56-YEAR-OLD WOMAN WITH A SINGLE ACTINIC KERATOSIS LESION*

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BACKGROUND

The patient is a 56-year-old white woman with skin type II who lives in Boulder, Colorado. She is in excellent physical health and rarely visits her physician for anything other than a routine annual examination. She spends a great deal of time outdoors hiking, swimming, and jogging, but she generally uses no sun protection or protective clothing other than a baseball cap. During her most recent annual examination, she asked her physician about a 1 cm², erythematous, raised, scaly lesion near her right temple (Figure). According to the patient, the lesion had been present for several months but had been asymptomatic. She had previously tried to treat it using an over-the-counter topical corticosteroid cream, which she discontinued after 2 weeks when the lesion did not improve. She had not been using any photosensitizing medications. She had moderate sun damage, especially on her face and the backs of her hands, but had no other skin lesions.

TREATMENT PLAN

Actinic keratosis is usually diagnosed clinically by the appearance and feel of the lesion. A skin biopsy is generally not required for the initial diagnosis of AK, although a biopsy should be considered for substantially thick lesions and when patients do not respond to treatment. Several characteristics of this patient’s lesion are suggestive of a diagnosis of AK. The lesion is erythematous. It is palpable and hyperkeratotic and occurring on a sun-exposed body surface. It has persisted for several months without healing. The patient also has a few characteristics that increase her risk of AK. AKs are most commonly encountered in patients with fair skin, who sunburn easily and tan poorly (Fitzpatrick skin types I and II). Approximately 80% of AK lesions occur in individuals over the age of 50. This patient’s exposure to ultraviolet (UV) radiation is very high as a consequence of the amount of time she spends outdoors, her lack of photoprotective measures, and her residing in Colorado. UV exposure increases with altitude by approximately 11% for every 1000 meters above sea level. UV-B exposure in Boulder, Colorado, may be approximately 20% greater than exposure for individuals at the same latitude who are closer to sea level.

CASE STUDY

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*Based on a case study developed with Perry Robins, MD, for a national grand rounds series.
Cryotherapy was selected for the treatment of this lesion. Cryotherapy, when performed properly, carries a high cure rate, low risk of complications, and rapid lesion resolution. It is the most commonly used treatment for single AK lesions. The most common side effect is short-term skin redness, mild stinging or burning, and postinflammatory hypopigmentation, which may take weeks to manifest. Cryotherapy may be administered in several different ways. Liquid nitrogen may be applied to the skin using a spray device or a cotton-tipped applicator. For AKs, a single application with a 1-mm margin is usually sufficient to cure the lesion. Marking the lesion area with a felt-tip pen may make it easier to see the lesion and the desired margin as the ice field begins to form. After the ice field has formed, the spray is maintained to keep the field frozen for the required amount of time. A freeze time of 5 seconds is usually adequate for AK lesions, although thick hypertrophic lesions or lesions larger than 2 cm in diameter may require freeze times of 30 to 45 seconds. If more than 1 application is required, the lesion should be allowed to completely thaw for 2 to 3 minutes before the next application of cryotherapy. For facial lesions where there is concern about the potential scatter of the liquid nitrogen to adjacent structures, such as the eye, a cryoprobe may be employed. In this case, the spray nozzle is positioned approximately 1 to 1.5 cm above the lesion, and the device is triggered until an ice field encompasses the lesion and the desired margin of surrounding tissue.

**Outcome and Follow-up**

At 3 months follow-up following a single application with liquid nitrogen, the patient’s lesion had completely resolved. She reported having had mild stinging and burning at the application site, but no significant pain, scarring, or hypopigmentation was noted. A post-treatment blister was managed with a topical antibiotic ointment until it resolved in several days.

Her physician took the opportunity to remind her about the importance of skin cancer prevention. She was encouraged to use a broad-spectrum sunscreen, to apply it 15 to 30 minutes before sun exposure, to reapply it every 2 hours and after swimming or perspiring, and to use it even on cloudy days. She also was reminded to wear sun-protective clothing, including a hat with a broad brim (at least 6 inches) and limit her sun exposure as much as possible by exercising outdoors during the morning and evening hours. She was told to perform regular self examinations using a full-length mirror and a hand-held mirror and to have a yearly examination by a dermatologist.

**-Decision Point-**

What follow-up regimen would you recommend for this patient? Should prophylactic therapy be considered?

Long-term follow-up is critical, usually every 6 to 12 months for such a patient, to assess for new lesions and encourage sun-safe behaviors. For any patient with lesion persistence or suspicion for recurrence, especially on the background of sun-damaged skin, 5-fluorouracil (5-FU) may be considered.

**Discussion**

Actinic keratosis is one of the most common conditions encountered by dermatologists, especially among older and fair-skinned patients. SCCs are very often preceded by AKs, and there is no way to predict whether a particular AK will eventually become an SCC. Therefore, it is important to iden-
tify and treat even single AKs to reduce the risk of SCC.

Cryotherapy is effective and safe as first-line treatment of solitary AK. In general, little post-treatment care is required. A blister may form at the treatment site, which is usually easily treated with a topical antibiotic. Some patients may experience scarring or hypopigmentation. The few clinical studies that have examined the efficacy of cryotherapy have shown that it is clearly very effective for AK treatment, with a low rate of recurrence. In a 1982 study in Australia, investigators evaluated more than 1000 AK lesions from a total of 70 patients. The mean lesion size was approximately 1 cm. Over a period of follow-up that varied from approximately 1 year to more than 8 years, only 12 recurrences were noted for a cure rate of nearly 99%. A more recent study prospectively examined the cure rate of cryotherapy as administered by dermatologists in clinical practice, who treated a total of 421 lesions in 89 patients. The mean lesion size was approximately 1 cm. These investigators found a cure rate after 3 months of approximately 67%. The investigators suggested that the lower cure rate in their study than in the Australian study may have been at least partly related to the shorter duration of follow-up, as some lesions regress spontaneously over time. Despite their differences, both studies show that most lesions resolve after a single cryotherapy treatment.

A combination of cryotherapy and a topical agent may also be considered for this patient. This not only helps to eradicate lesions, but also exposes subclinical lesions. One approach involves first exposing the skin to topical 5-FU and then completing the treatment with the application of liquid nitrogen. In this method, the patient is first treated with topical 5-FU twice daily for 10 days until erythema begins to develop. The patient then returns to the office for cryotherapy to treat all of the lesions identified by the 5-FU application. The 5-FU is discontinued after cryotherapy. This technique has been reported to remove lesions with rapid healing, and minimal side effects, scarring, and cryotherapy-related hypopigmentation.

Other options that could be considered for this patient include imiquimod, chemical peeling agents, diclofenac, photodynamic therapy (although it is rarely used on single lesions), local curettage, and even resurfacing lasers. Although not covered by insurance, cosmetically oriented patients may elect to proceed with Erbium:YAG laser ablation to mitigate scarring risk because this method avoids heat or cold injury.

REFERENCES