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ORIGINAL ARTICLE

Infantile Hemangiomas Treated by Sequential Application of Pulsed Dye Laser and Nd:YAG Laser Radiation: A Retrospective Study☆

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Abstract
Background and objectives: Infantile hemangiomas are the most common benign tumor in children. They have 3 phases of development: a proliferative phase, an involuting phase, and involution. Although active treatment is often not required, it is necessary in some cases. Of the possible treatments for hemangiomas, lasers have been shown to be effective in all phases of development. We report our experience with dual-wavelength sequential pulses from a pulsed dye laser and an Nd:YAG laser.
Material and methods: This was a retrospective, descriptive study of patients with infantile hemangioma in different phases of development treated with pulsed dye laser pulses followed by Nd:YAG laser pulses. Four dermatologists assessed the effectiveness of treatment on a scale of 10 to 0. Adverse effects and incidents related to treatment were recorded. The median and interquartile range were calculated as descriptive statistics. Pretreatment and posttreatment comparisons were performed using the Wilcoxon test.
Results: Twenty-two patients with hemangiomas in different phases of development were included. A statistically significant improvement was obtained both for the entire group and for different subgroups. Posttreatment events were reported in 4 patients, and included edema and ulceration, skin atrophy, and hyperpigmentation.
Conclusions: We believe that treatment with dual-wavelength light from a pulsed dye laser and a Nd:YAG laser is a viable treatment option for infantile hemangiomas when first-line therapies are ineffective or contraindicated.

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PALABRAS CLAVE
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Tratamiento láser

Hemangiomas infantiles tratados con aplicación secuencial de láser de colorante pulsado y Nd:YAG: estudio retrospectivo

Resumen

Introducción: Los hemangiomas infantiles son los tumores benignos más frecuentes en la infancia, presentando una fase proliferativa, una fase de involución y una fase residual. En muchas ocasiones no precisan de un tratamiento activo. No obstante, en algunos pacientes se impone la necesidad de un tratamiento. Entre las posibilidades terapéuticas ha demostrado utilidad, durante todas las fases evolutivas de la lesión, el tratamiento con láser. Comunicamos nuestra experiencia con el láser dual secuencial de colorante pulsado (LCP) y Nd:YAG.

Material y métodos: Se efectuó un estudio retrospectivo y descriptivo de los pacientes con hemangiomas infantiles en diversas fases evolutivas tratados con el láser dual de LCP y Nd:YAG. Cuatro dermatólogos valoraron el grado de efectividad en una escala del 10 al 0. Se recogieron los efectos adversos e incidencias relativas al tratamiento. En el análisis se utilizó para los valores descriptivos la mediana y el rango intercuartílico y la prueba de Wilcoxon para la comparación pre y postratamiento.

Resultados: Se recogieron 22 pacientes con hemangiomas en distintos estadios evolutivos, obteniéndose una mejoría estadísticamente significativa tanto en el conjunto de todos los pacientes como en los distintos subgrupos. Cuatro pacientes presentaron incidencias postratamiento: edema y ulceración, atrofia cutánea e hiperpigmentación.

Conclusiones: Consideramos que el láser dual de LCP y Nd:YAG puede ser una alternativa para el tratamiento de hemangiomas infantiles cuando las terapias consideradas de primera línea se muestran ineficaces o están contraindicadas.

Introduction

Infantile hemangiomas are the most common benign tumor in children, and their incidence is higher in girls and premature infants.[1–3] The tumors usually present as a single sporadic lesion, although multiple and familial forms are not uncommon. Infantile hemangiomas are vascular tumors, which are not usually present at birth but appear during the first weeks of life and grow rapidly over the following months (proliferative phase). The tumor then stabilizes and, after the child's first birthday, begins a slow, gradual regression that can last throughout childhood (involuting phase).[4,5] Although it is possible for infantile hemangiomas to regress completely, residual lesions of various types—atrophic scars, redundant fibrofatty tissue, yellowish discoloration, and telangiectasias—persist in a significant number of patients (involuted phase).

Fortunately, because of the benign course described above, most infantile hemangiomas (especially smaller ones and those located in non–cosmetically-sensitive areas) do not require treatment and can be managed by watchful waiting. The tumors should be monitored especially closely during the proliferative phase so that any complications that would necessitate active treatment—such as ulceration, pain, functional impairment, or the possibility of abnormal scarring and disfigurement—can be detected.

The treatment of infantile hemangiomas varies depending on the phase of development, site, and characteristics of the lesion and whether or not visceral involvement or comorbidities are present. Of the treatments currently available, oral propranolol is the first-line option because of its proven efficacy and good safety profile.[6–9] Other systemic treatments such as corticosteroids, bleomycin,[10] and interferon alfa are also used occasionally. Topical medications such as corticosteroids, β-blockers,[11,12] platelet-derived growth factor, and imiquimod[13] and various medical and surgical techniques such as sclerotherapy, cryotherapy, radiotherapy, electrocautery, and conventional surgery have also been shown to be useful. Laser treatment also plays an important role.

In this study, we present our experience with the treatment of hemangiomas in various phases of development using dual-wavelength sequential pulses from a pulsed dye laser (PDL) and a Nd:YAG laser (Cynergy Multiplex, Cynosure, Inc., Westford, MA, United States).

Materials and Methods

Study Population

This was a retrospective, descriptive, nonrandomized study of patients with infantile hemangiomas in different phases of development who were treated with dual-wavelength pulses from a PDL and a Nd:YAG laser in the laser department of Hospital Ramón y Cajal in Madrid, Spain, between May 2006 and July 2011. Patients with an incomplete clinical history or insufficient photographic documentation before or after the treatment were excluded.

Procedures

We informed the patients in detail of the likely benefits, risks, and potential complications of the treatment and about the other therapeutic alternatives available. Written