

A Comparative Evaluation Of Gingival Displacement With Or Without Retraction Paste –A Clinical Report

Dr. Ashish Choudhary¹, Dr. Aashima kulshreshtha², Dr. Pratik Prakash Bumb³,
Dr.Santosh Kumar Muradi⁴, Dr. Ankita Priya⁵, Dr. Deborah Lalhmingmawii Pachuau⁶

¹Professor and Head, Department of Prosthodontics and Crown & Bridge, School of Dental Sciences, Sharda University, Uttar Pradesh;

²Department of conservative and endodontics, School of Dental Sciences, Sharda University, Uttar Pradesh;

³PG 2nd year; Department of Prosthodontics and Crown & Bridge; Teerthanker Mahaveer Dental College and Research Centre; Moradabad, Uttar Pradesh;

⁴Sr.Lecturer, Department of Prosthodontics and crown & Bridge; Meghana Institute of Dental sciences, Mallaram, Nizamabad;

⁵Consultant Prosthodontist and Implantologist; Mundeshwari Dental Care, Patna, Bihar;

⁶PG 3rd year, Dept. of Prosthodontics, Crown & Bridge and Implantology, Vyas dental college & hospital, Jodhpur, Rajasthan

ABSTRACT:

Effective gingival retraction is essential to open a space surrounding the preparation margin and to have a clean and dry field to take the impression. Adequate retraction has to be accomplished in all subgingival areas to guarantee that the impression material or digital scan register beyond the margins of Preparation. This study was focused on evaluation and comparison of the amount of displacement of free gingiva with the use of a new retraction paste and retraction cord system

Keywords: retraction, cordless, retraction paste, cord and cordless

INTRODUCTION:

An accurate impression is essential for the precise fit of the permanent indirect dental restoration. In order to take accurate impressions, we must be able to clearly visualize the margins of the preparations .

The procedure to expose the subgingival finish lines of preparation may be termed as gingival displacement, also referred as gingival retraction and gingival deflection. Retraction is the temporary displacement of gingival tissue away from prepared teeth.[1]

Effective gingival retraction is essential to open a space surrounding the preparation margin and to have a clean and dry field to take the impression.

Adequate retraction has to be accomplished in all subgingival areas to guarantee that the impression material or digital scan register beyond the margins of Preparation

Several different methods of retraction are in use today, the most popular of which are

- 1) Cords
- 2) Laser or electrosurgey
- 3) Paste systems.

One of the commonly opted method to obtain gingival retraction is by the means of cords packed within the gingival sulcus. Nonmedicated cords packed in the gingival sulcus are safe but have restricted effect in controlling haemorrhage while Medicated cords for retraction are effective; however, various studies in the past have shown local and systemic side effects induced by medicaments used for gingival retraction.[1]

Apart from being time-consuming, the use of traditional retraction cord may cause discomfort and potential damage to periodontium if used carelessly.[2] Due to these shortcomings of conventional cord, the development of cordless retraction materials is becoming popular.

A cordless retraction material is in the form of a paste-like material and is supplied with a specialized metal dispenser. It displaces gingiva by means of its high viscosity when injected into the sulcus.

The purpose of this study is to compare and evaluate the efficacy of Gingival cord and Gingival Paste (Cordless system) based on the amount of gingival retraction using Stereomicroscope.

MATERIALS AND METHOD :

Selection criteria

For this study, a total of 20 participants aged above 18 years with healthy gingiva were selected with endodontically treated tooth that required fixed prosthesis in the anterior arch which are clinically and radiographically sound.

Patients with unhealthy abutments, periodontitis or any systemic condition were not included in the study.

Preparation of patient

Patients were assessed clinically and radiographically for the sound condition of the abutment. Abutments were prepared for full veneer restoration with subgingival margins taking care to avoid damage to surrounding gingival tissues. After the preparation of teeth, the area was isolated thoroughly

3 impression of each patient were taken at an interval of 7 days by different Techniques (TABLE 1)

	TECHNIQUE
A	With Ultrathin Gingival retraction Cord (SureEndo #000)
B	Gingival Retraction Paste (3M ESPE)
C	Gingival Retraction Paste (3M ESPE) along with ultathin cord

Method of application

Gingival Retraction Cord

After tooth preparation, the sulcus was rinsed with water and dried with compressed air at an angle. Non serrated cord Packer used to pack gingival retraction cord into the sulcus starting from interproximal area following tooth circumferentially.(FIGURE : 1)



FIGURE : 1

3M Retraction Paste

The prepared tooth was rinsed and dried. The 3M retraction paste was injected slowly into the gingival sulcus, with the help of the extra fin tio and the gun.(FIGURE:2)

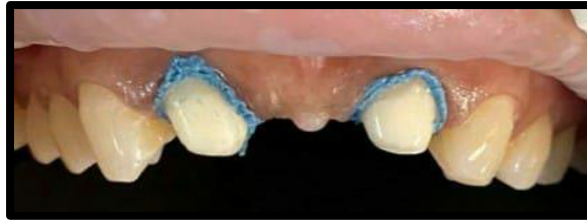


FIGURE:2

Gingival Retraction Cord with Retraction Paste

Teeth were rinsed and dried.Cord was packed into thje sulcus followed by paste instertion that was allowed to set for 2-3 mins followed by gentle rinse with water and three way syringe.(FIGURE : 3)



FIGURE:3

Making impressions and obtaining casts

Three impressions were made for each participant with soft putty and light body polyvinyl siloxane impression material (3M ESPE) [Figure 4 and 5]:



FIGURE : 4

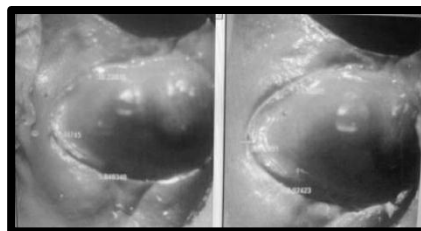
**FIGURE : 5**

During the interval, patient was given supragingival provisional prosthesis. Die stone models were fabricated using definitive type iv gypsum cast. Undamaged retrieved casts were sawed out, buccolingually from buccal to lingual at buccal ridge with the help of die cutting saw followed by measurement of the width of the retracted gingival sulcus under a stereomicroscope using an image analysis software De Winter image analysis software (Dewinter Optical, Inc., New delhi, India). [Figure 6]

**FIGURE : 6**

Recording sulcular width

The amount of gingival displacement was measured as the distance from the tooth to the crest of gingiva in the horizontal plane under stereomicroscope (SZMCTV1/2 Spectro lab equipment) using an image analysis software (De Winter image analysis software). The image analysis measurements were in micrometer scale, which was later converted into millimeter grading. The amount of retraction was calculated by subtracting the measured width before retraction from the one which was obtained after retraction (Figure 7 & 8)

**FIGURE : 7 & 8**

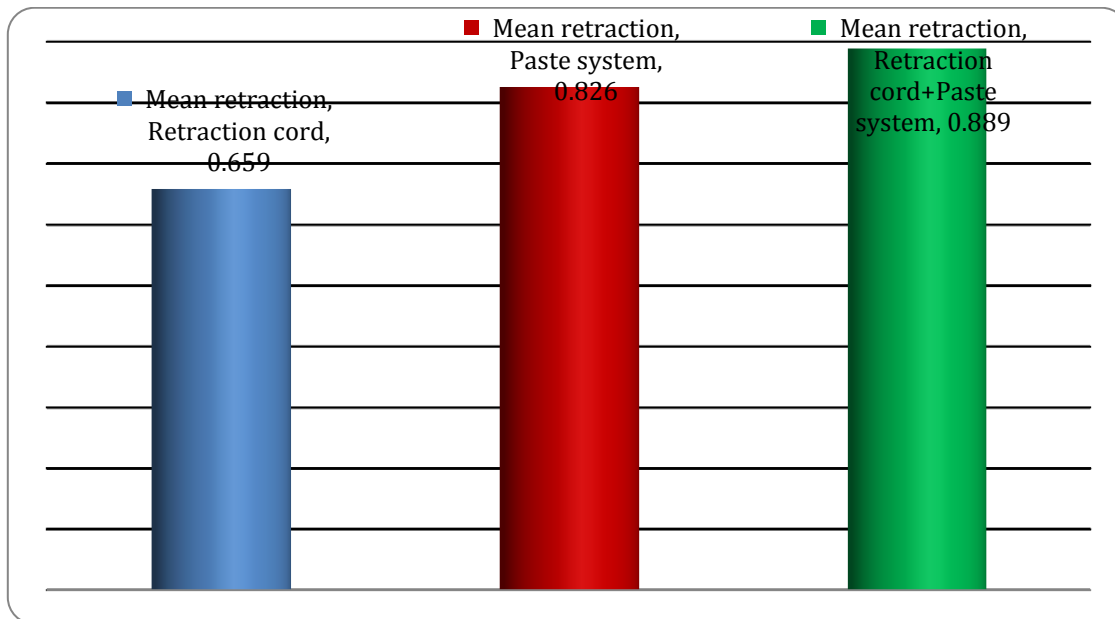
RESULTS:

The mean retraction was compared between Retraction cord, Paste system and Retraction cord+Paste system using the Kruskal-wallis test. There was a significant difference in mean retraction between Retraction cord, Paste system and Retraction cord+Paste system.(TABLE : 2 and GRAPH 1)

	Mean	SD	Critical value	p-value
Retraction cord	0.659	0.097	9.454	< 0.001*
Paste system	0.826	0.189		
Retraction cord+Paste system	0.889	0.211		

Kruskal-wallis test

*** Significant difference**



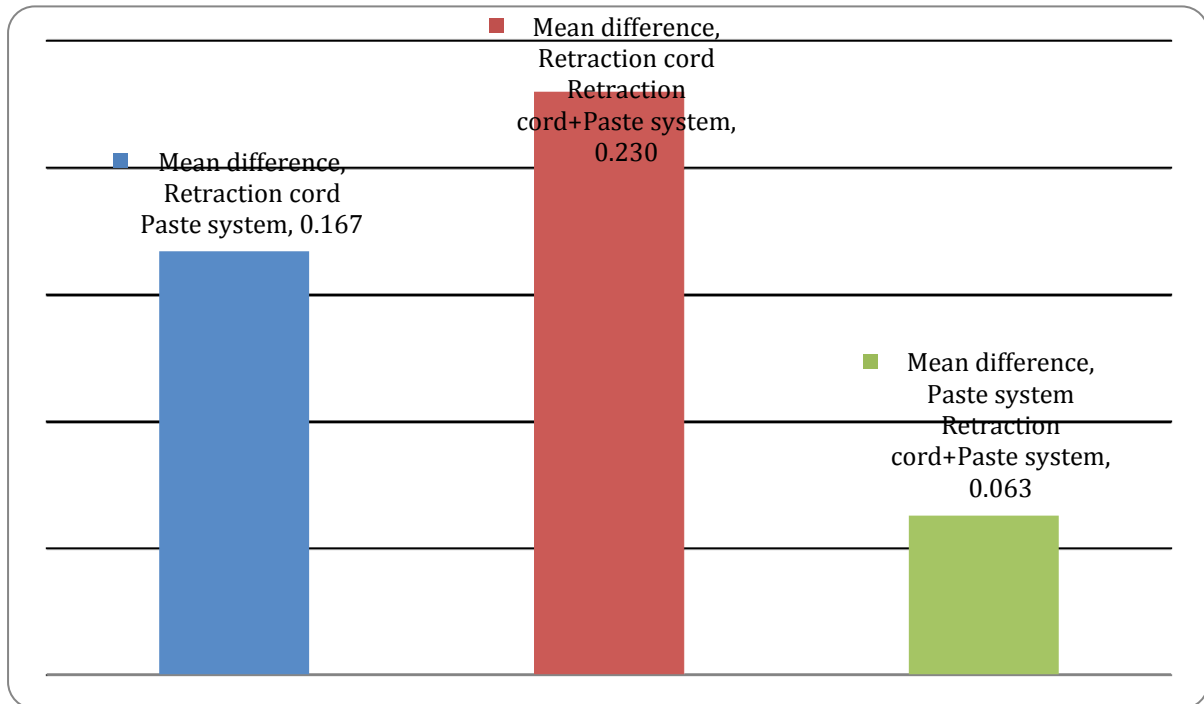
GRAPH - 1

The inter-group comparison of mean retraction was done using the Mann-whitney u-test. The mean retraction was significantly more among Paste system and Retraction cord+Paste system compared to Retraction cord alone. No significant difference was found between Paste system and Retraction cord+Paste system(TABLE:3 AND GRAPH: 2)

		Mean difference	p-value
Retraction cord	Paste system	0.167	0.009*
Retraction cord	Retraction cord+Paste system	0.230	< 0.001*
Paste system	Retraction cord+Paste system	0.063	0.486

Mann-whitney u-test

*** Significant difference**



GRAPH - 2

DISCUSSION:

The marginal integrity is one of the most basic criteria of the principles of tooth preparation.(3)The placement of margin or finish line in relation to the gingival margin has direct bearing on fabrication of restoration and health of the periodontal tissue of the prepared abutment teeth. (4)

From the periodontal point views, it is preferable to place the gingival finish lines of restoration supragingivally or equigingivally. (5)

For esthetics or other reason such as caries existing restoration and need for additional retention, the dentist may be forced to place them subgingivally. This requires some form of gingival displacement, for making the impression.(6)

Most studies on cordless techniques are demonstrations of their clinical use; their effects on the gingival and periodontal tissues are not well documented (Poss 2002, Shannon 2002, Smeltzer 2003).(7)

Various studies investigated the effects of different retraction techniques on the gingival and periodontal health but did not test the effectiveness of gingival displacement.

This study was focused on evaluation and comparison of the amount of displacement of free gingiva with the use of a new retraction paste and retraction cord system.

Both are cordless chemicochemical method of gingival displacement wherein the material is placed into the gingival sulcus with no pressure. All the measurements in the study were made by single operator to avoid interoperator variability.

The above mentioned results can be attributed to the following factors;

The mechanical method involves physical displacement of the gingival tissue by placement of materials within the sulcus to obtain maximal gingival retraction . Whereas, 3M ESPE Retraction Paste is a non-cord “mechanico-chemical” method of gingival displacement where the material is placed into the gingival sulcus with no pressure.

Still favourable and comparable results were obtained with retraction paste .

For impression making single step technique was used to avoid discrepancy that may creep in due to the use of two materials, tray positioning and the time that elapses in the two-stage procedure between removal of the cord and the impression making.

Furthermore, in double mix single step technique it is difficult to control the burn out effect. Putty may displace the light body and show an error so single step impression technique, therefor medium body consistency monophase material was used.

In the present study, a method of pouring the impression of retracted gingival and measuring this amount of displacement on the sectioned part of the cast under microscope with image analyzer system was followed. This method in part is similar to the technique used by Bowles et al., (8) Casts were made and compared with the pretreatment casts.

Sections of the casts were sawed out, and the teeth under investigation were sectioned buccolingually at the buccal eminence, followed by quantitative measurement of the width of the retracted sulcus, under a low-power microscope equipped with a 0.25-mm grid. The width was measured as the distance from the tooth to the crest of the gingiva. However, the 0.25-mm grid may not be a suitable grid measure for measuring gingival displacement as the minimum amount of displacement in human gingival has been reported to be 0.2 mm. Further digital measurement of the amount of displacement, as followed in this study, gives measurement with at least count of about 1 μ . Yet another technique of measuring the amount of displacement has been reported in the study done by Raja and Nair.(9)

CONCLUSION:

Apart from being time-consuming, the use of traditional retraction cord may cause discomfort and potential damage to periodontium if used carelessly. Cordless method was found to be more effective in gingival retraction.

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