International Journal of Dental Hygiene

Official Journal of the International Federation of Dental Hygienists

CASE REPORT

GA Van der Weijden
JMAG ten Heggeler
DE Slot
NAM Rosema
U Van der Velden

Parotid gland swelling following mouthrinse use

Authors' affiliations:
GA Van der Weijden, *DE Slot*, *NAM Rosema*, *U Van der Velden*, Department of Periodontology, Academic Center for Dentistry Amsterdam, University of Amsterdam and VU University Amsterdam, Amsterdam, The Netherlands
JMAG ten Heggeler, Clinic for Periodontology, Utrecht, The Netherlands

Correspondence to:
Fridus Van der Weijden
Department of Periodontology
Academic Centre for Dentistry Amsterdam (ACTA)
University of Amsterdam and VU University Amsterdam
Louwesweg 1
1066 EA, Amsterdam
The Netherlands
Tel.: +31 20 5188 548
Fax: +31 20 5188 512
E-mail: ga.vd.weijden@acta.nl

Dates:
Accepted 31 August 2009

To cite this article:
Int J Dent Hygiene **8**, 2010; 276–279
DOI: 10.1111/j.1601-5037.2008.00419.x
Van der Weijden GA, ten Heggeler JMAG, Slot DE, Rosema NAM, Van der Velden U. Parotid gland swelling following mouthrinse use.

Abstract: *Background:* Unilateral or bilateral swelling of the parotid gland is a reported side effect of rinsing the mouth with chlorhexidine. Although the incidence rate is extremely low, there have been several case reports on this topic and the authors of these reports have suggested several explanations for the mechanism of this complication. *Methods:* In this report, two cases of parotid gland swelling are discussed. Both patients developed unilateral parotid swelling following the use of a mouthwash, case 1 after using a chlorhexidine mouthwash following flap surgery and case 2 after using a hexetidine mouthwash in an approved clinical trial that was testing different mouthwashes. *Results:* In both of the cases, differential diagnoses were made to explain the cause of the parotid swelling. However, discontinuing use of the product resulted in an eventual complete resolution of symptoms in both patients. *Conclusions:* Swelling of the parotid gland following use of a mouthwash has previously been reported, although previous reports found this side effect only in patients who used chlorhexidine mouthwashes. This complication has therefore been informally linked to chlorhexidine. The present case report questions this hypothesis and suggests that parotid gland swelling may not be related to the type of mouthwash used, but may instead be a consequence of the rinsing action itself.

Key words: chlorhexidine; hexetidine; mouthrinse; parotid gland swelling

Introduction

Unilateral or bilateral swelling of the parotid gland is a reported side effect of rinsing one's mouth with chlorhexidine. However, this complication is extremely rare and a clear underlying mechanism is yet to be determined (1). The condition appears to

subside spontaneously within a few days after discontinuing use of the product. The clinical features of patients with this complication suggest that a mechanical obstruction of the parotid duct may occur, leading to parotid gland swelling and inflammation (sialadenitis). In all cases, spontaneous resolution has occurred upon discontinuation of mouthwash usage. The estimated frequency of parotid swelling among patients who regularly use this product for a short period is less than 1.0% (2). A recent study evaluated the adverse events that occurred in patients who used a 0.12% chlorhexidine mouthwash for 4 months. A total of 140 subjects used this product twice daily and 3.6% reported swollen parotid glands (3).

Case 1

The first patient was an otherwise healthy 59-year-old man who underwent flap surgery on the right side of his upper jaw. As part of his postoperative care, he was prescribed a 0.12% chlorhexidine mouthwash and instructed to rinse with 15 ml of this solution twice daily. After 4 days, he presented to the Clinic for Periodontology Utrecht with swelling of his left cheek (Fig. 1). As there was confusion about the swelling being on the opposite side of the operative site, the patient was thoroughly examined. The teeth on the swollen left side were tested for vitality and x-rays were taken to look for apical radiolucencies. Additionally, the temporomandibular joint was examined and the masseter muscle was palpated. All tests were negative.

As there was no pain related to the swelling, it was decided to simply monitor the condition for several days. Three days later, the patient returned for his regular 1-week postoperative suture removal appointment. This appointment was early in the morning, at which time the swelling had almost disappeared. It was decided not to further investigate the origin of this complaint. However, several hours later, the patient visited the clinic once more with renewed swelling of the left cheek. He explained that the swelling began just after he ate a bowl of yoghurt. As the cause of the swelling was unclear, he was subsequently referred to an oral surgeon for suspected sialolithiasis of the parotid gland.

Without performing any additional specific examinations, the oral surgeon diagnosed the patient with parotid gland swelling secondary to rinsing with chlorhexidine. All of the patient's complaints eventually disappeared after discontinuation of the rinsing with chlorhexidine. This patient had not previously experienced this type of adverse event.

Case 2

The second patient was a previously healthy 21-year-old woman who was participating in an approved study (MEC # 08-112) comparing the efficacy of several different mouthwashes. The study was conducted by the department of Periodontology at the Academic Centre for Dentistry Amsterdam (ACTA). During the first arm of this cross-over study, after the fourth rinse with a 0.1% hexetidine solution and within 1.5 days of entering the study, she developed a left-sided unilateral parotid swelling (Fig. 2). A clinical diagnosis of parotid gland swelling due to rinsing with the hexetidine solution was made. She was advised to stop rinsing. That evening, her symptoms worsened after dinner, which led her to visit the emergency dentist. The dentist advised her to consume a heavy quantity of sour sweets. As she was still concerned, she saw an oral surgeon the next day who confirmed the initial clinical diagnosis and advised her to stop using the mouthwash immediately. After 2 weeks, the swelling

Fig. 1. Case #1: Unilateral swelling on the left side.

Fig. 2. Case #2: Unilateral swelling on the left side.

had slowly dissipated, and by the time she arrived for her follow-up consultation with the oral surgeon, all complaints had subsided. This patient had not previously experienced this type of adverse event.

Background

There are numerous situations in which salivary gland swelling may occur (4). Swelling of the parotid gland as a result of rinsing with chlorhexidine (a bis-biguanide cationic antiseptic) has been previously reported. However, no reports of parotid swelling caused by the use of other mouthwashes, such as that experienced by case 2 (who used a mouthwash containing hexetidine, a saturated pyrimidine derivative cationic antiseptic) are known. The only similar adverse reaction that has been previously reported is the occurrence of parotid pain following a 7-day use of a 0.1% hexetidine mouthwash, which resolved after several days (5).

It has been suggested that overly vigorous rinsing may predispose individuals to unilateral or bilateral parotid swelling. According to Rushton (6), this hypothesis is supported by his observation that a patient who experienced parotid swelling after using a mouthwash reported no further recurrence of symptoms after gentler rinsing was recommended. Other evidence that supports a mechanical cause of parotid swelling is that swollen parotid glands have been reported after the use of mouthwash that contains chlorhexidine, but not after other methods of chlorhexidine administration (5).

An alternative explanation has been provided by Flötra *et al.* (7). These authors hypothesized that chlorhexidine may reduce the natural resistance of the mucous membranes to viral infection (7). This hypothesis is based on the observation of Rölla *et al.* (8) that salivary mucins are precipitated by chlorhexidine. The reduction in bacterial load that occurs due to the bacteriostatic effect of chlorhexidine may alter the oral environment such that it may predispose individuals to viral infections. In this case, the patient developed parotid swelling after using a chlorhexidine mouthwash for 8 weeks. Serological testing in this case indicated that the individual had viral parotitis. However, in the case presented by Flötra *et al.* (7), the roommate of the patient (who did not use the mouthwash) also developed a similar parotitis, thus questioning the relationship between the chlorhexidine use and viral parotitis in this patient. A more logical explanation for the viral parotitis these two individuals experienced would therefore seem to be mumps rather than chlorhexidine exposure.

In the two cases presented herein, parotid swelling developed 1.5 and 4 days (for case 2 and case 1, respectively) after the initiation of mouthwash use. This is presumably too short a treatment period to cause alteration of the oral environment in a manner that would promote a viral infection. In the second case, the mouthwash the patient used was a 0.1% hexetidine solution, not a chlorhexidine-containing solution. Although both hexetidine and chlorhexidine mouthwash products have antimicrobial properties, the latter is far more potent (9). Therefore, subsequent promotion of a viral infection following a reduction in bacterial load seems an unlikely cause of this patient's symptoms, given that hexetidine is not a potent antiseptic. The two cases presented above provide support for the hypothesis presented by Rushton (6), namely that vigorous rinsing may cause an obstruction of the parotid duct and subsequent swelling of the parotid gland. In case 1, the patient's swelling increased after eating, which is indicative of an obstruction of the duct and therefore further supports Rushton's hypothesis. Therefore, a cause of parotid swelling following the use of mouthwash is questionable. How this obstruction occurs is debatable. Vigorous rinsing may cause the mouthwash to enter the parotid duct, which may lead to an inflammatory reaction involving the duct wall and the gland parenchyma. The resulting duct wall oedema and cell infiltration would then cause a narrowing of the duct lumen and a transient obstruction.

However, if rinsing really does induce parotid duct obstruction, one would expect a higher incidence of sialodenitis, considering how frequently these products are used in dentistry. Millions of people use these oral hygiene products. Thus, a definitive explanation is not available as to what made these particular two patients develop a parotid duct obstruction.

Conclusion

The two cases presented above indicate that swelling of the parotid gland following mouthwash use is most likely the result of the rinsing procedure itself and not because of the active ingredients in the mouthwash.

Conflict of interest and source of funding

The authors declare that they have no conflict of interests. No funding was available for this publication.

Principal findings

Parotid gland swelling following use of a chlorhexidine mouthwash is most likely a consequence of the act of rinsing and is not linked with the chlorhexidine itself.

Practical implications

As the occurrence of a parotid swelling is a rare phenomenon, the dental professional may be misled regarding the aetiology of the swelling, especially if the condition develops following a surgical intervention, for example. Additionally, patients may be upset by their symptoms and they may fail to understand the relationship between the use of a mouthwash and their parotid swelling. The best course of action in these cases is to discontinue mouthwash use and wait for several days for the swelling to subside. Therefore, although this side effect is uncommon, the dental professional should be familiar with this benign and transient side effect of mouthwash use.

References

1 Addy M, Moran J. Chemical supragingival plaque control. In: Lindhe J, Lang NP, Karring T, eds. *Clinical Periodontology and Implant Dentistry*. Oxford, United Kingdom, Blackwell Munksgaard, 2008, 744–765.

2 Colgate Professional. Available at: http://www.colgateprofessional.com/products/Colgate-Periogard-Rinse-Rx-only/specifics (accessed on 29 September 2009).

3 McCoy LC, Wehler CJ, Rich SE, Garcia RI, Miller DR, Jones JA. Adverse events associated with chlorhexidine use: results from the Department of Veterans Affairs Dental Diabetes Study. *J Am Dent Assoc* 2008; **139:** 178–183.

4 Mandel L, Surattanont F. Bilateral parotid swelling: a review. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2002; **93:** 221–237.

5 Williams MJ, Adams D, Hillam DG, Ashley KC. The effect of hexetidine 0.1% in the control of dental plaque. *Br Dent J* 1987; **163:** 300–302.

6 Rushton A. Safety of Hibitane II human experience. *J Clin Periodontal* 1977; **4:** 73–79.

7 Flötra l, Gjermo P, Rölla G, Waerhaug J. Side effects of chlorhexidine mouthwashes. *Scand J Dent Res* 1971; **79:** 119–125.

8 Rölla G, Löe H, Rindom Schiött C. Affinity of chlorhexidine gluconate to hydroxyapatite and to salivary mucins. *J Periodontal Res* 1970; **5:** 90–95.

9 Eley BM. Antibacterial agents in the control of supragingival plaque – a review. *Br Dent J* 1999; **186:** 286–296.