

Oral Medicine

Controlling Gag Reflex by Acupuncture - A Case Report



Deepak Thomas
MDS (Prosthodontics)
P. G. Dip. Acupuncture
P. G. Dip. Tobacco Control
Director - Palich Dentistry™
Palich Acupuncture for Pain (PAP)

Abstract

|| Brief Background

Gag Reflex (GR) is a serious problem to both the patient and dentist. Despite a range of management strategies, some patients cannot accept even a simple dental treatment. The aim of this study was to evaluate the use of acupuncture in controlling the gag reflex during dental treatment requiring an upper alginate impression.

|| Materials and Methods

A patient agreed to try acupuncture to control gagging during upper alginate impression making. Prior to treatment the severity of gagging was assessed. Acupuncture needles (0.25 x 25mm) were then inserted into specific points on the body. Impression making was then carried out and the effectiveness of the acupuncture in preventing gagging was assessed. Acupuncture needles were then removed and the patient discharged.

|| Results

Acupuncture completely controlled the gag reflex in the patient during impression making.

|| Summary and Conclusions

Acupuncture was successful in controlling the gag reflex during impression making. It is a safe, quick and inexpensive technique with no side effects.

|| Key Words

Acupuncture, Gag reflex, impression.

|| Introduction

Gagging has been defined as an involuntary contraction of the muscles of the soft palate or pharynx that results in retching¹. It is a normal protective reflex designed to protect the airway and remove irritant material from the posterior oropharynx and the upper gastrointestinal tract. In some individuals this protective reflex is exaggerated causing difficulties in the provision and acceptance of routine dental treatment.

The aetiology of gagging has been categorized as somatic or psychogenic². Somatic gagging is induced by touching a trigger area in the oral cavity such as lateral border or the palate. Psychogenic gagging is induced without direct contact and the thought of the stimulus, such as a dental intervention, is sufficient to induce the reflex.

Other factors have been described which are not necessarily direct inducers of gagging, but will increase its risk and its severity in affected people. These contributing factors include anatomical variations, for example in soft palate anatomy³; medical conditions, such as nasal obstruction⁴; psychological factors, such as apprehension⁵ and neuroticism⁶; and dental or iatrogenic factors, such as faults in denture design related to tongue space, retention, position of the post dam and freeway space^{7,8}. It has been postulated that the important factors are the past dental experiences and the learned response. That is to say, that people who have had a bad dental experience in the past expect to gag, either consciously or sub-consciously, during future similar events. Consequently their gagging becomes a conditioned response to the dental situation. It is believed that it is only the severity of the response that distinguishes whether the person actually gags when something is placed in the mouth or at just the thought of it⁹.

A number of strategies have been used in an effort to control GR and allow the provision and acceptance of dental care. They include relaxation, distraction, and desensitization techniques; psychological and behavioural therapies; local anaesthesia, conscious sedation and general anaesthesia techniques; and complementary medicine therapies such as hypnosis and acupuncture¹⁰. Acupuncture has been used successfully to control the gag reflex.^{11,12}

|| Materials and Methods

A 21 year old female reported to the clinic requiring an upper alginate impression. While impression making, the patient was found to have severe gag reflex. After trying other methods, the patient agreed to undergo acupuncture treatment to control gag reflex. The appointment was given on the next day. She was instructed not to eat within 2 hours before the appointment. She was submitted to a single session of treatment, in which two maxillary impressions (or attempts to take them) were performed. The first one was performed before acupuncture (Fig.1) and the second after acupuncture (Fig.6)



Fig.1: Impression making before Acupuncture (Patient gagging)

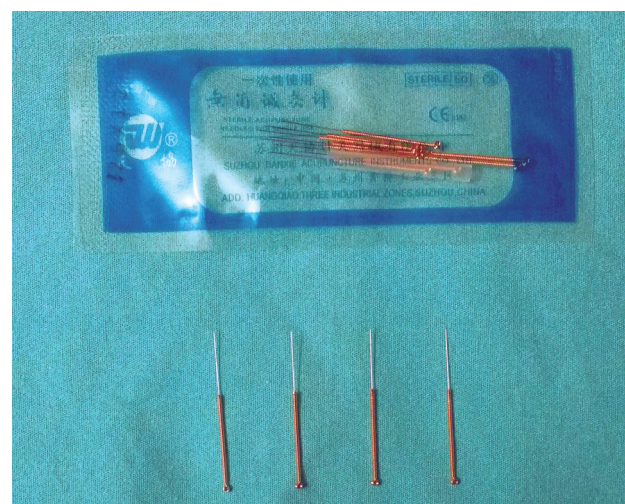


Fig.2: Acupuncture Needles



Fig.3: P6 Acupoint



Fig.6: Impression making with acupuncture needles in place (No gagging)

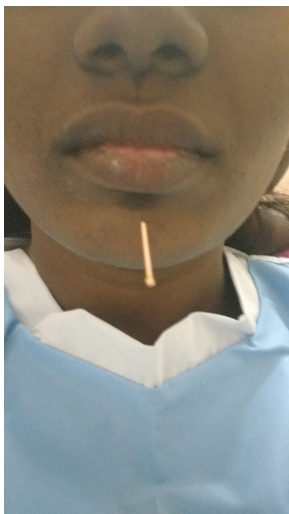


Fig.4: Ren24 Acupoint



Fig.5: Ear Acupoint

The acupuncture involved insertion of fine and disposable acupuncture needles measuring 0.25 x 25mm (Pic2) into three anti gagging points on the body, namely P6 , Ren 24 and a point on the ear . P6 (Fig.3) is located on the anterior forearm, two thumb finger width horizontally proximal to the transverse crease, between the tendons of palmaris longus and flexor carpi radialis. Here, perpendicular insertion of the needle is done upto a depth of 2mm to 4mm. Caution must be taken on over penetration since median nerve lies directly beneath this point.

Needling is done on both the arms. Ren24 (Fig.4) is located in the depression centre of the mentolabial groove inferior to the middle of lower lip. Here, oblique upward insertion of the needle is done up to a depth of 3mm to 6mm. The third point (Fig.5) is located in the ear above the external auditory meatus. Needling is done on both the ears up to a depth of 3mm. Needle sites should be sterilized before insertion of needles. Needles are left in situ when the impression is made (Fig.6)

The magnitude of the gag reflex was assessed using the Gagging Severity Index (GSI)¹³ prior to acupuncture (Table 1). The acupuncture needles were inserted, as described above, and dental treatment commenced. The Gagging Prevention Index (GPI)¹³ was used to assess the effectiveness of the ear acupuncture in controlling the reflex and allowing the dental treatment to take place (Table 2). On completion of the treatment , the needles were removed.

Table 1. Gagging Severity Index (GSI)

Grade	The gagging reflex is:
I	Very mild, occasional and controlled by the patient
II	Mild, and control is required by the patient with reassurance from the dental team
III	Moderate, consistent and limits treatment options
IV	Severe and treatment is impossible
V	Very severe; affecting patient behaviour and dental attendance and making treatment impossible

Source: Dickinson,2000

Table 2. Gagging Prevention Index (GPI)

Grade	Treatment management method employed:
I	Obtunded gag reflex; treatment successful
II	Partially controlled gag reflex; all treatment possible
III	Partially controlled gag reflex but frequent gagging; simple treatment possible
IV	Inadequately controlled gag reflex; simple treatment unable to be completed
V	Gag reflex severe; no treatment possible

Source: Dickinson,2000

|| Results

The GSI score was IV and the GPI score was I. i.e., the gagging reflex was severe and impression making was impossible before acupuncture and the gag reflex was completely controlled and the treatment was fully successful after acupuncture. There were no adverse reactions to the technique.

|| Discussion

There are few references in scientific literature related to the implication of acupuncture in dentistry; therefore, studies related to this field are needed. This study showed that acupuncture provided complete relief of nausea in the maxillary impression taking procedure. The etiology of gagging is complex and not fully understood. It may be somatic, psychogenic or a combination of both. Whatever may be the cause the outcome of it makes the acceptance of dental treatment impossible.

The patient in this study has been subjected to different techniques to overcome her problem before being advised to join this study, these techniques involved distraction methods, anaesthetizing the palate, reducing the amount of alginate material, choosing a smaller tray size, as well as increase the mixing time

for a faster setting: however, none of these modalities have been successful. Many studies have compared techniques to combat Gag Reflex: among these, acupuncture appears the most valid. In a study by Rosted et al¹¹, acupuncture controlled the Gag Reflex and the patients better accepted dental treatment. In another study, ear acupuncture was used for a case reported series of 10 patients where dental treatment was impossible due to a severe Gag Reflex, in eight out of ten cases it was possible to control the Gag Reflex completely, and the reflex was partly controlled in the remaining two cases¹². Our results were consistent with these studies.

Acupuncture has made the impression taking procedure comfortable for the patient. The acupuncture technique was relatively non invasive: it is cheap and requires little additional clinical time. The patient can return to normal daily activities after treatment. No other complications have been reported.

The mode of function in controlling Gag Reflex through acupuncture is not fully understood. Regarding the acupuncture point in the ear 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 point activates mechanisms that inhibit the muscle activity of the Gag Reflex¹⁴. Regarding the acupuncture points P6 and Ren24 the possible effect from both points can be explained. Stimulation of acupuncture point P6 activates the spinal segments C3-C6 and impulses ascend, via the spinothalamic tract, to centres in the mid brain, in particular the nucleus of the raphe magnus (nRm).

These impulses are mediated via A-delta fibre. The point Ren24 is located on the chin between the orbicularis oris muscle and the mentalis muscle. However, the innervation of this region is unclear as several anastomoses exist¹⁵. The sensory innervation is transmitted via the trigeminal nerve and the motor innervation is transmitted via the facial nerve, however, one cannot exclude the participation of fibres from the transversicollis nerve. The trigeminal nerve belongs to the somatosensory system, transmitting impulses from mechanoreceptors, thermoreceptors and nociceptors in the face and part of the oral mucous membrane, and terminating in the trigeminal nucleus. These impulses

are probably transmitted via A-delta fibres. The function of the trigeminal nucleus can be compared to that of the dorsal horn of the spinal column. Thus, fibres from the trigeminal nucleus continue, like the peripheral nervous system, via the spinothalamic tract to centres in the brain, including the nRm¹⁶. The nucleus of the raphe magnus is the main producer of 5-HT in the brain¹⁷, which is metabolised to, among others, beta-endorphine, which may have an anti emetic effect¹⁸. It has been shown that acupuncture accelerates the synthesis of 5-HT¹⁹, and it is likely that the serotonin mechanism takes part in the control of the gagging reflex. However, it is unclear whether the gagging reflex is blocked by receptors due to a release of beta-endorphine or a presynaptic inhibition of 5-HT receptors or a combination of both mechanisms.

|| Conclusion

Therefore, it can be concluded that acupuncture is 100% effective in controlling the Gag Reflex during impression making. Hence, acupuncture emerges as a safe, quick, cost effective, inexpensive and relatively non invasive technique with no side effects in controlling Gag Reflex and it can be performed in patients who are unresponsive to the conventional mode of treatment.

|| References

1. Glossary of Prosthodontic Terms, Edition 9
2. Saunders R M, Cameron J. Psychogenic gagging; identification and treatment recommendations. *Compendium of Continuing Education in Dentistry* 1997; 18: 430-433
3. Mack A O. Complete dentures. *Br Dent J* 1964; 116: 426-429
4. Wright SM. Medical history, social habits and individual experiences of patients who gag with dentures. *J Prosthet Dent* 1982; 42: 474-478
5. Barsby MJ. The control of hyperventilation in the management of gagging. *Br Dent J* 1997; 182: 109-111
6. Wright S M. An examination of the personality of dental patients who complain of retching with dentures. *Br Dent J* 1980; 148: 211-213
7. Faigenblum MJ. Retching, its causes and management in prosthetic practice. *Br Dent J* 1986; 125: 485-490
8. Levine M. Gagging, A problem in prosthodontics. *J Can Dent Assoc* 1960; 26: 70-75
9. Ramsay D S, Weinstein P, Miligrom P, Getz M S. Problematic gagging. Principles of treatment. *J Am Dent Ass* 1987; 114: 178-183
10. Dickinson CM, Fiske J. A review of gagging problems in dentistry: 2. Clinical assessment and management. *Dent Update* 2005; 32: 74-76, 78-80
11. Rosted P, Bundgaard M, Fiske J, Pedersen AM. The use of acupuncture in controlling the gag reflex in patients requiring an upper alginate impression: An audit. *Br Dent J* 2006; 201: 721-725
12. Fiske J, Dickinson C. The role of acupuncture in controlling the gagging reflex using a review of ten cases. *Br Dent J* 2001; 190: 611-613
13. Dickinson C. Gagging Problems in Dental Patients: Literature Review for the Diploma in Dental Sedation. 2000: GKT Dental Institute of King's College London.
14. Ernst E, White AR. Acupuncture as a treatment for temporomandibular joint dysfunction: A systematic review of randomized trials. *Arch Otolaryngol Head Neck Surg* 1999; 125: 269-272
15. Rodel R, Lang J. Peripheral branches of the facial nerve in the cheek and chin area. Anatomy and clinical consequences. *HNO* 1996; 44 : 572-576
16. Brodal P. The central nervous system. Structure and function. 3rd ed. USA: Oxford University Press. 2003
17. Veroux G, Percivalle V. Fundamental and scientific research in acupuncture. *Acupuncture Med* 1988; 5 : 12-14
18. Somri M, Vaida SJ, Sabo E et al. Acupuncture versus ondansetron in the preventing of postoperative vomiting. *Anaesthesia* 2001; 56: 927-932
19. Han JS. Electroacupuncture; an alternative to antidepressants for treating affective diseases? *Int J Neurosci* 1986; 29: 79-92