

COMPARING THE EFFECT OF GINGIVAL RETRACTION METHOD USING MAGIC FOAM CORD AND EXPASYL PASTE

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Abstract

Aim – The purpose of this study was to evaluate and compare the effect of two cordless retraction techniques and their influence on gingiva.

Material and Methods – Participants (n=40) with healthy gingival conditions were recruited- an expanding polyvinyl material (Magic foam cord), a paste like material (Expasyl) were applied in the posterior tooth of the subjects. Following impressions casts was measured for the gingival retraction with 3D scanner. Gingival health was assessed after one week and the collected data was tabulated and subjected to statistical analysis.

Result- Mean gingival displacement obtained by the Expasyl paste was more effective as compared to the magic foam cord i.e, 0.30mm and 0.23mm respectively and the obtained "p" value was p<0.001 which was extremely significant.

Conclusions – Within the limitations of this study the conclusions were made that both the retraction agents were convenient to use, painless and they achieved the adequate gingival retraction and they wont result in any gingival inflammation and gingival recession.

Keywords - Gingival retraction, Gingival inflammation, Gingival sulcus width, Gingival recession

INTRODUCTION

treatment offers Fixed prosthodontic several advantage over removable prosthodontic appliances in terms of function, esthetics, comfort, speech and longetivity of the prosthesis.⁽¹⁾ Effective gingival retraction prior to making an impression without damaging periodontal tissue is very important in long term success of cast restoration.⁽²⁾Gingival displacement is defined as a deflection of marginal gingiva away from the tooth. techniques The of gingival tissue displacement can be broadly classified as

nonsurgical and surgical methods. The nonsurgical methods include mechanical (Retraction cords) and chemicomechanical method (Pre impregnated retraction cords, Expasyl paste, Magic foam cords, Gingitrac, Merocel etc.); while surgical methods includes rotary curettage, electro surgical tissue displacement and lasers.⁽¹⁾ The most common form of mechanical tissue displacement practiced record a conventional fixed to prosthodontic impression mainly involves the use of gingival retraction cord. Retraction cords from these can be fabricated into configurations of knitted, braided or twisted cord⁽⁵⁾. Mechanical retraction cords, according to Forgia A et al¹, one of the pioneers of mechanochemical retraction were of the belief that arresting haemorrhage, seepage and deflecting the tissues from margins of teeth subgingivally prepared with chemically impregnated cords could be used on all patients regardless of their general health, to make impressions of prepared tooth.⁽⁶⁾

Nonmedicated cords placed in the gingival sulcus are safe but have limited effect in controlling haemorrhage.⁽⁷⁾ Medicated retraction cords are effective, however various studies in past have shown local and systemic side effects induced by medicaments used for gingival retraction. To address these problems, 3 new retraction systems have been introduced, copper wire reinforced retraction cord (Stay-put; Roeko, Coltene/Whaledent), polyvinyl siloxane foam retraction system (Magic foam cord; Coltene/Whaledent Inc) and aluminum chloride paste retraction system (Expasyl; Kerr corporation).

The present study was undertaken to identify the most efficient gingival retraction method out of expasyl paste and magic foam cord on the basis of amount of gingival retraction and effect of gingival retraction on gingiva i.e. gingival recession and amount of gingival inflammation.

METHODOLOGY

This study was conducted on healthy unblemished maxillary or mandibular molar teeth on 40 patients of age group 21-48 years requires various types of indirect fixed restoration in posterior teeth. All the patients were selected trough the department of prosthodontics and oral implantology of Maharaja Gangasingh dental college and research centre, Sri Ganganagar, Rajasathan, India. Exclusion criteria

- 1. Patients with any systemic diseases.
- 2. Patients having history of smoking, alcohol or using of specific drugs.
- 3. Patients with any gingival disease or patients with periodontal destruction were excluded from our clinical study.
- 4. Pregnant and lactating women were excluded.
- 5. Patients undergoing orthodontic treatment were excluded.
- 6. Patients allergic to tetrahydrozoline and aluminium chloride were excluded.

Study design-

A randomized controlled clinical study was designed in which 40 patients with healthy periodontium were selected.

Our clinical study was divided into three stages

Stage I- Expasyl paste application for gingival retraction (Baseline).

Stage II- Magic foam cord application for gingival retraction (1 week followed from baseline).

Stage III- Revaluation followed after I week of stage II.

Basic materials gingival used for displacement were Magi foam cord (Coltene/ WHaldent company)[Figure 1], Expasyl paste (Satellac Company)[Figure2]. Addition silicone (Light body consistency; Coltene, Affinis) [Figure 3] was used to make the impression.

Three impressions were made for each participants at the time interval of 8 days, one without gingival displacement, two after gingival retraction using 2 retraction system.

At the day of baseline initial impression was made and the impression was poured in dental stone and diagnostic cast was prepared. On the diagnostic cast custom tray was fabricated and tooth was prepared with a chamfer finish line was done from the mesiobuccal line angle to the distobuccal line at the height of free gingival margin to avoid tissue damage. Retraction was done using Expasyl paste [Figure 4] and secondary impression was made using custom acrylic tray with a combination of light body and putty silicone impression material followed by retraction [Figure 5] and the cast was poured using die stone and die was prepared.

After one week Gingival index and Gingival recession were measured and again the same prepared tooth was isolated and the retraction was done by using Magic foam cord. Impression was made by using custom tray with a combination of light body and putty silicone impression material. The impression was poured and die was prepared. [Figure 6]

Then the prepared tooth was trimmed into a die and each model model was given a label 1A, 1B, 1C; 2A, 2B,2C- where numerical denoted the participant and the alphabet indicated the retraction method or no retraction. (A- No retraction , B- Expasyl paste gingival retraction system, C- Magic foam cord).

The sulcus width or the amount of retraction was measured as the distance from the tooth to the crest of the gingiva in a horizontal plane. The quantitative measurement of the width (in mm) of the retracted sulcus was measured by using a 3-D laser scanner (SHINING 3D EX PRO 3D Scanner) [Figure 7& Figure 8]. The permanent restoration were cemented with Glass ionomer type I luting cement (GC gold label, Tokyo, Japan)

The amount of retraction was calculated by substracting the measured width (tooth to the gingival crest) before retraction from the one which was after retraction. Statical method paired t-test was used to compare the statistical significance of amount of gingival retraction b/w 2 groups.

To evaluate the effect of retraction on the health of gingival tissue health, the participants were again reviewed for periodontal health after 7 days of gingival retraction for any evidence of gingival inflammation, change in gingival contour & bleeding on probing. Loe & Silness test was used to assess the gingival health and gingival recession was. Paired t- test was done to compare Gingival index for both the retraction systems. Dr Pratibha Panwar.et.al., COMPARING THE EFFECT OF GINGIVAL RETRACTION METHOD USING MAGIC FOAM CORD AND EXPASYL PASTE



Figure 1(Magic foam cord)

Figure 2(Exapsyl paste)



Figure 3(Addition silicone impression material)

Figure 4 (Retraction with Expasyl paste)



Figure 5(Impression after retraction with custom tray) Fig 6(Retraction with Magic foam cord)



Fig 7(Die preparation)

Fig 7-(Measuring of distance of gingival retraction)



Fig 8-3 D scanner

RESULTS

It was observed that the mean change in sulcus width obtained for Expasyl paste was 0.30mm with the standard deviation 0.098 mm while with the magic foam cord was 0.23mm with the standard deviation of 0.10mm (table 1). The values were further subjected to paired -t test for comparision and the retraction produced by the Magic foam cord was less and the difference was clinically significant with the Expasyl paste. The obtained "p" value by the horizontal with the two retraction system was p<0.001 which was extremely significant. Maximum change in sulcus width produced by the Expasyl paste with a mean of 0.62mm and standard deviation 0.076 followed by Magic foam cord 0.23mm with standard deviation of 0.10.

Gingival index was assessed by using Loe and silness index after the one week placement of Expasyl paste and magic Dr Pratibha Panwar.et.al., COMPARING THE EFFECT OF GINGIVAL RETRACTION METHOD USING MAGIC FOAM CORD AND EXPASYL PASTE

foam cord respectively. Mean value of gingival index after placement of Expasyl placement and Magic foam cord is 0.39mm with standard deviation 0.26 while for Magic foam cord is 0.42mm with standard deviation 0.24 respectively. (table 2).

Gingival recession for all the 40 patients was measured using Mahajan's Table 1-

Count, N:	40				
Sum, Σx:	12.112				
Mean, µ:	0.3028				
Variance, o 2		0.00960566			
Standard Deviation : 0.098008469021815					
For	Ex	pasyl	paste		

classification where 4% GRD was observed after one week of placement of Magic foam cord where 96% shows no gingival recession and when measured with Expasyl paste no gingival recession was observed in any of the patients (graph 1).

Count, N:	40			
Sum, Σx:	9.487			
Mean, µ:	0.237175			
Variance,		σ2:		
0.010219594375				
Standard	Deviation	:		
0.10109200945179				

Table 2

For Magic Foam cord

Group	GINGIVAL INDEX SCOR	E GINGIVAL INDEX SCORE AFTER 1
	AFTER 1 WEEK OF EXPASY	L WEEK OF MAGIC FORM COARD
	PASTE	
Mean	0.3975	0.4252
SD	0.2684	0.2405
SEM	0.0424	0.038
Ν	40	40

GINGIVAL INDEX ONE WEEK AFTER GINGIVAL RETRACTION

Graph 1-

Gingival Recession for all the 40 Patients



DISCUSSION

The success of fixed prosthodontic treatment depends upon the precision and accuracy in every step involved in the procedure. Restoration involving fixed partial prosthesis routinely have subgingival margins or finish lines, either for esthetic or functional durability.⁽⁸⁾ In order to record sub-gingivally placed margins, the adjacent soft tissues needs to be retracted and displaced adequately for the impression material to penetrate and capture not only the features of preparation and finish line, but also some unprepared tooth structure apically.⁽⁹⁾

This study was carried out to compare the efficacy two cordless of chemomechanical gingival retraction system i.e., Expasyl paste and Magic foam cord on the terms of retraction achieved, gingival and gingival inflammation. recession Expasyl is a gingival retraction material with paste like consistency which is resilient on the hygroscopic expansion of kaolin on contacting the crevicular fluid & hemostatic properties of aluminium chloride to provide minor gingival displacement within 2 minutes while Magic foam cords is a polyvinyl siloxane material that gradually expands and fabricated for simple and quick sulcular retraction with no potentially traumatic episodes of packing of retraction cord.

In our present study we compared the retraction caused by Expasyl paste and Magic foam cord. In this study according to us both the cordless system were convenient to use and comfortable to patient, they were painless, no bleeding on removal and from the soft tissue point of view we noticed that there was no injury to sulcular epithelium. We observed that the maximum retraction produced by Expasyl paste was in range from 0.48-0.76mm and from Magic foam cord it was 0.42-0.70mm and the mean gingival displacement was 0.30mm-0.23mm for Expasyl paste and Magic foam cord respectively.

In the present study the retraction by Expasyl paste was greater than the Magic foam cord which is in accordance to study done by Raghav et $al(2015)^{(10)}$, Shrivastav et $al^{(11)}$, Rathod et $al^{(8)}$. In our study we observed that "p" value obtained by the with horizontal retraction the two retraction system i.e., Expasyl paste and Magic foam cord by paired- t test was p<0.001 which was extremely significant, represents that Expasyl paste provides better gingival displacement than the Magic foam cord.

The manufacturer claims that the Magic foam cord is an addition elastomer that becomes foaming during the addition reaction resulting in a temporary retraction of gingiva⁽¹²⁾ .While Expasyl paste is a viscous paste having kaolin as one of its constituent which hold its rigidity while creating a space b/w the tooth and the gingiva.⁽¹³⁾

In our study to evaluate the effects of retraction on the health of the gingival tissue health, the participants were again reviewed for periodontal health after 8 days of gingival retraction for any evidence of gingival inflammation, change in gingival contour and bleeding on probing. In our study we have measured gingival inflammation by GI (gingival index) which was given by Loe & Sillness in 1963 and gingival recession was measured acc to Mahajan's classification. The recession observed in our study with cordless techniques was too small and clinically insignificant. Rubina gupta et al and many other studies also have reviewed that the recession observed in cordless techniques was too small and clinically insignificant and undetectable.

In this study we observed that there was no GRD when measured for all 40 patient after Expasyl paste and Magic foam cord application followed by 1 week from baseline and 1 week from Expasyl paste application respectively. Within the limitations of this study we found that Expasyl paste was more effective for gingival displacement as compared to Magic foam cord, but both the techniques were convenient to use, pain less, quick, and wont results in gingival inflammation and gingival recession.

CONCLUSION

Both the retraction methods i.e., Expasyl paste and Magic foam cord employed in this study achieved adequate gingival retraction. Expasyl paste was the more effective method of gingival retraction in terms of both sulcus width and depth than Magic foam cord. Statistical analysis for the comparision of the horizontal retraction on the comparision of the effect of the Magic foam cord & Exapsyl paste for the sulcus depth was clinically significant. Also the statistical analysis for gingival recession for both the retraction methods i.e., Exapsyl paste and Magic foam cord was clinically insignificant.

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