The gagging problem in prosthodontic treatment. 
Part II: Patient management

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As stated in Part I of this review, an unusually active gag reflex may upset the patient, compromise the quality of treatment, and frustrate the dentist. Fortunately, the patient with a severe gagging problem is uncommon. However, when such a patient presents for treatment, it matters little to the patient or dentist how infrequently serious gagging problems occur. For both of them, at the point in time when treatment must be rendered, the frequency of occurrence might just as well be 100%.

CONSIDERATIONS

Effective management of gagging depends on treating the cause and not merely the symptoms. Through examination, taking of an 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 anomalies, biomechanical inadequacies of existing prostheses, or psychologic factors. It is important to recognize whether single or multiple factors are causing the problem.

MANAGEMENT PROCEDURES

Effective management of the “severe gagger” demands sincere interest in the problem and compassion for the patient. Numerous approaches to managing the severe gagger appear in the dental literature. They fall into the categories of (1) clinical techniques, (2) prosthodontic management, (3) pharmacologic measures, and (4) psychologic intervention. The specific techniques within the general categories must be matched to the cause of the problem. Where multiple causes are identified, multiple approaches to management often become necessary.

Clinical techniques

Various recommendations and specific approaches for performing clinical procedures in a manner that controls gagging are found in the literature. Some techniques are general and may be applied to all situations where gagging is a problem. Others are more specific, making them appropriate for only certain procedures or certain individuals.

Surgical. 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 patient. 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. In a report of a patient, the operation also involved the removal of the uvula, which was a little longer than normal. The technique was not described in any detail, and concluding remarks suggested that more patients reports would be required before surgical guidelines for tissue removal could be developed. This radical solution has not been widely accepted or used.

Prosthodontic. To avoid substandard impressions because of gagging, Borkin outlined an impression technique for edentulous patients. It provides greater control of setting time and discrepancies can be corrected easily. A primary impression is made by use of a stock tray and red modeling compound. A stone cast is poured, and a tray of acrylic resin or shellac baseplate is fabricated. The secondary impression is obtained by pouring Kerr impression wax (Kerr Mfg. Co., Romulus, Mich.) in the tray. The pliable nature of the wax allows reseating of the tray and border molding until desirable results are obtained.
A technique that employs ordinary marbles was reported by Singer as an effective approach to overcoming a patient's inability to tolerate complete dentures. The patient described retching violently when asked to open his mouth. At the first appointment, the patient was asked to place five marbles in his mouth, one at a time and at 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, the 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 records were made and the occlusion rims marked. While the dentures were being constructed, the patient continued to wear the upper and lower base trays in lieu of carrying marbles. The completed dentures were inserted at the seventh visit. Singer admits that a patient's motivation is an indispensable component of the marble technique. It appears that this approach presents definite medicolegal risks in the event of aspiration by the patient.

Radiographic. The gagging patient also presents serious obstacles to the production of acceptable dental radiographs. To minimize problems Richards suggested the use of fast-speed film; preset the timer, moisten the film pack, and have the patient rinse the mouth with cool water. When all such efforts fail, Richards recommends extraoral radiographs. Additional suggestions regarding radiographic technique were made by Brooks. These include beginning with less troublesome anterior regions, use of a systematic approach, working from one side of the chair to instill confidence in the patient, and soaking the film packs in ice water for 10 seconds to obtain radiographs of sensitive regions.

Psychologic. Many recommended clinical techniques are directed at diverting the patient's attention from the gagging stimuli. This, at times, may be done gently and with tact and at other times with stern words and action. When making impressions Landa recommended manipulating the oral and facial tissues more for psychologic reasons than for border molding. He also recommended talking to the patient, explaining the critical nature of accurate impressions. When inserting new dentures, Landa suggested that the dentist engage the patient in conversation on some topic of special interest, (2) have the patient count rapidly up to 50 or 100, and (3) have the patient read aloud. Kovats reported a technique that has the patient breathe audibly through the nose and at the same time, rhythmically tap the right foot on the floor. This procedure may be used during various clinical procedures. By concentrating on these activities the patient's attention may be diverted away from the gagging stimulus. A similar technique was described by Krol. To divert attention, the patient is instructed 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. At the point where the patient has difficulty carrying on conversation, intraoral procedures may be attempted.

When simple concentration on breathing is ineffective, Faigenblum discussed another approach. Evidence exists 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 discourage gagging. More generally, Faigenblum proposed that a well-rested and relaxed patient with an empty stomach is less likely to gag.

Prosthodontic management

Prosthodontic approaches to the patient with the gagging problem involve technical modifications to render the prosthesis more acceptable to the patient. No alterations, in fixed or removable partial prostheses, to solve a gagging problem have been reported in the literature. Excess thickness, overextension, or inadequate postdam 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. Jordan reported a patient who was not a gagger, but who experienced nausea when wearing a maxillary complete denture. At the patient's suggestion the high polish was removed, and on reinsertion the sensation of nausea disappeared completely. From his clinical experience, Jordan suggests that a matte finish is more acceptable to patients than a glossy surface.

In contrast to Jordan's recommendation, Feintuch described a technique that used a polished acrylic resin base tray to help the denture patient overcome gagging problems. After extractions, the smoothly polished base tray was given to the patient to insert at home. After 2 weeks of tolerating the toothless base tray, impressions were made. Subsequent appointments were uneventful.

Krol discussed the importance of "freeway" space...
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(Interocclusal distance to the gag reflex. He determined that the interocclusal distance was inadequate in more than 100 patients with serious gagging problems. The interocclusal distance was increased by either remounting and grinding the teeth or remaking the dentures when the discrepancy was gross. In all instances, an increase in the interocclusal distance resolved the gagging problem.

Reporting on the prosthetic treatment for a patient with a hypersensitive palate, Bay14 combined the overdenture principle with a modification in the shape of the denture base. Soft reline material was used to engage threaded posts in the overlaid teeth. Additionally, the palatal section of the upper denture remained open. The author claimed excellent retention, reduced bulk, and resolution of the patient’s gagging problem.

A technique similar to Bay’s was described by Zuckerman and Goldberg.15 After insertion of what was termed “an adequate maxillary denture,” the patient experienced severe gagging. Postinsertion adjustment did not resolve the patient’s difficulty. Removal of the palatal section of the denture stopped the gagging, but severely compromised the retention of the prosthesis. To provide retention, 12 intramucosal inserts were placed. It is interesting that the patient had no gagging problems prior to insertion of the prosthesis.

Pharmacologic measures

When clinical and prosthodontic procedures are ineffective, a number of pharmacologic agents have been described as useful in controlling and limiting the gag reflex. Their efficacy, however, is not universally accepted. The drugs used to control gagging may be classified as peripherally acting or centrally acting.

Peripheral acting drugs. Peripherally acting drugs are topical and local anesthetics. They may be applied in the form of sprays, gels, or lozenges or by injection. The effectiveness of these agents is limited to use in those patients who demonstrate only a minor gagging problem. Success is unlikely with the severe gagger.

The rationale for the use of these drugs is that if the afferent impulses from sensitive oral tissues are eliminated, the reflex of gagging will not take place. This approach may work well to help a gagging patient through a particular procedure, such as radiographs or impressions. It must be recognized that use of these locally acting agents does not provide a long-term solution.

When applied to the palate and dorsal surface of the tongue, topical agents are reported to be useful.16 In more severely affected patients, an injection of local anesthetic into the region just posterior to the hard palate is recommended. Kovats17 experienced success in making a maxillary impression by spraying the entire palate with a topical anesthetic. Topical anesthetics also may be administered in the form of lozenges.18

While topical applications may work for some problem gaggers, in other instances they may enhance gagging. Schole19 felt that “topical anesthetics may actually increase nausea and vomiting because the sensation of numbness produced in the sensitive palatal and pharyngeal areas may be sufficient to excite the vomiting reflex.” Krol20 agreed and suggested that even though the mucosa is anesthetized, the patient remains aware of the stimuli associated with gagging. For some patients, a perception of swelling of the tongue and palate is produced from topical anesthetics. Landa21 objected to the use of an injected local anesthetic especially in the region of the posterior palatal foramen. He felt that the injection itself often initiates the gag reflex. Of equal importance, such an injection may distend the tissues in the region, which is critical to providing an excellent peripheral seal. An impression of distorted tissues may compromise retention.

An additional local drug treatment was reported by Lincoln.22 For those patients unable to tolerate new dentures, the author resorted to the injection of alcohol. While no mention is made of the number of patients treated, the author claimed immediate relief in all patients. The technique involved the injection of 10 minims of 190 proof alcohol into the soft tissues approximately 4 mm distal to the lesser palatine foramen. This causes a slight sensation of fullness in the pharyngeal wall. The effect of the alcohol is reported to wear off after a few months. No explanation was made for the mechanism relieving the gagging symptoms.

Appleby and Day23 reported that with some gagging patients, common table salt can minimize the reflex. Placed on the tongue or in liberal amounts on the palatal region of the denture, salt may help gagging patients tolerate complete dentures.

Centrally acting drugs. Centrally acting drugs, which eliminate or reduce the gag reflex, may be categorized as antihistamines, sedatives and tranquilizers, parasympatholytics, and central nervous system depressants. There are medications in each category with definite therapeutic value. The use of drugs to manage the gagging patient, however, should not be routine. Pharmacologic intervention offers only a short-term solution, especially for severe, chronic problems.

Saunders24 reported the use of intravenous Valium
(Roche Laboratories, Nutley, N.J.) for the problem gagger. The rationale for its use was to permit the laryngologist to perform an adequate laryngeal examination on a patient exhibiting an active gag reflex. For those adequately trained, intravenous sedation would seem to be another approach that could be used to facilitate dental treatment. The selective use of drugs that depress and/or limit the gag reflex may be necessary for the gagger who is hysterically out of control. Kramer and Braham\textsuperscript{16} recommended the intramuscular injection of Phenergan (Wyeth Laboratories, Philadelphia, Pa.) and Nisentil (Roche Laboratories) for such a patient. The Phenergan exerts a strong antihistaminic, antisympathetic, and antiemetic effect. Nisentil provides a strong sedative effect.

Dental research in the area of pharmacologic agents to control gagging is virtually nonexistent. Only one clinical evaluation of a drug (Tigan, Beecham Laboratories, Bristol, Tenn.) as an antigagging agent was found in the dental literature. Prior research on this drug indicated successful relief of nausea and vomiting in a number of conditions including pregnancy, motion sickness, Meniere's syndrome, and labyrinthitis. A controlled study on the antigagging effect of Tigan was conducted under conditions simulating those of routine dental practice.\textsuperscript{22}

An active gag reflex was established in 40 dental students. The reflex was evaluated after a single 200 mg dose of Tigan was administered. Ten patients showed total block of the gag reflex, 14 showed a marked effect, five showed a mild effect, and 11 showed no effect. The authors concluded that Tigan was useful as an antigagging preparation in the routine practice of dentistry. One important question remained unanswered—for whom? While Tigan was effective against stimulation, one can only speculate on how effective it would be for the true problem gagger who retches at the site of an impression tray.

In a short article, Joffre\textsuperscript{23} asked how gagging could be controlled during examination, radiographs, and impressions and after insertion of new dentures. In each situation, if various standard clinical techniques fail, drugs are recommended to overcome the gagging. This seems to be an overdependence on pharmacologic options available to deal with the problem gagger.

**Psychologic intervention**

As discussed in Part I of this review, some patients' difficulty with gagging may be the result of psychologic stimuli. Indeed, Landa\textsuperscript{1} claimed that most problem gaggers fall into this category. It cannot be denied that psychologic factors at least contribute to the problem. And it is only reasonable to look for management techniques directed at psychologic causes. The spectrum of suggested approaches runs from a gentle chair-side manner to psychotherapy.

**Hypnosis.** Hypnosis has been used as a tool to deal with the psychologic etiology of gagging. Several patient reports that used dental hypnotherapy appear in the literature.\textsuperscript{2,26,28} Results are described as generally successful. In addition to being effective for selected patients, there are no lingering and/or adverse side effects, as may be the case when drugs are used. However, some very real limitations preclude the routine use of hypnosis as a general solution to problem gagging. Many patients cannot be subjected to hypnosis, and of equal importance, few dentists are skilled in the technique. The approach also requires multiple, lengthy interviews. One study reported on a patient whose natural teeth were removed under general anesthesia. Subsequently, the patient was unable to tolerate an empty impression tray. After nine hypnosis sessions the patient was able to have impressions made. Because of the time involved, hypnosis would not be considered a practical approach by many practitioners or patients.

**Behavioral therapy.** Behavior modification techniques have been used to treat and control a variety of hysterical disorders, including gagging. Epstein and Hershen\textsuperscript{27} reported on an hysterical gagger whose problem was so severe that he lost his job and developed interpersonal difficulties. At baseline assessment, the patient averaged 11 gagging episodes a day. The treatment was designed to reinforce and maximize patient self-management. The patient received no instruction or plan for controlling his reflex. He was urged to seek his own solution and received monetary rewards during a 1-week hospital stay when his daily rate of gagging decreased. During a 12-week follow-up period as an outpatient, only one gagging episode occurred.

A similar patient was reported by Altamura and Chitwood\textsuperscript{28} Their approach involved the use of behavior management procedures of systematic desensitization, covert reinforcement, and self-control. Eleven 1-hour sessions were used to train the patient to use these techniques. At baseline assessment, the patient averaged six gagging episodes per day. A 6-month follow-up showed no recurrence of gagging.

Patients may need to be referred to other professionals trained in the design and execution of behavioral therapy. The therapist and client may choose a treatment strategy that includes one or more of the available techniques, such as cognitive change strategies, model-
ing, fear reduction, self-management and self-instruction, hypnosis and suggestion, or systematic desensitization.26 None of this means, however, that dentists cannot be psychologically supportive of the patient. A number of very simple, commonsense actions on the part of the clinician can aid the patient in overcoming gagging difficulty.16 Some of the suggested actions are (1) creating a confident atmosphere by developing enthusiasm and security, (2) acting positively by expecting the best and avoiding the use of words like "gagging," (3) displaying sympathy and understanding to elicit more cooperation from an already embarrassed patient, and (4) giving reassurance by explaining that the reaction is normal and occasionally more active in some patients.

SUMMARY AND CONCLUSIONS

The most serious problem associated with the patient with an overactive gag reflex is the strong potential for compromised treatment. A complete oral examination, medical history, and conversation with the patient are important sources of information that assist with the management of gagging problems. Many techniques are available for controlling the exaggerated gag reflex, and no single technique will solve each patient's problem. The technique or techniques used should be dictated by the cause or causes involved. If organic disturbances, anatomic anomalies, or biomechanical inadequacies of existing prostheses are not key causes, the services of trained specialists are needed to help with behavioral management of the problem.

REFERENCES


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