

Contact allergy to permanent colorants used for tattooing a nipple after breast reconstruction

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Case Report

A 53-year-old woman, who had had allergic contact dermatitis intermittently since 1987 and who, over the years, had been found to be allergic to formaldehyde, Myroxylon Perirae resin (balsam of Peru), benzoic acid, benzoyl peroxide, parabens, wood tars, triethanolamine, ginseng extract, and *p*-phenylenediamine (PPD), consulted us again in August 2001. She had had a mastectomy for breast cancer and breast reconstruction was planned. However, in view of her previous reaction to PPD, would she tolerate the colouring agents used for tattooing a nipple?

The colouring materials to be used were manufactured by Spaulding Color Corporation, NY, USA, and

their labels stated that they contained iron oxides, titanium dioxide, glycerine, isopropanol, and distilled water. The red colorant was listed as containing D & C Red # 30 Lake, which is D & C Red # 30 (an indigoid colour) on an appropriate substrate (1). Patch tests with the products (as is) were, unexpectedly, strongly positive to 6 out of the 9 products tested (Table 1). Additional tests with glycerin (as is), isopropanol (as is), titanium dioxide (10% pet.), ferric oxide (5% pet.), and D & C Red # 30 (2% pet.) were negative.

The company was repeatedly contacted to obtain the complete qualitative chemical composition and also to determine why some of the colorants tested negatively. Besides the presence in some grades of aluminium hydroxide, amorphous silica and talc, the only information that they would give us was the following (as stated in the material safety data sheets): these are 'purified colours which are colorants manufactured for use in a variety of food, drug, and cosmetic applications. These products include U.S. Certified Organic Colorants, Purified Inorganic Colorants, and Non-certified Organic Colorants, and are produced to the highest purity standards possible ...'.

As no further investigations could be performed, we were unable to determine whether the allergen was a colouring agent itself or an additive. We wonder whether PPD [which is used in temporary henna tattoos (1)] or related azo-dyes might have been present.

Discussion

Tattoos and permanent make-up are widely used all over the world for aesthetic and other reasons. Tattooing is also an adjunct to reconstructive surgery, particularly of the face or breast.

Apparently, no tattoo colour manufactured has ever been approved by the FDA. According to the U.S. Food and Drugs Administration (<http://www.cfsan.fda.gov/~dms/cos-204.html>), 'the inks used in tattoos and permanent make-up and the pigments in these inks are

subject to FDA regulation as cosmetics and colour additives. However, FDA has not attempted to regulate the use of tattoo inks and the pigments used in them and does not control the actual practice of tattooing. Rather, such matters have been handled through local laws and by local jurisdictions. Although a number of colour additives have been approved for use in cosmetics, none have been approved for injection into the skin. Using an unapproved colour additive in a tattoo ink adulterates it. Many pigments used in tattoo inks are not approved for skin contact at all. Some are industrial grade colours that are suitable for printers' ink or automobile paint ...'.

We urge the authorities to regulate not only temporary (so-called 'henna') tattoos, from which there has been a high incidence of primary sensitization to PPD (2), but also permanent tattooing dyes and make-up. Moreover, it is unacceptable that companies that provide materials to be used in medical practice, in this case reconstructive surgery, are unwilling to provide detailed information when adverse reactions occur. Unfortunately, this attitude has also been encountered among manufacturers of other medical devices such as wound dressings, electrodes, adhesive tapes, etc.

References

1. *International Cosmetic Ingredient Dictionary and Handbook*, 8th edn. Washington D.C.: The Cosmetic, Toiletry and Fragrance Association (CTFA), Inc, 2000: 1274.
2. Le Coz C J, Lefebvre C, Keller F, Grosshans E. Allergic contact dermatitis caused by skin painting (pseudo-tattooing) with black henna, a mixture of henna and *p*-phenylenediamine and its derivatives. *Arch Dermatol* 2000; 136: 1515–1517.

Table 1. Patch test results with the colouring products (as is) used for tattooing a nipple

Product	Results after	
	D2	D4
Black 8001	++	++
Brown 8003	–	–
Brown 8006	++	++
Brown 8004 ^a	++	++
Cherri berri 8009 ^a	+	+
Lemon 8011 ^a	–	–
Fire red 8016	–	–
Salmon 8026 ^a	++	++
White 8007	++	++

^aMixtures including White 8007.

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