A Chemical Erythematous Macule of the Buccal Mucosa

Bukkal Mukozada Kimyasal Eritematöz Makül

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**ABSTRACT**

Electricity, heat, cold, radiation, and chemical or mechanical stimuli can be cause injury of the oral mucosa. The cause of a chemical or thermal burn which presents as an erythematous macule is usually a caustic drug or hot foods or beverages. The clinical appearance of the chemical burns in most cases depends on the severity of the tissue damage. These burns may produce localized mucositis, keratotic white lesions or as well as raw, bleeding, painful tissue surface due to the coagulation of the tissue. In this report, a case of an unusual chemical burn localized in the right buccal mucosa, produced by sodium bicarbonate, is reported and the importance of the history in differential diagnosis is emphasized.

**ÖZET**


**KEYWORDS**

Chemical burn, Sodium bicarbonate, Erythematous macule.

**ANAHTAR KELİMELER**

Kimyasal yanık, Nodyum bikarbonat, Eritematöz makül.
INTRODUCTION

Injury of the oral mucosa can be caused by electricity, heat, cold, radiation, and chemical or mechanical stimuli. The cause of a chemical or thermal burn which presents as an erythematous macule is usually a caustic drug or hot foods or beverages. The severity of the lesion depends on the type of chemical agent utilized and the concentration and duration of contact of the noxious agent with the tissues. Phenol, eugenol, trichloroacetic acid, aspirin, iodine, alcohol, acrylic resin, sodium perborate, silver nitrate, sodium hypochlorite, paraformaldehyde, chlorine compounds and agriculture chemical agents are but a few examples.

The signs and symptoms of burns of the oral mucosa vary considerably, depending on the nature of the causative agent. When the burn is reasonably severe, the coagulated mucosa can usually, though painfully, be seperated from the underlying tissues.

In this paper an exceptional case of a chemical burn produced by misuse of sodium bicarbonate for oral hygiene practice which is believed to be caused for the first time to such a lesion reported in the dental literature is presented and the importance of the history in differential diagnosis is emphasized.

CASE REPORT

A 51-year-old female was referred to the Oral and Maxillofacial Surgery Department with a complaint of a red and painful lesion on her right buccal mucosa by her general dental practitioner. Her history revealed that her gingiva was red, swollen and she observed bleeding both during the brushing and sometimes spontaneously. She had decided on her own to get antibiotic orally and use sodium bicarbonate as an adjunct to brushing for improving her oral hygiene. For this purpose she used sodium bicarbonate/water mouthwash with each tooth-cleaning episode. Because she didn’t satisfy from the outcome, she decided to use sodium bicarbonate powder on her gingiva directly. She continued both to get antibiotic and use sodium bicarbonate approximately for three weeks. When she saw a red, painful area in her right buccal mucosal region, she admitted to a dental practitioner. She was called that the cause of this erythematous lesion may be an atrophic candidiasis due to long lasting antibiotic use and antifungal treatment was recommended. Although such a treatment, there was no improvement.

The patient’s past medical history was non-contributory and there were no extraoral findings. The intraoral examination showed a red, 2 x 1.5 cm, tender, superficial lesion extending from the corner of the mouth to the posterior buccal mucosa in the right side (Fig 1). Visual examination of the remaining intraoral soft tissues disclosed unhealthy periodontal condition.

An incisional biopsy was performed with local anesthesia. Histologic examination showed marked intracellular and extracellular edema in the surface of the epithelium. The superficial part of the lamina propria contained dense inflammatory cell infiltrate (Fig 2). PAS-stained sections demonstrated the absence of fungal organisms in the epithelium.

Treatment consisted of triamcinolone in OraBase as a protective coating, an analgesic and a bland diet. The burn healed in 2 weeks (Fig 3).

DISCUSSION

The clinical appearance of the chemical burns in most cases depends on the severity of the tissue damage. These burns may produce localized mucositis, keratotic white lesions or as well as raw, bleeding, painful tissue surface due to the coagulation of the tissue. In the case presented the clinical appearance of the lesion was red and painful.

Chemical burns most often result from the patient applying analgesics such as aspirin or acetaminophen near to the mucosa adjacent to an aching tooth. It is also reported that caustic ingestion, accidental ingestion of hot foods or beverages, excessive consumption of fresh fruit and fresh fruit juice, and wrong oral hygiene practice may cause burns of the oral tissues. In the present case, the gingiva was hyperemic and swollen due to the poor oral hygiene.
Sodium bicarbonate that the patient used for improving her oral hygiene is a white, crystalline powder chiefly used as a gastric antacid. In aqueous solution, it is used locally for washing the nose, mouth, and vagina, and as a cleansing enema. Although it is known that in saturated solution sodium bicarbonate is used as a dressing for minor burns, in this case according to the patient’s history we have thought that the use of sodium bicarbonate, especially the application of its powder caused an erythematous macule. Some products as toombak and snuff that are known to contain sodium bicarbonate have strong alkalinity. Idris et al detected the clinical and histopathological characteristics of toombak-associated oral mucosal lesions. They reported that this property of toombak may contribute to the epithelial surface changes which are similar to those seen in lesions induced by snuff. It is concluded that chronic exposure of these products may result in an alkaline burn on the oral mucosa.

The Keyes technique that is used for the treatment of periodontal disease involves local mechanical therapy, local chemical therapy and systemic antibiotics. For the local chemical therapy baking soda and peroxide are used as an adjunct to home plaque control. However it is emphasized that abuse of the practices may lead to gingival injury. Herrin et al investigated whether the oral application of a baking soda - % 3 hydrogen peroxide dentifrice and a nearly saturated sodium chloride mouthwash, as a home care method for treating periodontal disease, creates a sodium burden for human subjects. They concluded that raw, erosive desquamative gingival lesions were seen in all treated subjects. In this case, it is thought that because of the high concentration of baking soda that the patient applied caused a red, tender, superficial lesion just after the application. This clinical appearance is consistent with the observation of Herrin et al.

Until a careful history is taken, the patient is usually unaware of the cause of the lesion. The identification of the chemical burn lesion is best accomplished by determining, through the patient history.

![Figure 1](image1.png)
*Figure 1. Patient shown on day of admission.*

![Figure 2](image2.png)
*Figure 2. Surface of the epithelium showing marked intracellular and extracellular edema. The lamina propria contained dense inflammatory cell infiltrate (H&E x 40).*

![Figure 3](image3.png)
*Figure 3. The right buccal mucosa after 2 weeks of treatment.*
In chemical burns, a white, white-brownish or red surface can be seen\textsuperscript{12}. In the chemical burn lesions which appear as a red surface, as in this patient, erythema from mechanical trauma, purpuric macule, cellulitis, allergic manifestations, erythroplakia, atrophic candidiasis, herald spot of disseminated red conditions, and fungal infections should be taken into account in differential diagnosis\textsuperscript{6}. This patient had been previously treated under an incorrect diagnosis of atrophic candidiasis due to long lasting antibiotic use and inappropriate antifungal treatment was recommended. In our clinic the chemical burn lesion was differentiated from the atrophic candidiasis via a detailed patient history and histologic examination confirmed the diagnosis.

The treatment for chemical burns is the application of a protective coating such as Orabase with or without steroids and initiation of a bland diet\textsuperscript{1,6}. In most cases, treatment is mainly symptomatic. If the agent is completely eliminated and there are no further exposures, prompt recovery is the rule\textsuperscript{1,3}. If pain is a problem, systemic analgesic may be administered. The analgesic tablets are to be swallowed and not be used topically\textsuperscript{6}. In the current case besides triamcinolone in Orabase and a bland diet, a systemic analgesic was recommended.

REFERENCES


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