participants also used cordless system. For chemo mechanical method, 58.04% preferred aluminium chloride while 27.68% used epinephrine as the haemostatic agent. 36.73% of participants observed gingival recession in the follow up period after performing gingival displacement procedure. Overall, 55.10 % participants strongly recommended practicing gingival retraction.

Conclusions: Those dentists who preferred the use of gingival displacement technique were able to detect many advantages of using it in their daily fixed partial denture practice and believed it to be very influential in final clinical outcome.

Keywords: Gingival displacement, marginal integrity.

INTRODUCTION

Precision and accuracy in every step is an integral aspect of fixed prosthodontic treatment. The longevity and aesthetics of any restoration are intimately linked to the gingival and periodontal tissues¹. Marginal integrity is one of the most important factors, which contribute to the success of restorations. The restoration can survive in the biological environment of the oral cavity, only if the

margins of restorations are closely adapted to the finish line of the preparation².

Gingival displacement or gingival retraction is defined as the deflection of marginal gingiva away from the tooth. 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

Received: Nov. 12, 2020: Accepted: Jan. 18, 2021

*Correspondence Dr. Shachi Patel.

Department of Prosthodontics and Crown and Bridge, AMC Dental College and Hospital, Ahmedabad, Gujarat, India.

Email: shachipatel17992@gmail.com

sulcus. Not only is exposure of the gingival margin important, but also some unprepared tooth structure apical to margin to have adequate horizontal and vertical gingival displacement to provide a bulk of impression material at the margin to prevent its tearing upon removal of the impression³.

For the successful fixed dental prostheses, a healthy coexistence between the restoration and their surrounding periodontal structure should be the goal of a prosthodontist. Several techniques have been proved effective and biocompatible in the management of the soft tissues. The selection of one of them in soft tissue management depends on the clinical situation and the preferences of the operator². Thus, the placement of any restoration in close proximity to the gingival tissues requires adequate access and isolation, for which various gingival retraction methods and materials are available.

This survey will help to get general idea about awareness and attitude regarding gingival displacement techniques being employed among the practicing dentists in Ahmedabad city. The survey also analysed current techniques in use for gingival displacement and their recent advancements. It will also evaluate the speciality wise opinion about gingival displacement and its importance in fixed dental prosthesis treatment.

MATERIALS AND METHODS

A survey was conducted amongst the dental practitioners who have been into clinical practice as well as those who are academically inclined and working in dental institutions of Ahmedabad city, Gujarat to evaluate the use of gingival displacement techniques practiced by them.

Inclusion Criteria:

- All registered General dental practitioners (BDS) practicing in Ahmedabad City.
- Dental professionals of various Dental specialties (MDS) who are practicing in Ahmedabad city.

Exclusion criteria:

- The Dental professionals not practicing in Ahmedabad city.

A total of 244 dental practitioners having their private dental practice and affiliated with academic Institute in Ahmedabad city participated in this survey. A self-made questionnaire containing 16 questions pertaining to Gingival Retraction, validated by 20 subject experts and approved by Institutional Ethical Committee was used for the study. It was a Close Ended Questionnaire with Multiple Choice of Answers. The questions were concerned with the use of gingival displacement methods, patient evaluation procedure, techniques and materials preferred by dentists, and their overall view about gingival retraction in general practice. The participants were given the questionnaire to be filled either through verbal meeting or through E-mails. Each participant was explained about the purpose of the study and prior consent was taken. Nearly 1500 dentists from various zones of Ahmedabad city were contacted via digital and verbal communication method; but only 244 participants responded back. Overall, 5-6 months' time period was taken to complete the survey. The survey was performed and the data obtained were analysed by using descriptive statistical analysis using Chi Square test as test of significance.

RESULTS

Out of the total participants, 50% of the participants were BDS (General practitioners). Amongst Specialists Dentists, Prosthodontists and Endodontists participated in larger number compared to other specialties (Fig-1). Out of 244 participated dentists, only 204 practiced fixed dental prosthetic treatment. Results showed that 76.06% (147 participants) performed Gingival Displacement Procedure in their routine practice; while 27.94% did not practice Gingival Displacement (Fig-2).

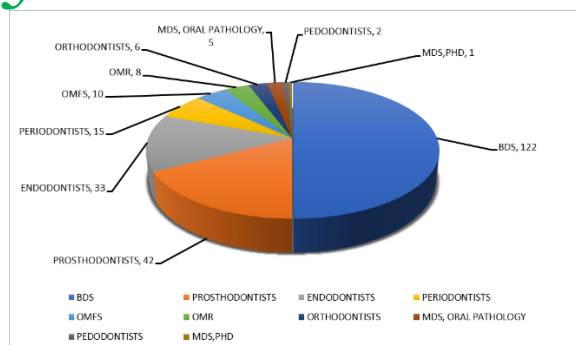


Fig 1: Specialty wise distribution of the participants.

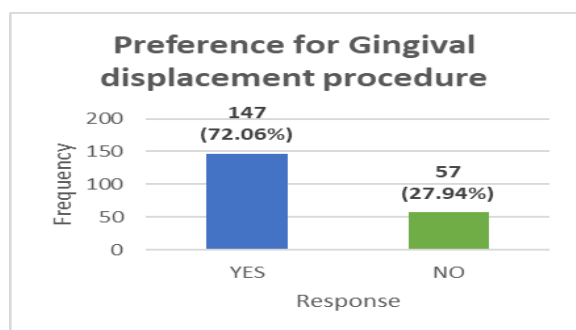


Fig 2: Preference for Gingival displacement procedure.

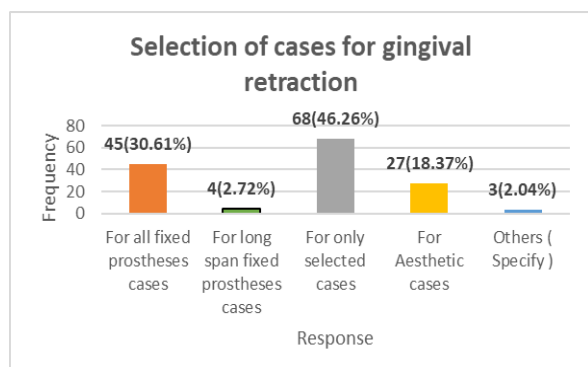


Fig 3: Selection of cases for gingival retraction.

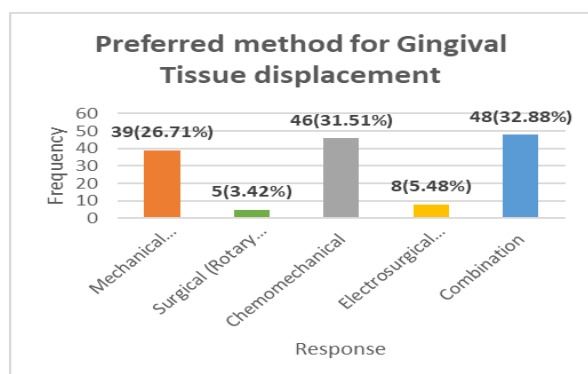


Fig 4: Preferred method for Gingival Tissue displacement.

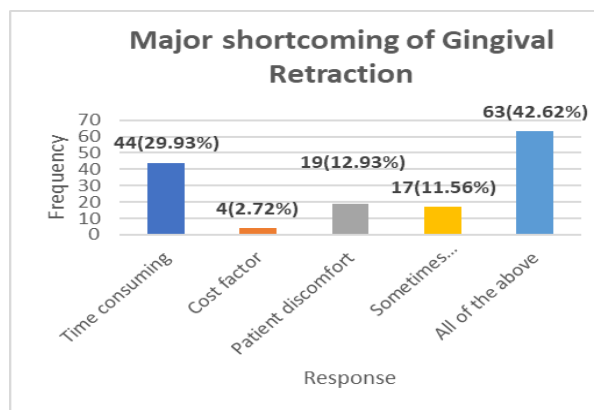


Fig 5: Major shortcoming of Gingival Retraction.

Results showed that amongst the participated dentists, most of them (46.26%) performed gingival retraction only for selected cases or for cases of aesthetic concern (Fig-3). Most of the dentists practiced either Chemo mechanical method (31.51%) or combination of more than one technique (32.88%) (Fig-4). For the chemo mechanical method, aluminium chloride was the chemical of choice for 58.04% participants; and 27.68 % preferred epinephrine (Fig-7). Extra chairside time requirement was considered as one of the major shortcomings of gingival displacement procedure (Fig-5). The type of cord preferred by majority of participants (56.46%) was braided type of cord (Fig-6) and the size most common used amongst the participants was '0' followed by '000' and '00'. Regarding the preparation of the cord before use, 78.23% preferred to wet the cord with saline or haemostatic agent before packing procedure; while 21.77% participants did not (Fig-7). Technique of cord placement depends on gingival biotype and the sulcus depth. Results showed that 66.67% of dentists practiced the double-cord technique in specific cases. When asked about cordless techniques, 51.02% of participants used cordless system as well; while 48.98% did not use it. Traumatic cord placement can permanently damage the soft tissues. Results revealed that 36.73% of participants observed post-operative gingival recession during the follow-up period (Fig-12).

Overall, 55.10% of the practitioners strongly recommended use of Gingival retraction while 41.50% of them said that Gingival retraction was beneficial in most of their cases (Fig-13).

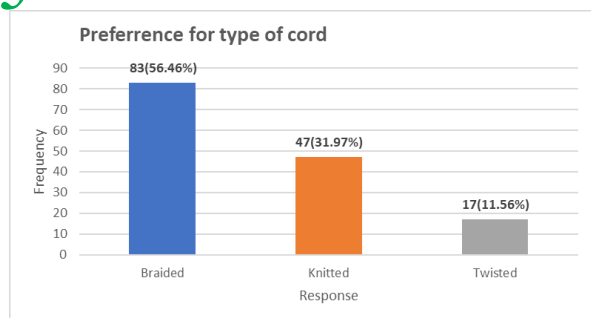


Fig 6: Preference for type of cord.

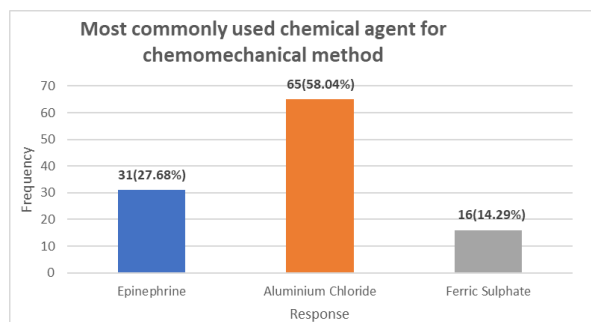


Fig 7: Most commonly used chemical agent.

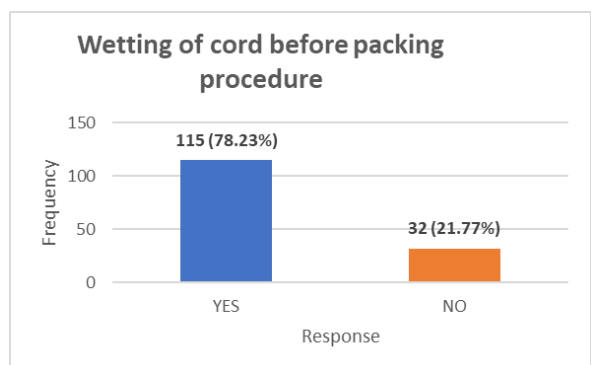


Fig 8: Wetting of cord before packing procedure.

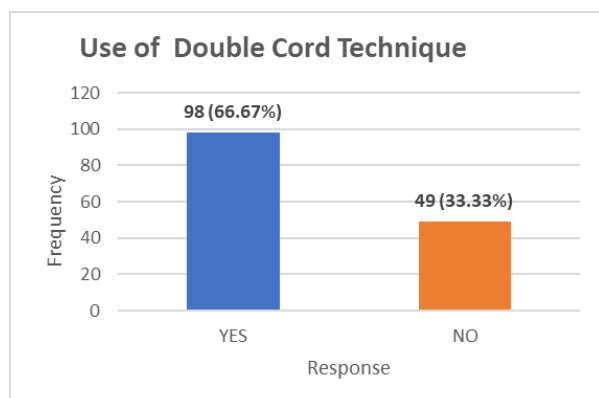


Fig 9: Use of double cord technique.

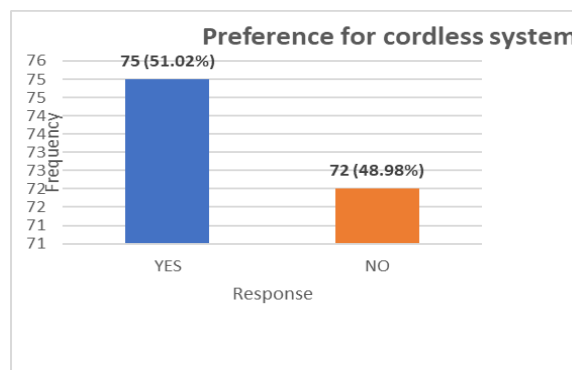


Fig 10: Preference for cordless system.

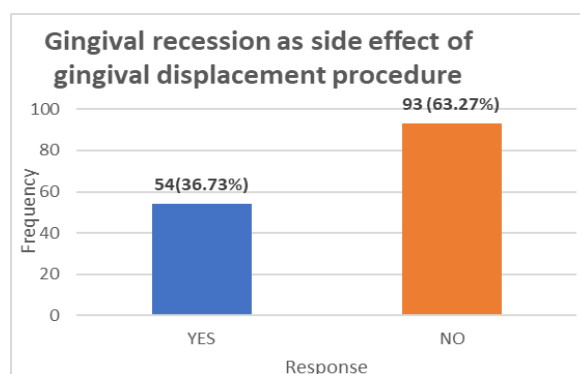


Fig 11: Gingival recession as side effect of gingival displacement procedure.

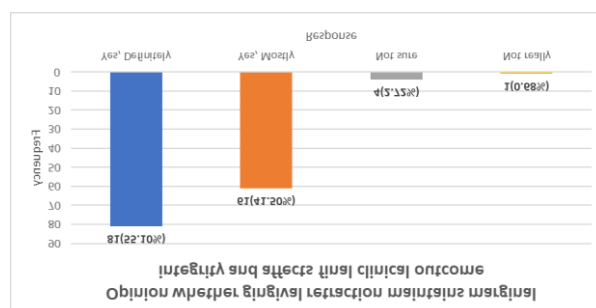


Fig 12: Opinion whether gingival retraction maintains marginal integrity and affects final clinical outcome.

DISCUSSION

Gingival retraction has wide applications in clinical dentistry: in fixed prosthodontics to expose the sub-gingival finish line for crown margins, in restorative dentistry for the management of cervical abrasion, root caries, and root sensitivity, as well as in implant dentistry to capture an accurate impression to enhance the marginal fit of the implant prosthesis.

This study mainly focused on the methods of gingival displacement used by Dentists of Ahmedabad city and to determine how many of them recommend the use of gingival displacement technique in their dental practice and also their reasons for using gingival displacement techniques. A total of 16 questions pertaining to gingival retraction were asked to these practitioners based on their experience, skill, knowledge, and success rate in fixed dental prosthesis.

Moldi et al. in 2013⁴ evaluated from his study that 60.3% of dentists indicated the use of mechanochemical method and 24.8% dentists indicated the use of chemical method, 12.4% used surgical method and 2.5% indicated the use of laser. That also indicated that most preferable was mechanochemical method of gingival displacement. These results support the present study which showed that among all the Dentists in Ahmedabad city, 72.06 % preferred the use of gingival displacement technique for successful clinical practice while 27.94 % of them do not follow the procedure believing it does not make major difference in clinical practice. Out of those who perform gingival displacement technique, 26.71% of them used mechanical method, 31.5 % used chemomechanical method, 3.42% used surgical method, 5.48% preferred use of laser; while 32.88 used combination of these methods.

In the present study, 85 % of respondents preferred to use impregnated cord and amongst them 58.04 % preferred aluminium chloride as a medicament, 27.68% used epinephrine; while 14.29 % used ferric sulphate as the medicament. On the other hand, Donovan et al.⁵ reported only 19.39% of dentists who used aluminium chloride. In the present survey, majority of the respondents preferred to use aluminium chloride. This could be due to the increased level of awareness regarding the side effects of epinephrine. In the present survey, 27.68% of respondents preferred to use epinephrine. Donovan et al.⁵ reported 79.3% of dentists who used epinephrine. Shaw and Krejci⁶ reported that epinephrine impregnated cord was used by 55% dentists as the method of the first choice for gingival retraction.

Removing a dry cord from the gingival crevice can cause injury to the delicate epithelial lining. In the present study, 78.2% of respondents wet the

retraction cord before removal from the gingival sulcus. This was supported by study done by Reddy et al.⁷ where 69.2% of respondents wet the retraction cord before removal from the gingival sulcus. Results were contradictory in the study done by Donovan et al.⁵ which reported that only 33.94% of respondents wet the cords before removal from the sulcus. Shrestha et al.⁸ showed that 44.4% soaked plain or impregnated cord in additional medicament before packing.

Cordless technique claims of being more effective in displacing tissues, and less injurious to gingival health. In the present study, 55.05% used cordless technique for gingival displacement. The survey did not determine whether this technique was used occasionally or routinely. The percentage of users is much higher compared to study by Shrestha et al.,⁸ in which only 5% used cordless technique and Ahmed et al.⁹, in which 28% of the participants used cordless technique. High percentage may be due to increasing awareness and it being less deleterious than the cord.

There are three types of mechanical cords: Braided cords have a tight weave, and hence are easier to place into the gingival sulcus without fear of fraying. They have good absorbency when used in combination with chemicals. Knitted cords have interlocking loops which helps in shaping and passively blending to the gingival sulcus. Twisted type of cord has the ability to fray while removing. In this study, 56.46% participants used braided type of retraction cord, 31.97% used knitted cords and twisted was used by 11.56% of the practitioners. This result was supported by the study of Kanimozhi et al.¹⁰, where 60% used braided, 13% used knitted and 27 % used twisted cords. According to K. D. Prasad et al.¹¹ inflammation of the sulcus can get exacerbated due to contamination of the sulcular wounds by the fibres of the cord. Hence, care should be exercised in choosing cord type and size. In the current survey, commonly used size was '0' (40.82%) followed by '000' and '00'. Results contradicted with the study by Kanimozhi et al.¹⁰, where 40% used 000 whereas 37% used 00 and 23% used 0. The increase in the diameter of the cord may increase the fluid absorbency and provide adequate space for the impression material¹².

According to Jignesh Chaudhari et al.¹³ Double cord impression technique was followed by 25% of the

practitioners. This technique is routinely used while making impressions of multiple prepared teeth and in cases where tissue health is compromised. In the present study 66.67 % respondents were in favour of using double cord technique when required.

Gingival recession has been a crucial factor in cases of mechanical method of gingival retraction. In study by Kanimozhi et al¹⁰, 49% of the participants has noticed gingival recession after gingival retraction. The time period within which gingival retraction has occurred has not been specified. 41% respondents noticed gingival recession only in few cases. The data of the types of cases in which gingival recession has been noticed was not collected. In the current study, 36.63 % of dentists observed recession after gingival retraction procedure.

Overall, majority of participants were in favour of using Gingival retraction as a part of clinical practice and they supported the benefits of same in the final outcome.

CONCLUSION

According to the results of this study, gingival retraction is being followed by 74% of the practitioners of Ahmedabad city and they not only used single method but a combination of techniques for gingival displacement in their routine clinical practice. Majority of participants were in agreement that marginal integrity was improved after gingival retraction. Also, few reported the soft tissue changes in terms of gingival recession, following gingival retraction during the follow up period.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

REFERENCES

1. Adnan, Samira & Agwan, Muhammad Atif. Gingival Retraction Techniques: A Review. Dental Update. 2018;45(4):284.
2. Gadhavi MA, Nirmal N, Arora H. A Survey on the use of various Gingival Displacement Techniques in Fixed Partial Denture by the Prosthodontists in Vadodara City. Indian J Dent Res 2018;29:176-80.
3. Paul A. Hansen. Current Methods of Finish-Line exposure by practicing Prosthodontists. J Prosthodont 1999;8(3):163- 170.
4. Moldi A, Gala V, Puranik S, Karan S, Deshpande S, Neela N. Survey of Impression Materials and Techniques in Fixed Partial Dentures among The Practitioners in India. ISRN Dent 2013;2013:430214.
5. T. E. Donovan Et Al. Review and Survey of Medicaments used with Gingival Retraction Cords. J Prosthet Dent. April 1985 ;53(4):525-531.
6. Shaw, DH;Krejci R. Gingival Retraction Preference of Dentists in General Practice. Quintessence Int. 1986;17:277-80.
7. Giridhar Reddy S V, Bharathi M, Vinod B, Reddy K R, Reddy N S. Gingival Displacement Methods used by Dental Professionals: A Survey. J Orofac Sci 2016;8:120-2.
8. Lajana Shrestha, Dilesh Pradhan, Viral V. Mehta, Siddharth Dixit. Gingival Retraction Methods: A Descriptive Survey amongst Dentists in Nepal. International Journal of Contemporary Medical Research 2017;4(9):1836-1839.
9. Ahmad Shah, Mohammad Arif Lone, Shahnaz Shabir. Assessment of Crown and Bridge Work Quality among Dental Practitioners: Survey. International Journal of Medical and Health Research. May 2019;5(5):77-79.
10. Kanimozhi S., Anusha Sathyamoorthy, Nirmal Famila Bettie And Lakshmi Priya A. Gingival Retraction Techniques practiced in Fixed Partial Dentures among Dental Practitioners - A Survey. World Journal of Pharmaceuticals and Life Sciences. 2019;5(2):203-210.
11. Prasad K, Hegde C, Agrawal G, Shetty M. Gingival displacement in prosthodontics: A critical review of existing methods. J Interdiscip Dent 2011;1:80-6.
12. Sushant K Garg, Sandeep Garg, Sangeetha Goyal. Comparative evaluation of fluid absorbency of retraction cords of different thickness after various medicament immersion, 2012; 30-34.

13. Chaudhari J, Prajapati P, Patel J, Sethuraman R, Naveen YG. Comparative Evaluation of the amount of Gingival Displacement produced by three different Gingival Retraction Systems: An In Vivo Study. Contemp Clin Dent 2015;6:189-95.

Questionnaire

General Information:

Doctor's Name: _____

Registration No. _____ Date: _____

Qualification with Speciality: _____

Address: _____

Survey Topic: "GINGIVAL DISPLACEMENT METHODS PRACTISED BY DENTAL PROFESSIONALS IN AHMEDABAD CITY – A SURVEY"

Following are the Questions for the Survey. Please tick mark an appropriate option as per your practice.

1. I am practicing as a dental professional since....

- a. $\leq$ 2 years b. 2 to 5 years
c. 5 to 10 years d. $\geq$ 10 years

2. Do you treat patients requiring Fixed Prosthesis? a. Yes b. No

If yes, in a period of one month, you come across approximately how many patients requiring fixed dental prostheses?

- a. < 10 b. 10 to 25
c. 25 to 50 d. > 50

3. Do you perform Gingival Displacement procedure for fixed prosthodontic procedures ? a. Yes b. No

If yes, your preferred method for Gingival Tissue displacement is.....

- a. Mechanical (Cord/Cordless) b. Surgical
(Rotary Curettage)
c. Chemo-mechanical d. Electrosurgical
(Laser)
e. Combination

4. I perform gingival retraction procedure before making impressions for the following cases....

- a. For all fixed prostheses cases
b. For long span fixed prostheses cases
c. For only selected cases
d. For Aesthetic cases
e. Others (Specify) _____

5. According to me, Gingival Retraction method serves best for?

- a. Better visualization of preparation margins
b. Gingival protection while tooth preparation
c. Sub gingival margin location
d. Control of haemorrhage
e. Impression with better margin capture

f. All of the above

6. According to me, major shortcoming of Gingival Retraction is?

- a. Time consuming b. Cost factor
c. Patient discomfort d. Sometimes harmful to the surrounding tissues
e. All of the above

7. The type of retraction cord I prefer to use is....

- a. Braided b. Knitted c. Twisted

8. Based on the Chemo mechanical method, which one you prefer to use?

- a. Impregnated b. Non-Impregnated

If Impregnated, then which Chemical agent you prefer....

- a. Epinephrine b. Aluminium Chloride
c. Ferric Sulphate e. Others (specify)

9. Most commonly used size of the retraction cord in my practice is...

- a. 000 b. 00 c. 0 d. 1
e. 2 f. 3

(More than one options can be selected)

10. Type of cord packer I prefer to use is

- a. Circlet serrated b. Circlet plain
c. Straight serrated d. Straight plain
e. Others (Specify) _____

11. Do you wet the retraction cord in saline or any haemostatic solution before packing procedure? a. Yes b. No

12. Do you use Double Cord Technique of Gingival Retraction whenever required ? a. Yes b. No

13. Have you used Cordless system of Gingival retraction ? a. Yes b. No

If yes, then amongst the cordless techniques of Gingival retraction, most preferred by me is

- a. Paste system b. Gel System
c. Foam type d. Strips

14. Have you observed Postoperative Gingival recession in any of the cases in whom Gingival displacement procedure was carried out ? a. Yes b. No

15. Does the gingival displacement procedure serve the purpose of marginal integrity and affect the clinical outcome of your cases ?

- a. Yes, Definitely b. Yes, Mostly c. Not sure
d. Not really e. Not at all

16. Do you suggest any upgradation in Gingival displacement techniques?... a. Yes b. No

If yes , then please suggest here

• **Signature of the Participant :**

• **Signature of Principal Investigator:**

• **Signature of HOD :**
