

## Reticulate Hyperpigmentation of the Skin After Topical Application of Benzoyl Peroxide

Sir,

Benzoyl peroxide (BP) is an effective and frequently used topical medication for the treatment of acne vulgaris. It is a strong, broad spectrum bactericidal agent that significantly decreases the number of *Propionibacterium acnes* in both the follicle and on surface skin (1). A common side effect after usage is irritation of the skin, usually manifested as a stinging or burning, and sometimes accompanied by erythema and scaling. Benzoyl peroxide is a strong irritant, but a weak allergen, rarely causing a contact dermatitis (2, 3). Tolerance can be achieved by gradually increasing the frequency of application over time. We describe two cases in which topical application of benzoyl peroxide resulted in an unusual pattern of reticulate hyperpigmentation of the skin, most likely as a sequela of an irritant contact dermatitis.

### CASE REPORTS

#### Case 1

A 29-year-old African-American man applied 5% benzoyl peroxide gel twice daily to the trunk for the treatment of acne vulgaris. The patient had no history of previous use of benzoyl peroxide. After 1 week of use, a bright erythematous, scaly eruption developed at the sites of application on the trunk. After discontinuing the benzoyl peroxide, the eruption resolved leaving a fine lacy reticulate pattern of dark brown hyperpigmentation across the trunk and shoulders (Fig. 1). A skin biopsy specimen revealed findings consistent with postinflammatory hyperpigmentation.

#### Case 2

A 31-year-old African-American man was treated for acne with 5% benzoyl peroxide gel twice daily to the trunk and face. The patient had no history of previous use of benzoyl peroxide. He subsequently developed an erythematous, scaly rash at the sites of application on the upper trunk; his face remained clear. He discontinued the benzoyl peroxide, and, over the next several weeks, a fine lacy reticulate pattern of dark brown hyperpigmentation developed over the upper trunk. A skin biopsy specimen revealed findings consistent with postinflammatory hyperpigmentation.

### DISCUSSION

Benzoyl peroxide is produced in 2.5, 5, and 10% strengths and can be applied as a gel, lotion, cream or wash. Its most common use is in acne vulgaris, although it has been recommended for use in a variety of other dermatoses (4). Although it is an uncommon sensitizer, its application is often irritating.

Haustein et al. (3) reported on the irritant potential of benzoyl peroxide. Eleven of 155 acne patients had clinical signs of intolerance on the face, which settled despite continued use in 10 cases. Twenty-nine percent of acne patients and non-exposed controls had a positive patch test with 5% BP. These reactions could not be interpreted as signs of allergy, because there were no positive reactions with 0.1% BP. The contradiction between the patch test findings, interpreted as irritant in nature, and the clinical findings of only 11 cases showing mild irritation was addressed by the authors. They explained that irritant reactions can vary widely between body regions and that pre-existing inflammation in acne may interfere with the elicitation of an allergic or irritant reaction on the face.

Our two patients appeared to develop an irritant response on the trunk after application of 5% benzoyl peroxide. One patient applied BP to his face with no irritation, consistent with the findings of Haustein et al. (3). Both patients then developed a pattern of reticulate hyperpigmentation after their initial dermatitis subsided. Biopsy in both cases was consistent with postinflammatory hyperpigmentation.

Postinflammatory hyperpigmentation develops after acute or chronic inflammation and trauma to the skin. The intensity of the hypermelanosis tends to be more pronounced in darker-skinned individuals. Other conditions that produce a pattern of reticulate hyperpigmentation include Riehl's melanosis, which is characterized by reticulate brown-black pigmentation of the face and neck. This is thought to be a result of a contact sensitization or photocontact dermatitis from a fragrance or cosmetic (5). Tar melanosis, also called melanodermitis toxica, is found in individuals exposed to tar, oil, pitch and other hydrocarbons. This is a photosensitivity reaction that presents with erythema, vesiculation, and pruritus. Later stages reveal a reticulate hyperpigmentation with hyperkeratosis. Erythema *ab igne* is characterized by reticulate hyper-

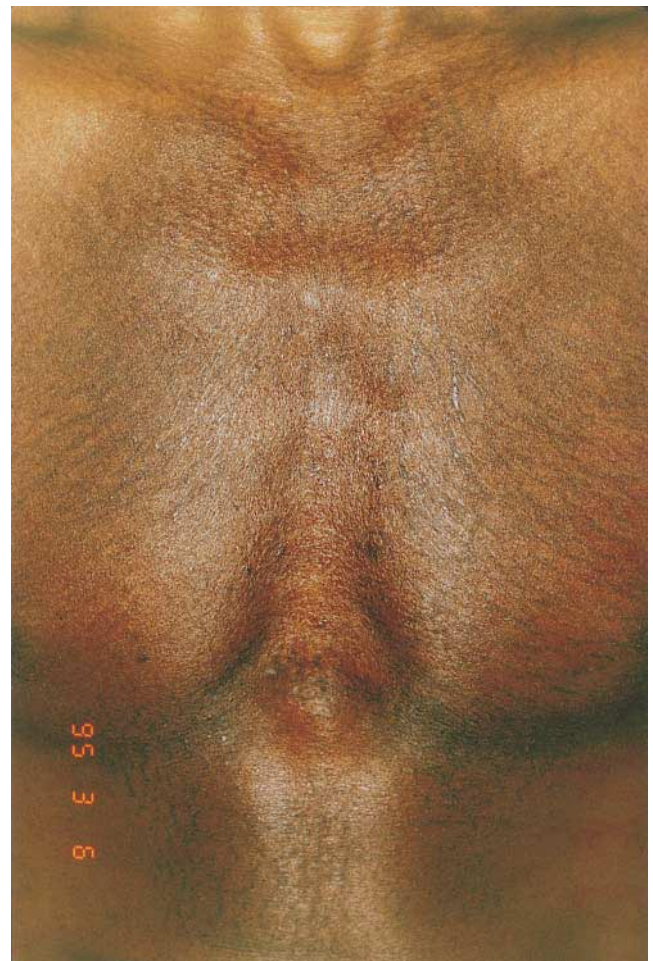


Fig. 1. Fine lacy reticulate pattern of dark brown hyperpigmentation across the chest.

pigmentation following a vascular pattern and occurs at sites of chronic heat exposure. Macular amyloid can also present with a hyperpigmented reticulate and rippled pattern over the trunk.

Our two cases illustrate an unusual side effect of treatment with benzoyl peroxide. Based on our review of the literature on the irritant nature of benzoyl peroxide, it appears that African-American patients, treated in areas other than the face, are at highest risk for this reticulate pattern of hyperpigmentation.

#### REFERENCES

1. Bojar RA, Cunliffe WJ, Holland KT. The short-term treatment of acne vulgaris with benzoyl peroxide: effects on the surface and follicular cutaneous microflora. *Br J Dermatol* 1995; 132: 204–208.

2. Morelli R, Lanzarini M, Vincenzi C, Reggiani M. Contact dermatitis due to benzoyl peroxide. *Contact Dermatitis* 1989; 20: 238–239.
3. Hausteil UF, Tegetmeyer L, Ziegler V. Allergic and irritant potential of benzoyl peroxide. *Contact Dermatitis* 1985; 13: 252–257.
4. Kligman AM, Leyden JJ, Stewart R. New uses for benzoyl peroxide: a broad spectrum antimicrobial agent. *Int J Dermatol* 1977; 16: 413–417.
5. Serrano G, Pujol C, Cuadra J, Gallo S, Aliaga A, Riehl's melanosis: pigmented contact dermatitis caused by fragrances. *J Am Acad Dermatol* 1989; 5: 1057–1060.

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## Acquired Curly Hair: A New Paraneoplastic Symptom?

Sir,

In our practice we occasionally encounter patients with a history of change in hair form, e.g. a puberty-related change from straight to curly hair or *vice versa*. There have also been reports of change from straight to curly hair as a side effect of treatment with etretinate (1) or isotretinoin (2). Here we report the case of a patient who developed curly hair shortly before a malignant disease was diagnosed.

#### CASE REPORT

The patient is a previously healthy man who at the age of 71 developed oesophageal cancer, the first symptom of which was epigastric pain. Oesophagogastrosocopy was performed, and biopsy showed the presence of a moderately differentiated squamous cell carcinoma. As exploratory thoracotomy revealed metastasis to mediastinal lymph nodes, the tumour was unresectable. Instead, the patient successfully underwent a 2-month course of radiotherapy combined with chemotherapy (cisplatin and fluorouracil), and has been recurrence-free for the past 4 years.

Two months before the onset of epigastric pain, the patient's hitherto straight hair became curly, especially at the sides and back. Not only the patient, but also his family noticed the change; his daughter envied his curly hair, and neighbours asked whether he had been having it permed. There were no changes in the colour or texture of the hair. The curly hair persisted for 7 months, from 2 months before the first symptoms of cancer became apparent until 1 month after completion of the concomitant radiotherapy and chemotherapy, when the hair once more became straight. During treatment he temporarily lost about 20% of his hair.

#### COMMENT

There are numerous cutaneous markers of internal malignancy, and a few associated hair symptoms are recognized.

For instance, the occurrence of hypertrichosis lanuginosa acquisita—the sudden appearance and rapid growth of long, fine, downy, whitish-yellow lanugo-type hair—has been reported in association with an internal tumour (3). Alopecia can occur in conjunction with malignant disease, though usually as a result of treatment; and changes in colour, shade, texture or curliness of the hair as it grows back again are well-known sequelae.

To the best of our knowledge, this is the first reported case of acquired curly hair in conjunction with malignancy—the curliness developing shortly before diagnosis and disappearing soon after successful treatment. Since a patient might not always think to mention recent curling of the hair, and since curly hair *per se* is hardly an abnormal clinical finding, such a symptom may easily be missed.

#### REFERENCES

1. Graham RM, James MP, Ferguson DJP, Guerrier CW. Acquired kinking of the hair associated with etretinate therapy. *Clin Exp Dermatol* 1985; 10: 426–431.
2. Bunker CB, Maurice PDL, Dowd PM. Isotretinoin and curly hair. *Clin Exp Dermatol* 1990; 15: 143–145.
3. Jemec GBC. Hypertrichosis lanuginosa acquisita. *Arch Dermatol* 1986; 122: 805–808.

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