



## Prosthetic management of gag reflex: Case report

### Gestion prothétique du réflexe nauséux: Cas clinique

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#### ABSTRACT

A relatively common oral health problem, gag reflex is a clinical challenge during dentures fabrication.

In the current literature several techniques have been described regarding this clinical condition. The latter use either psychological, pharmacological and prosthetic therapies to treat these patients.

The purpose of this case report is to highlight an original prosthetic strategy which consists on a progressive lengthening of the maxillary complete prosthesis allowing a patient with acute gag reflex to adapt to the denture palatal extension.

**Key words:** gag reflex, edentulous patient, dentures, geriatrics, prosthodontics.

#### RÉSUMÉ

Problème de santé bucco-dentaire relativement commun, le réflexe nauséux est un défi clinique lors de la réhabilitation prothétique.

Dans la littérature actuelle, plusieurs techniques ont été décrites concernant cette condition clinique. Ces dernières font appel à des thérapies psychologiques, pharmacologiques et prothétiques.

Le but de ce rapport de cas est de mettre en évidence une stratégie prothétique originale qui consiste en un allongement progressif de la prothèse complète maxillaire permettant à un patient souffrant d'un réflexe nauséux aigu de s'adapter à l'extension palatine de la prothèse.

**Mots clés:** réflexe nauséux, patient édenté, prothèses amovibles, gériatrie, prosthodontie.

#### INTRODUCTION

Gagging is a protective reflex, developed to protect the respiratory tract and to exclude irritants from the posterior oropharynx and the upper gastrointestinal tract. This process is modulated by afferent and efferent fibers that pass from and to the spinal bulb. It plays a role in the declaration of brain death [1]. The physiologic mechanisms of gagging and swallowing are closely related. The same afferent nerve pathways, brain centers, and efferent nerve pathways transmit the respective stimuli [2].

It can be categorized as psychogenic or somatic depending on the origin. The somatic reflex is triggered by touching intraoral areas: the palate, the dorsal surface of the tongue, the uvula and the posterior pharyngeal wall. The psychogenic reflex is generated without direct physical contact by olfactory, visual or auditory factors [3]. For successful prosthetic management, it is very important to find the cause and plan the treatment accordingly. The oral insertion of a removable prosthesis in patients prone this phenomena can result in extreme discomfort and anxiety, which creates additional obstacles for the practitioner [4]. The therapeutic interventions can be

psychological, pharmacological or prosthetic.

The purpose of this case report is to highlight an original prosthetic strategy in order to overcome the nausea reflex in a patient undergoing full denture fabrication.

#### CASE REPORT

##### Patient information

A 48-year-old woman consulted the department of removable prosthodontics at the Center of Consultation and Dental Treatment (CCTDR) for oral rehabilitation.

The patient's chief complaint was the impairment her chewing efficiency and esthetics. She also reported discomfort when large items, such as a toothbrush or dental mirror were inserted in her mouth causing her gag reflex.

As a consequence, the patient rarely made appointments with the dentist and only had extractions as an emergency therapy. She eventually decided to respond to her aesthetic and functional requirements.

Her medical history is diabetes under oral anti-diabetics and morbid obesity currently being treated for by a nutritionist.

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**Clinical findings**

Clinical examination revealed hypertonic facial muscles and an equality of the facial structures at rest. The endo buccal examination showed sufficient crestal bone height on both the maxilla and mandible arch. The prosthetic corridor is reduced due to thickness of the cheek and tongue.

**Diagnostic assessment**

A panoramic radiography did not show anything particular sign.

No TMJ (temporo-mandibular joints) disorder signs or symptoms were observed during clinical examination.

Our primary diagnosis is: complete edentulous patient with gag reflex (triggered by physical contact on the soft palate) Therapeutic challenges: reduced prosthetic space due to tissue spread over dental arches and patient discomfort caused by the nausea reflex.

The therapeutic objectives were to restore the patient's oral aesthetic function and psychology.

Prognosis: favorable outcome is expected.

**Therapeutic intervention**

Firstly, the triggering areas were identified using a dental mirror.

After breathing exercises and gargling for one minute with a salted mouthwash, preliminary diagnostic impressions were made using stock trays and fast-set irreversible hydrocolloid.

The impression tray must be well adapted to receive minimum amount of hydrocolloid. The dentist must be quick and effective hence reducing patient's discomfort. Individualized impression trays are made by the lab technician and will serve for secondary impression.

The clinician can engage the patient in a conversation during prosthetic procedures in order to create a distraction. The maxilla-mandibular relation was recorded and the prosthetic teeth were chosen in accordance with patient's facial features. The teeth setup was carried by the dental technician and followed by the aesthetic and functional try-in chairside.

During the try-in, the palatal wax was cut to increase patient's compliance. After the polymerization, half of the palatal acrylic was trimmed using a bur (Figure 1). A relining was performed using soft liner® (GC corporation) to ensure denture initial retention (Figure2). The patient was instructed to perform breathing exercises whenever the gag reflex occurred instead of just removing the dentures.



**Figure 1.** the initial palatal extension of the maxillary prosthesis after polymerisation.



**Figure 2.** the maxillary prosthesis relined with soft liner (2mm were added to the posterior region after 2 weeks)

The patient is reviewed every two weeks and an additional 2mm of soft liner® was added to lengthen the palate, this procedure was renewed until a satisfactory velopalatal-joint was obtained (Figure 3). Once the patient became accustomed to the correct palatal length, the relining material was replaced by acrylic resin by lab technician (Figure 4).



**Figure 3.** the maxillary prosthesis after 6 weeks



**Figure 4.** Maxillary prosthesis rebased with acrylic resin once the patient was accustomed to the palatal length.

**Follow up and outcomes**

The patient was reviewed after 3 months, 6 months and then one year for occlusal balancing. Prosthetic integration was obtained with minimal discomfort (Figure 5).



**Figure 5.** Esthetic and functional integration of the maxillary and mandibular prosthesis.

## DISCUSSION

Managing patients with gag reflex presents a clinical challenge for the dental surgeon.

A proper posterior joint is indispensable for maxillary denture retention. In such clinical cases, the usual prosthetic palatal joint can create patient's discomfort. This technique allows a progressive tissue and psychological conditioning. The maxillary prosthesis is gradually lengthened with a thin layer of relining material until the desired posterior palatal joint is obtained.

The challenges of this technique are: the reduced initial stability of the prosthesis, which will gradually improve as the palatal joint is lengthened, the necessity of a good dexterity during the manipulation of the relining material and two laboratory stages.

On the other hand, the thinness of softliner®, contribute greatly to the psychological conditioning; it is the main advantage of this clinical method. [...]

In the current literature several interventions have been described on how to manage gag reflex on edentulous patients.

Prosthetic procedures as cited by Hiromi Hotta and al, in their article they recommended the fabrication of maxillary denture with a shorter arch as well as a shorter palatal extension. The dentures reached as far as the premolars. After customization masticatory function will be enhanced through extension of the denture base and addition of artificial teeth progressively [5].

Other authors have described the use of pharmacological drugs to alleviate gag reflex such as topical and local and general anesthetics, antihistamines, sedatives, tranquilizers, parasympatholytics, and CNS depressants [6]. The application of local anesthesia at the level of the reflex zones, can also be used, these peripheral agents with topical action are applicable in different forms: a sprayer that projects the anesthetic product directly on the mucous membranes of the palate based on lidocaine, the gel or cream, which can be applied to the mucous membranes, the mouthwash based on viscous lidocaine at 0.5%, flavored lollipop with 0.5% tetracaine, injection with 2% lidocaine [7][8][9].

Non-pharmacological approaches such as behavioral management, acupressure, acupuncture, transcutaneous electric nerve stimulation, employing salt on the tip of the tongue, prosthetic devices, laser stimulation, and ear plug techniques.

For acupuncture at the P6 point (a point located on the inside of the wrist), it was shown that the prosthetic rehabilitation was successfully completed and that the gag reflex was reduced compared to sham acupuncture. The

same procedure with sedation showed similar results [10]. Psychotherapy has been used by some authors, they practiced hypnosis, behavior management, systemic desensitization, and covert reinforcement fear reduction modeling.

Many clinicians recommended clinical techniques that aimed at diverting the patient's attention from the stimuli that cause the nausea reflex.

Landa and al suggested that the dentist engages the patient in conversation about a particular topic of interest. Kovats and al reported a technique of having the patient breathe through his or her nose and create a rhythm while tapping the right foot on the floor.

One technique described by Krol and al is to ask the patient hold one leg up, which requires conscious effort [11].

Colvenkar and al advocated the prescription a technic that exhausts the lingual muscles. It consists on making the patient to hold a bead on his/her tongue for 5minutes. The use of this technique helped the patient to slowly deplete the gag reflex over time and to continue the procedure without gag reflexes [12].

Another technique suggested by Colvenkar and al is to use a virtual reality headset during the prosthetic procedures. This technique has been proven effective on controlling the gag reflex [13].

The primary take-away of this clinical case is: dentists should not be discouraged in the presence of edentulous patients with gag reflex, with clinical perseverance a prosthetic integration is obtainable.

### *Patient perspective*

The patient was able to accept her denture and her masticatory function was greatly improved.

## CONCLUSION

The gag reflex is a relatively frequent clinical problem that dental surgeons are confronted with during prosthetic rehabilitation.

It seems judicious to better understand its mechanisms in order to limit its effects.

It is important for the clinician to evaluate which technique will be the most appropriate, if necessary, prosthetic, pharmacological and non-pharmacological techniques can be combined adequately manage this reflex.

This case presents a technique that allows the practitioner to transcend this prosthetic challenge, by a progressive tissular and psychological conditioning.

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