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Gagging : Revisited

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Abstract

Gagging though a normal protective reflex designed to protect the airway, when exaggerated can be a stressful experience for both the patient and clinician. 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. The etiology of gagging though unknown, has broadly been categorized as somatic or psychogenic A number of strategies have been used in an attempt to control gagging in the dental setting so that patients can cope with treatment. Many situations require a combination of treatment techniques. But most important is good education & motivation of the patient The purpose of this article is to outline the etiology of problematic gagging and review the management of patients with an exaggerated gag reflex.

Introduction

Gagging has been defined as an ejectory contraction of the muscles of the pharyngeal sphincter [1]. It is a normal protective reflex designed to protect the airway and remove irritant material from the posterior oropharynx and the upper gastrointestinal tract. Air is forced over the closed glottis producing a characteristic retching sound. The patient who gags may present with a range of disruptive reactions; from simple contraction of palatal or circumoral musculature to spasm of the pharyngeal structures, accompanied by vomiting.

Gagging may be accompanied by excessive salivation, lacrimation, sweating, fainting, or, in a minority of patients, panic attack. When stimulation occurs intraorally, afferent fibers of the trigeminal, glossopharyngeal, and vagus nerves pass to the medulla oblongata. From here, efferent impulses give rise to the spasmodic and uncoordinated muscle movement characteristic of gagging. The centre in the medulla oblongata is close to the vomiting, salivating, and cardiac centres, and these structures may be stimulated during gagging. Furthermore, neural pathways from the gagging centre to the cerebral cortex allow the reflex to be modified by higher centers. [2]

Gagging is a natural reaction to tactile stimulation of certain intraoral structures. Five intraoral areas are known to be ''trigger zones'': palatoglossal and palatopharyngeal folds, base of tongue, palate, uvula, and posterior pharyngeal wall. Gagging may also be

elicited by nontactile sensations such as visual, auditory, or olfactory stimuli. [3]

Gagging commonly occurs during various dental procedures. Although mild gagging problems require only minor procedural modifications, however, providing dental treatment for severe gagging can be a stressful experience for both patients and clinicians.

The gagging reflex can be elicited by the dentist's fingers or instruments contacting the oral mucosa or even by nontactile stimuli, for example, patients seeing the dentist or remembering a previous dental experience. A patient with a gagging problem is often dissuaded from seeking regular oral care resulting in have poor dental health and requiring extensive treatment. They tend to visit a dentist only when in pain, and may request treatment under general anesthesia [4,5]. The purpose of this article is to outline the etiology of problematic gagging and review the management of patients with an exaggerated gag reflex.

Etiology of Gagging

Wright [7] believed that the factors important in the etiology of gagging include: local and systemic disorders, anatomic factors, psychological factors, and iatrogenic factors.

1. LOCAL FACTORS: like Nasal obstruction, postnasal drip, catarrh, sinusitis, nasal polyps, and mucosal congestion of the upper respiratory tract, a dry mouth, and medications that cause nausea as a side effect are thought to predispose to or cause gagging. [8]
2. SYSTEMIC FACTORS: Chronic gastrointestinal disease, notably chronic gastritis, peptic ulceration, and carcinoma of the stomach, can lower the intraoral threshold for excitation and contribute to gagging.
3. ANATOMIC FACTORS: Other factors have been described which are not necessarily direct inducers of gagging, but which increase its risk and its severity in affected people. These contributing factors include anatomical variations, for example in soft palate anatomy [9]; medical conditions, such as nasal obstruction [10]
4. PSYCHOLOGICAL FACTORS: such as apprehension [11] and neuroticism [12]

These can be divided into extra oral and intraoral stimuli.

A. 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. Landa13 observed that an acoustic stimulus can instigate a gag reflex in some patients. The smell of various dental substances, cigarette smoke etc have been reported to cause gag reflex.
B. 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 relatively hypersensitive in the posterior portion than anteriorly. Similarly, the upper surface of the posterior 1/3 of the tongue is the most sensitive region in the entire oral cavity.

5. IATROGENIC FACTORS: Iatrogenic factors like poor clinical technique may elicit the gag reflex in patients not normally susceptible to gagging. For example, an overloaded impression tray or an unstable or poorly retained prosthesis may induce gagging. such as faults in denture design related to tongue space, retention, position of the post dam and freeway space. [14,15] An increased vertical dimension of occlusion has also been suggested as precipitating gagging. [16] Ramsey., et al. [17] postulate that the important factors are the past dental experiences and the learned response.

Classification

Faigenblum [18] 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.

Dickinson and Fiske classified gagging reflex as:

1. Grade I (Normal gagging reflex): This type is a very mild form of gagging which can be controlled by the patient. It is seen during high risk dental procedures such as maxillary impression taking or restoration to the distal, palatal or lingual surfaces of molar teeth which may directly stimulate the trigger zones.
2. Grade II (Mild gagging): This is a mild type of gagging and occurs occasionally during routine dental procedures such as fillings, scaling and impressions. Control is required by the patient with reassurance from the dental team.

3. Grade III (Moderate gagging): This is a moderate and consistent type of gagging which limits treatment options. It may occur routinely during normal dental procedures such as simple physical examination of high risk areas, such as the lingual aspect of lower molars.
4. Grade IV (Severe gagging): It represents a severe form of gagging and makes dental treatment impossible without interventions. This type occurs with all forms of dental treatment including simple visual examination.
5. Grade V (Very severe gagging): This type is a very severe form, affecting patient behaviour and dental attendance. It occurs easily and may not necessarily require physical intervention to trigger the reflex. Dental treatment becomes impossible without appropriate interventions.

Management

The management of the patient with a mild to moderate gagging problem may be performed in general dental practice. However, a patient with a severe gagging problem requires modification in behaviour of the dentist as well as the treatment plan.

The possible treatments are outlined in Gagging prevention index (GSI) [19]

Type I: Obtunded gag reflex; treatment successful

Type II: Partially controlled gag reflex; all treatment possible

Type III: Partially controlled gag reflex but frequent gagging; simple treatment possible

Type IV: Inadequately controlled gag reflex; simple treatment unable to be completed

Type V: Gag reflex severe; no treatment possible.

The management of the gagging patient may be influenced by the severity and etiology of the problem. It is important that the clinician obtains a detailed history. A number of strategies have been used in an attempt to control gagging in the dental setting so that patients can cope with treatment. They include Psychological intervention, Pharmacological intervention, surgical correction, Accupuncture and acupressure & Dental Procedural management.

1. BEHAVIOUR MODIFICATION: An exaggerated or extended period of gagging in the absence of a normal stimulus is usually a learned response. [21] Theoretically; this response can be unlearned or extinguished. Behavioural modification is the most successful long-term method of managing the gagging patient. Generally, the objectives are to reduce anxiety and ''unlearn'' the behaviours that provoke gagging. Relaxation, distraction, suggestion and hypnosis, systematic desensitization using training denture bases, errorless learning and cognitive behavioural therapy are all methods that can be employed, singly or in combination. [22]

A. Relaxation techniques may be helpful in reducing the gag reflex if it is due to anxiety. Relaxation can help ameliorate or override 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.

B. Distraction techniques can be useful to temporarily divert a patient's attention and may allow a short dental procedure to be performed while the mind is dissociated from a potentially distressing situation. The distraction techniques includes: Conversation, concentration on breathing, for example, inhaling through the nose and exhaling through the mouth, making the patient to participate in activities that cause muscle fatigue, such as raising a leg off the dental chair and holding the position. [23] Distraction techniques can be valuable for short dental procedures but may be inadequate, when used alone, in patients with a severe disruptive gag reflex.

C. Suggestion and hypnosis: Distraction techniques can be refined by incorporating an element of suggestion. [24] Patients can be informed that retching will not occur during the distracting activity. Visual imagery may be used to enhance suggestion. Hypnosis may help to relax a patient and so temporarily remove or ameliorate the gag reflex to allow dental treatment to be performed [25] but should be done only if the patient agrees and if the clinician is well trained.

D. Systematic desensitization: In systematic desensitization 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 intensity, duration, and frequency of the noxious stimuli is slowly increased, thereby allowing the patient to gently habituate by developing coping strategies to deal with the feelings of discomfort or panic experienced.'

•. Training Bases: This is a further desensitization technique, whereby a patient is progressively supplied with a series of small to full-sized denture bases. It is useful for patients who are to become denture wearers.

- Errorless learning: This desensitization technique is an effective simple method that can be used by all clinicians. The disadvantage is that it can be a very slow technique. However, once a motivated patient understands the procedure and rationale, the interval between clinic appointments can be extended while the patient continues to practice the exercises. The patient is instructed to set aside time to position the denture closer each day and eventually into the mouth in ''successive approximations.'' That is, the denture is placed perhaps millimeters at a time closer to the final position. In situations where retching is induced simply by looking at the denture, then the patient is merely requested to look at or hold the denture and to stop before symptoms of retching develop. The process is repeated, with a small increase in time spent undertaking this task, until eventually the patient can wear the denture.

E. Cognitive behavioural therapy: This method invites patient's to challenge hard held beliefs. Alteration or elimination of unhelpful cognitions may lead to a change of behavior. Cognitive behavioral therapy (CBT) invites patients to challenge strongly held beliefs about the consequences of gagging by asking the patient to confront these beliefs with evidence collected from life experience. [26]

2 Pharmacological intervention:

It includes local anaesthesia, conscious sedation, Intravenous sedation & general anaesthesia.

A. Local anesthesia : The use of local anesthesia for gagging is based on the fact that if the mucosal surfaces are desensitized, the patient is less likely to gag. The agents may be applied in the form of sprays, gels, lozenges, mouth rinses, or injection. While topical anesthetics may work for some patients, in others it may increase nausea and vomiting and may fail to suppress the gag reflex. [27]

B. Conscious sedation: The use of conscious sedation with inhalational, oral, or intravenous agents may temporarily eliminate gagging during dental treatment while maintaining reflexes that protect the patient's airway. [28] Often, the use of sedation does not obviate the need for other treatment modalities. Sedation may be used initially to allow urgent dental treatment to be completed after which a behavioural approach is used to affect a long-term solution. Nitrous oxide, used for inhalation sedation, alters the perception of external stimuli and it is suggested that this altered perception depresses the gag reflex. The use of oral sedatives may be unpredictable and is usually only useful in the mild gagging patient with an underlying anxiety state. Intravenous sedation is often much more predictable than oral sedation, and can be of use in patients where inhalation sedation is ineffective. [2]

C. Intravenous sedation: Yoshida Harushi et al found that in prosthodontic treatment extended to the posterior regions, propofol IV sedation proved useful in managing reflex control. However, the potential of intravenous (IV) sedation as a way to overcome problems in gagging management during dental treatment has not been sufficiently explored. [29]

D. General anaesthesia: General anaesthesia is used in a minority of patients who do not respond to any form of sedation or behavioral therapy as a last resort.

3. SURGICAL CORRECTION: Surgical correction is done in cases of atonic and relaxed soft palate found in nervous patients resulting in severe gagging. To correct this situation, an operation is done to shorten and tighten the soft palate.

4. ACCUPUNCTURE AND ACUPRESSURE: 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. The technique of ear acupuncture is relatively noninvasive. It causes little discomfort, is cheap and requires little additional clinical time. Rosted [30] describes acupuncture as a very safe technique provided basic anatomy and aseptic procedures are applied by an appropriately trained practitioner. According to J. Fiske and C. Dickinson [19] and Hashim., et al. [31] ear acupuncture was 100% successful in controlling the gag reflex. The possible explanation to the mechanism of action of this technique is that one of the main nerves involved in swallowing, the vagus nerve, also supplies the part of the ear that contains the anti-gagging acupuncture point. The point is also adjacent to a branch of the trigeminal nerve. Together, the trigeminal and vagus nerves are responsible for much of the sensory and motor functions of the larynx, pharynx, and palate. Therefore, stimulating these anti-gagging points activates mechanisms that inhibit the muscle activity of the GR. [32]

Acupressure caves are the sensitive points in the human body that feel soreness, distension when a deep pressure is applied for 5-20 min. the accupressure cave points are: Left and right concave area at medial aspect of the forearm (NEIGUAN) & Concave area between first and second metacarpal bones (HEGU)

5. Dental procedural management:

The precautions that should be taken includes: avoiding patient visits after meals & making patient accustomed to instrumentation. For clinical procedures the patient is asked to flex forehead downwards & not to allow the saliva to pool inside the mouth. Use of rubber dam is highly advocated.

The modifications required during impression making are: Construction of accurately fitting trays (palate devoid trays), Use of fast setting impression material, Use minimum amount of impression material, Use of salt on the tip and lateral border of tongue and hard palate & Application of various distraction techniques. During delivery of prosthesis use a few lemon drops before insertion of dentures. Take care that the prosthesis should neither be overextended nor under extended.

Summary

Over gagging can be distressing for both the patient and clinician. There appears to be no universal remedy for the successful management of the gagging patient. A wide variety of management strategies & many situations require a combination of treatment techniques.

But with good education & motivation of the patient & prudent approach & precise treatment by the dental surgeon a level of comfort can be achieved & successful treatment can be delivered.

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