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Dental Practitioners Perspectives and Knowledge on Gingival Displacement during Fabrication of Fixed Partial Denture- The Crosssectional Survey

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Abstract

➢ ***Statement of Problem***

Gingival displacement is the deflection of the marginal gingival away from the tooth. It is also called as gingival retraction or tissue dilation. Its process is to expose the margins while taking the impression of the prepared tooth. It (gingival displacement) comprises of bending the gingival margin far from the tooth surface which inturn would provide adequate horizontal and vertical space between the prepared finish line and the gingiva to inject sufficient amounts of impression material.

➢ ***Purpose***

To review the knowledge regarding gingival displacement among dental practitioners during fabrication of fixed partial dentures.

➢ ***Material and Method***

Survey was conducted in TMDCH. Total sample size was 50. A questioner was framed with 26 structured questions and distributed to the clinical practitioners. The collected response were sent to statistical analysis.

➢ ***Result***

Among the clinical practitioners in dentistry at TMDCH, 68% prefer the use of gingival displacement techniques for successful clinical practice while 31% of these do not follow the procedure presuming with a belief that it do not cause any significant change in the clinical practice.

➢ ***Conclusion***

Those clinical practitioners who preferred the use of gingival displacement technique blamed it as a time consuming affair and was not feasible on economic grounds for the class of patient they treated.

Keywords:- *Gingival Displacement, Gingival Retraction,Displacement Cord, Mechanochemical*

I. INTRODUCTION

As we are aware and conscious of the fact that plausible progress has been made in procedures for making fixed prosthodontic impression over the bygone decade(1). The most prominent and foremost objective for impression and interim crowns or fixed dental prosthesis is to register the prepared abutment and finish lines with precise accuration(2). For every gingival procedure in order for the subgingival line to be registered, there should be proper displacement of gingival tissue(3).

Maintaining a dry field is very important in fixed partial denture(4). If we don't maintain a dry field, the finish line recording in the impression will be disintegrate /hampered which will only affect the marginal integrity. Marginal integrity is one of the basic requirements for the restoration and to maintain good periodontal health. In case of a subgingival finish line, retraction is a must and one should make sure that the fluid is controlled well in the gingival sulcus(5) thus the clinicians should be aware of all the existing and different methods that shall be used to achieve gingival retraction.

II. GINGIVAL DISPLACEMENT

➢ *Definition:*

Gingival displacement is the deflection of the marginal gingiva away from the tooth(6)

➢ *Indications for Displacement*

- Adequate access to the prepared tooth.
- Reproduction of the finish line.
- For accurate duplicating the sub gingival margins.
- Creating the best condition and environment for fluid control and impression material.
- Maintaining the marginal integrity and precision of the restoration for prevention of periodontal disease.
- Helps to obtain accurate marginal fit which will reduce marginal leakage and deterioration of tooth.

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➢ *Criteria:*
- Effectiveness in displacement of gingiva and hemostasis.
- Absence of irreversible damage to the gingival.
- Paucity of untoward systemic effect.

➢ *Methods:*

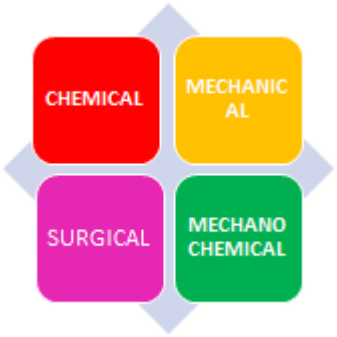

Fig 1

❖ *Classification of Gingival Displacement:*

THOMPSON.M.J 1959
➢ CONVENTIONAL
➢ RADICAL

BARKMEIER AND WILLIAMS1978
➢ SURGICAL RETRACTION
- GINGIVECTOMY
- GINGIVOPLASTY
- PERIODONTAL FLAP PROCEDURES
- ELECTROSURGERY
- ROTARY GINGIVAL CURETTAGE

➢ NON-SURGICAL RETRACTION
- RUBBER DAM
- CLAMPS
- RETRACTION CORD-IMPREGNATED / NON IMPREGNATED
- RETRACTION RINGS
- COPPER BANDS

A. Mechanical Tissue Dilation:

One of the first and earliest methods used for physical displacement of the gingival(7)
- RUBBER DAM
- STRINGS OR COTTON FIBRES
- TEMPORARY METAL CROWN FILLING WITH THERMOPLASTIC STOPPING MATERIAL OR GUTTA PURCH

- *Disadvantages:*
  Incisional injury to the gingivaltissues.

- *Advantages:*
  Good method to confirm gingival margins (multiple abutments).

➢ *Rubber Dam:*

Rubber dam is not only useful in the preparation of the tooth but also when the impression is being made (3). With this technique, wax should be used to block out the clamp, thereby preventing its displacement. when the prepared teeth are in a clean and dry environment, it paves way for good impression.

➢ *Strings or Cotton Fibres:*

These are most commonly used to displace gingival tissue(8). When compared to chemically impregnated cords, plain cotton cord has poor ability to displace gingival (9). We need to keep in mind, over packing can traumatize the tissue and that it should be placed firmly and gently.wetting the cord with injury to thedelicate epithelial attachment(10)

➢ *A Temporary Crown*

When you leave it in place for more than 12 hours, it can cause recession. So the uncovered neck of the tooth would be sensitive and susceptible to caries. Impressions cannot be made at the same appointment as the tooth preparation(11).

B. Mechanochemical Method

Mechanical chemical dilation is the method where you impregnate the cord with chemicals that are eased into the intracrevicular space beneath the cavity margin without force (12). A cord is used for mechanically separating the tissue from the cavity margins and is impregnated with a chemical for hemostasis as impressions are made(13). The area must be kept dry but not desiccated if the haemostatic chemical in the cord is bound to have maximum effectiveness(14). The impregnated string indeed injuresthe gingival sulcus epithelium (15). The injuries that are caused are temporary and they usually heal within 7 to 10 days (except those caused by zinc chloride concentration above 8%) After 5 to 10 minutes the cord is gently removed(16) and the sulcus surrounding the cavity margins is exposed and homeostasis is maintained(17). If the bleeding is evident, then the crevice is repacked for another 5 minutes(18) Sub gingival packing instrument is directed towards the area where the cord is already secure pushing away from the area dislodingthe cord(19) The cord is pushed into the sulcus which inturn mechanically stretches the circumferential periodontal fibers(20). Incase of a braided (e.g. Gingibraid) or a knitted (e.g. Ultrapak) cord, placement is always easier(21). Inarea where very narrow sulcus preclude placement of the smaller size of twisted or braided cord, we can use the flattened wool like cord, that are preferable for the initial displacement of tissues (22)

C. Electrosurgery

Electrosurgery and its concerned techniques haven been known to us for, over a century now., it was not until the late 1960s that the principles of electro surgery became understood and improved equipment became position the passive or insufficient plate under the shoulder for bi-terminal application. The selection of electro varies depend upon the tooth, and its arch position. available(23). Two general types of electrosurgical units (ESU) are monopolar

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and bipolar(23). These two are used extensively in medicine, but only monopolar systems have been established in dentistry (except for the use of bipolar units by oral surgeons). Electro surgery units can be used to remove tissues to a minor extend and before making the impression(24) In one technique, the inner epithelial lining of the gingival sulcus is removed, thus prominently increasing the access for a sub gingival crown margin, and effectively controlling postsurgical hemorrhage (provided that the tissue are not inflamed). Unfortunately there is potential gingival tissue recession after treatment(25)

You can determine the depth of the tissue removal by the morphology of the tissue and its biological width(26).It should be kept in mind that the Electro surgery requires profound local anesthesia and all the armamentarium required for this, should be made of plastic(27). You should

➢ *Advantages*

- It controls any degree of hemorrhage.
- It prevents seeding of bacteria into the incision site.
- Electrodes are flexible wires that can be bent or shaped easily to fit any requirement never need sharpening are self-sterilizing; and require no pressure to function.
- It allows planning of soft tissues, a procedure unique to electro surgery.
- It provides a clear or at least a better view of the operative site.
- It increases operative efficiency and reduces chair time.
- It enhances the quality of the restorations and eliminates scar formation.

➢ *Disadvantage*

- It may be contraindicated in patients with a non compatible or poorly shielded cardiac pacemaker patient.
- It produces an unpleasant odor and sometimes even an unpleasant taste.

III. MATERIALS AND METHOS

A total of 45 clinical practitioners in dentistry at THAI MOOGAMBIGAI DENTAL COLLEGE AND HOSPITAL, was selected for this study. The questionnaire included the question with the use of a gingival displacement method, technique and various materials used for gingival displacement technique. The survey was performed by a 2 examiner and the collected response were sent to the statistic analysis.

➢ *Various Drugs Used for Gingival Displacement:*

CHEMICAL	BRAND
0.1-0.8% Racemic epinephrine	RACORD, GINGI-PAK, SIL-TRAX, SULPAK
100% ALUM SOL. POT. ALUM. SULFATE	RASTRIN GENT II, FLEXI-BRAID, GINGI YARN
5%-25% Aluminum chloride sol.	HEMODENT, GINGI-AID, GINGI-GEL
Ferric sub-sulfate MONSELS SOL.	-
13.3% Ferric sulfate sol.	ASTRINGEDENT, VISCOSTAT
8%-40% Zinc chloride sol.	-
20%-100% Tannic acid	-
45% Negatol sol.	NEGATAN

COMBINATIONS	BRAND
EPINEPHRINE + ALUM	R-44,45-46 ASPETICO
EPINEPHRINE + ZINC PHENOL SULPHONATE	RACORD
4% EPINEPHRINE + ALUM	SULPAK,ULTRAX
0.1% EPINEPHRINE + COCAINE	-
ZINC CHLORIDE + 8% EPINEPHRINE	-
ALUM + ALUMINIUM CHLORIDE	-

Table 1

IV. RESULTS

Among the clinical practitioners in dentistry at TMDCH, 68% prefer the use of gingival displacement techniques for successful clinical practice while 31% of these do not follow the procedure believing it does not make major difference in clinical practice.

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questions	Options	n	%
01) Do you practice fixed prosthodontics?	Yes	31	68
	No	14	31
02) How many patients do you treat within one month for fixed partial denture?	<50	44	98
	50-100	1	2
	>100	0	0
03) Do you prefer gingival displacement for successful clinical practice?	Yes	27	60
	No	7	6
	Sometimes	11	24
04)If yes than why?	For subgingival finish line preparation	27	60
	Visibility of finish line	13	29
05) If no than why?	Time consuming	12	27
	Not beneficial	7	6
06) Which displacement method do you follow?	Mechanical	17	38
	Chemical	3	7
	Chemicomechanical	22	49
	Combination of the above	2	4
	Others	0	0
07) If you prefer chemico-mechanical method which method do you prefer to use?	Epinephrine	19	42
	Aluminum chloride	11	24
	Ferric sulfate	6	13
	Aluminium potassium sulfate	3	7
	Tannic acid	0	0
	others	6	13
08) Which displacement cord do you use?	Ultra pak	16	36
	Gingipak	15	33
	Combination	14	31
09) Do you ask for medical history?	Routinely	30	67
	Occasionally	14	31
	Never	1	2
10) Do you use displacement cord along with medicament?	Yes	26	58
	No	16	36
	If any specify	3	7
11) If yes which one do you prefer?	Aluminium chloride	13	29
	Epinephrine	22	49
	Nasal/eye drops	2	4
	Others	8	18
12) Are you aware of various cordless systems for gingival displacement?	Yes	22	49
	No	23	51
13) Do you prefer any of the below mentioned cord less displacement system?	Expasyl	10	22
	Gingifoam	30	67
	Others	5	11
14) According to you, which technique is better to achieve gingival displacement?	Displacement cord without medicament	7	16
	Displacement cord with medicament	35	78
	Others	3	7
15) Which instrument do you use for packing the cord?	Cord packer	28	62
	Probe	15	33
	others	2	4
16) Do you think that displacement procedure will cause the gingival recession?	Yes	16	36
	No	29	64
17) Is gingival sulcus duplicated in the cast after gingival displacement?	Yes	26	58
	No	19	42

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18) Do you believe that gingival displacement harms the marginal gingiva in terms of pressure applied may be even up to point of invading the biological width?	Yes	7	16
	May be	26	58
	Not really	12	27
19) Does gingival displacement affect your clinical success in fixed prosthesis?	Yes	19	42
	No	26	58
20) Is marginal integrity of fixed prosthesis better with gingival displacement?	Yes	30	67
	No	15	33
21) Is the inclusion of marginal displacement method in your practice cost-effective option for you?	Yes	13	29
	May be	26	58
	Not really	6	13
22) Do you recommend gingival displacement method in implant prosthesis?	Yes	11	24
	May be	17	38
	Not really	18	40
23) How often do you prefer gingival displacement procedure before making impression for fixed prosthesis?	For all fixed prostheses cases	14	31
	For long span fixed prostheses	3	7
	For only selected cases	26	58
	Never	2	4
	Othes	0	0
24) Do you wet retraction cord before removal from the gingival sulcus?	Yes	21	47
	No	24	53
25) Do you check pulse rate and blood pressure?	Routinely	10	22
	Occasionally	30	57
	Never	5	11
26) Have you ever had a patient complaining of any systemic manifestation as a result of gingival displacement?	Yes	9	20
	No	36	80

Table 2

V. DISCUSSION

Success rate of the Fixed dental prosthesis depends on the precise impression making of the prepared finish line. In this article, we have discussed in an elaborate fashion about the gingival displacement and the methods pertaining to that, and also each of the methods have been dealt in detail, with pros and cons concerning every single one of them.

Across the globe, researchers have been conducted on different methods of gingival displacement, their effect on gingival and periodontal health as well as the marginaladaptation after gingival displacement technique. The study that we did predominantly focused on the methods of gingival displacement after asking 21 questions to the clinical practitioners, the answers were drawn in accordance with all that we have got as a result of this study.

VI. CONCLUSION

Through this study, it has become very evident that despite of giving so much of importance to gingival displacement technique, many clinical practitioners fail to replicate this into our clinical practice, altogether avoiding its advantages and benefits.

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