

# Erosive Pustular Dermatitis of the Scalp

## Treatment With Topical Tacrolimus

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The Cutting Edge: Challenges in Medical and Surgical Therapeutics

### REPORT OF CASES

#### CASE 1

A 65-year-old man had an 8-year history of erosive, pustular, and atrophic lesions on his alopecic scalp (**Figure 1**). The lesions developed since 1992, after treatment of actinic keratoses by topical fluorouracil and local trauma. Histologic examination of a skin biopsy specimen revealed an ulcerated atrophic epidermis with parakeratosis; a chronic inflammatory dermal infiltrate composed of lymphocytes, macrophages, and neutrophils; and a complete absence of hair follicles. Results of direct immunofluorescence microscopy and microbiologic examination were negative. Blood zinc level was within normal limits, and serum immunoelectrophoresis did not show a monoclonal gammopathy. No evidence for an underlying systemic disease was found to suggest superficial pyoderma gangrenosum. The diagnosis of erosive pustular dermatosis of the scalp (EPDS) was then made. The patient had been treated in 1993 with a 1-year course of topical 0.05% retinoic acid, and thereafter with a 5-month course of 30-mg/d oral isotreti-

noin, which resulted in worsening of the lesions. Furthermore, a 2-month trial with 100 mg/d of oral sulfapyridine was ineffective. From 1995 to 1999, repeated applications of potent topical corticosteroids (clobetasol propionate and mometasone furoate) improved the skin disease, but also increased the skin atrophy (**Figure 2**), with erythema and telangiectasias.

#### CASE 2

A 55-year-old man presented in 2001 with extensive actinic keratoses of his alopecic and sun-damaged scalp. From 1998 to 1999, he underwent several courses of topical fluorouracil and ablative treatment with an ultrapulse carbon dioxide laser. After laser therapy, the treated area developed an inflammatory reaction with a wide, erosive, pustular, crusted, and atrophic eruption. The lesions persisted for 2 years with regular flares, without any response to topical or systemic antibiotic therapy. General clinical examination was normal, and complete blood cell count was within normal limits. The diagnosis of EPDS was clinically made, and no skin biopsy was performed.



**Figure 1.** Atrophic, pustular, erosive, and crusted lesion of the scalp of patient 1.



**Figure 2.** Patient 1. After 4 years of treatment with topical clobetasol propionate or mometasone furoate, partial control of the eruption and worsening of the skin atrophy are observed.

## THERAPEUTIC CHALLENGE

Erosive pustular dermatosis of the scalp is a rare chronic disease with extensive pustular lesions, erosions, and crusting of the scalp, leading ultimately to scarring alopecia.<sup>1,2</sup> Response of EPDS to therapy has been variable and different treatment regimens have been tried, including topical or systemic antibiotics, oral isotretinoin, zinc sulfate or aspartate, and dapsone.<sup>3-5</sup> Topical potent corticosteroids have been reported to be the most effective therapy of this disease.<sup>3</sup> However, there is a major risk of worsening atrophy of the treated skin after prolonged use.

## SOLUTION

Daily application of topical 0.1% tacrolimus ointment was started in both patients. This treatment resulted in a significant improvement of the first patient's lesions within 2 weeks. Scarring and atrophic lesions were almost resolved after 6 months of topical tacrolimus use (**Figure 3**). Thereafter, the applications were progressively tapered to 3 times a week, without any recurrences after 1 year.

In the second patient, a prompt response to daily application of topical 0.1% tacrolimus ointment was observed after 2 days. To improve the atrophic condition of this sun-damaged scalp, daily application of topical 0.05% retinaldehyde cream (Ystheal) was added 2 weeks later, but after 1 week of use, the latter was stopped because of lesion relapse. Disappearance of the pustular and erosive lesions was observed within 1 month. After 8 months of therapy, a recovery of the skin atrophy was observed.

## COMMENT

Erosive pustular dermatosis of the scalp is a rare condition, with approximately 40 cases reported.<sup>4</sup> The disease is characterized by the development of sterile pustular lesions with a nonspecific inflammatory reaction of the scalp, which appears to be distinct from folliculitis decalvans, pyoderma gangrenosum, or cicatricial pemphigoid.<sup>1,2</sup> Erosive pustular dermatosis of the scalp typically develops in long-standing atrophic sun-damaged skin changes.<sup>3</sup> Local trauma to this atrophic skin acts as a triggering factor. Erosive pustular dermatosis of the scalp occurs rarely after the treatment of actinic keratoses or squamous cell carcinoma by x-ray radiation therapy, skin grafting, fluorouracil cream, or topical tretinoin.<sup>1,3-8</sup> Our second patient is, to our knowledge, the first case of EPDS observed after resurfacing carbon dioxide laser therapy.

The pathophysiological mechanisms of this inflammatory process remain unclear. Histologic features are not specific, with a spectrum of inflammatory changes involving epidermis and dermis, ulceration, atrophy, or hyperkeratosis and reduced number or absence of hair follicles.<sup>8</sup> Microorganisms found in EPDS probably represent a secondary colonization rather than primary infection.<sup>3</sup> It should be noted that an erosive pustular eruption has also been reported on legs of patients with



**Figure 3.** Patient 1. After 6 months of daily topical 0.1% tacrolimus ointment application, complete resolution of the eruption is observed with a significant improvement of the atrophic condition.

atrophic skin associated with chronic venous insufficiency.<sup>9</sup> These observations suggest that this inflammatory reaction results from ineffective wound healing process in an atrophic skin.

Potent topical corticosteroids have been widely used in EPDS with a variable and inconstant response.<sup>3</sup> Nevertheless, the prolonged use of potent topical corticosteroids on atrophic skin may be deleterious. Topical tacrolimus is a potent anti-inflammatory and immunosuppressive molecule, which has been shown to be effective in the management of chronic inflammatory skin diseases, such as atopic dermatitis.<sup>10</sup> Topical tacrolimus is devoid of many side effects of topical corticosteroids such as epidermal atrophy, striae-distensae, or telangiectasia. However, there is concern about potential cutaneous carcinogenic effects associated with its long-term use on UV radiation-exposed skin,<sup>11</sup> similar to those reported with systemic tacrolimus in transplant recipients.<sup>12,13</sup>

Topical tacrolimus has been very effective in our 2 patients, with rapid control of the inflammatory process and an improvement of the atrophic condition. Our 2 observations strongly suggest that topical tacrolimus constitutes a novel therapeutic alternative for EPDS. However, neoplastic changes has been reported in EPDS.<sup>14</sup> In the absence of data about a potential carcinogenic effect of this drug after long-term use on photodamaged skin, those patients should be carefully followed up, especially after tacrolimus treatment.

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## REFERENCES

1. Pye RJ, Peachey RD, Burton JL. Erosive pustular dermatosis of the scalp. *Br J Dermatol.* 1979;100:559-566.
2. Burton JL, Peachey RD, Pye RJ. Erosive pustular dermatosis of the scalp—a definition. *Br J Dermatol.* 1988;119:411.

3. Trueb RM, Krasovec M. Erosive pustular dermatosis of the scalp following radiation therapy for solar keratoses. *Br J Dermatol*. 1999;141:763-765.
4. Ena P, Lissia M, Doneddu GM, Campus GV. Erosive pustular dermatosis of the scalp in skin grafts: report of three cases. *Dermatology*. 1997;194:80-84.
5. Drouin CA, Cloutier RA. Recurrence of erosive pustular scalp dermatosis after a skin graft [in French]. *Ann Dermatol Venerol*. 1999;126:335-338.
6. Layton AM, Cunliffe WJ. Erosive pustular dermatosis of the scalp following surgery. *Br J Dermatol*. 1995;132:472-473.
7. Rongioletti F, Delmonte S, Rossi ME, Strani GF, Rebora A. Erosive pustular dermatosis of the scalp following cryotherapy and topical tretinoin for actinic keratoses. *Clin Exp Dermatol*. 1999;24:499-500.
8. Grattan CE, Peachey RD, Boon A. Evidence for a role of local trauma in the pathogenesis of erosive pustular dermatosis of the scalp. *Clin Exp Dermatol*. 1988;13:7-10.
9. Bull RH, Mortimer PS. Erosive pustular dermatosis of the leg. *Br J Dermatol*. 1995;132:279-282.
10. Kang S, Lucky AW, Pariser D, Lawrence I, Hanifin JM. Long-term safety and efficacy of tacrolimus ointment for the treatment of atopic dermatitis in children. *J Am Acad Dermatol*. 2001;44:S58-S64.
11. Bieber T. Topical tacrolimus (FK 506): a new milestone in the management of atopic dermatitis. *J Allergy Clin Immunol*. 1998;102:555-557.
12. Otley CC, Pittelkow MR. Skin cancer in liver transplant recipients. *Liver Transpl*. 2000;6:253-262.
13. Naldi L, Fortina AB, Lovati S, et al. Risk of nonmelanoma skin cancer in Italian organ transplant recipients: a registry-based study. *Transplantation*. 2000;70:1479-1484.
14. Lovell CR, Harman RR, Bradfield JW. Cutaneous carcinoma arising in erosive pustular dermatosis of the scalp. *Br J Dermatol*. 1980;103:325-328.

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