

An easy and effective way to reduce gag during orthodontic impression recording

Muhammad Kamran^a, Rehan Qamar^b

Abstract

Introduction: Gag reflex is one of the most common problems encountered during impression taking for orthodontic records. Various methods advocated for gag reflex control include behavior modification, acupuncture and pharmacological agents.

Material and Methods: Study was carried out on 30 patients at University College of Dentistry, the University of Lahore. The severity of gag was recorded by gag severity index. After addition of local anesthetic to impression material, gag preventive index was used to determine the efficacy.

Results: Male to female ratio was 1:1. Mean age was 21.6 ± 6.9 years. Wilcoxon signed ranked test showed statistically significant reduction of gag ($p = .000$) with addition of local anesthetic.

Conclusions: Addition of local anesthetic to impression material in patients with gagging results in significant reduction in gag reflex

Keywords: Gag severity index; gag reflective index; orthodontic impression record

Introduction

The process of orthodontic record acquiring involves a good impression of the oral cavity. The art of successfully recording the oral anatomy depends upon the appreciation of anatomical features to be recorded, the impression material and handling of the operative technique.¹ One of the most frequent problems encountered during impression taking is an exaggerated gag reflex, defined as ejective contraction of muscles of pharyngeal sphincter.²⁻⁴ The etiology of gagging may be somatic which is induced by touching trigger area e.g. lateral border of tongue, or may be psychogenic in which there is no direct contact of the trigger but the thought of stimulus such as dental intervention is sufficient to induce the reflex.⁵ A proportion of the population has a profound and exaggerated reflex that can

cause acute limitation of the patient's ability to accept dental treatment and the clinician's ability to provide it. The exact prevalence of the problem in relation to dental treatment is however unknown.⁶

Numerous methods have been reported in literature to reduce the gag reflex during impression taking.⁷ Some studies have shown the effectiveness of the acupuncture and behavior modification.⁸⁻¹² Pharmacologic agents that act peripherally or centrally e.g. topical and local anesthetics and general anesthesia also control gag reflex by eliminating the afferent impulses from sensitive oral tissues.^{12,13}

This current study introduces a simpler technique using local anesthetic solution which can be performed on chair side. The aim was to evaluate the effectiveness of adding local anesthetic cartridge to alginate powder during mixing for impression taking in patient having gag reflex. Based on the outcomes, this technique might be used clinically for controlling gag reflex during impression taking.

^a Corresponding Author. BDS, FCPS-II Resident Orthodontics, University College of Dentistry, The University of Lahore. Email: mkamran917@gmail.com

^b BDS, FCPS; Professor of Orthodontics, University College of Dentistry, The University of Lahore.

Material and Methods

The current study was carried out on 30 patients reporting to Orthodontic Department, University College of Dentistry, The University of Lahore. Patients included in the sample were between the ages of 15-25 years, had a history of gag reflex. Excluded patients included patients with syndromes, having history of known allergy to lignocaine and dental materials used in impressions. The severity of gag was assessed by Gag Severity Index⁵ (GSI, Table I). The alginate powder was taken in a bowl and one cartridge of 1.8ml local anesthetic (lignocaine 2% with 1:10000 adrenaline) solution was added to it and mixing with water was done. This procedure was single blind in which the patient was not informed about the addition of local anesthetic solution in the impression material. After mixing the tray was loaded and impressions of upper and lower jaws were taken. The effectiveness of the method was assessed by Gag Prevention index⁵ (GPI) in controlling the gag reflex and allowing the impression to be carried out successfully. The data collected was analyzed using SPSS 20. Mean and SD were calculated for numerical variables like age and gag indices. Frequencies, percentages and ratios were determined for categorical data like gender. Wilcoxon signed rank test was applied to determine the effectiveness of the procedure. P value of <.05 were considered significant.

Table I: Gagging severity index (GSI)

I. Very mild, occasional and controlled by the patient
II. Mild, and control is required by the patient with reassurance from the dental team
III. Moderate, consistent and limits treatment options
IV. Severe and treatment is impossible
V. Very severe; affecting patient behavior and dental attendance and making treatment impossible

Table II: Gag Prevention index

I. Obtunded gag reflex; treatment successful
II. Partially controlled gag reflex; all treatment possible
III. Partially controlled gag reflex but frequent gagging; simple treatment possible
IV. Inadequately controlled gag reflex; simple treatment unable to be completed
V. Gag reflex severe; no treatment possible.

Results

The male to female ratio was 1:1 (15 males, 15 females). The mean age of study population was 21.6 ± 6.9 years (Table III). By comparing.

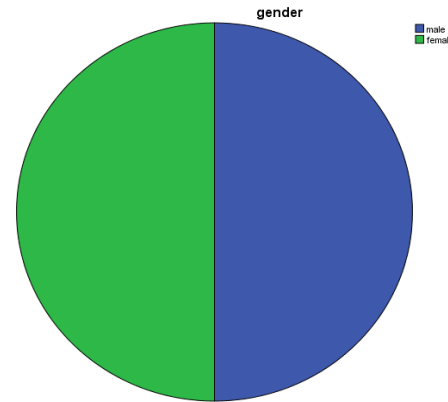


Figure 1: Gender distribution of the sample

Table III: Descriptive statistics of age

	N	Minimum	Maximum	Mean	Std. Deviation
Years	30	12	44	21.60	6.961

Table IV: Test statistics of gag reflex

		N	Mean Rank	Sum of Ranks
Gag Preventive Index - Gag severity Index	Negative Ranks	30 ^a	15.50	465.00
	Positive Ranks	0 ^b	.00	.00*
	Ties	0 ^c		
	Total	30		
a. Gag Preventive Index < Gag severity Index				
b. Gag Preventive Index > Gag severity Index				
c. Gag Preventive Index = Gag severity Index				

*P value <0.05

the pre and post impression gag mean value, the Wilcoxon signed ranked test showed statistically significant reduction of gag ($p = .000$, Table IV). The mean value of gag before impression (Gag severity index) was 3.33 indicating moderate gagging. After mixing the local anesthetic in alginate the value was 1.20 (Table V) which showed the obtunding of gag reflex with successful impression taking.

Table V: Mean, SD and range of gag reflex

	N	Min	Max	Mean	S.D
Gag severity Index	30	3	4	3.33	.479
Gag Preventive Index	30	1	2	1.20	.407

Discussion

Gagging problems are not uncommon in a dental practice. Anecdotal evidence suggests that up to 87% of dentists encounter patients who experience this problem at least once a month.⁹ The etiology of gagging is complex and not fully understood. Whether its etiology is somatic, psychogenic or a combination of the two, the outcome is to make the acceptance of dental treatment difficult for some patients.⁵

An effort has always been made by clinicians to control the gag reflex during impression taking. Psychological intervention like behavior modification, diverting patient attention and prolonging the expiratory effort at the expense of inspiration and acupuncture has been advocated to be effective in controlling the gag.^{7,9,13,14}

The current study used local anesthetic agent to reduce gag reflex which showed significant results in reducing the gag which mirrors the finding of Hattab FN¹⁵ and Lee singer¹⁶ who used local anesthetic swab to apply local anesthetic topically before taking impression. The deposition of local anesthetic around the posterior palatine foramen has been recommended for the patients who gag.¹⁷ However; the administration of local anesthetic may not be possible because it may itself provoke the gag and may also distend the tissue resulting in inaccurate impression.¹⁸ In this study such adverse effect of local anesthetic agent were avoided because it was not injected into soft tissues, rather mixed in hydrocolloid impression material. This technique resulted in significant reduction of the gag ($p=.000$) and this may be because of the desensitization of the mucosa of posterior palate which results in cessation of efferent

impulses from the sensitive oral mucosa. This study is single centered and comprised of a small sample. Furthermore any adverse effects on the properties of alginate could not be observed in this study. However, in the present study, investigators noted no adverse effects clinically.

Conclusions

Addition of local anesthetic agent to alginate impression material can result in significant reduction in of exaggerated gagging reflex while impression taking of orthodontic patients and this method can be used as a valid alternative to the other methods because of its easy manipulation, ease of use, effectiveness and less cost.

References

1. Turner JW, Moazzez R, Banerjee A. First impressions count. *Dental Update* 2012;39:455-8, 460-2, 465-6.
2. Cakmak YO, Ozdogmus O, Günay Y, Gürbüz B, Tezulaş E, Kaspar EC, Hacıoglu H. An earplug technique to reduce the gag reflex during dental procedures. *Forsch Komplement med.* 2014;2:94-8.
3. Farrier S, Pretty I A, Lynch CD, Addy LD. Gagging during impression making: techniques for reduction. *Dental Update* 2001;38:171-2,174-6.
4. Savage R D, McGregor A R. Behavior therapy in prosthodontics. *J Prosthet Dent* 1970; 24: 126-32.
5. J. Fiske, C. Dickinson. The role of acupuncture in controlling the gagging reflex using a review of ten cases. *Br Dent J* 2001;190:611-3.
6. Dickinson C M, Fiske J. A review of gagging problems in dentistry: 1. Aetiology and classification. *Dent Update* 2005; 32: 26-8, 31-2.
7. Rosted P, Bundgaard M, Fiske J, Pedersen AML. The use of acupuncture in controlling the gag reflex in patients requiring an upper alginate impression: an audit. *Br Dent J* 2006; 201: 721-5.
8. Chate RA. Acupuncture for controlling gag reflex? *Br Dent J.* 2001;24:191:537.
9. Rosted P, Bundgaard M, Fiske J, Pedersen AM. The use of acupuncture in controlling the gag reflex in patients requiring an upper alginate impression: an audit. *Br Dent J.* 2006;201:721-5.
10. Neumann JK, McCarty GA. Behavioral approaches to reduce hypersensitive gag response. *J Prosthet Dent* 2001;85:305.

11. Barsby MJ. The use of hypnosis in the management of 'gagging' and intolerance to dentures. *Br Dent J* 1994;176:97-102.
12. Bassi GS, Humphris GM, Longman LP. The etiology and management of gagging: A review of the literature. *J Prosthet Dent* 2004;91:459-67.
13. Kaira LS., Dabral E, Kukreja HS. Gagging: A Review. *Nitte J Health Sci* 2014;4:149-55.
14. Shriprasad S, Shilpashree HS. Gag Reflex: No more gag to a dentist; the behavioral techniques, pharmacological techniques, acupressure and acupuncture in controlling the gag reflex. A review. *Bang J Med Sci* 2012;11:12-7.
15. Hattab FN, Al - Omari MA, Al - Dwairi ZN. Management of a patient's gag reflex in making an irreversible hydrocolloid impression. *J Prosthet Dent* 1999;81:369.
16. Lee-Singer I. The marble technique: A method for treating the 'Hopeless gagger' for complete denture. *J Prosthet Dent* 1973; 29: 146-55.
17. Watt DM, MacGregor AR. The diagnosis and treatment of problems of edentulous patients in designing complete dentures, 2nd edi, Bristol; Wright.1986, Pg no. 154-7.
18. Kalra A, Kinra M, Gupta K, Mittal N, Bhanote S, Goyal M. Gaggers and Their Management. *Ind J Dent Sci* 2012;4(5):100-3.