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Treatment of segmental lichen aureus in the pediatric age with a 755 nm alexandrite picosecond laser. A new therapeutic approach for pigmented purpuric dermatosis

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Introduction

Lichen aureus (LA) is a variant of pigmented purpuric dermatosis (PPD) characterized by rust macules with a lichenoid appearance. It usually appears in middle-aged adults, being rare during the pediatric age. It presents most often on the lower legs, with solitary lesions, although segmental distribution may occur [1]. Pigmented purpuric dermatosis treatment is challenging and is not standardized. Local corticosteroids and calcineurin-inhibitors, ascorbic acid, rutoside, colchicine, pentoxifylline and UV-therapy are the most commonly used treatments [2, 3]. We present a case of segmental LA treated with a 755 nm picosecond alexandrite laser, the first case of PPD in the scientific literature.

Patient and Technique

A 9-year-old boy presented with an asymptomatic linear pigmented lesion on the right leg (Figure 1a). Dermoscopic examination showed a coppery-red background pigmentation with focal areas of normal skin and twisted red loops. Parents declared that it had appeared two years previously after minor trauma with a football. Topical corticosteroids had been used in the past without any improvement. A 5 mm-punch biopsy

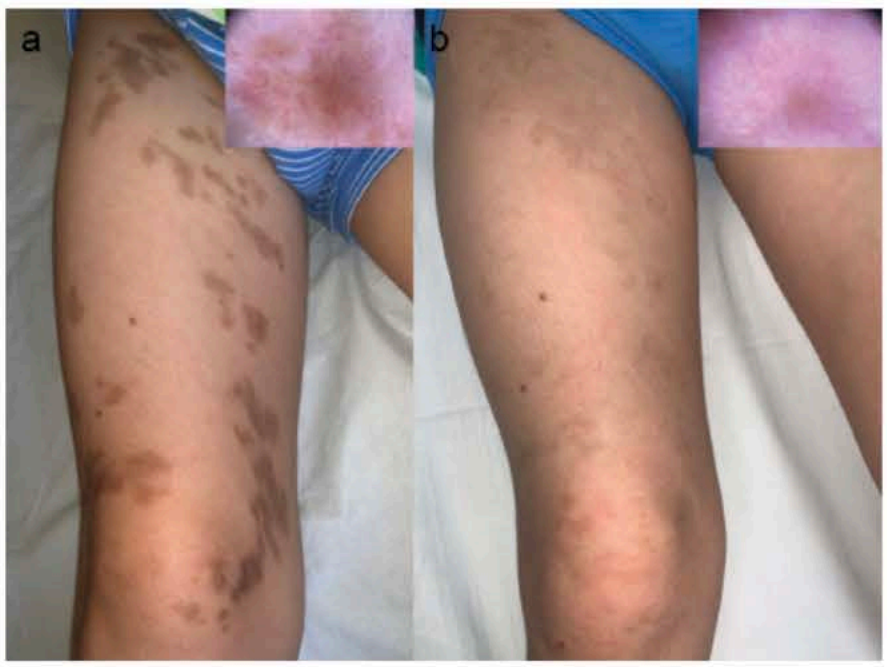

Figure 1 Clinical presentation. Brownish aggregated macules arranged in a linear fashion over the right leg of the patient. Dermoscopy shows a coppery-red background pigmentation and twisted red loops at the edges of the pigmentation. Some skin-colored areas are present (a). Clinical response after four sessions of a 755 nm alexandrite picosecond laser. A clearance rate of more than 75 % of the lesion is present. Dermoscopy shows a marked improvement of both pigmented and vascular components (b).

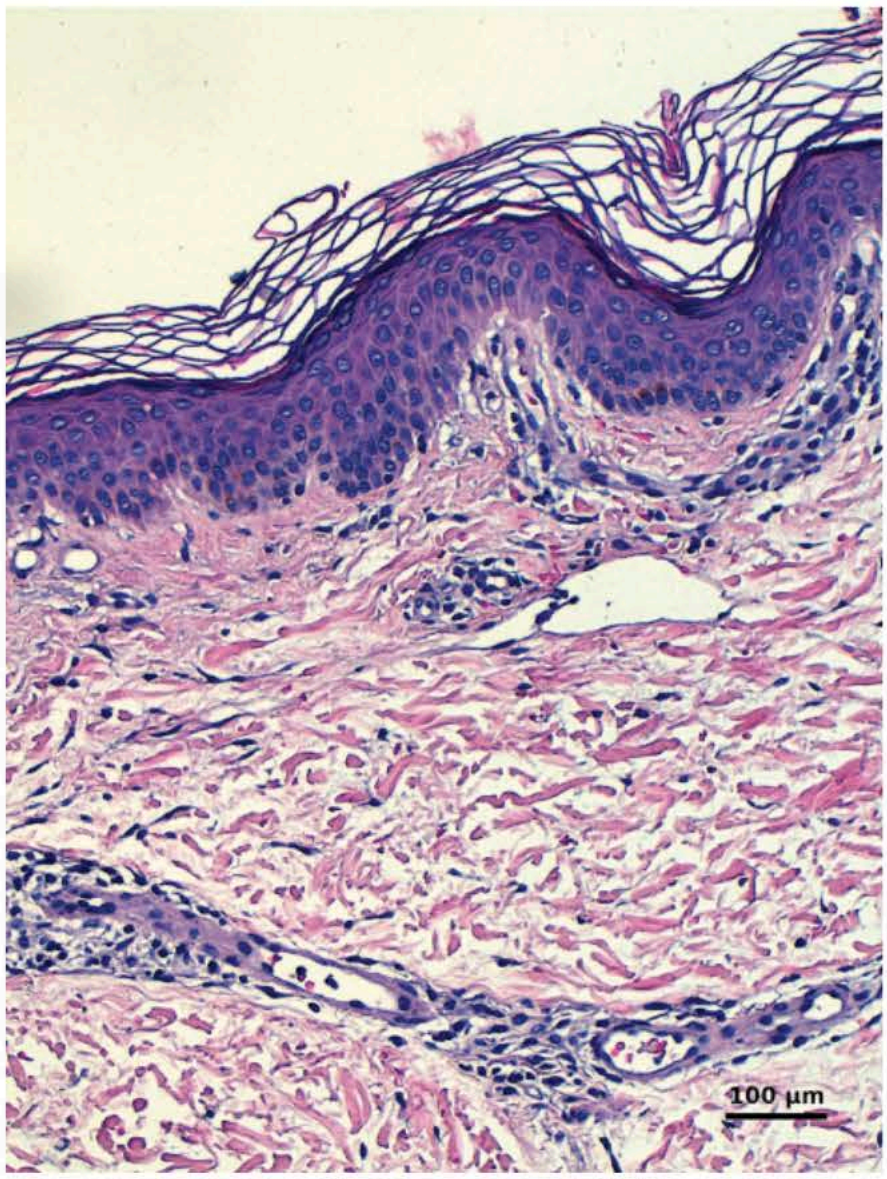

Figure 2 Histologic examination shows a lymphocytic and histiocytic infiltrate surrounding dermal vessels and erythrocyte extravasation. A vacuolar degeneration of the basal membrane is present in some areas.

was performed. Histology showed a lymphohistiocytic infiltrate surrounding dermal vessels, hematic extravasation and focal areas of basal vacuolar changes (Figure 2). Clinicopathological correlation was consistent with segmental LA.

The patient was treated with a 755 nm picosecond alexandrite laser (Picosure®, Cynosure, Westford, MA, USA) using a 4 mm spot and a fluency of 3.5 J/cm^2 with a clinical endpoint of epidermal "frosting". A topical mixture of lidocaine 2.5 % and prilocaine 2,5 % was applied under occlusion for one hour and then cleansed with aqueous chlorhexidine solution. After each procedure, topical fusidic acid was prescribed twice daily for seven days. After four sessions, more than 75 % of clinical improvement was present (Figure 1b). All the procedures were well tolerated by the patient with minimal discomfort. No recurrence was noted after six months follow-up.

Discussion

Although LA is usually confined to a small area, several reports of segmental LA exist in the scientific literature [1, 4, 5], including pediatric cases [6, 7]. Lichen aureus histologic analysis is characterized by a lichenoid lymphocytic infiltrate with a grenz zone and extravasated erythrocytes. However, LA may not only manifest with lichenoid features, but also perivascular, spongiotic or a mix [8]. Unilateral linear capillaritis (ULC) is a rare variant of PPD that mainly affects young adult or teenage males. Like other PPDs it can spontaneously disappear [5], and has been related with vascular factors (such as local venous stasis) and drugs [9]. There is controversy whether ULC is a separate entity or represents a variant form of LA. To the best of the authors' knowledge, ULC represents a segmental LA variant that may show subtle, unspecific histologic features, similar to the present case.

Dermoscopic features of PPD mainly include coppery-red background pigmentation, a network of interconnected brown lines, linear vessels, twisted red loops and round to oval red or brown dots [10]. It can be used as an auxiliary tool to improve the accuracy of the clinical diagnosis and to help differentiate between other entities such as nummular eczema. The typical coppery-red background corresponds with the dermal infiltrate of lymphocytes and histiocytes, extravasation of red cells and hemosiderin deposit [11].

PUVA and nbUVB (UVB-narrowband) treatments have been widely used for PPDs in both pediatric patients and adults, with potential therapeutic effects and a good safety profile. Full remission after treatment is expected, although some cases of clinical relapse have been described during dose-reduction or after conclusion of treatment [12]. UV-therapy is believed to work because of its immunomodulatory effects on T-cell activity. 595 nm PDL has been reported in small case series in both Schamberg's disease and lichen aureus with a good clearance rate. Intense pulse laser (IPL) has been used in both entities, alone and as photodynamic therapy (PDT) in combination with 20 % topical aminolevulinic acid (ALA). Fractional non-ablative 1,540 nm erbium glass laser has also been tried in three cases of Schamberg's disease with complete clearance [3].

Laser and light-based therapies appear to be a promising tool for the treatment of PPDs. The laser of choice will depend on the PPD subtype and clinical presentation. In this case, we decided to use the 755 nm picosecond alexandrite laser because of the marked pigmentary component of the lesion. The primary mechanism of action of picosecond lasers is based on a photomechanical effect, rather than a thermal effect. Consequently, it produces less damage to surrounding tissues and has a lower risk of post-inflammatory hyperpigmentation [13]. The 755 nm laser should be considered if a brownish or dark pigmentation is present, as in LA. Laser therapies also exhibit anti-inflammatory properties [13] that could play a role in the treatment of PPDs. In addition, laser therapies can be safely used in the pediatric age. Further

studies are needed to elucidate the optimum parameters and to compare it with other light-based therapies.

Conflict of interest

None.

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