

## Chemical Burns to the Scalp from Hair Bleach and Dye

Charlotte D. Jensen<sup>1</sup> and Heidi Sosted<sup>2\*</sup>

<sup>1</sup>Department of Dermatology, Odense University Hospital, Odense, and <sup>2</sup>National Allergy Research Centre, <sup>2</sup>Department of Dermatology, Gentofte Hospital, University of Copenhagen, Ledreborg Allé 40, 1, DK-2820 Gentofte, Denmark. \*E-mail: hesos@gentoftehosp.kbhamt.dk  
Accepted March 20, 2006

Sir,

Several hair styling procedures, for example, bleaching and dyeing of the hair, involve application of chemicals that are highly toxic to the skin (1). While allergic contact dermatitis due to hair care products is often described (1–5), only a few cases of burns caused by hair care chemicals have been reported (6–10). We present here 2 cases of burns to the scalp from a bleaching product and a hair dye.

### Case 1

A 12-year-old girl had the hair on her vertex bleached professionally and experienced a severe chemical burn from the bleaching product. The product was a mix of bleach and colour. The hair on the top of the scalp was aggregated with a rubber band and the bleaching product applied to the hair. The treated area was occluded with a plastic bag. Some hairdressers use this method of bleaching to speed up the process. The treatment normally lasts 40 min, but in this case it was discontinued after 20–30 min because the patient felt unwell and experienced a stinging pain on the scalp where the hair was being bleached. When the plastic bag was removed, vapour emanated from the scalp and the area was immediately rinsed with cold water. Within the next days necrosis appeared on the scalp, leading to a sharply demarcated crust, which after few weeks became detached together with the hair, leaving an oval-shaped ulcer measuring 9×9 cm (Fig. 1). Plastic surgery with excision of the ulcer base and placing of a skin graft was performed.

The patient was patch-tested several months later with the European standard series and a hairdresser tray, with negative results.

### Case 2

A 26-year-old woman had permanent dark red hair highlights carried out at a hairdressing salon. She had had her hair dyed several times before without problems. Half an hour into the procedure she experienced a stinging, burning pain on the scalp localized to the region where the dye chemicals were applied and she put her head under cold, running water to ease the pain. She went directly to the emergency ward and was prescribed pain relievers and a tar shampoo. In the next few days she experienced fever, facial erythema, swelling of the neck and developed a 2×3 cm corrosion on the scalp with discharge of pus. As scar tissue was generated, no hair growth remained in the corroded area. The patient was patch-tested with the European standard series and a hairdresser tray, and all was negative except nickel, which was not relevant to this case. It was concluded that the burn was caused by a toxic reaction to the hair dye chemicals. No information about the product ingredients was obtained.

## DISCUSSION

The literature on chemical burns is limited. One is a case where a chemical burn to the scalp happened



Fig. 1. Scalp wound of a 12-year-old girl one month after professional hair bleaching.

during a hair highlighting procedure (6). It is not certain why the burn occurred, but it was speculated that the highly irritant chemicals came into direct contact with the skin, although the hairdresser claimed that all routine precautions had been taken. The injury was not apparent until after a couple of weeks. Cases have also been described where hair care products induced ignition of the hair, resulting in severe burns (7–9), and there is a case of a non-chemical burn induced by direct scalp contact with aluminium foil used in the bleaching procedure. The foil was overheated by a hair dryer during the process (10).

For our case 1 it is very likely that an incorrect procedure was responsible for the injury. It has not been established why the burn in case 2 occurred, but it is possible that the procedure used was responsible here too. However, it can not be excluded that the product itself was somehow responsible. These 2 very severe cases remind us of the toxic potential of some hair care chemicals and emphasize the necessity for hairdressers to follow the recommended procedures with care in order to avoid injuries.

## REFERENCES

1. Cronin E. Hair preparations. In: Cronin E, ed *Contact dermatitis*. Edinburgh: Churchill Livingstone, 1980: p. 115–126.
2. Sosted H, Agner T, Andersen KE, Menné T. 55 cases of allergic reactions to hair dye: a descriptive, consumer complaint-based study. *Contact Dermatitis* 2002; 47: 299–303.
3. Uter W, Lessmann H, Geier J, Schnuch A. Contact allergy to ingredients of hair cosmetics in female hairdressers and clients – an 8-year analysis of IVDK data. *Contact Dermatitis* 2003; 49: 236–240.
4. Sosted H, Menné T. Allergy to 3-nitro-p-hydroxyethyl-aminophenol and 4-amino-3-nitrophenol in a hair dye. *Contact Dermatitis* 2005; 52: 317–319.
5. Sosted H, Johansen JD, Andersen KE, Menné T. Severe allergic hair dye reactions in 8 children. *Contact Dermatitis* 2006; 54: 87–91.
6. Goon P, Misra A. A possible chemical burn to the scalp following hair highlights. *Burns* 2005; 31: 530–531.
7. Boucher J, Raglon B, Valdez S, Haffajee M. Possible role of chemical hair care products in 10 patients with face, scalp, ear, back, neck and extremity burns. *Burns* 1990; 16: 146–147.
8. Wilson DI. Scalp burns in elderly women – the perils of the perm. *Burns* 1999; 25: 182–183.
9. Kerner E, Matheney K, Boertman JA, Sullivan WG. Facial and scalp burns from hair activator products. *J Burn Care Rehabil* 1988; 9: 524–525.
10. Peters W. The hair color-highlighting burn: a unique burn injury. *J Burn Care Rehabil* 2000; 21: 96–98.