

REVIEW

Gagging : Aetiology and Management

Smita Musani¹, Iqbal Musani², Ramandeep Dugal³, Mukund Kothavade⁴

Professor^{1,3,4}

Department of Prosthodontics
M A Rangoonwala Dental College,
Pune

Professor²

Department of Pedodontics and Preventive
Dentistry, Bharati Vidyapeeth's Dental College
and Hospital Pune

Article Info

Received: July 15, 2010

Review Completed: August 15, 2010

Accepted: September 10, 2010

Available Online: October, 2010

© NAD, 2010 - All rights reserved

ABSTRACT:

A dental appointment with a patient who gags is a nightmare for the dentist and the auxiliary staff. The problem compromises the quality of dental treatment and is a barrier to optimal patient care. Effective management of such a patient depends on treatment of the cause and not merely the symptom.

This article reviews the literature on gagging problem from English language peer review articles from 1940 to 2008 found by conducting an electronic Pub med research, with additional references from citations. It covers normal gag reflex, and factors that may be associated with aetiology of gagging. A review of management of patients follows and includes strategies to assist clinicians.

Key words: gagging, vomiting

INTRODUCTION

Active gag reflex upsets the patient, compromises quality of treatment and frustrates the dentist. Effective management of gagging depends on treatment of the cause and not merely symptoms. By thorough examination, taking of adequate medical history, and conversation with the patient, the dentist needs to determine if the patient's problem is related to iatrogenic factors, organic disturbances, anatomic or psychological factors. It is important to recognise whether, single or multiple factors are causing the problem.³

THE PROBLEM

Gagging normally occurs during dental procedures as in making maxillary impression etc. Some patients experience mild reflexes, which can be easily handled by the dentist, while for some even contact with the instrument or finger can cause a severe reflex. Anticipation of this distress, can often dissuade a patient from seeking regular oral care and

they report only when there is pain and may request treatment under general anaesthesia.²

Sometimes the treatment rendered is radical involving complete extraction which in fact compounds the existing gagging problem as the patient is now unable to tolerate the new removable prosthesis.¹

Faigenblum⁵ classification of patients with gag reflex differentiates mild from severe retching. The patient with mild retching may experience nausea with minimal reaction to a stimulus and generally is able to control the response. Fortunately most patients fall in this category. Present from birth the gag reflex can be compared to the swallowing reflex. Swallowing occurs when the muscle action is smooth and co ordinate, when muscle action is smooth and unco ordinate gagging occurs.

THE NATURE OF GAGGING

The gag reflex is a normal healthy defence mechanism. It functions to prevent foreign bodies from entering the trachea.

Email for correspondence:
smitamusani@gmail.com

Some clinicians suggest that not all regions of the mouth are equally sensitive to stimuli that produce the gag reflex. Yet⁵ regions of maximum sensitivity are identified as trigger areas. These are the fauces, base of the tongue, palate, uvula and posterior pharyngeal wall.

A clinical description of gagging behaviour has been described:

1. Puckering of the lips or attempting to close the jaws.
2. Elevating of furrowing the tongue, with rotation from back to front and with the hyoid bone at the centre.
3. Elevation of soft palate and hyoid bone.
4. Fixation of the hyoid bone.
5. Closing of the nasopharynx by an approximation of the posterior pillars of the fauces that elevate the soft palate.
6. Contraction of the anterior and posterior pillars of the fauces, causing the tonsils to rotate in an anteriomedial direction.
7. Elevation, contraction and retraction of the larynx and closure of the glottis.
8. Retching or simultaneous and uncoordinated respiratory muscle spasm, and
9. Vomiting.

Other reflex behaviours that are extra oral in nature also can be observed by the clinician. These include excessive salivation, lacrimation, coughing and sweating. At times a full body response may occur. The patient extends the head, arms in an attempt to completely withdraw from the attending stimuli, if the stimulus is repeated, collapse may occur for the extremely apprehensive or excited patient.

NEURAL INVOLVEMENT IN GAGGING:

When stimulation occurs of the soft palate or posterior third of the tongue, afferent impulses are transmitted to a centre in the medulla oblongata. From this centre, efferent impulses arise and are transmitted, resulting in the spasmodic and uncoordinated movements of gagging. The centre in medulla oblongata is very close to the vomiting, salivating and cardiac centre, explaining why gagging may be accompanied by additional reflex activity (Ex. Drooling, tearing).

AETIOLOGY

1. SYSTEMIC DISORDERS:^{15, 16, 17}

- Deviated septum, nasal polyps or sinusitis block nasal passages and increase likelihood of the gag reflex.
- Alcoholism, smoking, chronic gastritis, carcinoma of the stomach, peptic ulcer, and cholecystics are related to chronic gastrointestinal irritability and gagging.
- Medication that a person may be taking are another consideration if this produce nausea as a side effect.
- Diaphragmatic hernia has also been implicated as a systemic cause for gagging.

2. PSYCHOLOGICAL FACTORS: Patients may gag to gain attention from the dentist, to avoid treatment, and/or to avoid the outcome of treatment. Further, fear is the underlying factor influencing the psychological gagger. The fear may be generalized and vague or quite specific. Often the fear is not merely that of pain. Some patients gag because of an abnormal fear of swallowing a foreign object. Study by WRIGHT on 53 retches provides no suggestions that people who retch during dental treatment or while wearing dentures are particularly neurotic.

3. PHYSIOLOGIC FACTORS:

These can be read and understood if divided into extra oral and intraoral stimuli.

EXTRAORAL STIMULI: Visual, auditory and objector stimuli are extra oral factors that can elicit the gag reflex. The sight of a mouth mirror or impression tray is stimulus enough to cause some patients to gag. Landa⁴ observed a deaf patient suffer a spasm of gagging while observing the gagging of another patient. An acoustic stimulus can instigate a gag reflex in some patients. Landa describes a husband and wife who were both severe gaggers. The sound of the wife gagging was sufficient to precipitate an attack of gagging in the husband, who was seated in another operatory. Certain smells may cause a patient to gag. The smell of various dental substances, cigarette smoke etc have been reported to cause gag reflex.

INTRAORAL STIMULI: The effect of tactile stimuli gag reflex is well known. Patients show considerable variation in the ability to withstand various tactile stimuli. The palate is roughly divided into two response regions for tactile irritation hyposensitive and hypersensitive. A line drawn through the fovea palatine demarcates the relatively hyposensitive anterior portion from the hypersensitive posterior portion. The tongue may be similarly divided into a hypersensitive anterior region and a hypersensitive posterior one third. It has been stated that the upper surface of the posterior 1/3 of the tongue is the most sensitive region in the entire oral cavity.

4. IATROGENIC STIMULI:

Tactile stimulation of the oral tissues inevitably occurs when executing various dental procedures, careful examination and execution of modified techniques can minimize stimulation that causes gagging. However, gagging difficulties caused by crowns or fixed partial dentition are not reported in the dental literature. Because of their more obstructive nature, complete dentures have drawn all the attention. Biomechanical aspects related to gagging are inadequate post dam, over extended posterior borders, inharmonious occlusion, poor retention, surface finish of acrylic and inadequate free way space.

Inadequate Post Dam: Produces gagging as a result of too little pressure applied to the palatal tissue. When a post dam is too shallow, the tight pressure that results, can produce a tickling sensation which elicits a gag.

Over extended Borders: The posterior part of the maxillary denture and the distolingual part of the mandibular denture may impinge on, one, or more trigger areas and cause gagging.

Occlusion: Landa⁴ suggests that correct occlusion and balanced articulation are critical for minimizing the gag reflex. A stable occlusion causes the denture to compress the underlying tissues. Conversely, instable occlusion produces movement of the denture base, which in this produce a tickling sensation and gagging.

Under extended prosthesis may also contribute to a gagging problem. Inadequately extended borders that result in poor retention produce an unstable prosthesis. Movement of such prosthesis may stimulate additional oral tissues sufficiently to elicit a gag.

A smooth shining surface has been reported to cause nausea and gagging in some patients. When such a surface is coated with saliva, a slimy sensation may result.⁹

Krol⁸ has suggested **that inadequate freeway space** may be an additional cause of gagging related to complete dentures; he found that the gagging problem was eliminated or greatly relieved when the freeway space was increased. This explanation suggested that elevator muscles do not relax normally, if the occlusal vertical dimension exceeds the rest vertical dimension. This may cause a spasm that sets in action a chain of swallowing muscle responses. One possible sequence would involve a spasm of the tensor palatine muscle, which produces sensation when the maxillary denture seems to extend too far backward. The tensor palatine muscle slightly depresses the soft palate and presses it against the posterior border of the denture, producing a gag reflex.

5. ANATOMIC FACTORS:

The past dental literature suggests that gagging in dental patients may be due to anatomic causes.^{10,11} Studies conducted by Susan Wright using cephalometrically oriented lateral skull radiographs showed no evidence that:

1. The palate was especially long or steeply angled in patients who were gaggers.
2. There was no tongue enlargement or reduction of the pharyngeal airway in patients who were gagging.
3. The postures of the soft palate, tongue and hyoid bone were compared in patients with or without their dentures, wearing dentures caused less modification in the posture of the tissues in the gaggers than in their matched control.

In absence of either gross abnormality of the radiologic anatomy of those who were gaggers, Wright suggests some other reason for gagging is likely.

MANAGEMENT OF GAGGING PATIENTS:

- Examination to be started, only after patient consent.
- Inform the patient what you are going to do.
- Limit examination to prevent stimulating a gag response then.⁷

PATIENT ASSESMENT:

- He should be motivated and willing to invest time and effort in the treatment.
- Does he think the goal is achievable?
- Is he willing to try and commit home work and make the treatment work?

COMMON TECHNIQUES:

- Sympathetic approach towards the patient.
- Build his confidence by telling him that the problem could be overcome, but would take time.
- Explain and demonstrate stop signal, ex. raising the hand, to feel that he has some control over the procedure.
- Simple measures like no over loading the impression tray, fast setting materials, ensuring sufficient aspiration, treatment in upright position, frequent cessation of treatment etc can be used.

SPECIFIC TREATMENT MODALITIES:

BEHAVIOUR MODIFICATION TECHNIQUES:

- Most successful long term method of management.
 - It reduces anxiety and helps "unlearn" the behaviour that provokes gagging.
 - The below mentioned methods singly or in combination can be used to manage the problem.^{12, 13, 14}
1. Relaxation techniques: This can overcome unhelpful thought processes. Ask the patient to tense and relax certain muscle groups, starting with the legs and working upwards, while

continually providing reassurance in a calm atmosphere.

2. Distraction:¹⁸ Used temporarily for short procedures like x rays or impressions. Conversation. Concentration on breathing, repeating a mantra silently throughout, counting numbers rapidly in different methods. Muscle fatigue activities like holding a leg off the chair for some time can also be tried.
3. Hypnosis: Done only if the patient agrees and if the clinician is well trained.
4. Systematic desensitisation: Behaviour that has been learned by classic conditioning, can be unlearned by reversing the conditioning process. The technique consists of incremental exposure of the patient to the feared stimulus. The patient under conditions of relaxation and reassurance copes with this. The intensity, duration and frequency of the noxious stimulus is slowly increased. Allowing the patient to deal with the situation gradually. Toothbrush, marbles, acrylic discs, training bases etc have been used for different lengths of time to train patients. Singer⁶ advocated use of glass marbles which were slowly increased as far as their number and time was concerned. Once tolerated maxillary and mandibular bases are given to the patient which are then later converted to final dentures. Homework is an essential component of this program.
5. Cognitive behavioural therapy: This method invites patient's to challenge hard held beliefs. For example: A patient might feel that water from the hand piece will cause choking. The cognitive behaviour psychotherapist tries to rationalise this absurd idea.

PHARMACOLOGICAL METHODS:

LOCAL ANAESTHESIA: Though some authors criticise it, administering LA, especially near the posterior palatine foramen has shown to reduce gagging.¹⁹

CONSCIOUS SEDATION: Inhalation, oral or iv agents reduce anxiety and still maintain reflexes that protect the airway.

GENERAL ANAESTHESIA: Sometimes the last resort. Has its own risks and cannot be used routinely.

TREATMENT PROBLEMS	MANAGEMENT OPTIONS
1. PROSTHODONTIC: Unable to tolerate impressions:	1. Distraction techniques 2. Relaxation 3. Systematic desensitisation 4. Hypnosis 5. Sedation
Unable to use dentures	1. Systematic desensitisation. 2. Acrylic discs and training bases can be useful.
2. RESTORATIVE: unable to tolerate examination and instrumentation.	1. Desensitisation 2. Sedatives 3. No short term method would work.
3. RADIOGRAPHIC:	1. Fast speed films, moisten film packs, ask patient to rinse with ice-cold water. 2. Distraction methods. 3. Ask patient to prolong expiratory effort at the expense of inspiration, as gagging never occurs with apnoea.
4. PLACEMENT OF IMPLANTS:	1. Implant supported over dentures help by reducing the area of residual ridge to be covered. 2. They increase the stability in the prosthesis making removable prosthodontic appliances more comfortable for the patient.

CONCLUSION:

Though a wide variety of management strategies are available, no one remedy has been diagnosed to solve the problem. Studies including case series and randomised clinical trials with single treatment modalities and mixed intervention approaches should be encouraged to improve evidence base.

REFERENCES:

- G. S. Bassi et al. The aetiology and management of gagging. *J Prosthet Dent* (2004);**91**: 459-467.
- S. M. Wright. Medical history, social habits and individual experiences of patients who gag with dentures. *J Prosthet Dent* (1981);**45**: 474-478.
- D. J. Conny et al. The gagging problem in prosthodontic treatment. Part 1. *J Prosthet Dent* (1983);**49**: 601-606.
- J. S. Landa. Practical full denture prosthesis. Kimpton London 1954.
- M. J. Faigenblum. Retching, its causes and management in prosthetic practise. *Br Dent J* (1968);**125**: 485-490.
- L. Singer. The marble technique, a method for treating the hopeless gagger for complete denture. *J Prosthet Dent* (1973);**29**: 146-150.
- D. J. Conny et al. The gagging problem in prosthodontic treatment. Part 2. *J Prosthet Dent* (1983);**49**: 757-761.
- A. J. Krol. A new approach to the gagging problem. *J Prosthet Dent* (1963);**13**: 611-616.
- Jordan L. J. Are prominent rugae and glossy tongue surfaces desired on artificial dentures? *J Prosthet Dent* 52; (1954).
- J. R. Pasterollo. Chronic gagging in new denture wearers. *J Am. Dent. Asso.*(1959);**59**: 748-749.
- A. D. Mack. Complete dentures. Part II. The type of mouth. *Br Dent J.* 1964;**116**: 426-429.
- L. S. Altamura et al. Covert reinforcement and self control procedures in systematic desensitisation of gagging behaviour. *Psychol Rep* 35 (1974), **4**: 563-566.
- G. A. Zach. Gag control. *Gen Dent*(1989);**37**: 508-559.
- J. K. Neumann. G. A. McCarty. Behavioural approaches to reduce hypersensitive gag response. *J Prosthet Dent* (2001);**85**: 305.
- Lawes F.A. E. Gagging. *Dent J Aust* **21**: 198; 1949.
- Bohne C. Psycho logic treatment of patients with extreme nauseous reflex. *Dent Abstr* **5**: 224, 1960.
- Machella T.E. Gagging reflex. *Dent Abstr* **6**: 617, 1961.
- J. E. Longemann. Swallowing physiology and pathophysiology. *Otolaryngol Clin North Am* (1988);**21**:613-623.
- D. S. Ramsay et al. Problematic gagging. Principles of treatment. *J Am Dent Asso* (1987);**114**: 178-183.