A Simple Solution to the Common Problem of Ecchymosis

Postprocedural and traumatic ecchymosis is an extremely common occurrence. Patients are increasingly seeking minimally invasive procedures that potentially cause bruising. Oftentimes, patients are anxious to minimize bruising so that others do not notice that they had cosmetic intervention. Strategies to reduce ecchymosis are limited to agents of only modest benefit (eg, arnica and bromelain).1,2 Pulsed-dye laser (PDL) therapy is known to be beneficial for the treatment of vascular conditions. The objective of this study was to evaluate the effectiveness and safety of a long-pulse PDL (595 nm) for the treatment of ecchymoses.

Methods. Ten adults with skin types ranging from I to IV and at least 1 ecchymosis were enrolled in the study. Ecchymosis resulted from cosmetic procedures or traumatic injury. Duration of ecchymoses ranged from 48 hours (n=6) to 72 hours (n=4). Subjects received a single treatment with the 595-nm V-Beam PDA (Candela Corp, Wayland, Massachusetts) with the following settings: spot size, 10 mm; fluence, 7.5 J/cm²; and pulse duration, 6 milliseconds. The DCD (Dynamic Cooling Device; Candela Corp) was set at 30 milliseconds with a 20 millisecond delay. Each subject served as his or her own control: subjects with 2 ecchymoses had 1 treated; those with a single lesion had half treated. Photographs were taken before treatment and at 24 hours, 48 hours, and 7 days after treatment. Two blinded assessors graded bruise severity from 0 to 10 (0, no bruise; 10, worst bruising).

Results. Relative to the untreated ecchymosis, treated lesions resolved more rapidly (Figure). In all 10 subjects, accelerated resolution of the treated bruise was evident within 24 hours. Benefit was apparent 6 hours after treatment in 1 patient. Twenty-four hours after treatment, the average improvement was 62% and 13% for treated and untreated bruises, respectively. Forty-eight hours after treatment, the average improvement was 76% and 37% for treated and untreated lesions, respectively. One week after treatment, treated and untreated bruises had improved by 87% and 81%, respectively. Adverse effects were minimal, but 2 patients experienced minor transient crusting.

Comment. The precise mechanism by which laser treatment accelerates resolution of ecchymoses is unknown. Ecchymoses result when extravasated blood accumulates in tissue. The yellow color that develops in older

Figure. Two ecchymoses of equal duration on the inner aspect of the upper extremity. In each figure panel, the bruise labeled “A” on the patient’s arm is the experimental bruise; the one labeled “B” on the patient’s arm is the control bruise and never received treatment. All further citations herein to alphabetic labels refer to figure panel labels, not bruise labels. A, Before treatment with pulsed-dye laser (PDL); B, 6 hours after a single PDL treatment; C, 24 hours after treatment; D, 48 hours after treatment; E, 96 hours after treatment; and F, 1 week after treatment.
bruises correlates with macrophage degradation of hemoglobin to bilirubin. The PDL emits yellow light (595 nm) matching an absorption peak of oxyhemoglobin. Bilirubin has a broad absorption peak at 460 nm.3

We observed the most dramatic responses in bruises with pronounced erythematous and/or violaceous components, suggesting that laser intervention is most effective if initiated when hemoglobin predominates. All of the bruises in our study were between 48 and 72 hours old. In a recently published study, DeFatta et al4 reported maximum efficacy of PDL treatment for ecchymoses resulting from facial cosmetic procedures when the PDL therapy was performed between 5 and 10 days postoperatively. Our greater success in treating younger bruises may relate to different bruise causes. In our study, bruises were the result of either minor trauma or nonsurgical cosmetic procedures. Relative to bruising due to surgery, such bruising is typically more superficial and associated with less tissue inflammation and edema, both of which potentially impede laser energy absorption. Furthermore, we used higher fluences than DeFatta et al used (7.5 J/cm² vs 6 J/cm²).

In conclusion, this study demonstrates that the long-pulsed PDL can safely be used to improve ecchymoses. Further study will help to better define optimal laser parameters. This simple technique can help to alleviate the common stigma associated with cosmetic intervention by expediting healing.

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Author Contributions: All authors had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis. Study concept and design: Karen, Hale, and Geronemus. Acquisition of data: Karen, Hale, and Geronemus. Analysis and interpretation of data: Karen, Hale, and Geronemus. Drafting of the manuscript: Karen and Hale. Critical revision of the manuscript for important intellectual content: Hale and Geronemus. Administrative, technical, and material support: Karen, Hale, and Geronemus. Study supervision: Hale and Geronemus.

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VIGNETTES

Pre Tibial Lymphoplasmacytic Plaque in Children

Recently, Gilliam et al1 described 2 young patients with a persistent, reddish-brown pretibial plaque. Based on the presence of numerous polyclonal plasma cells in the infiltration, the authors proposed a diagnosis of isolated cutaneous plasmacytosis.

Report of a Case. Herein, we describe an 11-year-old girl with a 5-year history of a reddish-brown, uneven, irregular plaque, 4.0 × 2.5 cm in diameter, on the left anterior tibia. The lesion resembled clinically the entity described by Gilliam et al1 (Figure 1). It had been stable over the last 5 years, apart from a short-term, partial remission following intralesional steroid injections (performed before our observation).

Three biopsy specimens taken over a period of 8 months revealed different features. The first was characterized by small dermal granulomas admixed with lymphocytes and numerous plasma cells (Figure 2A). The 2 subsequent specimens showed features similar to those reported by Gilliam et al1 and were characterized by dense dermal lymphoid infiltrates admixed with numerous plasma cells, without granulomas (Figure 2B). The epidermis showed focal parakeratosis in all 3 biopsy specimens. Immunohistochemical analysis of the plasma cells revealed a polyclonal pattern of immunoglobulin light chain expression.

A mycobacterial infection was excluded by Mantoux test, QuantiFERON-TB Gold test (Cellestis Inc, Valencia, California), Fite stain, and polymerase chain reaction (PCR) for Mycobacterium tuberculosis, Mycobacterium avium, Mycobacterium intracellulare, mycobacteria other than tuberculosis, and a fresh tissue culture. Results of investigations for Bartonella henselae (PCR); Toxoplasma gondii (PCR and serologic analysis); leishmaniasis (Giemsa stain and serologic analysis); Treponema pallidum (immunohistochemical and serologic analysis); Borrelia burgdorferi, Borrelia afzelii, and Borrelia garinii (serologic analysis); and fungi (culture, fresh tissue culture, and periodic acid–Schiff stain) were all negative.

Comment. Primary cutaneous plasmacytosis typically presents with multiple, brownish-red macules and plaques on the trunk, mainly in Asian adult patients. Histologically, it is characterized by dense perivascular infiltrates

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