Multiple Miliary Osteomas of the Face Ablated With the Erbium:YAG Laser

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The Cutting Edge: Challenges in Medical and Surgical Therapeutics

REPORT OF A CASE

A 62-year-old woman with no history of acne vulgaris presented with a 15-year history of slowly progressive and disfiguring multiple facial dermal nodules varying from grain-of-sand to pea size (Figure 1). Tissue was taken for histopathologic study and demonstrated well-circumscribed aggregates of ectopic bone (osteoma cutis). Findings of a complete blood cell count and automated chemistry profile (including serum calcium, phosphorus, and alkaline phosphatase) were normal except for a nonfasting triglyceride level of 3.42 mmol/L (303 mg/dL) (reference range 0.11-2.15 mmol/L [30-150 mg/dL]). This patient was diagnosed as having multiple miliary osteomas of the face, a type of primary osteoma cutis.1

THERAPEUTIC CHALLENGE

The cosmetic disfigurement and progressive nature of the nodules caused this patient great concern, and she sought a solution to her problem. The challenge was to provide safe, efficacious, and nonscarring ablation of the nodules by either surgical or medical means.

SOLUTION

The erbium:YAG laser (Continuum Biomedical, Dublin, Calif) is a relatively new resurfacing and ablating laser that not only ablates skin but is an efficient ablator of bone.2,3 It was reasoned that this might be an effective tool for ablation of the small superficial dermal nodules and for exposure of the larger nodules that could then be rubbed out with gauze or lifted out with a dermal curette. This surgical approach could be combined with the use of topical 0.05% tretinoin cream to further assist in the elimination of some smaller nodules.

The patient began treatment with a topical regimen of 0.05% tretinoin cream at bedtime and 12% lactic acid cream twice daily. Two weeks later, following written and verbal informed consent, a 3 × 3-cm test area of the left lateral cheek was resurfaced with the erbium:YAG laser (5-mm spot size, 1.0 J, 5 J/cm², 10 passes) using 1% lidocaine hydrochloride with epinephrine 1:200 000 infiltration anesthesia. A smoke evacuator was used. After 5 or more passes, following epidermal and upper papillary dermal ablation, multiple tiny grain-of-sand–sized white particles were exposed and easily wiped off with cotton gauze. With additional passes, more white nodules were exposed and wiped off; other particles were ablated with additional laser passes. After a total of 10 passes with the laser, the exposed upper dermal tissue was smooth to palpation and no additional nodules could be seen. A hydrogel dressing was applied for 24 hours, and the patient then compressed the ablated area with 5 mL of 10% povidone-iodine solution in 0.24 L of water 3 times a day followed by application of anhydrous ointment (Aquaphor Healing Ointment; Beiersdorf Inc, Norwalk, Conn).

On the morning of the procedure, the patient began taking oral valacyclovir, 500 mg, twice daily for 5 days. One week after the procedure, the test area had reepithelialized with moderate erythema present; 10 days following the procedure, treatment with tretinoin and lactic acid creams was resumed. Twenty days after surgery, there was minimal erythema present and no scarring.

Seven weeks after the test ablation, a full-facial erbium:YAG procedure was scheduled. On the morning of the
the surgery, the patient started taking oral valacyclovir, 500 mg, twice daily for 7 days. Diazepam, 10 mg, acetaminophen, 600 mg, and codeine phosphate, 60 mg, were given orally 1 hour before surgery. An all-amide topical anesthetic ointment equivalent to 20% lidocaine (Eutectic LA; Medical Center Pharmacy, Tampa, Fla) was applied without occlusion to the entire face 45 minutes before the procedure. Immediately prior to the surgery, bilateral supraorbital, infraorbital, and submental nerve blocks were accomplished with 1% lidocaine hydrochloride with epinephrine 1:200,000. Internal Cox eye shields and a Hughes dental shield (Delasco, Council Bluffs, Iowa) were inserted. Using the erbium:YAG laser (7-mm spot size, 2.0 J, 5 J/cm², 5–11 passes), the entire face was resurfaced. As with the test session, after 5 or more passes, small to large white nodules were exposed (Figure 2), which could be readily rubbed off with cotton gauze. With additional passes, more were exposed and rubbed off. A few larger pea-sized nodules required a small dermal curette for removal. Some small nodules were ablated with additional passes of the laser. The postoperative management was identical to the original test area. Six days after surgery, the face was reepithelialized with minimal erythema, and by 10 days after the procedure, the patient resumed treatment with topical tretinoin and lactic acid creams. After 1 month, there was minimal erythema and no scarring in the central cheeks where there was more aggressive ablation (11 passes). A few superficial grain-of-sand–sized particles could be palpated on the central cheeks, but after 2 months, the erythema had resolved and the face was smooth (Figure 3) with only a few small grain-of-sand–sized dermal nodules palpable or visible on the cheeks. Both the physician and patient were pleased with the results.

The current plan is to continue treatment with the topical tretinoin cream and hope that this will cause transepidermal elimination of the few remaining small nodules. Otherwise, a future limited erbium:YAG laser ablation procedure of the small persistent central cheek osteomas may be done.

**COMMENT**

This case demonstrates successful smoothing (via exposure and ablation) of multiple miliary osteomas of the face. The addition of topical 0.05% tretinoin cream before and after the procedure may have contributed to the result via transepidermal elimination of small superficial osteomas.4

Miliary osteoma cutis is a rare type of primary osteoma cutis and is characterized by the multiple formation of bone in the dermis.5 Osteoma formation may be due to indigenous fibroblasts differentiating into osteoblastic cells.6 Dynamic bone studies indicate a high rate of internal remodeling;7 but diphosphonate (etidronate disodium) therapy has failed to achieve improvement.8,9 Multiple miliary osteomas occur predominantly in women on the face, although they may occur on the scalp or the chest in men.1,5,9 Although some patients have a history of acne vulgaris, this may be coincidental.

No effective therapy for the treatment of increasing and spreading cutaneous ossification has been established.8 Previously described therapies consist of surgical excision7,10 or, in one case, 0.05% tretinoin cream producing transepidermal elimination of some osteomas.9
However, transepidermal elimination of fragments of bone can occur spontaneously. The erbium:YAG laser, emitting in the near infrared at 2.94 μm at the peak of the water absorption spectrum, with a pulse duration of 250 microseconds, is an efficient ablator of skin and bone. With skin resurfacing it is characterized by minimal residual thermal damage, rapid healing, fast resolution of erythema, cutaneous contraction, effective ablation of epidermal and dermal lesions, and satisfactory improvement of rhytids and scars. The erbium:YAG complex explosive removal process may play a role in loosening the osteomas thus allowing their easy physical removal when exposed.

The erbium:YAG laser appeared to be the ideal tool for exposure and ablation of the multiple dermal nodules of osteoma cutis in this patient. Following a successful test area ablation, the entire face was resurfaced to expose the osteomas, which could then be readily physically removed with light gauze rubbing or curettage of larger nodules. Some small osteomas were directly ablated by the laser. Topical tretinoin cream may have provided an adjunctive benefit. The result was satisfactory smoothing of the face without scarring, pleasing to both the patient and physician.

REFERENCES