CASE REPORT
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Effective Topical Combination Therapy for Treatment of Lichen Striatus in Children: A Case Series and Review

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ABSTRACT

Lichen striatus (LS) is an uncommon linear dermatosis that is primarily seen in children from 4 months to 15 years of age. While some of these eruptions are asymptomatic, others can be quite pruritic. In darker-skinned individuals, post-inflammatory hypopigmentation can be significant and may provide a cause for concern for the patients and/or their parents. In our case series of 4 patients, we observed rapid resolution of LS by combining a topical retinoid with a topical steroid. To our knowledge, this is the first report of successful treatment with this kind of combination therapy in the English literature. The patients not only achieved satisfying cosmesis, but also complete resolution of their pruritus. The most common side effect of topical tazarotene is localized irritation at treatment sites, but the patients in this particular series tolerated the treatment well.

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INTRODUCTION

Lichen striatus (LS) is an uncommon linear dermatosis primarily seen in children between the ages of 4 months and 15 years. Typically, the lesions consist of pink, red, or flesh-colored flat-topped lichenoid papules arranged linearly, often along the lines of Blaschko. Lesions are usually solitary, but rare cases of multiple lesions distributed bilaterally have been reported.[1-3] Lesions occur most often on the limbs, and, less frequently, on the trunk or face.[4] Lichen striatus develops at a higher frequency in children with a personal or family history of atopy.[5] While some of these eruptions are asymptomatic, others can be quite pruritic. Reports of associated pruritus range from 11% to 34%.[5-6] Although LS is usually self-limited, it may last up to 1 to 2 years. Treatment is considered elective for either symptomatic or cosmetic concerns.[7] While topical steroids are considered first-line therapy for relief of pruritus, they have not had significant effects on modulating the course or duration of LS.[6] In darker-skinned individuals, post-inflammatory hypopigmentation can be significant, and may provide a cause for concern for the patients and/or their parents.

Retinoids have proven to be a successful therapy for treatment of a variety of cornification disorders and are known to modulate keratinocyte proliferation and differentiation.[8] In this report, we will provide a case series of LS treated with a combination of a topical steroid and a topical retinoid. In our experience, the addition of a topical retinoid shortens the duration of the treatment and leads to earlier resolution, when compared to treatment with a topical steroid alone. This combination of topical agents also appears to be effective in improving postinflammatory dyspigmentation in patients with darker skin. The most common side effect of the treatment is mild irritation.

CASE REPORT

Case 1

An African-American girl, aged one year, presented with a linear, papular dermatitis involving the lower chin and right cheek. The rash had been present for about 2 weeks, and the onset was insidious without any known trigger. This had initially been treated with hydrocortisone and nystatin, with little improvement. Exam revealed monomorphic, 2 mm to 3 mm inflammatory papules in a Blaschkoid distribution extending from the right infraorbital area to the right buccal cheek, submandibular area, and lateral neck (Figure 1). There was minimal scale, but no crusting, erosion, or evidence of excoriation. The patient was diagnosed with inflamed LS, and desonide 0.05% ointment and tazarotene 0.05% cream were prescribed to be mixed and applied twice daily. At her 2-month follow-up visit, the patient's mother reported that within 2 weeks of starting the treatment, the LS had resolved almost completely. The treatment was subsequently discontinued, and follow-up exam revealed minimal residual hypopigmentation following Blaschko's lines on the lower chin, extending to the neck and postauricular area (Figure 2).

Case 2

An African-American boy, aged 4 years, presented with a 2 to 3-year history of an eruption that began on the right mid-back. Over time, it had progressed to involve a wide area on the back, as well as the right neck, cheek, arm, and hand. While this eruption had remained asymptomatic, the patient's mother was concerned about the increasing discoloration on his face. Examination revealed multiple-grouped, hypopigmented macules and flat-topped papules without erythema or scale in a Blaschkoid distribution. The patient was initially diagnosed with Blaschkoid hypomelanosis, with differential diagnoses

FIGURE 1. A 1-year-old African-American girl presented with acute onset of a linear, papular eruption involving the lower chin and right cheek.

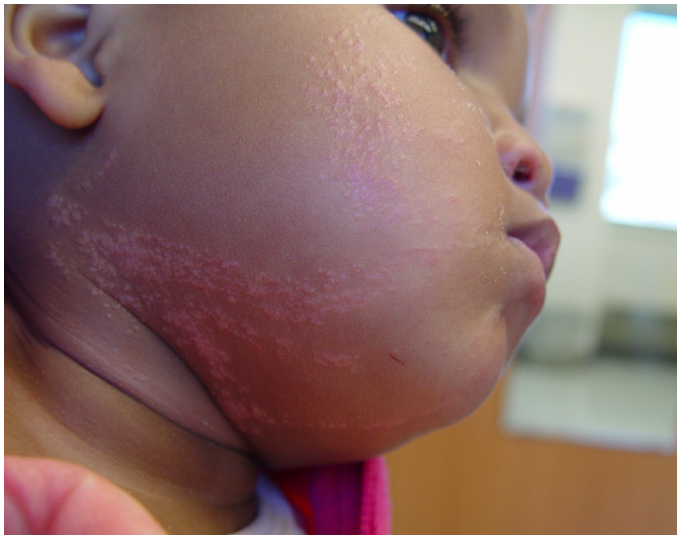


FIGURE 2. Minimal residual hypopigmentation on the right cheek at 2-month follow up following topical treatment with desonide 0.05% ointment and tazarotene 0.05% cream.

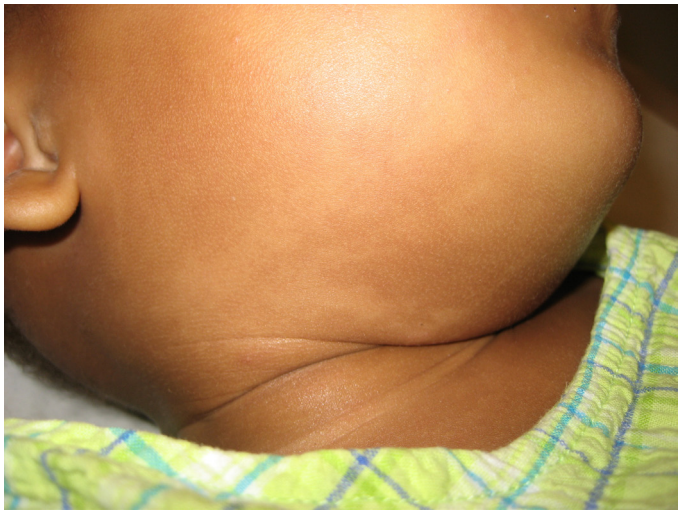
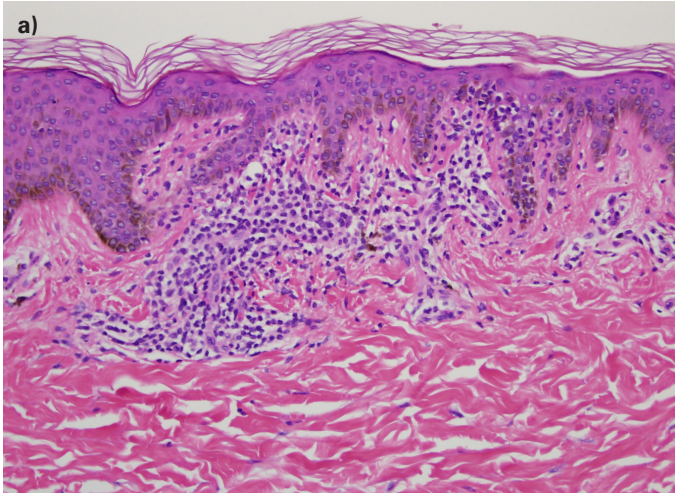
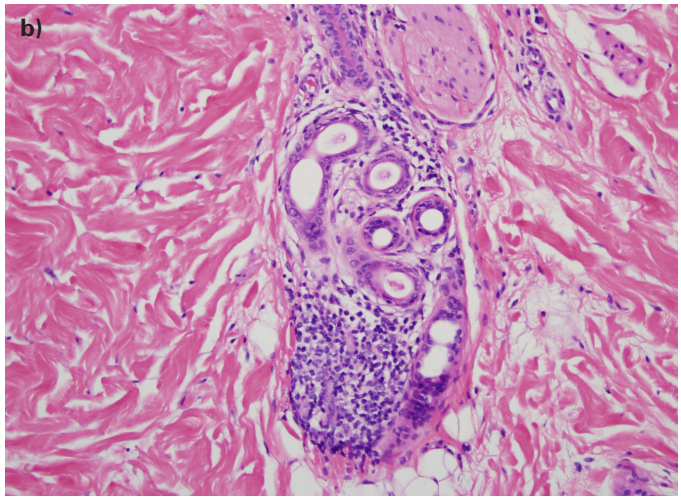


FIGURE 3. Lymphoid and lichenoid infiltrates on biopsy of a patient with a 2 to 3-year history of linear cutaneous eruption following a Blaschkoid distribution. The characteristic findings on histology support the diagnosis of LS. **a)** 20x magnification; **b)** 20x magnification demonstrating adnexal infiltrate.





including hypomelanosis of Ito, epidermal nevus, LS, and less likely, lichen planus. A 4 mm punch biopsy revealed lichenoid spongiotic dermatitis with focal inflammatory infiltrates around eccrine glands and mild papillomatosis (Figure 3). Therefore, LS was the most likely diagnosis. Although early-stage linear epidermal nevus may have similar histologic findings, this condition is usually progressive and recalcitrant to topical treatment. Tazarotene cream and desonide ointment were prescribed for application to the lesions on the right face and right upper extremity. At the 2-month follow-up visit, the patient showed noticeable improvement at the treated sites, with minimal hypopigmentation along the right jaw and several residual confetti-like hypopigmented macules on the right malar cheek. Overall, there was less pigment change compared to the surrounding area. The previous linear, hypopigmented streak on the right arm improved markedly and was no longer palpable.

Case 3

A Caucasian boy, aged 7 years, presented with a 1-year history of changes in the nailbed of his right middle finger. Initially, his parents had attributed these changes to trauma, but over the following several months, the patient also developed linear erythematous patches with flat-topped papules on the dorsal hand extending to the adjacent ring finger. The patient complained of pruritus and irritation. With use of 1% hydrocortisone for over 2 months, little improvement was noted. Fluocinolone 0.025% ointment and tazarotene 0.1% gel were prescribed to be

TABLE 1.

Summary of Case Reports and Case Series of Various Topical Treatments for Lichen Striatus (LS)

Authors	Age (years)	Topical Treatment(s)	Treatment Duration (weeks)	Response
Patrizi et al.	36/115 pts age 0.2 to 10	Low- to mid-potency topical steroids	Not specified	No decrease in duration of inflammation or postinflammatory hypopigmentation
Kus S, Ince U	30	Pimecrolimus 1%	3	Complete resolution
Saez-Rodriguez et al.	43	Pimecrolimus 1%	2	Residual hyperpigmentation
Campanati et al.	**A.** 24 **B.** 75 **C.** 25	Pimecrolimus 1%	**A.** 6 **B.** 3 **C.** 3	**A.** Complete remission, itch resolution **B.** Complete remission **C.** Complete remission, itch resolution
Vukićević et al.	11	Tacrolimus 0.03%	7	Improvement in 3 weeks; cleared at 7 weeks
Fujimoto et al.	22	Tacrolimus 0.1%	6	Largely improved in 2 weeks, cleared in 6 weeks
Kim et al.	3	Tacrolimus 0.03%	12	Cutaneous lesion and nail dystrophy were almost cleared
Jo et al.	**A.** 6 **B.** 3	Tacrolimus 0.03%	**A.** trunk 4; extremity 12 **B.** 12	**A.** Trunk: cleared in 1 month Extremity: Regression in 3 months **B.** Improved in 1 week, cleared by 3 months
Ciconte et al.	**A.** 19 **B.** 40	A. Calcipotriol ointment B. Clobetasol propionate ointment + calcipotriol ointment and intralesional triamcinolone	24	**A.** Cleared **B.** Cleared

mixed and applied to the affected area once or twice daily, as tolerated. At 2-month follow-up, the cutaneous lesions over the left 3rd and 4th fingers had cleared completely. The ridge over the nail plate persisted. Nail glue was suggested to minimize incidental trauma. The patient reported that all discomfort had resolved soon after treatment was initiated.

Case 4

A Caucasian boy, aged 2 years, presented with a history of atopic dermatitis since infancy. His mother noted that he had developed an itchy area on his right arm 4 to 5 months prior to the appointment. This had initially been treated with triamcinolone, without improvement. Examination revealed a linear streak of lichenified, flat-topped papules coalescing into a plaque on the right lateral upper extremity. This distribution was recognized as a Blaschkoid pattern, and the patient was diagnosed with LS. Fluocinonide 0.05% ointment and tazarotene 0.05% cream were prescribed, to be mixed and applied to the affected area twice daily. At his 2-month follow-up visit, a residual hypopigmented patch was noted along the lines of Blaschko on the right lateral upper extremity. Within the hypopigmented patch, there were a few mildly erythematous, thin plaques with minimal scale. Both the erythema and the extent of the plaque had improved. The parents reported that the pruritus in that area appeared to have resolved, as well.

DISCUSSION

Lichen striatus is an uncommon condition for which no clear, effective treatment has been established. In most cases, LS is self-limited, and usually lasts up to 1 to 2 years. Observation is a common approach, especially when the lesions are asymptomatic. Patients are more likely to seek treatment if the lesions are pruritic, located in a cosmetically sensitive area, or cause other cutaneous problems, such as nail fragility. The existing English-language literature on the treatment of LS is limited. Topical steroids are the most commonly employed class of agents when the lesions are inflamed and/or pruritic. There are conflicting reports about whether topical steroids shorten the duration of the lesions. In a retrospective study of 115 children with LS, Patrizi et al. did not note any shortening of the duration of either the inflammatory stage of LS or the duration of the postinflammatory hypopigmentation in patients treated with topical steroids as compared to those who were not treated.[6] There have been several case reports and case studies of LS treated with calcineurin inhibitors, as well as a case series of treatment with calcipotriol +/- the addition of topical and intralesional steroids. The results of these treatments are varied, as shown in Table 1.[6, 9-16]

In this case series, we observed rapid resolution of LS by combining a topical retinoid with a topical steroid. To our knowledge, this is the first report of successful treatment with this kind of combination therapy in the English-language literature. The patients not only achieved satisfying cosmesis, but also complete resolution of their pruritus. The most common side effect of topical tazarotene is localized irritation at treatment sites, but the patients in this particular series tolerated the treatment well. The tolerability of the treatment may be due to using the topical steroid in combination with the retinoid, as the steroid may minimize local irritation. The use of topical tazarotene in children under 12 years of age is off-label, as the safety and efficacy have not been determined in

this patient population in large-scale evidence-based studies. However, the safety and efficacy of topical tazarotene have been demonstrated in many case-based studies.[17-20] Systemic retinoids, on the other hand, have been used successfully to treat ichthyosiform disorders during the first decade of life.[21] While systemic retinoids are effective, they can be associated with serious adverse effects, thus limiting their use in children.[17] Risk of systemic absorption was highly unlikely in our case series, due to only localized application.

CONCLUSION

This case series has demonstrated the efficacy and tolerability of tazarotene treatment of LS in the pediatric population for the first time. In this report, we specifically reviewed patients with recalcitrant disease that did not respond to topical steroid therapy alone. The results were reproducible in nearly all patients using this combination regimen. While it is difficult to completely prevent the hypopigmented sequelae, the duration and severity of the disease can be improved markedly. In our experience, early treatment with these agents helps limit the progression of LS, and thereby further improves cosmesis. Ideally, a placebo-controlled, randomized study would be helpful to confirm the superior efficacy of the combination treatment as delineated in this study.

DISCLOSURES

The authors have disclosed no relevant conflicts of interest.

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