



REVIEW ARTICLE

MANAGING GAG REFLEX DURING REMOVABLE COMPLETE DENTURE TREATMENT: A CASE REPORT

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ABSTRACT

The gag reflex is an innate reflex to protect the upper respiratory and digestive tracts from any event that could cause their obstruction. However, in some patients, this reflex may be unpredictable and exaggerated. The realization of prosthetic care can then become painful for the patient, and delicate for the practitioner. The gag reflex not only interferes with the quality of the therapeutic act but can also prevent the patient from wearing a dental appliance in which he or she had placed hopes. A perfect understanding of the different etiological mechanisms is an essential prerequisite. Indeed, depending on the etiology and importance of this reflex, the practitioner will preferentially use one therapy over another or will have to combine several treatments for the most intractable nausea.

INTRODUCTION

Nausea comes from the Greek Naus, which means ship. Originally used for seasickness. It is a feeling of unease and discomfort that manifests itself in a desire to vomit. It is an innate reflex to protect the upper respiratory and digestive tracts against any event likely to cause their obstruction. But it can also be an acquired reflex conditioned by stimuli and built on the basis of an innate reflex (Bassi, 2004; Bertrand, 2002; Strohl-hazard, 1998). The gag reflex is therefore useful during prosthetic care, where many instruments or materials can be ingested by accident. However, when it manifests itself in an exaggerated way, it not only interferes with the progress of the therapeutic act but may also prevent the wearing of a dental appliance in which the patient had placed hopes, in particular the restoration of his aestheticism and oral functions. In a removable prosthesis, several acts are likely to condition a gag reflex. In order to facilitate prosthetic care for the "sensitive" patient and to accustom him to integrate his future prosthesis, different complementary techniques and therapies aimed at reducing or even eliminating this reflex are proposed in this article through a clinical case.

Etiological mechanisms of gag reflex: The gag reflex follows the classic path of the simple reflex arc which involves: a receptor; an afferent and efferent pathway; an integration center and an effector. But with a particular complexity.

The study of the afferent pathways shows that nausea can be triggered by very diverse etiologies that Krol divides into two main types: Somatogenic stimuli and psychogenic stimuli. (Bassi, 2004; Bertrand, 2002; Strohl-hazard, 1998; Nirmal, 2015; Conny, 1983). We summarized the etiological mechanisms that may increase sensitivity to the gag reflex in the following diagram (Fig 1).

Clinical Case: Mrs. R. M, a 47-year-old woman with asthma, came to us for a consultation because of her gag reflex problem that she attributes to a "too long" new complete removable denture. The patient constantly feels a nauseous reflex when inserting her dental appliance or after a period of wear. The patient tells us that she has a bad memory of previous prosthetic care since she triggered severe nausea and even vomiting throughout the various prosthetic stages. The clinical examination was able to confirm the patient's sensitivity, a simple palpation of the soft tissues in the lower molar region triggered the gag reflex. Exo oral examination reveals an overestimated of the vertical dimension of occlusion (VDO). By having the patient say a low-pitched "Ah" the velum was coming off the posterior edge of the maxillary prosthesis, this means that this edge is too expanded. At the end of this clinical examination, we noticed that the gag reflex in this patient undeniably has a general origin (asthma) as well as a local origin (prosthetic) that intertwines with a psychological component (bad experience of previous care). To solve the patient's severe nausea, we decided to approach the treatment through three routes. The first is psycho-behavioural. The second is pharmacological. The third at the prosthetic construction level by making a new, more suitable complete

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removable denture while using the patient's dental appliance as transitional prosthesis and a desensitizing means against her gag reflex.

Managing gag reflex

Pre-prosthetic phase: The patient has taken a psychological follow-up from the beginning of the treatment. The bad memory of previous dental care and the fear of a nauseous reflex have been mitigated by building confidence and a friendly atmosphere. The patient's dental appliance was used as a transitional conditioning and desensitization prosthesis against her gag reflex problem. It has made it possible to gradually move from an under-extended prosthesis to a prosthesis using all positive posterior support surfaces, even reflexogenic ones (Lassauzay, 1998). The overestimated (VDO) was reduced by simply grinding the occlusal surfaces, which relieved the patient. A contact anaesthesia based on xylocaine gel at 2% was applied to facilitate the therapeutic procedures (Strohl-hazard, 1998; Neumann, 2001; Prashanti, 2015). The procedure is detailed in the figures below (Fig 2, 3, 4, 5, 6). The prosthesis is placed in the mouth and the patient is made to say a low-pitched "Ah" for a prolonged time. At each appointment the resin is added and the patient is comforted by the therapeutic approach. Gradually, from week to week, the receptors lower their sensitivity threshold, retention is increased and apprehension decreases. The prosthesis was easily reinserted into the oral cavity

Prosthetic phase

During taking impressions: We place the patient in an orthostatic position. This position prevents breathing discomfort, material from flowing into the throat and makes it easier to tip forward in case of nausea. The old corrected prostheses were used as individual impression trays to minimize painful procedures for the patient. The material used is an heavy polyether "impregum" for its fast setting, pleasant taste and smell and putty consistency compared to other materials (Van overest-eerdmans, 1985). Before taking the impression, the patient was asked to rinse with a mouthwash containing an anesthetic agent. The impression tray was filled out, out of sight of the patient and without excess. It was delicately inserted into the mandible first as it has fewer reflexogenic zones than the maxilla. At the same time as the impression was taken, we tried to divert the patient's attention through the "Krol technique" while discussing pleasant topics with her. This technique consists in asking the patient to keep one leg horizontal without support. When he begins to show signs of fatigue, a higher effort of consciousness is made to keep his foot elevated, which makes him forget the anxiety-provoking situation. It is at this point that the practitioner can insert the impression tray (Conny, 1983; Farrier, 2011; Kim, 1999).

During registering the intermaxillary relationships: The "space of donders" must be respected when recording the intermaxillary relation in order to prevent nausea. For this reason we wanted to have the smallest possible volume of the occlusion rim in order to avoid a crowding. The patient's occlusal vertical dimension was restored according to physiological and aesthetic requirements in order to promote better prosthetic integration.

The patient, concerned about the crowding of the occlusal RIM, was reassured by explaining that the final prosthesis will be less cumbersome, smoother and therefore more comfortable to wear (Begin, 1983; Lejoyeux, 1979; Lejoyeux, 1993).

During try-in of the complete wax dentures: There is a corridor in which tooth arrangement must be performed in order to avoid lingualized arrangement that disrupts the lingual posture to a retracted and elevated position causing gag reflex. For this purpose we have chosen small volume posterior teeth in order to adapt them to the prosthetic corridor and the arrangement of the mandibular teeth has been carried out respecting the Pound and Ackermann Area (Fig.7). The thickness of the wax rim and the contour of the polished surface were also finished in such a way as to respect the lingual space. Particular attention was paid to the creation of velopalatal juncture, which was clinically determined and transferred to the master model. The wax palatal plate at its level has been rounded and thinned out (Lejoyeux, 1979; Lejoyeux, 1993; Rignon-bret, 2018).

- Gysivestibular line.
- Guideligneor crest line.
- Pound line(The teeth must be below this line).
- ckermannprevious bearing area.

During placement of the complete denture in the patient's mouth: Before the prosthesis was placed in the mouth, we checked that the surface condition was well polished. The prostheses were then moistened in a solution of mouthwash to reduce the sensations of dryness and foreign bodies. The mandibular prosthesis was inserted first. Its stability has been verified. Then the maxillary prosthesis, finally both sets. Anequilibration according to the principle of balanced occlusion has been refined to prevent any risk of occlusal instability causing gag reflex. To distract the patient and get her tongue used to the presence of the "foreign body", we asked her to clench her prosthetic teeth and observe a period of silence while explaining that she must take the time to get used to it. Hygiene measures were provided to her. Indeed, a prosthesis where tartar will not accumulate will remain less reflexogenic for the tongue. Although this has disadvantages, the patient was encouraged to keep her prostheses overnight in order to integrate them.

Post-prosthetic phase: The patient who was called back several times afterward no longer suffers from nausea.

DISCUSSION

At the end of our literature search on this subject, we did not find any high-powered comparative studies on a specific treatment. Often the authors explain a technique that has worked well on their patients. The techniques described in the literature are mainly based on psychological, pharmacological and prosthetic techniques. It will be necessary to find techniques adapted to each patient according to the intensity and etiology of his gag reflex. After conducting a detailed individual investigation at the first consultation, we noticed that the gag reflex in this patient is severe and multifactorial in origin. So, we approached its treatment in three ways. The first way is psycho-behavioural. Its purpose is to relax and distract the patient as much as possible.

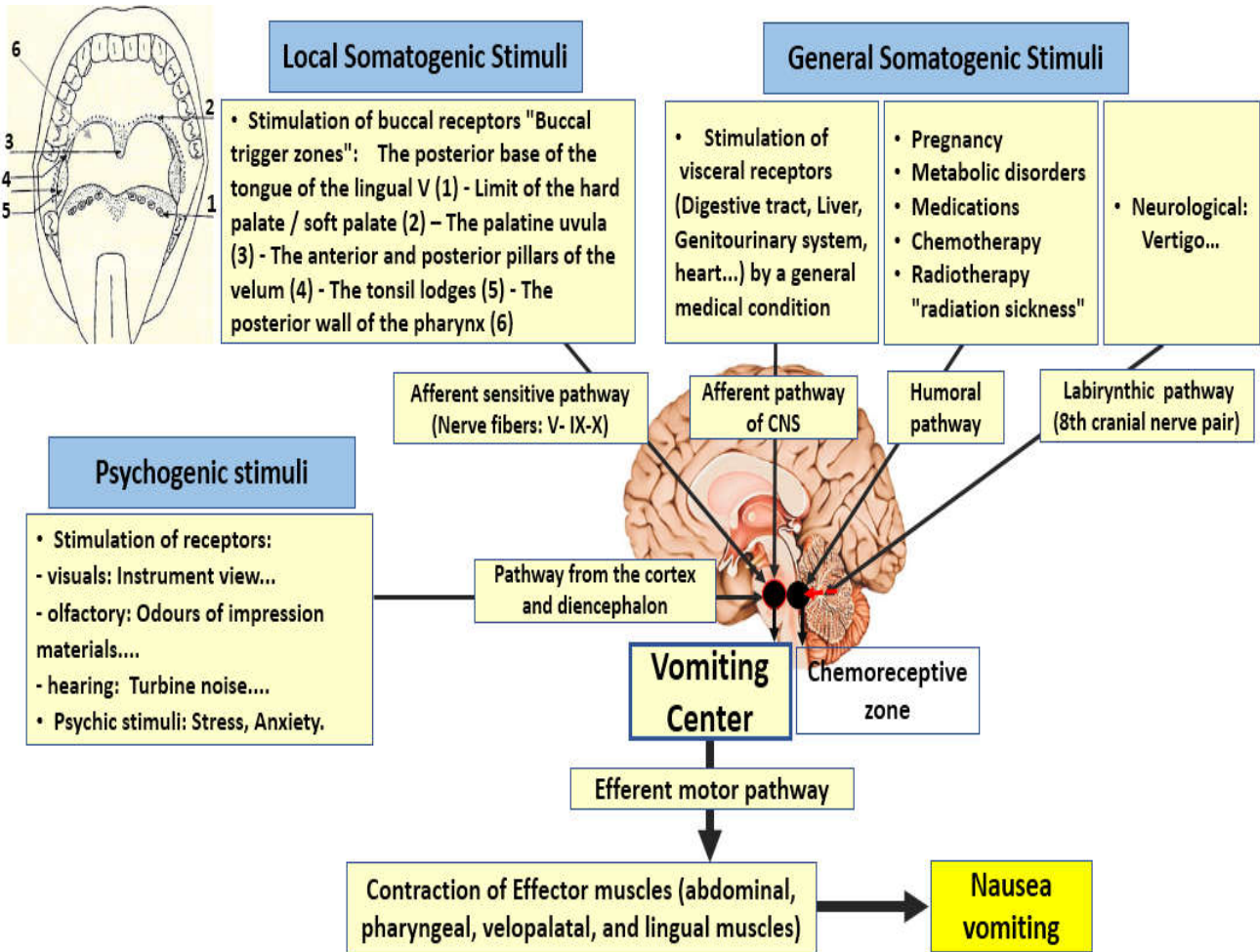


Fig 1. Etiological mechanisms of the gag reflex.



Fig 2. The velopalatal juncture is determined within physiological limits specific to the patient and its posterior limit is drawn with an aniline pencil

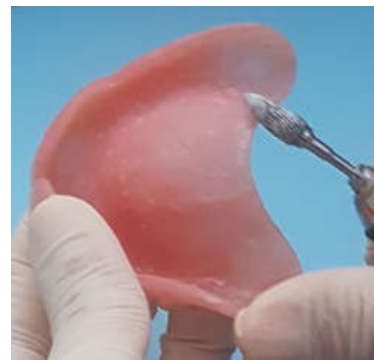


Fig 3. The prosthesis is reduced until it no longer triggers a gag reflex.



Fig 4. The lack was estimated at 3mm from the posterior limits of the velopalatal juncture.



Fig 5. The wax is adapted in length to the anatomy and position of the velum in order to support the acrylic resin which will be gradually added



Fig. 6. a) Addition of 3 mm



b) Addition of 6mm



c) Addition of 9 mm after 3 weeks.

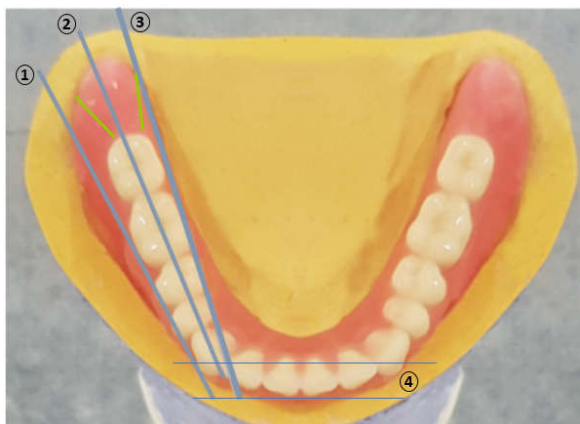


Fig. 7. Landmarks of mandibular tooth arrangement



Fig. 8. Intrados of the final prosthesis with the new posterior limit.

According to Dickinson and Fiske, a relaxed and low-stress patient will be less likely to trigger a gag reflex during care (Dickinson, 2000). Psycho-behavioural therapies are based on desensitization, distraction and relaxation techniques such as controlled breathing and hypnosis (Nirmal Raj, 2015; Bassi, 2004; Neumann, 2001). We opted for two methods recognized as simple and effective that we used concurrently: "a conversational technique" and the "Krol technique" (Kim, 1999; Krol, 1971). As Sewerin recommends, the practitioner's attitude also plays an important psychological role. Our calm, firm and confident attitude has created a climate of trust that is less reflexive (Strohl-hazard, 1998; Sewerin, 1984; Spyridon, 2018). The second therapeutic route is drug therapy. Not without side effects, this route should be used with caution.

The use of local anesthetics seems interesting. In the most rebellious cases, the prescription of systemic drugs seems to be more effective. Metopimazine (Vogalene®) and metoclopramide (Primperan®) are the main antiemetics that practitioners can prescribe. Sedative or homeopathic premedication can also be performed to reduce anxiety reflexes. For our case, despite the patient's severe reflex, psychological therapies were found to be sufficient. We only used a local anaesthetic with xylocaine gel and in mouthwash as a preventive measure. As the patient is asthmatic, the spray form was ruled out as it can be very dangerous and can trigger a violent allergic reaction (Quincke's edema) (Neumann, 2001; Beuzebec, 1995). The third way is in the prosthetic construction (Strohl-hazard, 1998). The use of the old prosthesis as a transitional prosthesis has been an excellent therapeutic means of desensitization and therefore a significant psychological therapeutic means (Lassauzay, 1998).

In addition, the prostheses made in accordance with the prosthetic requirements illustrated in the clinical case were perfectly accepted and integrated by the patient, unlike previous prostheses that did not comply with them. For Means and Flenniken, the gag reflex in complete removable denture is due to: an inadequate posterior velopalatal juncture, thick posterior edges, a lingual space not respected, an overor underestimated occlusal vertical dimension, insufficient retention, or malocclusion (Strohl-hazard, 1998). Thus, the overextended velopalatal juncture of the old prosthesis is incriminated in the problem of gag reflex (Begin, 1983). Indeed, the location of this joint being difficult, it is sometimes arbitrarily carried out by the dental technician. However, its realization requires an individual research for each patient and taking into account the type of palate. Thus, its clinical design was our exclusive responsibility and was controlled at each clinical stage. This joint must be well located, rounded, as thin as possible, tight and sufficiently compressive to prevent a possible reflex (Rignon-bret, 2018). Similarly, the overestimated VDO in relation to the old prosthesis may also be a possible cause of the gag reflex. Krol explains that with an overestimated VDO, the elevating muscles of the mandible can not relax normally. Spasm generated is transmitted to muscles of swallowing, one muscle in particular (the tensor of the velum palati) which would lower the velum palati against the prosthesis. The patient will have the impression that his maxillary prosthesis extends too far to the back of the throat, which can cause gag reflex (Begin, 1983; Lejoyeux, 1993).

Conclusion

The gag reflex is a clinical reality that all practitioners face. It is a difficult obstacle to overcome and often the cause of many

failed prosthetic treatments. Knowledge and understanding of etiological mechanisms is essential in order to adapt appropriate therapeutic solutions to the etiologies encountered. These may be prosthetic, medicinal or psychological. Prosthetic therapeutics are mainly based on the respect of the fundamental rules of design of a removable prosthesis. The use of local anesthetics seems interesting. The prescription of general symptomatic medications must be vigilant and not systematic because the success of treatment very often depends on the quality of the patient/practitioner relationship. The use of psycho-behavioural techniques can be long and tedious, but yields very conclusive results. Finally, collaboration with other specialists who master methods such as hypnosis or acupuncture can provide effective help.

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