

Correspondence

Successful treatment of disseminated superficial actinic porokeratosis with calcipotriol

Editor,

Disseminated superficial actinic porokeratosis (DSAP) is the most common type of porokeratosis. It is related to sun exposure and an autosomal dominant inheritance pattern is recognized. No ideal treatment of this clonal disorder of keratinization exists.¹ We describe a patient in whom the complete resolution of lesions was achieved with topical treatment with the vitamin D₃ analog calcipotriol. Thus we add more evidence on the efficacy of calcipotriol to the literature.

We present a 73-year-old Caucasian woman with a 5-month history of lesions on her lower legs. No subjective complaints were reported. Family history was negative. The patient had no medical history of immunosuppression, x-ray treatment, or arsenic intake. Extensive sun exposure was evident.

On physical examination, multiple red-brown, annular macules were seen to be evenly distributed on the front and lateral surfaces of the lower legs (Fig. 1). Close examination showed central atrophy and an elevated hyperkeratotic ridge. Some scaly plaques were observed on the forearms.

A punch biopsy specimen taken from the keratotic border disclosed the characteristic cornoid lamella, as well as atrophy of the epidermis, flattening of the rete

ridges, and absence of the granular layer. Perivascular lymphocytic infiltrate was present in the upper dermis (Fig. 2).

In accordance with the clinical presentation and histological findings, DSAP was diagnosed. Topical treatment with calcipotriol 0.005% cream twice daily for 3 months was started with excellent therapeutic outcome. At follow-up 6 months later, the patient was free of lesions.

Disseminated superficial actinic porokeratosis was first described by Chernosky and Freeman,² since then various treatment options have been described but are poorly standardized. There is a lack of controlled studies and therapy is usually empiric. It encompasses potent topical steroids, keratolytics, topical retinoids, topical 5-fluorouracil, imiquimod 5%, anthralin, cryotherapy, carbon dioxide laser, pulsed dye laser, curettage, excision, dermabrasion, and oral retinoids. A summary of therapeutic regimens for DSAP, together with their advantages and disadvantages, is given in Table 1.

Treatment with calcipotriol and another vitamin D₃ analog, tacalcitol, has been rarely reported.³⁻⁵ Vitamin D₃ analogs induce genes critical for keratinocyte differentiation, such as transglutaminase or involucrin.⁶



Figure 1 Multiple brownish annular, plaques distributed evenly on the lower legs. Close inspection of lesions revealed central atrophy with an elevated keratotic border

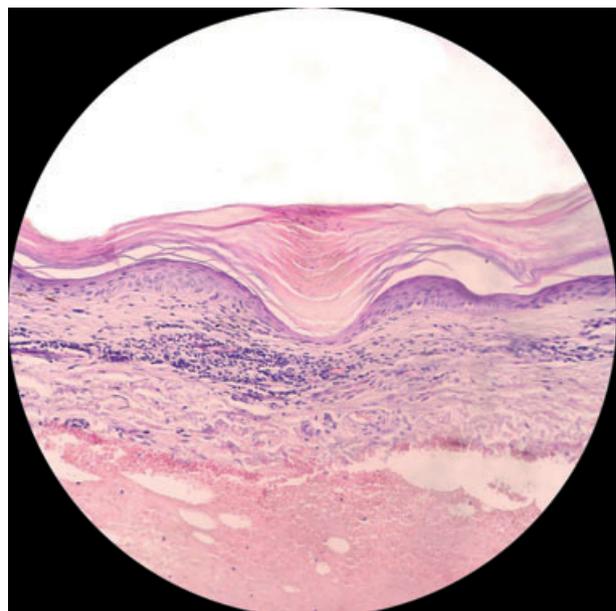


Figure 2 Histology showed the typical cornoid lamella. (Hematoxylin and eosin stain; original magnification $\times 100$)

Table 1 Treatment options for disseminated superficial actinic porokeratosis

Treatment modality	Drug/treatment option	Advantages	Disadvantages	References
Topical	Potent steroids	Relief of pruritus	Low clearance rate	McDonald & Peterka ¹¹
	Keratolytics	Reduce hyperkeratosis and roughness	No effect on erythema and pigmentation	Chernosky & Freeman ²
	5-Fluorouracil	Simple	Occlusion	Shelley & Shelley ¹²
			Long treatment course	
			Recurrence	
	Calcipotriol	Simple	Side-effects (irritation, pigmentation, ulceration)	Harrison & Stollery ³
		Cost-effective	Insufficient data	
	Imiquimod 5% cream	Simple	Strong inflammatory reactions	Ahn <i>et al.</i> ¹³
			Expensive	
	Diclofenac 3% gel	Simple	No benefit	Vlachou <i>et al.</i> ⁹
Systemic	Retinoids	Most reproducible results	Without longterm remission	Hacham-Zadeh & Holubar ¹⁴
			Side-effects	
Procedural	Cryotherapy	Few complications	Pretreatment may be needed to remove the hyperkeratotic border	Derehi <i>et al.</i> ¹⁵
		Simple	Scar formation	
		High percentage of cure		
		Low cost		
		Short treatment period		
	ALA-PDT	Field treatment	No benefit	Nayeemuddin <i>et al.</i> ¹⁰
		Short treatment period		
	CO ₂ laser		Scarring	Barnett ¹⁶
			Hypopigmentation	
			High cost	
	Pulsed dye laser	Cosmetic improvement	High cost	Alster & Nanni ¹⁷
	Dermabrasion		Variable degree of success	Campbell & Voorhees ¹⁸
			Scarring	
			Hypopigmentation	
	Excision	Required if any suspicion of malignant degeneration occurs	Not useful for multiple lesions	Shelley & Shelley ¹²
			Scarring	

ALA-PDT, aminolevulinic acid with photodynamic therapy

They may also inhibit proliferation by inducing sphingomyelin hydrolysis and modulation of protein kinase C activity.⁷ The significant effect of both vitamin D₃ analogs suggests that keratinocytes present in the lesional skin in DSAP express functional vitamin D₃ receptors.

By contrast, immunohistochemical studies show that keratinocytes beneath and central to the cornoid lamella in DSAP stain in patterns similar to those of squamous cell carcinoma and actinic keratosis, respectively. The good response of DSAP to calcipotriol raises the question of whether porokeratosis is a result of faulty maturation of keratinocytes or an increased rate of proliferation.⁸ In addition, the poor effects of photodynamic therapy with aminolevulinic acid (ALA-PDT) and 3% diclofenac gel confirm that DSAP does not have much in common with actinic keratosis in terms of its pathophysiology.^{9,10}

Ilko Bakardzhiev, MD PhD
Department of Dermatology and Venereology
Resort Clinic
Varna
Bulgaria

Svetlana Kavaklieva, MD
Georgy Pehlivanov, MD PhD
Department of Dermatology and Venereology
Faculty of Medicine
University of Sofia
Sofia
Bulgaria
E-mail: kavaklieva@abv.bg

Conflicts of interest: None.

doi: 10.1111/j.1365-4632.2010.04704.x

References

- 1 O'Regan GM, Irvine AD. Porokeratosis. In: Wolff K, Goldsmith L, Katz S, eds. *Fitzpatrick's Dermatology in General Medicine*, 7th edn. New York, NY: McGraw-Hill 2008; 442-447.
- 2 Chernosky ME, Freeman RG. Disseminated superficial actinic porokeratosis (DSAP). *Arch Dermatol* 1967; 96: 611-624.
- 3 Harrison PV, Stollery N. Disseminated superficial actinic porokeratosis responding to calcipotriol. *Clin Exp Dermatol* 1994; 19: 95-96.
- 4 Thiers BH. The use of topical calcipotriene/calcipotriol in conditions other than plaque-type psoriasis. *J Am Acad Dermatol* 1997; 37: 69-71.
- 5 Böhm M, Luger TA, Bonsmann G. Disseminated superficial actinic porokeratosis: treatment with topical tacalcitol. *J Am Acad Dermatol* 1999; 40: 479-480.
- 6 Bikle DD. Vitamin D: a calciotropic hormone regulating calcium-induced keratinocyte differentiation. *J Am Acad Dermatol* 1997; 37(Suppl.): 42-52.
- 7 Geilen CC, Bektas M, Wieder T, et al. The vitamin D₃ analog, calcipotriol, induces sphingomyelin hydrolysis in human keratinocytes. *FEBS Lett* 1996; 378: 88-92.
- 8 Fernandez-Flores A. Small lesions of porokeratosis show a normal proliferation rate with MIB-1. *Acta Dermatovenerol Alp Panonica Adriat* 2008; 17: 22-25.
- 9 Vlachou C, Kanelleas AI, Martin-Clavijo A, Berth-Jones J. Treatment of disseminated superficial actinic porokeratosis with topical diclofenac gel: a case series. *J Eur Acad Dermatol Venereol* 2008; 22: 1343-1345.
- 10 Nayeemuddin FA, Wong M, Yell J, Rhodes LE. Topical photodynamic therapy in disseminated superficial actinic porokeratosis. *Clin Exp Dermatol* 2002; 27: 703-706.
- 11 McDonald SG, Peterka ES. Porokeratosis (Mibelli): treatment with topical 5-fluorouracil. *J Am Acad Dermatol* 1983; 8: 107-110.
- 12 Shelley WB, Shelley ED. Disseminated superficial porokeratosis: rapid therapeutic response to 5-fluorouracil. *Cutis* 1983; 32: 139-140.
- 13 Ahn SJ, Lee HJ, Chang SE, et al. Case of linear porokeratosis: successful treatment with topical 5% imiquimod cream. *J Dermatol* 2007; 34: 146-147.
- 14 Hacham-Zadeh S, Holubar K. Etretinate in the treatment of disseminated porokeratosis of Mibelli. *Int J Dermatol* 1985; 24: 258-260.
- 15 Dereli T, Ozyurt S, Ozturk G. Porokeratosis of Mibelli: successful treatment with cryosurgery. *J Dermatol* 2004; 31: 223-227.
- 16 Barnett JH. Linear porokeratosis: treatment with the carbon dioxide laser. *J Am Acad Dermatol* 1986; 14: 902-904.
- 17 Alster TS, Nanni CA. Successful treatment of porokeratosis with 585 nm pulsed dye laser irradiation. *Cutis* 1999; 63: 265-266.
- 18 Campbell JP, Voorhees JJ. Etretinate improves localized porokeratosis of Mibelli. *Int J Dermatol* 1985; 24: 261-263.