

Gaggers And Their Management

Abstract

The gag reflex is a normal involuntary defense mechanism that prevents foreign bodies from entering the trachea, pharynx or larynx. The patient who gags may present with a range of disruptive reaction, from simple contraction of palatal or circumoral musculature to spasm of the pharyngeal structures, accompanied by vomiting. Factors that are believed to be important in etiology are; Local and systemic disorders, Anatomic factors, Psychological factors, Iatrogenic factors. Management of gagging includes- Clinical techniques, Psychological technique, Surgical technique, and Pharmacological management.

Key Words

Gaggers, larynx, trachea, pharyngeal

Introduction

Most difficult and common problem, which is described and analyzed by many dentists, is Gagging or retching, which has been found extremely difficult to treat. Single etiologic factor has not been identified and subjects suffering from the problem have been arbitrarily divided into two groups.

- **Somatogenic** - those in whom the physical stimulation produce the gag
- **Psychogenic** - those in whom the stimulation appears to be psychic in origin

A wide range of strategies is presented to aid the clinician for the treatment of these patients.

Gagging severity index (GSI)^[1]

The gagging reflex is:

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

The Gagging Prevention Index (GPI) was used to assess the effectiveness of the ear acupuncture in controlling the reflex and

allowing dental treatment to take place.

Gagging prevention index (GPI)^[1]

Treatment management method employed:

- Obtunded gag reflex; treatment successful
- Partially controlled gag reflex; all treatment possible
- Partially controlled gag reflex but frequent gagging; simple treatment possible
- Inadequately controlled gag reflex; simple treatment unable to be completed.
- Gag reflex severe; no treatment possible.

Extra Oral Symptoms

These include excessive salivation, lacrimation, coughing, fainting or in minority of patients, a panic attack and sweating; at times a full-body response may occur. The patient extends the head, arms, neck and back in an attempt to completely withdraw from the offending stimuli.

Intra Oral Symptoms

The patient who gags may present with a range of disruptive reaction; from simple contraction of palatal or circumoral musculature to spasm of the pharyngeal structures, accompanied by vomiting.

Trigger Zone Of Gag Reflex^[2]

Gagging may be elicited by nontactile and tactile stimulation of certain intraoral

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Submission : 20th May 2012

Accepted : 13th October 2012

Quick Response Code



structures.

Five intraoral areas is known as trigger zones:

- palatoglossus & palatopharyngeal folds,
- base of tongue,
- palate,
- uvula and
- Posterior pharyngeal wall

Nontactile sensations such as-

- visual,
- auditory and
- Olfactory stimuli

Khan offered clinical description of gagging behaviors -

These behaviors are -

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

Faigenblum's classification:

Mild Retching: Patients with mild retching experiences nausea with minimal reaction to a stimulus and generally are able to control the response.

Severe Retching: Most of the dental patients fall under this category. The patients who demonstrate severe retching response may be unable to tolerate impressions, operative procedures, or insertion of new or old dentures. Such patients often receive compromised dental care.

Etiology of gagging^[3]

Five factors that are believed to be important in etiology are-

1. Local and systemic disorders
2. Anatomic factors
3. Psychological factors
4. Physiologic factors
5. Iatrogenic factors

1. Local and systemic disorders-

1. Nasal obstruction
2. Postnasal drip
3. Sinusitis
4. Nasal polyp
5. Mucosal congestion of Upper respiratory tract
6. Dry mouth
7. Chronic Gastrointestinal disease
8. Chronic gastritis peptic ulceration
9. Carcinoma of stomach
10. Hiatus hernia
11. Uncontrolled diabetes

2. Anatomic factors-

Anatomic abnormalities, oral and pharyngeal sensitivity predispose a patient to gag when dentures are poorly constructed.

1. Along soft palate
2. Sudden drop at the junction of hard and soft palate
3. An atonic and relaxed soft palate elicits gagging by allowing the uvula to contact the tongue and the soft palate to touch the posterior pharyngeal wall.

3. Psychological factors-

Systemic conditions that have psychosomatic components are-

1. Temporomandibular pain dysfunction syndrome
2. Atypical facial pain
3. Denture intolerance
4. Burning mouth syndrome.

Psychosomatic reaction may be active or passive. An active reaction is due to factors that currently have some functional purpose in the patient's life situation for various psychologic reasons patients may gag to gain attention from the dentist, and/or to avoid the outcome of treatment. In contrast, a passive reaction is the result of, conditioned reflexes established earlier in life for various reasons, the causes of which are no longer functionally important.

Kamer and Braham stated that "fear is almost always the underlying factor influencing the psychological gagger." This 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.

4. Physiologic factors-

Extraoral stimuli: The mere sight of a mouth mirror or impression tray is stimulus enough to cause some patients to gag. Landa observed a deaf patient suffer a spasm of gagging while viewing the gagging of another patient.

Acoustic stimuli- The sound of the wife gagging was sufficient to precipitate an attack of gagging in the husband.

Olfactory stimuli - Certain smells may cause a patient to gag. The smell of various dental substances, cigarette smoke on the dentist fingers and even perfume have been reported as olfactory stimuli to the gag reflex.

Intraoral stimuli- The tactile response is roughly divided into two response regions: hyposensitive and hypersensitive regions. Line drawn through the fovea palatinae demarcates relatively hyposensitive anterior and hypersensitive posterior portion. The tongue was similarly divided into the hyposensitive anterior and hypersensitive posterior one third. Landa reported that the upper surface of the posterior one third of tongue is the most sensitive area in oral cavity.

5. Iatrogenic factors^[5]

In the otherwise non-gagging patient, poor execution of intraoral procedures may elicit the gag reflex. Sensitive tissues may be stimulated because of rough or careless technique and temperature extremes of instruments or because of-

1. Inadequate Posterior Palatal Seal and loose denture
2. Overloaded impression trays
3. Unstable & poorly retained prosthesis-produced movement of the denture base, which produces a tingling sensation and gagging
4. Overextended border of prosthesis particularly in the posterior area of palate and retro mylohyoid space, distolingual part of mandibular denture- this impinges one or more of the trigger areas and thus produce gagging.
5. Placing maxillary teeth too far in a palatal direction and mandibular teeth too far lingually, so that dorsum of the tongue is forced into pharynx during the act of swallowing.

Management

Clinical techniques-

1. Marble technique^{[3],[5]}

Singers marble technique is a method by which the gag reflex can be exhausted. It consist of seven steps-

- **Ist visit-** No oral examination of any kind was made at the first office visit. Five rounded, multicolored, glass marbles approximately ½ inch in diameter were placed on a tray in front of the patient. The patient was told to put the marbles in his mouth, one at a time at his leisure, until all five marbles were in his mouth. Since the fear of swallowing the foreign

object can induce a gag reflex, the patient was assured that if he swallows the marble, it could not harm him. Continual assurance that he would be able to wear dentures was given to the patient at each weakly visit. He was urged to keep five marbles in his mouth continuously for one week, except when eating and sleeping.

- **IInd visit-** The patient was given assurance that he would be able to wear dentures, which further bolstered his own motivation.
- **IIIrd visit-** Before impression making; the hard palate, soft palate, cheeks, lips and tongue were swabbed with 2% pentocaine solution in order to produce topical anesthesia. Preliminary impression of impression compound is made. Base plate of matte finish is prepared.
- **IVth visit-** The lower base plate is inserted, and the patient was told to continue to keep three marbles in his mouth, in addition to base plate. A training bead (a small bead of colored acrylic resin) was placed on the lingual aspect of the lower base plate at the normal position of the lower central incisors. The patient should be reassured that he is making excellent progress.
- **Vth visit-** The upper base plate was inserted, he was asked to keep both of them in his mouth continuously, except when eating. The use of marbles was discontinued.
- **VIth visit-** Occlusal rims were now used to establish the jaw relations. The patient should continue to wear the upper and lower base plates while the dentures are being acrylized.
- **VIIth visit-** The completed lower denture was inserted first and used in conjunction with the upper base plate. The training bead was placed in the lower denture as a guide to tongue position. The patient should be instructed to keep the tip of the tongue always touching the bead, which would prevent the lower denture from lifting. Next the upper denture was inserted.

"MARBLE TECHNIQUE IS USEFUL IN ASSURING SO CALLED HOPELESS GAGGERS."

2. Roofless Denture^[3]-

Maxillary denture can be reduced to a U-shaped border situated approximately

10mm from the dental arch. Denture wearers with the above type of dentures reported that reduction of the palatal coverage influences their sense of taste positively, and reduces or eliminate gagging tendency. Falmer and Connely (1984) described this technique but they noted that it would only be satisfactory if the maxillary ridge is well formed, to minimize horizontal movements.

3. Matte finish denture^[3]-

Jordan in 1954 suggested that a smooth highly polished surface which is coated with saliva may produce a slimy sensation which is sufficient to cause gagging in some patients; a matte finish has been advocated as more acceptable in this situation.

4. Training bases^{[2],[6]}-

Patient is supplied with a series of small to full sized denture bases. A thin acrylic denture base without teeth is fabricated and the patient is asked to wear it at home, gradually increasing the length of the time the training base is worn. Initially 5 min once each day, then twice each day and so on. After 1 week; 3 min each day, then 15 min, 30 min & 1 hr. Anterior teeth are added and when the patient is able to tolerate it, posterior teeth are added.

5. Inadequate free way space^[4]-

Kroll discussed the importance of interocclusal distance to the gag reflex. He determined that the interocclusal distance was inadequate in patients with serious gagging problems. The interocclusal distance was increased by either remounting and grinding the teeth or remaking the denture when the discrepancy was gross.

6. Modification of edentulous maxillary custom tray^[7]-

To prevent gagging ,attach a disposable saliva ejector to the base plate wax in the midline of the tray.

7. Teaching the patient to swallow with their mouth open-

It has been suggested that all patient who gag characteristically swallow with their teeth clenched, using the teeth, lips and cheeks as a buttress for the tongue to push against. Teaching the patient to swallow with teeth apart, the tip of the tongue placed anteriorly on the hard palate, and orbicularis oris relaxed, has been advocated.

8. Radiographic^[8]-

The gagging patients also presents serious obstacles to the production of acceptable dental radiographs. To minimize these problems Richard suggested the use of fast-speed film, preset the timer, moisten the film pack, and ask the patient rinse the mouth with cool water. When all such efforts fail, Richards recommends extraoral radiographs.

Psychologic intervention-

- **Behavior modification-** It is the most successful long term method of managing the gagging patient. Generally the objective is to reduce anxiety and unlearn the behavior that provokes gagging. Relaxation, distraction, suggestion and systemic desensitization.
- **Hypnosis -**
- **Praise patient -**
- **Pleasant environment -**
- **Acupuncture^[1],**-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. Dental treatment was then carried out and the effectiveness of acupuncture in preventing gagging is assessed.

Method -

Ear acupuncture was selected for the following reasons-

- There is a specific, recognized anti-gagging point on the ear. The needles are not disturbed during access to the mouth for dental treatment
- The needles are out of the patient's line of vision - a bonus for anyone with a dislike of needles
- The technique involves the insertion of one, fine, single-use disposable needle of 7mm length into the anti-gagging point of each ear to a depth of 3 mm. The needles are manipulated for 30 seconds prior to carrying out dental treatment. The needles remain in Situ throughout treatment and are removed before the patient is discharged. The patient does not require an escort and is not inconvenienced in anyway following treatment.
- **Acupressure^[3] -** Follows the same principle as acupuncture, but the former stimulate the points with gentle finger pressure rather than fine needles and therefore is a less

invasive technique. Chengjiang (REN-24) is an effective acupressure point for controlling the gag reflex during impression making. To make use of it locate the REN-24 point. It is situated in the horizontal mentolabial groove. Approximately midway between the chin and the lower lip. Apply light finger pressure with the index finger progressively increase the finger pressure until the patient feels some discomfort and distension. The acupressure should start at least 5 min before impression making, continue through the impression procedure, and should 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.

- **Placebo Effect^[1]**- The placebo or suggestive effect of treatment can be very powerful. A recent systematic review has confirmed that the placebo effect is mediated via endogenous opioids.

Surgical Technique^[3]

Leslie reported a surgical technique to relieve gagging for the patient unable to tolerate

complete dentures. The basis for this technique stems from the observation that persistent gagging results from an atonic and relaxed soft palate, which is found in the nervous system. As a suspended organ, the palate is not in normal relation with the uvula and the pharyngeal wall. In such cases, the uvula touches the tongue and the soft palate rests back on the pharyngeal wall. This produces a tendency to gagging and nausea that often results in vomiting. To correct this situation, Leslie advocated an operation to shorten and tighten the soft palate on healing after the removal of the uvula. This radical solution has not been widely accepted or used.

Pharmacological Management^[3]

1. Locally acting- peripherally acting drugs/ local anesthesia - They may be applied in the form of sprays, gels or lozenges or by injection. The effectiveness of these agents is limited.

When mucosal surface is desensitized, the patient is less likely to gag. The deposition of LA around the posterior palatine foramen has been used for patient who gags. However, the administration of a local injection may not be possible and may itself provoke gagging. Furthermore injection of LA solution may distend the tissue resulting in an inaccurate impression, which may compromise retention of prosthesis.

A topical anesthetic containing benzocaine (14%), butyl aminobenzoate(2%) and tetracaine hydrochloride (2%) can be sprayed on a gauze pad and placed on the back of the upper arch until the impression is obtained.

Dispense 1 capsule of LA solution 8ml of 2% lidocaine with 1 part in 100,000 epinephrine to the plastic measuring cylinder and then add water to the correct volume. Now to this solution add impression material, mix thoroughly. Insert the loaded tray gently in the patient's mouth and press until set.

2. Centrally acting drug- It is only a short term solution for severe gagging problem and should not be used routinely

1. Tranquilizers like chlorpromazine are useful in patient under strain/tension.

2. Semi hypnotic, antihistamines, parasympatholytics.

3. General Anesthesia- A minority of patient does not respond to any form of sedation or behavioral therapy and dental treatment under GA may be appropriate as a last resort.

4. Conscious sedation -Removal of anxiety may prevent gagging. The use of conscious sedation with inhalation, oral or intravenous agents may temporarily eliminate gagging during treatment while maintaining reflexes that protect the patient's airway. It alters the perception of external stimuli and it is suggested that this altered perception depresses the gag reflex. The patient tolerance to the placement of intraoral object is increased and the anxiolytic properties of NO can reduce or

abolish negative cognition associated with gagging. Oral sedation may be useful in mild gagging. Intravenous sedation is often much more predictable than oral sedation, and can be of use in patient where inhalation sedation is ineffective. Oral sedation may be useful in mild gagging. Intravenous sedation is often much more predictable than oral sedation, and can be of use in patient where inhalation sedation is ineffective.

Conclusion

There are various methods of management of gag reflex and causes of gag reflex. If dentist is effectively able to control, and avoid gag reflex in patient's it will lead to efficient dental treatment and hold over patient's.

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Source of Support : Nill, Conflict of Interest : None declared