Acute care for unusual cases of dentinal hypersensitivity

Charles E. Jerome*

The case histories of two patients are presented to demonstrate use of soft mouthguard appliances as carriers for desensitizing dentifrice when restoration of the teeth or application of desensitizing agents is clinically impractical. Potassium nitrate in dentifrice form was a readily available source of potassium ions for altering pulpal nerve sensitivity. Both patients had factitious habits that exacerbated dentinal hypersensitivity and required acute care. (Quintessence Int 1995;26:715-716.)

Introduction

Dentinal hypersensitivity is a ubiquitous problem, occurring most commonly with cervical toothbrush abrasion, following recently placed restorations, and after periodontal surgery. Most in-office procedures to limit hypersensitivity are aimed at blocking dentinal tubules through restoration or coating with varnishes. Small incisal edges and cingulum tooth surfaces exposed to wear are difficult to restore and do not retain varnishes well. These areas are more amenable to treatment with potassium nitrate-containing dentifrices. High levels of potassium in the dentinal fluid can maintain pulpal sensory nerves in a depolarized state, reducing hypersensitivity.

Brushing with desensitizing dentifrice may not be effective enough in patients with extensive dentinal exposure from bruxism or other factitious habits. In two patients experiencing dentinal hypersensitivity, a soft mouthguard appliance was used as a carrier for desensitizing dentifrices.

Case reports and technique

Case 1

A 20-year-old man reported severe temperature hypersensitivity involving his maxillary anterior teeth. The clinical examination revealed that the patient had no prior restorations and was practicing good oral hygiene. Further examination and investigation of his dental history revealed a bruxism habit and severe anterior overbite. Near pulpal exposures on the maxillary central incisors were apparent both clinically and radiographically. The teeth were not sensitive to percussion, and the periapical areas of the maxillary central incisors were normal.

It was apparent from the patient's loss of vertical dimension of occlusion and severe dentinal exposure caused by bruxism that a comprehensive restorative treatment plan that included a means to eliminate bruxism would be required. However, treatment of the patient's chief complaint was the primary concern.

A home-care regimen with a potassium nitrate-containing desensitizing dentifrice (Denquel, Richard-son-Vicks) was considered as the least invasive primary care treatment. Because of the unusually large area and severity of the hypersensitivity, ensuring the patient's compliance with the use of a dentifrice alone was a problem. Additionally, simple brushing of the hypersensitive areas with a desensitizing dentifrice may not provide enough therapy.

A vacuum-formed 0.015-inch soft acrylic resin mouthguard appliance was fabricated to protect the maxillary anterior teeth from further bruxism damage and to allow the dentifrice to be in contact with the teeth for prolonged periods. The soft acrylic resin mouthguard was delivered to the patient at the initial visit. He was instructed to wear it as much as possible and to replenish the mouthguard with small amounts of dentifrice in the anterior area as required.

The patient reported excellent compliance at the 24-hour follow-up evaluation. He was able to wear the
appliance continuously and drink without symptoms while wearing it for the first 24 hours. After 1 week, he could drink room temperature water without wearing the appliance.

The patient was referred for a comprehensive treatment plan and informed that it was highly likely that endodontic treatment would be required to facilitate that plan.

Case 2
A 19-year-old woman complained of pain in her mandibular teeth when she drank hot and cold liquids. The patient was sensitive to air spray and tactile exploration of the incisal edges of her mandibular right central and lateral incisors. Clinically, the right central and lateral incisors demonstrated exposed dentin at the incisal edges. Facial enamel craze lines were revealed by fiberoptic transillumination. There was no apparent periradicular pathosis.

Localized incisal wear on the involved teeth was confirmed to be coincident with a fingernail-biting habit. The diagnosis was reversible pulpitis and dentinal exposure hypersensitivity caused by nail biting.

The incisal edges were not amenable to restoration or convenient placement of any form of medicament. A vacuum-formed soft acrylic resin mouthguard was planned as a carrier for a potassium-nitrate containing dentifrice (Sensodyne, Dentco).

The patient was instructed to place a small quantity of toothpaste into the anterior mouthguard area and wear it for a few hours each day. Anti-inflammatory medication was not prescribed. At the 1-week follow-up, the patient reported a noticeable reduction in hypersensitivity and was conscious of using the mouthguard as an aid to breaking her fingernail-biting habit.

Discussion
Potassium nitrate can be used as a desensitizing agent in the form of a solution, gel, paste, or commercial dentifrice. Potassium nitrate in dentifrice form is readily available to be used as a topical ointment rather than just a toothpaste.

The desensitizing effect of potassium nitrate is thought to result from penetration of potassium ions into the pulp, where repolarization of the sensory nerves is prevented after initial depolarization. If increased levels of potassium nitrate are maintained, the depolarized state decreases perception of pain.3

Among the available desensitizing agents, which include tubule blockers, fluorides, and potassium compounds, potassium nitrate and potassium oxalate salts show the least ambiguous results.3

Although retention of plaque is usually a critical component in the development of dentinal hypersensitivity, the affected teeth in these patients involved relatively plaque-free areas.4 Also, both patients had factitious habits that were responsible for the hypersensitivity. At least in the first patient, paranormal function on the mouthguard may have been responsible for enhancing infusion of potassium ions into the dentin.

Because dentinal hypersensitivity is usually accompanied by pulpal inflammation, prescription of anti-inflammatory medication is indicated for severe cases.5

In the first case, the patient’s inability to drink even room temperature water made the possibility of dehydration a serious concern. In both patients, the factitious habits had to be addressed as etiologic factors for the hypersensitivity. Mouthguards provided an introduction to a habit-breaking appliance and made the patients conscious of the frequency of their paranormal function.

Hypersensitivity of incisal edges and cingulum surfaces is unusual but very amenable to treatment. A soft mouthguard and pressure from occlusion are used to enhance infusion of a desensitizing dentifrice into exposed dentin. Simple toothbrushing with a desensitizing compound might not have produced the desired results.

These case reports do not imply that bruxism and nailbiting can be cured in 1 week with a soft mouthguard. Rather, they present a simple treatment modality for management of some acute hypersensitivity problems.

References