Treatment of a Becker's Nevus Using a 694-nm Long-pulsed Ruby Laser

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Becker's nevus is an uncommon pigmented smooth muscle hamartoma that develops during adolescence and occurs primarily in young men. The nevus is characterized by hypertrichosis and hyperpigmentation and is usually located unilaterally over the shoulder, upper arm, and scalp. We describe a patient with a Becker's nevus who was treated with a long pulsed ruby laser in order to decrease hair density and pigmentation. © 1998 by the American Society for Dermatologic Surgery, Inc. Dermatol Surg 1998;24:1032-1034.

Becker's nevus is an uncommon cutaneous hyperpigmentation with a male-to-female ratio of 4:1. This pigmented lesion is usually not present at birth but develops slowly during puberty or during the second decade of life. Becker's nevi are typically located on the shoulder, chest, and proximal arm and generally demonstrate hypertrichosis. Histologically, the lesion occurs with equal frequency in all races, and while concomitant malignancies have not been reported, it has been associated with various physical abnormalities such as limb defects and spina bifida. Histologically, Becker's nevi demonstrate slight hyperkeratosis, with elongation of the rete ridge pattern and basal hyperpigmentation. Melanocytes are only mildly increased in number and smooth muscle hamartomas are occasionally evident within the reticular dermis. A 7- to 10-mm laser spot size is used with a fixed pulse duration of 3 msec to generate fluences up to 40 J/cm². In order to protect melanin-containing structures in the epidermis, a contact sapphire lens "cooling handpiece" is applied to the treatment area, which decreases skin surface temperature and helps to prevent unwanted thermal injury.

The procedure for hair removal using the Epilaser may be summarized as follows: 1) hair-bearing areas are shaved, 2) a treatment grid is drawn in red ink in order to provide the laser operator with an outlined area to treat, 3) the cooling tip is applied firmly to the treatment site, and 4) laser energy is then discharged to the area with nonoverlapping pulses. During the first laser treatment, a fluence of 18 J/cm² with a 10-mm spot size was used, causing the patient only minimal pain, mild erythema, and a burning sensation that lasted 1-2 hours (Figure 2). He developed purpuric, nonblanching macules and fine epidermal crusting by the third postoperative day, which resolved completely after 2 weeks. A second and third treatment at 19 and 22 J/cm², respectively, was performed at 6-8-week time intervals with evidence of continued hair and pigment.
reduction (Figure 3). The patient tolerated the treatments well without the need for topical anesthetics or systemic analgesics. Hair density decreased by 50% after a single ruby laser treatment and continued to decrease with subsequent treatments until a 90% reduction in hair growth was achieved after the third laser session (Figure 4). The average of three manual hair counts was calculated within a 3 cm² area within each of three representative sections of the nevus as an indicator of hair density. The clinical reduction in hair and pigment continued to be evident 10 months after the final treatment. No scarring or skin textural changes were observed.

Discussion

Becker’s nevi pose a significant treatment challenge to cutaneous surgeons due to their large size and degree of hair density. These nevi are not only cosmetically undesirable but are also psychosocially distressing, as traditional surgical therapies have been either unsuccessful or have resulted in scarring. Less invasive treatments such as camouflage makeup, wax epilation, and shaving are temporary remedies and are time consuming to perform. The hyperpigmentation in Becker’s nevi has been treated successfully with Q-switched (QS) ruby (694 nm) and frequency-doubled Nd:YAG (532 nm) laser irradiation; however, recurrence rates have been high and the terminal hairs within the nevi were typically unaffected.10–12

Laser-assisted hair removal using red and infrared wavelengths of light has revolutionized the treatment of unwanted hair growth.8,9,13–16 One of the known side
effects of laser-assisted hair removal is hypopigmentation. Because the laser’s target is follicular melanin and laser light must first penetrate the epidermis in order to reach the hair follicle, epidermal melanin is often injured during the hair removal process, resulting in a decrease in pigmentation. Therefore, laser-assisted hair removal using a wavelength within the red electromagnetic spectrum results in decreased hair density and simultaneous skin lightening. While hypopigmentation is generally considered a complication of ruby laser-assisted hair removal, we utilized this side effect to our advantage in order to impact both the unwanted hair growth and the hyperpigmentation associated with our patient’s Becker’s nevus. Three consecutive laser treatments using the laser parameters and time intervals outlined resulted in remarkable long-term hair and pigment reduction.

This report indicates that long-pulsed ruby laser irradiation is an effective and rapid method to treat the hypertrichosis and hyperpigmentation characteristic of a Becker’s nevus. Long-term evaluation will be necessary to determine whether the favorable results observed in this patient will be permanent.

References