

Gagging-A Barrier to Patient Care in Prosthodontics

Mandira Ghosh, Baisakhi Mallick*

Department of Prosthodontics and Crown and Bridge, Dr R Ahmed Dental College and Hospital, Kolkata, West Bengal, India.

Abstract

Gagging is a frequent hazard to the performance of dental procedures. In addition, once having suffered an unpleasant gagging experience in a dentist's office, the patients develop a fear of further visits to dentists. This stimulation of the gagging reflex also produces a special problem in prosthodontic services such as impression making and other prosthodontic rehabilitation procedures such as teeth reduction and insertion of prosthesis. The purpose of this paper is to describe methods of managing the gagging reflex of a patient by modified treatment approaches starting from impression making to design of the prosthesis aided by training dentures to help the patient to tolerate the prosthesis in the mouth before fabrication of definite prosthesis.

Keywords: Conscious sedation, Gag reflex, Palateless denture, Protective gagging, Training denture.

INTRODUCTION

In our day, today practice every dentist has had experience with the patient with abnormal gag reflexes. Gagging has been defined as an ejector constriction of the muscles of the pharyngeal sphincter. The normal protective reflex designed to protect the airway and remove irritant material from the posterior oropharynx and upper gastrointestinal tract is termed as gagging. It can range from mild choking to violent, uncontrolled retching which may or may not precede vomiting. The characteristic retching sound is produced when spasmodic contraction of respiratory muscles occurs and the air is forced through the closed glottis. In addition, chest muscles are fixed, and thoracic inlet muscles are contracting. This causes obstruction of the venous return, dilating the veins of the head and neck, with flushing and congestion of the face. As the swallowing center is in close proximity to the vomiting, salivation, and cardiac centers; this explains why gagging may be associated with vomiting, excessive salivation, increase in heart rate, lacrimation, increased perspiration, and even collapse. The respiratory center and deglutition center are also inhibited during gagging which interrupts the cycle of respiration. The stimulus of gagging can be physical, auditory, visual, olfactory, or psychologically mediated, and muscular contractions result in vomiting. The reflex is also triggered when the region of the soft palate or the posterior third of the tongue is stimulated. Impression taking can be very difficult to patients when the gag reflex is triggered.

PSYCHOGENIC GAGGING

Anxiety, fear, and apprehension can cause psychogenic gagging. Visual, acoustic, olfactory, and imaginary stimuli are other causes of psychogenic gagging. The sight of a dentist holding an instrument or impression tray for insertion in the mouth, hearing another person gagging sound, odors persisting on the dentist's hands with certain procedures, or the smell of impression material can induce the reflex. Gagging may be a manifestation of a personality defect of the patient which leads to the inability to tolerate dentures. These problems should be treated by a psychiatrist.

SOMATOGENIC GAGGING

Due to local, physical, or systemic stimuli somatogenic gagging happens. The gag reflex is most often induced by tactile stimuli to trigger zones during dental treatment. The tonsillar pillars are the most sensitive area. Stimulating the tongue, the palate, and the posterior pharyngeal wall will also stimulate gagging. The soft palate is more sensitive than the hard palate, and the midline of the soft palate is less sensitive than the areas lateral to it. Tactile stimuli can be induced during taking radiographs,

Address for correspondence: Baisakhi Mallick,
Department of Prosthodontics and Crown and Bridge, Dr R Ahmed Dental
College and Hospital, Kolkata, West Bengal, India.
Email: mallickbaisakhi2@gmail.com

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making impressions, or during examination procedures. Wearing dentures or orthodontic appliances also generate tactile sensation. Oral, nasal, or pharyngeal mucosal inflammation as well as postnasal drip may induce gagging. An overextended denture border can initiate gagging. Even after the elimination of the physical cause, the corrected dentures or even new dentures still will be associated with gagging due to a psychogenic cause. Parasympathomimetic drugs or the excessive alcohol consumption either irritates the gastric mucosa or stimulates the vagus nerve endings resulting in gagging. In addition, parasympathetic impulses arising from strong emotional stimuli or severe pain may cause somatogenic gagging.

GAGGING-A POSTINSERTION DENTURE PROBLEM

There are several reasons for gagging after insertion of dentures. According to Morstad and Petersen^[1,2] the phenomenon can be classified as an immediate type and a delayed type of gagging. Immediate gagging is caused by overextension or too much thickness in the posterior border of the maxillary denture or by a bulgy distolingual flange in the mandibular denture. The delayed type of gagging can occur from 2 weeks to 2 months after denture insertion. It may be due to an incomplete border seal which allows seepage of saliva under the denture. Malocclusion makes the dentures to become unstable, permits saliva to enter below the intaglio surface and may produce gagging.

MANAGEMENT OF GAGGING

Various clinical techniques are directed at diverting the patient's attention from the gagging stimuli. Landa^[3] suggested to engage the patient in conversation on some topic of special interest. Kovats^[4] reported a technique that has the patient breathe audibly through the nose and simultaneously, rhythmically tap the right foot on the floor. Through these activities, the patient's attention may be diverted away from the gagging stimulus. Faigenblum^[5] stated that vomiting is impossible during apnea. To control gagging the patient should be instructed to prolong the expiratory effort at the expense of inspiration. This will produce a state of apnea and reduces gagging. A similar technique was described by Krol.^[6] He instructed the patient to raise his or her leg and hold it in the air. As the patient's muscles become increasingly fatigued, more and more conscious effort is required to hold the leg up. Thus, the attention of the patient is diverted. When the patient has difficulty carrying on a conversation, intraoral procedures may be attempted.

PROSTHODONTIC MANAGEMENT

The prosthodontic approach to the patient with the gagging problem involves technical modifications to render the prosthesis more acceptable to the patient. Excess thickness, overextension, or inadequate post-dam should be corrected before more radical modifications in the prosthesis are made. The smooth, shiny surface of a complete denture is

objectionable to some patients. From his clinical experience, Jordan suggests that a matte finish is more acceptable to patients than a glossy surface. Krol^[6] discussed the importance of "Freeway" space to reduce the gag reflex. In all instances, an increase in the interocclusal distance resolved the gagging problem. Borkin^[7] outlined an impression technique for edentulous patients with excessive gagging. A primary impression is obtained by pouring Kerr impression wax. The pliable nature of the wax allows for reseating of the tray and border molding until desirable results are obtained. Singer^[8] employs ordinary marbles as an effective approach to overcome a patient's inability to tolerate complete dentures. At the first appointment, the patient was asked to place five marbles in his mouth one at a time and his leisure. The patient was further instructed to keep the marbles in his mouth continuously for 1 week, except when eating and sleeping. After 1 week patient's ability to tolerate the marbles was evaluated, and he was reassured that he would be able to tolerate dentures. At the third visit, modeling compound impressions 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, the use of marbles was discontinued, and at the sixth visit, jaw relation records were made and the occlusion rims were marked. The completed dentures were inserted at the seventh visit. The patient's motivation is an indispensable component of the marble technique according to Singer. Although Singer's approach^[8] has definite medicolegal risks in the event of aspiration by the patient.

TRAINING BASES

In this desensitization technique, a patient is progressively supplied with a series of small to full-sized denture bases. A thin acrylic denture base,^[9,10] without teeth, is fabricated and the patient is instructed to wear it at home, gradually the wearing time of the training base (Figure 1) is increased. Eventually, the patient is able to tolerate the training base for



Figure 1: Training denture

most of the day. The timing and rate of progress will vary between patients. First anterior teeth are added to the original or an extended training base and, when the patient is able to tolerate this, posterior teeth are added. Palateless dentures^[11,12] (Figure 2) have been tried in some patients and loss of retention is not always significantly affected. Some authors, however, would still only recommend this option as a last resort.

COGNITIVE BEHAVIORAL THERAPY^[13,14]

Changing irrational thought processes is the main motto of this therapy. For example, some patients retch when water from the high-speed handpiece is felt. A fear of choking may be the cause or believing that breathing will stop, resulting in death. Some patients may believe that the fear of dentistry will cause a fatal heart attack. A cognitive behavioral psychotherapist^[13,14] will rationalize these thought processes in patients with persistent psychogenic gagging.

PHARMACOLOGIC MEASURES^[15-17]

Since the gag reflex is governed by the parasympathetic portion of the visceral (autonomic) nervous system, drugs which cause depression of the parasympathetics^[4,12] are useful. The atropine series of drugs inhibits acetylcholine action of the postganglionic parasympathetic nerves, especially that of the vagus nerves, thereby antagonizing lacrimation, salivation, contraction, or hypermobility of the alimentary tract which normally initiates gagging or vomiting.^[15] Some antihistamines are useful too, but they do not reduce salivation which is a causative factor for gagging, in some patients, central nervous system depressants, such as barbiturates^[4] and tranquilizers, reduce fear and apprehension associated with gagging at the cortical level. Topical anesthetics, such as troches or sprays, are also indicated. However, in some patients, these may actually produce the gag reflex by the feeling of numbness; in fact, toxic effects occasionally can be observed because of the rapid absorption of these medicaments into the vascular bed. As the protective cough reflex may be inhibited by anesthetizing the pharynx, especially during

impression procedures, foreign material might be aspirated into the lungs resulting in aspiration pneumonia. Injection of local anesthetics in the area of the greater palatine foramen before impression making might cause gagging. In addition, the resultant impression might be inaccurate because of tissue expansion from the injected solution. Webb^[18,19] suggests that distortion of tissue contour due to injection of anesthetic solution can be minimized by adding hyaluronidase I.-3. C.C. to 1 cc. of 2% lidocaine HCl. He also suggested the use of this injection technique for insertion of dentures thereby controlling postinsertion gagging.

CONSCIOUS SEDATION^[20,21]

When a disruptive gag reflex is due to anxiety, removal of the anxiety may prevent gagging. The use of conscious sedation with inhalation, oral, or intravenous agents may temporarily eliminate gagging during dental treatment and it also maintains reflexes that protect the patient's airway. While sedation may allow adequate treatment to be performed, it will not help the patient overcome retching during wearing a prosthesis. Intravenous sedation^[20] is often much more predictable than oral sedation and can be of use in patients where inhalation sedation is ineffective.

SURGICAL CORRECTIONS

Leslie suggested a surgical method to relieve gagging for the patient unable to tolerate complete dentures. Leslie suggested that persistent gagging results from an atonic and relaxed soft palate, which is found in the nervous patient. To correct this situation, Leslie advocated an operation to shorten and tighten the soft palate.

THE ROLE OF ACUPUNCTURE

Acupuncture is a system of medicine in which a fine needle is inserted through the skin to a depth of a few millimeters, left in place for a time, sometimes manipulated, and then withdrawn. Acupuncture is one of the range of treatment options that can be employed in an effort to control gagging. There is a specific, recognized anti-gagging point on the ear. The technique involves the insertion of one, fine, single-use disposable needle of 7 mm length into the anti-gagging point of each ear to a depth of 3 mm. The needles are inserted for 30 s before carrying out the dental treatment. The needles remain *in situ* throughout the treatment and are removed before the patient is discharged. The patient does not require an escort. The technique is said to be safe, quick, inexpensive and relatively non-invasive.

ACUPRESSURE TECHNIQUES

Acupressure technique has been described as effective in controlling the gag reflex during dental procedures. Chengjiang (REN-24) is an effective acupressure point for controlling the gag reflex. REN-24 point^[22] is located in



Figure 2: Flangeless denture

the horizontal mento labial groove, approximately midway between the chin and the lower lip. Light finger pressure is applied with the index finger. Progressively, the finger pressure is increased until the patient feels discomfort. The acupressure^[22] procedures should start at least 5 min before impression making, continue through the impression procedure and be terminated only after the impression has been removed from the patient's mouth. Pressure can be applied by the patient, dental assistant, or dentist. Acupressure caves are sensitive points in the human body that feel soreness and distention, when deep pressure is applied for 5–20 min. These points are the left and right concave areas at the medial aspect of the forearm and the concave area between the first and second metacarpal bones.

SUMMARY AND CONCLUSION

The overactive gag reflex produces a barrier to patient care in prosthodontics as well as other branches of dentistry. Many techniques are available for controlling the exaggerated gag reflex and no single technique will solve each patient's problem. Under normal situations, gagging is a protective reflex for the patency of the airway, but it can be developed into a habitual defense mechanism to escape anticipated procedures. Therefore, gagging can be classified as having either psychogenic or somatogenic origin, or it can be a combination of both. In order for the patient to obtain permanent relief from gagging, it is important for the dentist to diagnose the type of gagging. Somatogenic gagging in denture patients is caused by stimuli resulting from lack of retention, malocclusion, incorrect vertical dimension of occlusion (either too great or too small), under extension, overextension, excessively thick posterior borders, insufficient posterior palatal seal, and lack of tongue space. Correction of the apparent problem in the denture is the indicated treatment. Psychotherapy, posthypnotic suggestions, and depressing the cerebral cortex with various medications will control the psychic type of gagging according to the degree of mental involvement. Through his professional knowledge, the prosthodontist should sense the correct approach and suitable procedures and materials to reduce the potential of the gag reflex. Building a relationship with the patient based on developing confidence is more valuable than applying most medicaments.

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