

## Original Research

### A comparative evaluation of different gingival displacement agents in achieving finish line

Dr. Ruchika C Jain<sup>1</sup>, Dr. Abhishek Dubey<sup>2</sup>, Dr. Pratik Prakash Bumb<sup>3</sup>, Dr. Saniya J Kasat<sup>4</sup>, Dr. Santosh Kumar Muradi<sup>5</sup>, Dr. Ankita Priya<sup>6</sup>

<sup>1</sup>PG 2<sup>nd</sup> year, Department of Prosthodontics, College of Dental Sciences, Davangere 577004, Karnataka, India;

<sup>2</sup>Senior lecturer, Department Prosthodontics, Seema Dental College and Hospital, Rishikesh, India;

<sup>3</sup>PG 2<sup>nd</sup> year, Teerthanker Mahaveer Dental College and Research Center; Moradabad; Uttar Pradesh, India;

<sup>4</sup>PG 3<sup>rd</sup> year, Department of Prosthodontics, Bharati Vidyapeeth Dental College and Hospital, Pune, Maharashtra, India;

<sup>5</sup>Sr. Lecturer, Department of Prosthodontics, Meghana Institute of Dental Sciences, Mallaram, Nizamabad, India;

<sup>6</sup>Consultant Prosthodontist and implantologist, Ragiv Nagar, Patna, Bihar, India;

#### ABSTRACT:

**Background:** The present study was conducted to compare different gingival displacement agents in achieving finish line.

**Materials & Methods:** 3 impressions with unblemished right mandibular central incisor were made; impressions with knitted retraction cord impregnated with 25% aluminum chloride (group I), expasyl (group II) and Racegel (group III) according to Latin block design. **Results:** The mean change in sulcus width in group I was 0.28 mm, in group II was 0.23 mm and in group III was 0.21 mm. The difference was significant ( $P < 0.05$ ). **Conclusion:** The amount of gingival retraction obtained by al aluminum chloride was maximum as compared to expasyl and racegel.

**Key words:** Aluminum chloride, Expasyl, Racegel.

Received: 11 September, 2020

Accepted: 16 November, 2020

**Correspondence:** Dr. Ruchika C Jain, PG 2<sup>nd</sup> year, Department of Prosthodontics, College of Dental Sciences, Davangere 577004, Karnataka, India

**This article may be cited as:** Jain RC, Dubey A, Bumb PP, Kasat SJ, Muradi SK, Priya A. A comparative evaluation of different gingival displacement agents in achieving finish line. J Adv Med Dent Sci Res 2020;8(12):39-41.

#### INTRODUCTION

Success of fixed prosthodontics restorations is largely dependent upon the long-term health and stability of the surrounding periodontal structures.<sup>1</sup> No single restoration in dentistry is more dependent upon, nor influences more the health of periodontal structures than the full coverage restoration.<sup>2</sup> Full coverage preparations often require subgingival margins because of caries, existing restorations, esthetic demands, or the need for additional retention. In such situations, the clinician must make impressions that accurately capture the prepared cervical finish lines and permit the fabrication of accurate dies on which the restorations are fabricated.<sup>3</sup>

Chemico-mechanical displacement is the most commonly used method. An alternative to overcome the demerits of acidic nature of the chemical agents would be to use nasal decongestants such as

tetrahydrozoline and oxymetazoline with higher pH as gingival displacement solution which is safer to the tissues.<sup>4</sup> Furthermore, to overcome the shortcomings of the mechanical method of gingival displacement, newer cordless systems such as Racegel have been introduced which are less time-consuming, more comfortable to the patient, easy application, and minimally invasive. Newer gingival displacement materials have been introduced like NoCord by Centrix USA, which is a polyvinyl impression material which claims to produce gingival displacement along with making accurate impressions. Aquasil, as an impression material, has been introduced a long time ago, but its clinical efficacy as a retraction agent has not been tested.<sup>5</sup> The present study was conducted to compare different gingival displacement agents in achieving finish line.

**MATERIALS & METHODS**

The present study was conducted in the department of Prosthodontics. It comprised of 60 patients of both genders. All were informed regarding the study and their consent was obtained. Ethical approval for the same was obtained from ethical approval committee. Data such as name, age, gender etc. was recorded. 3 impressions with unblemished right mandibular central incisor were made; impressions with knitted retraction cord impregnated with 25% aluminum

chloride (group I), expasyl (group II) and Racegel (group III) according to Latin block design. Intraoral scanner and Vernier caliper were used to study and compare the dimensional accuracy of each die obtained following which the dies were sectioned and evaluated under optical microscope with image analyzer to measure the amount of gingival retraction. The data was subjected to statistics. P value less than 0.05 was considered significant.

**RESULTS**

**Table I Distribution of patients**

Groups	Group I	Group II	Group III
Number	25% Aluminum chloride	Expasyl	Racegel
Number	20	20	20

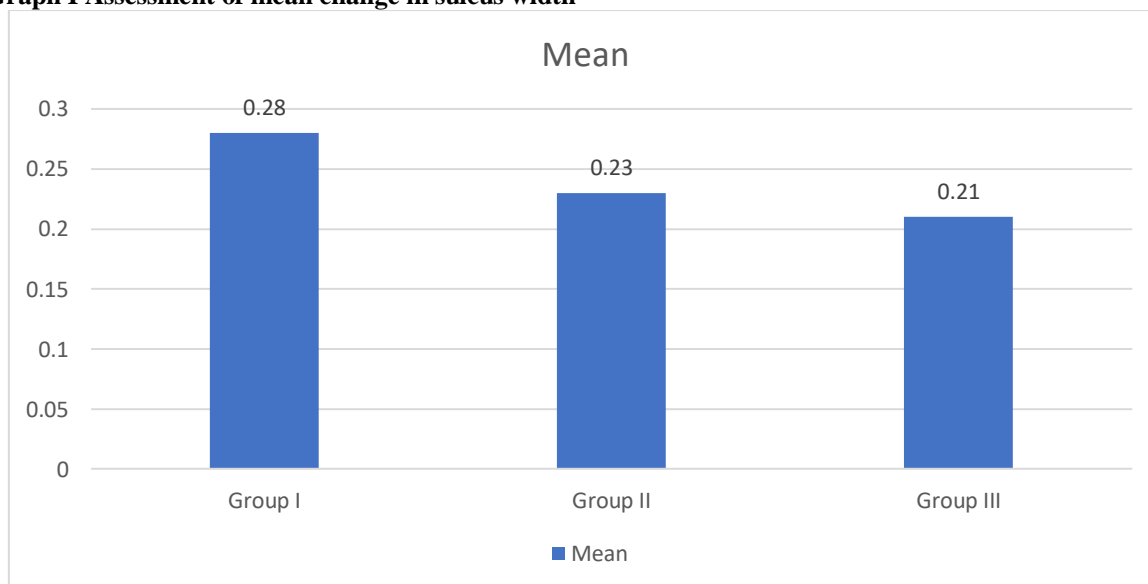
Table I shows that in group I, 25% aluminum chloride, in group II expasyl and in group III racegel was used as gingival displacement material. Each group had 20 patients.

**Table II Assessment of mean change in sulcus width**

Groups	Mean	P value
Group I	0.28	0.052
Group II	0.23	
Group III	0.21	

Table II, graph I shows that mean change in sulcus width in group I was 0.28 mm, in group II was 0.23 mm and in group III was 0.21 mm. The difference was significant (P< 0.05).

**Graph I Assessment of mean change in sulcus width**



**DISCUSSION**

The goal of Prosthodontics is to achieve esthetic and functional restoration of what is missing. Fixed prostheses have been the most common treatment modality to replace the missing tooth structure or teeth.<sup>6</sup> Tissue management or gingival displacement, defined as 'the deflection of marginal gingiva away from the tooth is a crucial step before recording the impressions for optimum reproduction of marginal

details in fixed restorations.<sup>7</sup> The optimum gingival displacement has been reported to be approximately 0.2 mm without which impressions have higher incidences of voids, tearing of impression materials, and less marginal accuracy.<sup>8</sup> Gingival displacement facilitates effective impression making, fluid management, finishing and placement of tooth preparation margins, removal of excess cement, etc. Impressions made with sulcular width lesser than the

critical value i.e 0.15-0.2mm, have higher incidence of voids in the marginal area and decrease in tear strength of impression material.<sup>9</sup> The present study was conducted to compare different gingival displacement agents in achieving finish line.

In present study, in group I, 25% aluminum chloride, in group II expasyl and in group III racegel was used as gingival displacement material. Gajbhiye et al<sup>10</sup> did a comparative evaluation of these new gingival displacement materials was deemed necessary for efficacy in tissue management and dimensional accuracy. Ten individuals were selected according to the inclusion and exclusion criteria for gingival displacement using retraction cord impregnated with aluminum chloride and two polyvinyl siloxane impression materials (Aquasil and NoCord VPS impression system) according to Latin block design. Statistical analysis showed that the amount of gingival retraction obtained by using retraction cord impregnated with aluminum chloride as gingival retraction agent was maximum as compared to NoCord followed by Aquasil. All three gingival displacement techniques could produce gingival displacement >0.2 mm which is the optimum amount of retraction required for impression making. All the three materials are found to be dimensionally accurate.

We found that mean change in sulcus width in group I was 0.28 mm, in group II was 0.23 mm and in group III was 0.21 mm. Chaudhari et al<sup>11</sup> evaluated efficacy of newer retraction agent tetrahydrozoline with two widely used retraction systems i.e., Expasyl retraction system and medicated retraction cords on basis of amount of gingival retraction. Retraction was done with aluminium chloride; Tetrahydrozoline and Expasyl according to Latin block design. The amount of gingival retraction obtained by using aluminium chloride as gingival retraction agent was maximum (148238.33  $\mu\text{m}^2$ ) compared to tetrahydrozoline (140737.87  $\mu\text{m}^2$ ) and Expasyl (67784.90  $\mu\text{m}^2$ ).

Kesari et al<sup>12</sup> compared and evaluated the efficacy of ViscoStat clear, Vasozine, and Racegel (with and without cord) with respect to the amount of lateral gingival displacement produced by them. Thirty consented volunteers were selected in the age group of 18–22 years. Maxillary right first premolar and lateral incisor and maxillary left central incisor and canine were selected for each individual. Mean displacement produced (in  $\text{mm}^2$ ) by Racegel with cord, tetrahydrozoline, ViscoStat clear, and Racegel is 0.2256, 0.2158, 0.2069, and 0.1414, respectively. The largest mean gingival displacement was produced by Racegel with cord (0.2256  $\text{mm}^2$ ) and lowest by

Racegel without cord (0.1414  $\text{mm}^2$ ). There was no significant statistical difference in the amount of gingival displacement produced between the four agents.

## CONCLUSION

Authors found that the amount of gingival retraction obtained by al aluminum chloride was maximum as compared to expasyl and racegel.

## REFERENCES

1. Baba NZ, Goodacre CJ, Jekki R, Won J. Gingival displacement for impression making in fixed prosthodontics: Contemporary principles, materials, and techniques. *Dent Clin North Am* 2014;58:45-68.
2. Baharav H, Kupersmidt I, Laufer BZ, Cardash HS. The effect of sulcular width on the linear accuracy of impression materials in the presence of an undercut. *Int J Prosthodont* 2004;17:585-9.
3. Rayyan MM, Hussien AN, Sayed NM, Abdallah R, Osman E, El Saad NA, *et al.* Comparison of four cordless gingival displacement systems: A clinical study. *J Prosthet Dent* 2019;121:265-70.
4. Chandra S, Singh A, Gupta KK, Chandra C, Arora V. Effect of gingival displacement cord and cordless systems on the closure, displacement, and inflammation of the gingival crevice. *J Prosthet Dent* 2016;115:177-82.
5. Csempezs F, Vág J, Fazekas A. *In vitro* kinetic study of absorbency of retraction cords. *J Prosthet Dent* 2003;89:45-9.
6. Kellam SA, Smith JR, Scheffel SJ. Epinephrine absorption from commercial gingival retraction cords in clinical patients. *J Prosthet Dent* 1992;68:761-5.
7. Donovan TE, Chee WW. Current concepts in gingival displacement. *Dent Clin North Am* 2004;48:vi, 433-44.
8. Gupta A, Prithviraj DR, Gupta D, Shruti DP. Clinical evaluation of three new gingival retraction systems: A research report. *J Indian Prosthodont Soc* 2013;13:36-42.
9. Smeltzer M. An alternative way to use gingival retraction paste. *J Am Dent Assoc* 2003;134:1485.
10. Gajbhiye V, Banerjee R, Jaiswal P, Chandak A, Radke U. Comparative evaluation of three gingival displacement materials for efficacy in tissue management and dimensional accuracy. *J Indian Prosthodont Soc* 2019;19:173-9.
11. 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. *Contemporary Clinical Dentistry*. 2015 Apr;6(2):189.
12. Kesari ZI, Karani JT, Mistry SS, Pai AR. A comparative evaluation of amount of gingival displacement produced by four different gingival displacement agents – An in vivo study. *J Indian Prosthodont Soc* 2019;19:313-23.