Factors affecting gagging and its management in prosthodontic patient: A review.

Supreet Kaur Chhabra[1], Sandeep Garg[2]

[1]Senior resident, Kusum Devi Sunderlal Dugar Jain Dental College and Hospital, Kolkata, West Bengal.
[2]Professor and Head, M M college of dental sciences and research, Mullana, Ambala, Haryana.

Abstract

Gagging is a protective reflex to safeguard the upper respiratory tract and the digestive tract from foreign body obstruction. When this reflex becomes abnormally active, compromise in the quality of dental treatment is observed. The selection of effective management techniques depends on causes and factors affecting gagging. The article aims to review the nature, factors, neurophysiology, different treatment modalities of gagging so that clinicians include strategies and utilize flexible approaches in dealing with this gag reflex.

Keywords- Gagging, vomiting, acupressure.

Address of correspondence: Dr. Supreet Kaur Chhabra, Flat no. 602, Action area 2D, New Town, West Bengal.
Email address: - supkaur2012@gmail.com **Phone no:** 9464937575. **DOI:** 10.5281/zenodo.6987144
Submitted: 18-June-2022 **Revised**: 11-Jul-2022 **Accepted:** 22-Jul-2022 **Published:**15-Aug-2022
Bibliographic details: Journal of Orofacial Rehabilitation Vol. 2(2), Aug 2022, pp. 65-70.

Introduction

Gagging is protective reflex for airway protection and removal of irritant material from posterior oropharynx and GIT.[1] Embarrassment in patients and compromised dental treatment are major cause of concern for a dentist. For effective management of gagging patients, the dentist should determine all possible factors (anatomic, organic, psychological) and causes of this active gag reflex.

Classification of Gagging

Faigenblum classified patients into mild and severe retching patients. Mild retching patients usually can tolerate the reflex but may have nausea. The patients with severe retching react usually in an exaggerated manner to the impression making, prosthesis insertion and operative procedures.[2,3]

Morstad classified gagging reflex into immediate and delayed. The immediate gagging reflex occurs immediately after the delivery of the prosthesis. Whereas the Delayed gagging reflex occurs after denture insertion (within two weeks to two months).

Davis classified gagging as either somatogenic or psychogenic. The somatogenic gagging is induced by physical stimuli. The five 'trigger zones' for physical stimuli of intra oral areas are base of tongue, palate, uvula, palatoglossal and palatopharyngeal folds and posterior pharyngeal wall.[4] Whereas psychological stimuli like anxiety, fear and apprehension causes psychogenic gagging.[1]

Neurophysiology of gagging and its clinical description

Afferent impulses arise due to stimulation of the palate (posterior part i.e. soft palate) or the posterior third of tongue and are transmitted to medulla oblongata. Following that efferent impulses are transmitted from the center of medulla oblongata resulting in retching/gagging.

Factors affecting gagging

a) ***Local and systemic disorders***:
Diaphragmatic hernia, uncontrolled diabetes and conditions associated with disorders in nasal mucosa like nasal polyps, nasal congestions can predispose to gagging. The congestion of mucosa (oral, pharyngeal) may increase the gag reflex.[5] Chronic diseases of gastrointestinal tract like long term gastritis, ulcers, carcinomas of intestines, stomach, partial gastrectomy, cholecystitis results in increased irritability and decreased threshold for excitation of oral cavity.[6]

b) Anatomical factors:
Gag reflex can be due to factors like anatomic abnormalities and oro-pharyngeal sensitivities. [7,8] In a study of denture wearers, no anatomic anomaly was observed when radiologic anatomy of gagging and non-gagging patients was compared.[9]

c) ***Social factor***:
Heavy smoking and drinking can result in inflammation of pharynx and hence hypersensitive gag reflex.

d) ***Physiologic factors:*** They are extra oral/non tactile and intraoral/tactile stimuli.

Extraoral Stimuli:
Stimulus of vision, hearing(auditory) or objector stimuli (odour of smoke of cigarette, dental materials and clinic) can predispose to gagging. Landa describes how gag reflex precipitated in a patient due to acoustic stimulus of his gagging wife in another operatory.[10]

Intraoral Stimuli:
Tactile (Intraoral) stimulation is present while execution of dental procedures. According to Landa, most sensitive regions in oral cavity are palate (posterior part) and upper surface of the posterior one third of the tongue.[10] Dental literature suggests due to biomechanical considerations like inadequate post dam, freeway space, retention, over extended posterior borders gag reflex may get exaggerated.[11,12] Movement of the prostheses due to these considerations stimulates tickling sensation and contributes to gagging. Krol explained how inadequate freeway space can elicit a gag reflex. If vertical dimension is more than vertical dimension at rest vertical dimension, spasm of tensor palatini muscles occurs. Due to spasm, tactile sensation is produced which can predispose to gag reflex.[1]

e) ***Iatrogenic Factors***: Iatrogenic factors like incorrect occlusion, insufficient retention, inadequate finish of denture can affect reflex of gagging. Landa explained that by correction of occlusion and using balanced articulation, gag reflex can be managed.[10]

Gagging Scores:
Dickinson & Fiske gave the gagging severity index. He scores the gagging reflex based on severity of reflex observed in a patient.[13]
Scores are normal, mild, moderate, severe, very severe.
Normal gagging- It is very mild and occasional. It can be controlled by the patient.
Mild gagging- In such cases, cooperation is required in addition to control of patient.
Moderate gagging- Treatment options are limited. Measures to prevent this reflex are required as it can't be controlled by the patient.
Severe gagging- treatment options are further limited. Gagging reflex can occur even during simple visual examination.
Very severe gagging- This form requires specific control for any dental treatment.

Management-

Clinician has to obtain a detailed history in a comfortable and reassuring environment. After the intraoral examination, the consent is taken to proceed with the treatment plan. The role of the clinician is to understand the patient's difficulties and to provide him/her with best dental care with minimal possible stress[1,14,15] Effective management depends on the factors and causes and not only on the symptoms of the gagging patients fall into the following categories-

1)Psychologic intervention
2) Prosthodontic management
3) Pharmacologic measures
4) Surgical techniques
5) Acupressure technique and Acupuncture technique.

1) Psychologic intervention-

Psychotherapy includes hypnosis, behavior management procedure of systemic desensitizing, covert reinforcement modelling fear reduction. Patient is asked to relax and tense muscles of legs and upper limbs. This relaxes the patient and thus helps him/her to adapt to the dental procedures.

Distraction techniques diverts patient attention for short dental procedure. Landa suggested engagement in other topics of patient's interest for distraction.[10] Kovats suggested a technique by which patient taps his /her right foot on the floor and simultaneously breathes audibly through nose.[16] Faigenblum stated that by simply talking to patient clinician can distract the patient to carry out the clinical procedures.[3] Krol asked the patient to raise one of their leg and told him/her to concentrate on keeping the leg in the same position for the duration of impression procedure. This will help the patient to prevent the episode of gag reflex by distraction from clinical procedure.[1] Robb explained the use of two suggestion/distraction technique. Firstly, the patient is asked to focus on 'sick stick' during impression procedure. Secondly in 'temporal tap' technique, dentist taps the temporo-parietal suture for distracting the patient from the clinical procedure. Some dentists use virtual reality goggles, chair mounted television and music therapy as an aid to manage the anxiety of the patients by distraction.

'Controlled rhythmic breathing' was the method used by Hoad-Reddick to overcome gag reflex.[15] Barsby suggested to encourage 'relaxed abdominal breathing'.

Hypnosis is one of the management approaches for the patients with gagging. Use of hypnosis for the treatment of disease is called hypnotherapy. But due to lengthy and multiple interviews it is not used by many dentists.[17] Desensitization Technique provides with permanent effects in contrast to temporary solutions by the distraction techniques. Wilks used a number of successful methods of desensitization (habituation and de-conditioning). Patient is asked to repeatedly hit the tongue, holding and rolling buttons below the surface of tongue. Patient is explained the technique to swallow by keeping the teeth apart. These techniques will result in desensitization and hence prevention of gag reflex. The Cognitive Therapy emphasizes on change of irrational thought processes.[18] For example, in some patients retching is observed during use of high-speed handpiece due to fear of choking and breathlessness.

2) **Prosthodontic management:**

It involves certain modifications of the prosthesis for better acceptance in the patients. Evaluation and corrections of thickness and overextension of prosthesis are made before making any radical modifications. Jordan suggested that smooth,

glossy surface results in more gag reflex as compared with matte finish.[16]

Krol evaluated of 100 patients with gagging problem due to inadequate freeway space. He explained the management of reflex by adequate freeway space.[1]

Borkin advocated the use of intraoral wax, which being thermoplastic could be used to obtain the final impression in gagging patients.[19]

Singer's marble technique was reported as one of the effective approaches for complete denture gagging patients. At the first appointment, the patient was asked to place five marbles in his mouth one at a time and at his leisure. On the day of second appointment, patient is advised to keep the marbles for 1 week except for eating and sleeping. At the third visit modeling compound impression were made, refined and completed. At the fourth visit, the lower base tray was inserted along with three marbles in the mouth, and a "training bead" was placed on the lingual aspect of the base tray to maintain proper tongue position. During the fifth visit, patient was advised to discontinue the use of marbles. On sixth visit, jaw records were made and the occlusion rims marked. The completed dentures were inserted at the seventh visit and patients were motivated to use the prosthesis.[20]

Modification of edentulous maxillary custom tray -

In this technique second layer of self cure acrylic is added to original custom tray. For removal of excess impression material, wax spacer is removed to prevent initiation of gag reflex.[21,22]

Denture modifications-

Palateless denture, Nickel chrome alloy or aluminium cast metal denture base are the possible modifications to prevent gag reflex.[23,24] The advantage of such metal base denture is increased rigidity, retention thereby providing a stable base for recording of jaw relations.[25,26] Bay recommended shape modification of denture base in combination with overdenture principle for excellent retention and management of the gag reflex.[27] In patients with hollow obturators, application of the neutral zone principle prevents gagging.[28,29]

3) Pharmacologic measures-

After psychologic and prosthodontic measures, pharmacologic measures are considered as possible way to manage gagging patients. These are classified as drugs acting peripherally or centrally.

Peripherally acting drugs-

These drugs are topical and local anesthetics. They are available in the form of sprays, gels, or lozenges or by injection. Topical anesthetics used include topical benzocaine 14% and tetracaine hydrochloride 2%. These are effective only for minor gagging. These drugs don't provide long term solution.[30] Kovats successfully made the maxillary impression by using topical anesthetic spray over the hard palate. [31] Schole observed that Topical anesthetics may actually induce nausea and vomiting.[32] Use of an injectable local anesthesia was objected by Landa as it can initiate gag reflex and may distend the tissues, which results in compromised retention.[10] Appleby and Day suggested by using table salt on the surface of tongue or on the palate, gagging may be prevented in complete denture patients.[33]

Centrally acting drugs-

These drugs can be sedatives, tranquilizers, anti-histaminics and central nervous system depressants.

Kramer and Braham recommended the use of Phenergan and Nisentil in gag reflex patients.[30]

4) Surgical Techniques-

Surgical technique was recommended for some patients of gagging. It was observed

that gagging usually occurs due to atonicity and relaxation of palate. So, Leslie et al described this technique for shortening and tightening of soft palate for better tolerance to dentures.[34] But this technique is not acceptable nowadays.

5) Acupuncture and Acupressure:

Acupuncture is a technique that uses single disposable needle
(7mm in length). The needle is inserted up to 3mm into anti-gagging point of each ear. Before the dental treatment starts, needle is manipulated for interval of 30 seconds. The needle remains in the anti gagging point during the dental procedure. and it remains in situ while the dental procedure. Needle is removed just before the patient is discharged.

In acupressure technique, is relatively noninvasive, safe and quick as compared to acupuncture. In this technique, an acupressure point is located at midpoint between chin and lower lip (in the horizontal mento-labial groove). The pressure point is named Chengjiang (REN-24). Index finger is used to apply the pressure. The procedure of applying pressure starts at least 5 minutes prior to impression procedure. The pressure applied until the patient feels discomfort and it should be continued throughout impression masking.[35,36,37]

Summary and Conclusion:

Compromised quality of treatment is one of serious problems associated with the gag reflex. To manage the problem of gagging clinician requires knowledge and experience of all the management techniques. No single technique is sufficient to manage gagging problem, so a thorough examination, detailed history and diagnosis for selection of technique may help to overt this gag reflex.

References:

1.Krol AJ: A new approach to the gagging problem J Prosthet Dent 1963 13:611.
2. Savage RD, Macgregor AR : Behavior Therapy in Prosthodontics J Prosthet Dent 1970; 24(2): 126-131.
3.Faigenblum MJ. Retching its Causes and Management in Prosthetic Practice.Br Dent J 1968;125: 485-490
4.Singh S, Ali FM, Nazirkar G, Dole VK, Gaikwad B. Gag- Etiology and its skillful management- A review. Journal of Evolution of Medical and Dental Sciences 2013; 2(10):1509-1516.
5.AshishR. Gagging: A problem to prosthetic dentistry – Review. Drug invention today 2018:10(1):48-54.
6.Susan MW. Medical history, social habits and individual experiences of patients who gag with dentures. J Prosthet Dent. 1981; 45: 474-478.
7.Pastorello JR. Chronic gagging in the new denture wearer. J Am Dent Assoc. 1959;748-9.
8. Mack AD. Complete dentures. Part II. The type of mouth. Br Dent J 1964;116:426-9.
9.Newton AV. The psychosomatic component in prosthodontics. J Prosthet Dent 1984;52:871- 4.
10. Landa JS: Practical full Denture Prosthesis : Lond, 1954.
11.Kaira LS, Dabral E, Kukreja HS. Gagging: A review. Nitte University Journal of Health Science 2014; 1(1):149-515.
12. Malik P, Rathee M. Gagging and its management: A review. Int J Sci Res.2014; 3(1):357-358.
13.Dickinson CM, Fiske J. A review of gagging problems in dentistry: I. Aetiology and classification. Dental Update Jan/Feb 2005: 26-32.
14.Singer JL. The marble technique : method for treating the hopeless gagger for complete dentures. J Prosthet Dent. 1973;29:149.
15. Murphy WM. A clinical survey of gagging patients. J Prosthet Dent. 1979;42:145.

16. Conny DJ, Tedesco LA: The gagging problem in prosthodontic treatment. Part II: Patient Management J Prosthet Dent. 1983;49(6): 757-761.
17.Barsby MJ. The use of hypnosis in the management of 'gagging' and intolerance to dentures. Br Dent J. 1994;176:97-102.
18. Humphris GM, Ling M. Behavioural sciences for dentistry. Edinburgh: Churchill Livingstone. 2000; p. 73, 81-2, 88.
19. Borkin D N. Impression technique for patients that gag: J Prosthet Dent.1959;9:386
20.Singer JL. The marble technique : method for treating the hopeless gagger for complete dentures. J Prosthet Dent. 1973;29:149.
21.Means C R, Flenniken I E. Gagging-A problem in prosthetic dentistry. J Prosthet Dent.1970; 23(6);614-20.
22. Morstad A T. Post insertion Denture Problem, J Prosthet Dent. 1968;19:126-132
23. John B. Palateless dentures: Help for the gagging patient. J Prosthet Dent. 1984;52:691-93.
24. Ramsay DS, Weinstein P, Milgrom P, Getz T. Problematic gagging: principles of treatment. J Am Dent Assoc. 1987;114:178-83.
25.Akeel R, Assery M, al-Dalgan S. The effectiveness of palate-less versus complete palatal coverage dentures (a pilot study). Eur J Prosthodont Restor Dent. 2000 Jun;8(2): 63-6.
26. Floystrand F, Karlsen K, Saxegaard E, Orstavik JS. Effects on retention of reducing the palatal coverage of complete maxillary dentures.Acta Odontol Scand. 1986;44:77-83.
27. Bay M: Prosthetic treatment for a patient with hypersensitive palate. NZ Dent J.1970;66:117.
28. Beresin VE, Schiesser FJ. The neutral zone in complete dentures. J Prosthet Dent. 2006; 95: 93-101.
29. Hatim NA. Gag Reflex Reduction in A Patient with Maxillofacial Prosthesis.(A Clinical Report) Al-Rafidain Dent J. *2008*; 8(1): 114–119
30. Kramer RB, Braham RL. The management of the chronic or hysterical gagger. J Dent Child. 1977;44(2):111-6.
31. Kovats J J.Clinical evaluation of the gagging denture patient. J Prosthet Dent. 1971; *25: 613*-15.
32. Schole M.L. Management of the gagging patient. J Prosthet Dent. 1959;9:578-583.
33. Appleby R.C., Day H.J. Gagging as related to prosthetic dentistry. Iowa State Dent J. 1956; 42:142.
34. *Leslie SW. A new operation* to overcome *gagging* as an. aid to denture construction. J Can Dent Assoc. 1940; 6: 29-32.
35. 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(11):721–5.
36. Vickers AJ. Can acupuncture have specific effects on health? A systematic review of acupuncture antiemesis trials. J R Soc Med. 1996;89(6):303-11.
37. Paterson C, Dieppe P. Characteristic and incidental (placebo) effects in complex interventions such as acupuncture. BMJ. 2005;330(7501):1202-5.