

# Case reports: the use of a psychological technique for the treatment of severe gag treatment

Tim Newton BA, PhD, CPsychol<sup>1</sup> and Robert Emanuel BDS, MSc, FDS RCSEd<sup>2</sup>

<sup>1</sup>Professor of Psychology as applied to Dentistry, Kings College London; <sup>2</sup>Specialist in Special Care Dentistry, Sussex Community NHS Trust, UK.

## Abstract

This article examines a simple behavioural management technique which allows treatment to be carried out on patients with a severe gag reflex. The technique involves using a marble to desensitise the patient's gag reflex by encountering a graded exposure to a foreign body within the mouth. It presents three cases where treatment was completed successfully without recourse to pharmacological methods of anxiety/behaviour control, but involved fixed end removable prosthodontic treatments which normally pose a severe problem to those patients with an overactive gag reflex.

**Key words:** Oral Gag reflex, behavioural management technique, dentistry

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## Introduction

The gag reflex is a normal defence mechanism which prevents material from entering the trachea, including food and liquids. This protective mechanism may become problematic if it is sensitised during dental treatment. The patient with 'excessive' gagging may present difficulties in accepting dental treatment, and in extreme cases difficulties may also present in swallowing tablets, and eating certain foods. The aetiology of severe gagging has been reported by Bassi *et al* (2004) and is summarised in *Table 1*. Despite the gag reflex being essentially physiological in nature, it has been suggested that severe gagging is most readily susceptible to psychological management, in particular the use of behavioural techniques to reduce the sensitivity of the reflex (Ramsey *et al.*, 1987). The technique is based on the observation that in certain groups of individuals the gag reflex may become de-sensitised either deliberately e.g. sword-swallowers, or as a result of repeatedly being triggered to induce vomiting e.g. in individuals with bulimia nervosa (Faust and Schreiner, 2001). The technique consists of graded exposure to the stimulus that causes gagging, starting with an object that causes a mild gagging response which the patient can cope with. This is repeated until the patient is able to tolerate the stimulus, at which point a slightly more aversive stimulus is introduced. Through repeated exposure the gag reflex becomes desensitised allowing treatment to take place.

Singer (1973) and Wilks and Marks (1983) both describe the use of a marble as the object to encourage desensitisation the reflex, the advantage of this object being that it is widely available, and the patient can use it at home between visits. The patient is asked to place the marble in their mouth for increasing periods of time, over a period of two to three weeks, with strict instructions to avoid making themselves gag excessively. This paper describes three case studies in which the 'marble technique' was used in the successful rehabilitation of patients who presented with severe gagging during dental treatment.

## Case Study 1

An 18-year-old male was referred by his general dental practitioner (GDP) to the Special Care Dental Services in West Sussex to receive dental care under sedation. The referral explained that the patient had an extreme gag reflex and this was sufficient to make even examination and radiographs difficult. The referral requested a full examination as the GDP had been unable to complete this thoroughly or successfully. However, the GDP had managed to take an extra-oral orthopantomograph (OPG) which showed multiple carious lesions.

There was no relevant medical or social history of note; however, the patient had unsuccessfully tried intravenous (IV) sedation in the past and had been told that in the future general anaesthesia (GA) may be necessary. The patient

incidentally reported no great fear of dentistry, with his gag reflex being his main concern. On examination the patient did have an extreme gag reflex, but a cursory examination was possible with care. The medium sized carious cavities were confirmed and treatment options were discussed.

The usual options for the extremely anxious/gagging patient were discussed including confidence building, sedation and general anaesthetic. The disadvantages of GA including the patient not actively learning how to accept treatment in a less invasive way in the future were also discussed. The 'marble technique was discussed with the patient who agreed to try the technique at home, including instruction on how to perform it and advice on precautions to avoid swallowing the marble. After practising the technique at home for one month, the patient returned for a review appointment. On examination his gag reflex had markedly improved and was able to tolerate not only a thorough examination but also a scale and polish and bitewings. The patient was also keen to explore aesthetic improvement of his upper anterior teeth, where there was a congenitally missing upper left lateral incisor and a peg shaped upper right lateral incisor. It was agreed that if the first phase of restorative treatment was successful then the second aesthetic phase of the treatment could be attempted.

#### *Phase one – reparative*

Six amalgam restorations, including lower posteriors were provided without any major difficulty. Confidence building techniques were also incorporated into the treatment sessions.

#### *Phase two – aesthetic*

1. Photographs were taken (*Figure 1*)
2. Study model and wax up to plan final appearance of restorations (*Figure 2*)
3. Gingival electrosurgery to provide crown lengthening to upper right lateral incisor palatally
4. Directly placed composite build up for upper left canine. (A matrix was constructed from the wax up to ensure the final shape of the restoration was consistent with that of the wax up)
5. Full coverage porcelain crown to disguise the peg-shaped upper right lateral incisor
6. Final review at six months (*Figure 3*).

*Table 1. Aetiology of gagging (Bassi et al., 2004)*

Local and Systemic Factors	Nasal Obstruction Medication Gastrointestinal  Time of day	Catarrh, Sinusitis, Polyps If side effect is nausea: Hiatus Hernia, Gastritis, Peptic ulceration, Carcinoma of the stomach  Worse in morning
Anatomical Factors	Neural pathways	Vagus nerve distribution?
Psychological Factors	Classical conditioning	Dental treatment becomes associated with gagging causing a conditioned gag response.
	Operant Conditioning	When dental treatment is deliberately avoided by the patient who uses gagging as a way of encouraging the clinician to postpone or abandon treatment
Iatrogenic factors	Mostly prosthodontic	Overextended dentures, unstable dentures, increased vertical dimension



Figure 1. Case study 1: Pre-operative view



Figure 2. Case study 1: Waxed up upper study model



Figure 3. Case study 1: Final result at six months

## Case Study 2

A 54-year-old male was referred to the Department of Sedation & Special Care Dentistry at Guy's and St Thomas NHS Trust for the placement of an upper partial denture. The patient was fit and healthy, taking no current medications and was accompanied to all appointments by his wife who encouraged him in the use of the technique. He had previously been unable to have impressions taken unless under sedation and could not tolerate wearing any upper appliance as a result of excessive gagging during placement and whilst wearing the denture. He reported no other situations in which his gag reflex was marked. Following assessment of the history of his gagging problem, the 'marble trick' was suggested to him as an option. He undertook to use the technique for a period of two weeks.

Upon his return two weeks later, the patient expressed great satisfaction with the treatment, and demonstrated his ability to place the marble in his mouth and roll it around. He had undertaken the technique every day for short periods of time, up to eight times a day. He stated that he felt he could leave the marble in for 'as long as he wanted'. He was advised to continue using the technique during the course of his dental treatment, and that he could re-use the technique should the gag reflex problem return.

Subsequent dental treatment, including the taking of impressions, and placing the upper denture proceeded without problems. At discharge the patient was wearing his upper partial denture throughout the day.

## Case Study 3

A second patient referred to the Department of Sedation & Special Care Dentistry at Guy's and St Thomas NHS Trust with extreme gagging in response to dental treatment was a 63-year-old gentleman who required a lower partial denture. The patient had been diagnosed HIV-positive for 22 years and was taking a number of anti-retroviral drugs, to which he had responded well. At assessment the patient reported additional difficulties when swallowing tablets and when eating certain foods – those that he described as 'slimy' including gristle, or fatty foods. He was encouraged to try the 'marble trick' but at the initial attempt during the appointment found it difficult to put the marble in his mouth. He was encouraged to spend one week placing the marble on his lips, then inside his mouth for short periods of time.

At a two week follow up appointment, the patient reported that he had used the marble twice a day over the period and was able to place the marble in his mouth for periods of up to five seconds. However, he reported avoiding placing the marble too far back in his mouth as this would induce gagging. The patient was praised for his achievement in overcoming the reflex so far, and encouraged to repeat the procedure for another two weeks working on

both increasing the duration of exposure and moving the marble gradually back for short periods of time.

At the four week post initial assessment visit, the patient was comfortable with rolling the marble around for up to 30 seconds in his mouth, including posteriorly. He was booked for the taking of an impression of the lower jaw, and encouraged to continue using the marble. At the impression taking visit, the patient was able to tolerate having the impression taken, but expressed the view that he would not be able to tolerate having an object in his mouth permanently. In discussion with the care team, the patient was given an impression tray to take home, and place in his mouth for increasing periods of time each day, in order to acclimatise him to having an object in his lower jaw.

At the follow up appointment for placement of the lower partial denture, the patient was able to tolerate placement of the denture and was taught how to both remove and replace the denture. He was advised to wear the partial denture for as long as he could without gagging. An appointment was made for follow up at two weeks. At the follow up appointment, the patient reported some difficulty placing the denture and that it was difficult to keep in his mouth for long periods owing to the movement caused by the denture not being placed properly. He was advised on the correct placement, and observed repeatedly placing the denture to provide feedback and prompting on his technique. Subsequently the patient reports wearing his lower partial denture for increasing periods of time during the day, most notably for eating, and at social events. He continues to have problems when swallowing tablets and certain foods.

## Discussion

These three case studies demonstrate the use of graded exposure in excessive gagging using a marble. In two instances, the marble alone was sufficient to reduce the gag reflex to the extent that the patient could tolerate dental treatment. In all the cases, gagging was controlled without recourse to pharmacological methods. This is particularly important in avoiding the risks associated with general anaesthetic, which in case one was the original treatment plan suggested by the referring GDP. In the third case, the technique was extended by using other stimuli such as an impression tray, an indeed the lower denture itself to continue the exposure. The technique of gradually building up a denture and allowing the patient to wear successive stages of a denture (called a training denture) has been advocated by Bassi *et al.* (2004). The technique requires compliance on the part of the patient, though in these three instances this was not problematic.

A common fear expressed by clinicians and in the literature on gagging is that the patient may swallow on gag on the marble itself (Farrier *et al.*, 2011), however, a search of published literature on Medline conducted by the cur-

rent authors found no reported cases of this happening. Nevertheless, it is important to discuss with the patient precautions against pushing themselves to the point of gagging and ensuring that they do not swallow the marble.

## Conclusion

This simple technique can be successful in allowing patients to overcome their gagging problem and to receive both routine and more complex dental care. It can provide a useful alternative to sedation or GA in the management of hypersensitive gagging during routine dental treatment.

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### Address for correspondence:

Dr Robert Emanuel  
Haywards Heath Health Clinic  
Heath Road  
Haywards Heath  
West Sussex  
RH16 3BB  
Email: robert.emanuel@nhs.net