

CASE REPORT



## Bubble bath burns: an unusual case

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### ABSTRACT

We present an unusual case of flash burn injury in an adolescent following accidental combination of foaming bath bubbles and tea light candle flame. There has not been any reported similar case described before. This serves as a learning point for public prevention and clinicians managing burn injuries.

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Bubble bath; flame burns;  
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### Introduction

Bath time burns are generally associated with scalds.[1] We report a case of an adolescent who sustained flash burns after the foaming bath soap she was using was exposed to a naked flame, causing flash burns to her face, neck, chest and arms. Pressurized aerosol cans, such as deodorants, air-fresheners and insecticides have been reported to cause burn injuries after exploding.[2–4] However, to our knowledge, a flash burn caused by igniting bath foam has not been reported before in the literature. We feel its unusual presentation merits a case report to highlight the potential hazards of a seemingly benign bubble bath and furthermore to highlight to other burns surgeons of yet another emerging aetiological factor.



### Case report

A 14-year-old girl was having a bath at approximately 11 pm. She wore a moisturising gel mask covering most of her face, the only exposure to the air was via the apertures over her eyes and mouth. The lower half of her body lay completely submerged beneath the water, leaving her upper chest, arms and head above water. She had been using a commercially available pliable bubble foam spray manufactured to produce bubbles in the bath, and these had covered the surface of the water. The windows of the bathroom were left opened throughout and scented tea candles were placed along the peripheries of the bath. She accidentally tipped one of the scented tea candles into the

bath causing an immediate purple flash flame which engulfed her upper torso. She immediately commenced first aid comprising of a cold water shower over 20 min. She then presented to the local regional burns centre. On examination, her airway was patent with no sign of inhalational injury on oropharyngeal examination. However, she sustained partial thickness burns to her lips, face, right upper breast, neck and right arm which were patchy in distribution. There was also singeing of eyelashes bilaterally but sparing of the eyebrows as these were covered by the face mask. Her lips appeared grossly oedematous and were the worst affected area, this was probably due to the aperture in the gel mask exposing this area. No ocular injury was noted on fluorescein examination. Final estimation of total burn surface area (TBSA) post debridement of blisters was approximately 1.5% superficial partial thickness burn with larger areas of surrounding erythema. She was managed conservatively with topical paraffin ointments and silicone dressings. Given the severity of lip burns, and the nature of flash burn which occurred in a small room, she was admitted for overnight for airway observation and pain management, and was discharged 24 h later (Figure 1).

### Discussion

Bubble bath is not typically regarded as a flammable product. Bubble baths are associated with a time of fun for the young and relaxation for adults. Our literature review has not identified any previous

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**Figure 1.** Flash burns to face and neck with lip swelling.

publications describing flame burns while bathing. We postulate the reason as to why this novel foam, which was manufactured specifically for bubble baths caused these flame burns. The product was delivered via an aerosol system. Aerosols contain chemical propellants, usually hydrocarbon such as propane, butane and isopropane, stored in a pressurized liquid form.[5,6] Aerosols cause a dispersion of liquid droplets into the air.[7] These flammable droplets spread over a larger area than liquid counterparts, and it is this larger surface-to-volume ratio makes aerosols extremely flammable and susceptible to causing explosions.[7] Likewise foam has a larger surface to volume ratio than bulk fluids. The product in question contained the following ingredients: Aqua, butane, isobutane, propane, palmitic acid, triethanolamine, perfume and cosmetic colourants. Butane, isobutane, propane are highly flammable chemicals if exposed immediately to high heat. The flammable nature of the foam means that it is

clearly a high risk for patients who use candles or smoke during a bath. The dangers of the product should be highlighted on the canisters and the public should be educated about preventative measures, particularly the importance of keeping the product away from and their direction of use oriented away from heat sources. Furthermore, we highlight this rare aetiology of burn injury to plastic surgeons to be aware of this causative factor as well as providing knowledge to further advise our patients.

### Disclosure statement

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of this article.

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