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Case Report

Intraoral chemical burn in an elderly patient with dementia

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Abstract: We describe the case of a 77 year-old Japanese woman who was referred to the Department of Oral and Maxillofacial Surgery at Tokyo Women's Medical University Hospital with symptoms of spontaneous intraoral pain and dysphagia evoked by accidental alkaline (calcium oxide) ingestion. The stomach and esophagus were examined under endoscopy, but no evidence of burns or ulceration associated with the calcium oxide was apparent in the upper gastrointestinal tract. Oral care, antibacterial therapy (cefmetazole sodium) and nutritional management were performed after hospitalization. Mucosal erosions, dysphagia and pneumonia were almost resolved after 16 days of oral care and antibacterial treatment. Re-burn of the oral mucosa associated with accidental ingestion was not reported after discharge. Oral management may have potential to improve the management of intraoral chemical burns, but symptomatic treatment remains the only strategy for burn management. Accidental ingestion of chemicals by patients with impaired cognition may result in dire consequences and prevention is thus more important than burn management.

Keywords: Chemical burn, intraoral, dementia

Introduction

Intraoral burn is a common consequence of accidentally ingesting excessively hot foods and beverages [1, 2]. Often, the burn is mild; inconspicuous or involves only a small area, and usually resolves quickly without treatment [1, 2]. On the other hand, serious burns can also result from accidental ingestion of chemicals (acid or alkali) [3-9]. In the case of chemical burns, mucosal necrosis results and the burn tends to be more severe. In general, accidental chemical ingestion is uncommon due to the strong chemical smells and tastes involved and the limited situations for exposure. However, a lack of recognition of danger (such as in children, the elderly or patients on benzodiazepines for psychological reasons) represents a clear risk factor for accidental ingestion of chemicals [10, 11]. Dementia patients may also be at higher risk of accidental ingestion [10]. However, intraoral chemical burns in a patient with dementia have not been reported in detail [10]. We present an uncommon case of intraoral chemical burns caused by accidental ingestion of calcium oxide in an elderly patient with dementia.

Case report

A 77 year-old Japanese woman reported to the emergency department with acute intraoral bleeding and pain due to accidental ingestion of calcium oxide as food preservative included in an imported snack from China. The patient was brought to the hospital by family members who were present at the time of the accident. A thorough medical history and clinical examination revealed that the patient had been on medication for bipolar disorder for 4 years and for dementia with Lewy bodies for 10 years. In the emergency hospital, endoscopy of the stomach and esophagus showed no evidence of burns or ulcers associated with calcium oxide in the

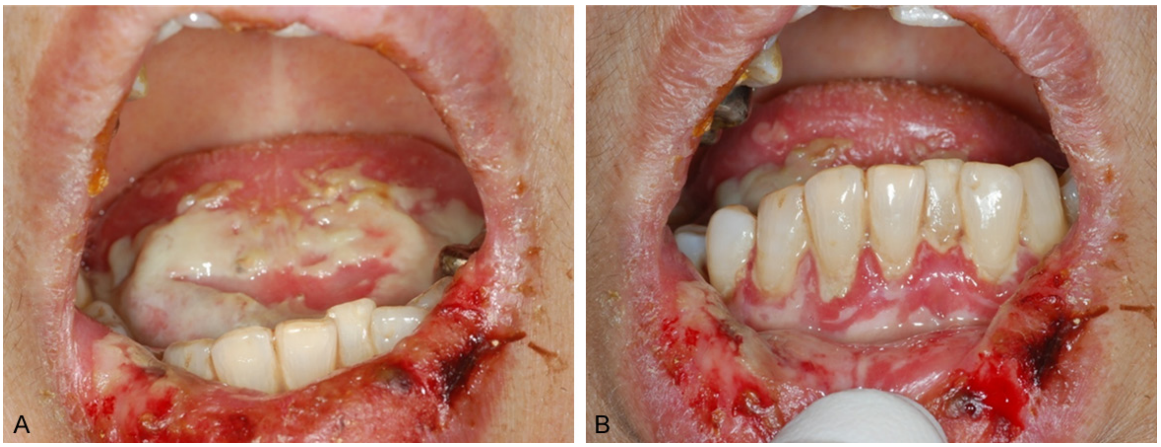

Figure 1. Erosion and false membrane apparent on the intraoral mucosa.

upper gastrointestinal tract. Active treatment was therefore not performed for the accidental ingestion. However, 2 days after the episode, the patient visited the Department of Oral and Maxillofacial Surgery at Tokyo Women's Medical University Hospital with symptoms of intraoral spontaneous pain and dysphagia. The initial clinical examination demonstrated: blood pressure, 106/74 mmHg; heart rate, 88 beats/min; body temperature, 36.6°C; respiratory rate, 14 breaths/min; and peripheral oxygen saturation (SpO_2), 95% in room air. Level of consciousness was 1-2 on the Japan coma scale (JCS) [12]. Oral hygiene condition was poor, and erosions and false membrane were observed on the oral mucosa (**Figure 1**). The patient also reported odynophagia. No evidence of extraoral burns or respiratory dysfunction was identified.

Immediately on admission, the patient received rehydration by infusion of Ringer's solution about 1500 mL/day. Moreover, cefmetazole sodium (2 mg/day) was infused for prevention of secondary infection associated with oral bacteria. Oral care using sodium hydrogen carbonate gauze was performed each day during hospitalization. Vaseline was applied to the intraoral burn region. Upper gastrointestinal scope examination was performed again to evaluate upper gastrointestinal injury, showing no evidence of damage to the gastrointestinal mucosa. Nutrition management by nasogastric tube was advised due to the dysphagia. On hospital day 12, aspiration pneumonia developed. Piperacillin-tazobactam (13.5 g/day) was infused for 5 days. Mucosal erosions, dysphagia and pneumonia had almost resolved after 16 days of oral care and antibacterial therapy. Since discharge from hospital after 21 days, no further burns of the oral mucosa or other accidental ingestions have been reported.

Discussion

Intraoral burns resulting from accidental ingestion of hot food and beverages have frequently been reported [1, 2]. Moreover, accidental ingestion of chemicals (acid or alkali) causes serious burns, mostly located in the upper gastrointestinal tract, including the intraoral region [3-9]. In this case, severe erosions and ulcers were evoked by accidental ingestion of alkaline calcium oxide. Ingestion of alkaline chemicals represents a potentially life-threatening problem [5]. Mucosal exposure to lye results in rapid, deep liquefactive necrosis, and may also lead to respiratory compromise, shock, and perforation of the esophagus or stomach if liquid lye is ingested. Esophagoscopy should therefore be performed as soon as possible after ingestion to directly observe the extent of damage [5]. In this case, the initial screening and management were performed in accordance with earlier studies [13], and only the intraoral region was evaluated for chemical burns.

Children and the elderly experience accidental burns relatively frequently [6, 11]. In addition, psychological disorders and elderly dementia patients can be considered at risk of accidental burns. For example, benzodiazepine use has been associated with major burns [11]. In the present case, the patient was under long-term

medication with benzodiazepines prescribed by a physician (not psychiatrist) for bipolar disorder. The suggestion has been made that primary-care physicians may increase a patient's risk of sustaining burns by prescribing certain medications [10, 11]. Psychotropic drug use in older adults should be reviewed carefully, and attempts should be made to taper or eliminate unnecessary medications [10, 11]. Although no concrete guidelines are yet available to guide physicians in evaluating risk in dementia patients, warning signs of unsafe behavior may include a history of minor burns from food or utensils, or failing to turn off the stove.

Aspiration pneumonia was reported, even though oral care was carefully performed to prevent secondary infection. It must be noted that complications associated with severe burn conditions may involve any part of the body, not only burn sites.

The statistical survey of the Japanese Ministry of Health has reported that the elderly population is continuing to increase in Japan. Accordingly, the number of patients with cognitive disease (dementia, Alzheimer's disease, etc.) has also increased in comparison to the last decade. On the other hand, the number of caretakers for elderly individuals and dementia patients is insufficient, due to the growth of the nuclear family and declining birth rates in Japan. Patients with dementia experiencing intraoral burns might thus be expected to increase. As the population ages, we may encounter more elderly people with dementia in whom this kind of burn incident arises and burn prevention strategies may therefore be warranted [10]. Symptomatic treatment is the only strategy for burn management [5, 6, 13, 14], so prevention of accidental ingestion may be more important than management. The present findings support the need for assistance and supervision with daily activity and burn prevention education in this population. Development of educational criteria for relatives and a system for preventing complications in patients with elderly dementia are also needed.

Disclosure of conflict of interest

None.

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