

CASE REPORT

The case of the exploding egg

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The vast majority of paediatric burns occur in developing countries, and many of these injuries are entirely preventable. In general, four paediatric injury patterns have been identified in toddlers and infants, who are at a significantly increased risk of burn injuries. Children <2 years of age are often innocent bystanders, but as they grow older physical mobility, social independence and gender-specific high-risk activities come into play.

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Microwave ovens provide an efficient method of defrosting, cooking and reheating foods. However, owing to the different properties of food components and microwave ovens, their use leads to differential energy distribution. This results in varying cooking times, differential heating and, in the case of enclosed foods, explosion. Vollmer *et al.*^[1] studied the mechanics of microwave technology and the heating of different components. They particularly observed the heating of 100 fresh and boiled eggs in standard microwave ovens. In most of the eggs only the shell surface cracked, but one of the eggs generated enough energy to cause an explosion and destroy the entire container.

The differing thermodynamics of heating an egg can be explained by the high water content of the egg white compared with the more fatty egg yolk. During heating, the water vaporises rapidly, increasing pressure within the egg. On removal from the heat source, expansion of the yolk continues, overcoming the pressure exerted from the egg shell, and finally resulting in an explosion.

There have been cases in the literature of exploding microwaved eggs causing corneal laceration and facial burns.^[2,3] The Burns Unit at Red Cross War Memorial Children's Hospital, Cape Town, South Africa has had two such documented burns patients. The first was a 5-year-old child who sustained 4% partial thickness burns to the

lower face and neck. The second was a 4-year-old child who sustained 6% partial thickness burns to the face. Neither child sustained corneal injuries. Both had attempted to microwave eggs, which exploded after removing them from the microwave oven. These burns healed with conservative therapy, but have left the children with depigmented facial scars.

These cases highlight the differing thermodynamic reactions that can occur when eggs are heated in microwave ovens. To prevent this from happening, eggshells should be pierced to avoid rapid pressure changes when prepared in such ovens. The eggs should also be allowed time to stand before consumption. Fortunately, the facial injuries are usually relatively constant and mild, but some patients may suffer ocular disturbances and long-term decrease in visual acuity.^[4]

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