Hemangiomas are benign vascular malformations of childhood characterized histologically by endothelial proliferation and clinically by rapidly expanding erythematous nodules. The incidence in newborns is approximately 2% to 3%, making them the most common tumors of infancy. Hemangiomas are typically classified as superficial (cutaneous), deep (subcutaneous), or mixed (cutaneous and subcutaneous) and have a female to male predominance of 3 to 1.

Sixty to seventy percent of hemangiomas are localized to the head and neck. These tumors are characterized by a rapid proliferative phase lasting upward of 1 year followed by a spontaneous involution phase occurring in 50% of patients by 5 years of age and 90% of patients by 9 years of age.

Most hemangiomas do not require therapy; however, complications including ulceration, bleeding, and compression of vital structures occur in 40% of cases. These complications, as well as the fact that 50% of children will exhibit residual skin changes including dyspigmentation, atrophy, and redundant fibrofatty tissue after spontaneous lesional involution, often propel affected patients and their parents to seek medical intervention.

A multitude of treatments have been used to treat hemangiomas, including radiation, surgical excision and grafting, intralesional and systemic corticosteroids, and cryotherapy. Unfortunately, these treatments have been associated with excessive risks, including scarring and systemic side effects. Over the past 25 years, developments in laser technology have rendered vascular-specific pulsed dye laser irradiation of hemangiomas as the treatment of choice for many of these lesions. More recent technologic laser developments have provided another viable treatment alternative with high clinical efficacy and few adverse sequelae. Fractional photothermolysis, a process that creates microscopic treatment zones of coagulated tissue through delivery of discrete columns of thermal injury, has been used successfully to improve the skin surface texture in scars and rhytides. Fractional laser treatment was applied in the case of a residual hemangioma described below.

Case Report

An 18-year-old girl presented with fibrofatty tissue and redundant skin involving her midbrow and temple resulting from an extensive mixed hemangioma involving the entire right side of her head during infancy. The lesion underwent spontaneous resolution over the ensuing 10 years. She subsequently received pulsed dye laser treatment for residual surface telangiectasias and carbon dioxide (CO2) laser abrasion of the areas to improve the residual defects at the age of 13 years. Because of her continued dissatisfaction with the appearance of her skin, she presented for further evaluation and treatment.

After the skin areas were cleansed with mild soap and water, a topical anesthetic cream (LMX-5, Ferndale Laboratories, Ferndale, MI) was applied.
under plastic wrap occlusion for 60 minutes. Immediately prior to treatment, the cream was thoroughly removed with water-soaked gauze and the skin areas dried.

A fractionated 1,440-nm erbium-doped fiber laser (Fraxel, Reliant Technologies, Mountain View, CA) was applied to the wrinkled and hypertrophic skin in the glabellar and right temple areas using a 15-mm handpiece with an energy density of 25 J/cm² and density of 10. A total energy of 2.4 kJ was delivered after 8 to 10 successive laser passes. Concomitant cooling of the skin to maximize patient comfort was achieved with the use of a forced air device (Zimmer, Irvine, CA).

Immediately posttreatment, the skin appeared mildly erythematous and slightly edematous with noticeable tissue tightening (manifested by reduction of skin wrinkling and bulk flattening). The patient reported a mild sunburn sensation, but was otherwise comfortable. She was instructed to apply a thermal spring water mist (La Roche-Posay, France) at least twice daily, followed by a mild moisturizer (Toleriane, La Roche-Posay). The patient reported rapid healing of the areas with full resolution of erythema and swelling and no discernible peeling (but a feeling of dryness) within 4 to 5 days posttreatment.

One month thereafter, another (identical) fractional laser treatment was applied to the areas without sequelae. Marked clinical improvement of the skin areas was apparent 1 month after the treatment and was maintained at 6-months follow-up (Figure 2).

Discussion

Hemangiomas are characterized by a two-stage process of rapid growth and regression, often resulting in residual disfigurement that has been difficult to treat. While the use of various antiproliferative agents (corticosteroids, interferon) and treatments (radiation) can effectively slow the proliferative stage of growth and vascular-specific laser treatments can successfully reduce the erythematous component, little has been found to be cosmetically effective in ameliorating the residual disfiguring tissue hypertrophy of these lesions. As such, surgical extirpation with subsequent scar production has often been the only viable treatment option.

As this case report illustrates, remarkable skin texture improvement can be obtained with little to no postoperative risk when fractional laser skin treatment is applied. After each of the two fractional laser treatments, the skin surface showed progressive normalization of its texture markings and

![Figure 1. Wrinkled skin on the glabella and temple after pulsed dye laser and CO2 laser ablation at baseline (prior to fractional laser treatment).](image1)

![Figure 2. Noticeable improvement of skin texture 1 month after second 1,440-nm erbium-doped fiber laser treatment.](image2)
diminution of residual tissue bulk. Sensation and coloration of the treated skin remained intact.

Fractional laser photothermolysis should be considered when patients present with residual hemangiomas or skin redundancy. The resultant clinical effects can be achieved with minimal patient morbidity.

References


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