# Atrophying pityriasis versicolor as an idiosyncratic T cell–mediated response to *Malassezia*: A case series

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***Background:*** Atrophying pityriasis versicolor (PV), first described in 1971, is a rare variant in which lesions appear atrophic.

***Objective:*** We sought to determine the pathophysiology of atrophying PV.

***Methods:*** A retrospective chart review identified 6 cases of atrophying PV. In all cases, routine light microscopy, an elastic tissue stain, and immunohistochemical assessment for the expression of CD3, CD4, CD8, GATA3 and CXCR3 was performed.

***Results:*** All cases demonstrated hyperkeratosis with intracorneal infiltration by pathogenic hyphal forms as well as epidermal attenuation and papillary dermal elastolysis. A supervening, mild-to-moderate, superficial lymphocytic infiltrate was noted and characterized by a focal $CD8^+$ T cell–mediated interface dermatitis along with a mixed T–cell infiltrate composed of $GATA3^+$ and $CXCR3^+$ T cells.

***Limitations:*** Small sample size and the loss of some patients to follow-up.

***Conclusion:*** Atrophying PV represents the sequelae of a mixed helper T–cell ($T_H1$ and $T_H2$) idiosyncratic immune response to *Malassezia* and can present as a protracted dermatosis that may clinically mimic an atypical lymphocytic infiltrate. $T_H1$ cytokines can recruit histiocytes, a source of elastases, and upregulate matrix metalloproteinase activity, which may contribute to epidermal atrophy. (J Am Acad Dermatol 2017;76:730-5.)

***Key words:*** pityriasis versicolor; atrophy; *Malassezia*; CD4; CD8; $T_H1$; $T_H2$; GATA3; CXCR3.

Atrophying pityriasis versicolor (PV) was originally described by De Graciansky and Mery in 1971[1] and many of the earlier reported cases were associated with concomitant topical corticosteroid use. In 2003, Crowson and Magro presented a series of patients with atrophying pityriasis versicolor, describing the same clinical and histological findings in the absence of topical corticosteroid use, thus suggesting that the infection itself is responsible for the atrophic features.[2] Since then there have been several cases of the same phenomenon reported in the literature.[1-23] Herein, we describe 6 additional cases of atrophying PV not associated with topical corticosteroid use. The pathophysiologic basis of atrophying PV is explored and the literature is reviewed as it pertains to atrophying PV.

*Abbreviations used:*

| | |
|---|---|
| MMP: | matrix metalloproteinase |
| PAS: | periodic acid–Schiff |
| PV: | pityriasis versicolor |
| $T_H$: | helper T |

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Support for Jonathan Levy's elective rotation at Weill Cornell Medicine came from a Canadian Dermatology Foundation Kalz bursary. This research otherwise has no funding sources.
Conflicts of interest: None declared.
Accepted for publication August 30, 2016.

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Published online November 2, 2016.
0190-9622/$36.00

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http://dx.doi.org/10.1016/j.jaad.2016.08.062

## MATERIALS AND METHODS

Six cases diagnosed as atrophying PV were uncovered in the database of one of the authors over the time period of July 2006 to October 2015. In each case, a detailed clinical history was obtained. Follow-up was also attempted on these cases. Five cases of typical PV without atrophy were also drawn from the database to represent control cases. Biopsy material was available for routine light microscopic assessment. In each case, a Verhoeff-van Gieson stain was conducted as well as a limited battery of phenotypic studies. Specifically, in each case, a CD3, CD4, and CD8 stain was obtained. Serial sections were tested after optimizing each antibody with formalin-fixed, paraffin-embedded tonsils. Each antibody (obtained from ABCAM, Cambridge, MA) was optimized with antigen retrieval for 30 minutes. In addition, the expression of CXCR3 (clone 557183, 1:200 dilution, BD Pharmingen, San Diego, CA) was also assessed to determine the presence of helper T ($T_H$) 1 cells while a GATA3 stain was performed to assess for the presence of $T_H2$ cells.

### CAPSULE SUMMARY

- Atrophying pityriasis versicolor is a rare variant of the condition.
- Pityriasis versicolor is characterized by a mixed $T_H1/T_H2$ immune response to *Malassezia* that resembles a type IV hypersensitivity reaction. The $T_H1$ component contributes to epidermal atrophy and elastolysis.
- Atrophying pityriasis versicolor should be considered in the differential diagnosis of atrophic lesions.

## RESULTS

### Case synopsis

Case 1: A 56-year-old man who was otherwise healthy presented with a 2-year history of asymptomatic, yellowish-brown, slightly atrophic patches in the right axilla. There was no prior treatment of these lesions. The clinical differential diagnosis included PV, erythrasma, and patch stage mycosis fungoides. A diagnosis was made of atrophying PV after which the patient was treated with a single dose of ketoconazole 400 mg orally as well as topical ketoconazole cream. The atrophic lesions were resolved at follow-up 2 weeks later.

Case 2: A 50-year-old man was seen with a few years' history of pruritic, hyperpigmented, slightly atrophic plaques that were widespread over the body and fine scale over the trunk, arms, buttocks, and anterior thighs (Fig 1). The lesions were previously treated with mineral oil and an over-the-counter moisturizer, but no topical corticosteroids. Past medical history was relevant only for hypothyroidism, which was treated with levothyroxine. Clinically, he was suspected to have mycosis fungoides, eczema, or atypical pityriasis rosea. After a diagnosis of atrophying PV was rendered, treatment consisted of ketoconazole 400 mg orally once and then repeated after 2 weeks. The patient was not seen in follow-up.

Case 3: A 30-year-old woman presented with a 6-month history of a mildly pruritic eruption consisting of pinkish-brown patches on her neck, chest, abdomen, pubic area, and upper arms that developed following increased sun exposure. Past medical history is relevant for asthma and bipolar disorder. The clinical differential diagnosis was limited to PV, and there was no associated topical corticosteroid use. After treatment with ciclopirox shampoo and daily administration of glycolic acid (15%) lotion (which was later switched to ketoconazole 2% cream) the lesions resolved.

Case 4: A 28-year-old woman was seen in the clinic with annular, scaly, atrophic plaques that were photo-distributed on the back and extremities without any prior treatment. The primary diagnostic consideration was subacute cutaneous lupus erythematosus. The patient was lost to follow-up prior to receiving the diagnosis of atrophying PV.

Case 5: A 41-year-old man presented with asymptomatic, hyperpigmented patches of unknown duration on the buttocks. Clinically the patient was thought to have patch stage mycosis fungoides or macular amyloid. The patient was lost to follow-up.

Case 6: A 74-year-old man presented with asymptomatic, atrophic, scaly plaques that were light-brown. The skin lesions had not been previously treated and had been present on the chest, neck, and arms for an unknown duration of time. The initial clinical impression was PV, but given the atrophic nature of the lesions, extragenital lichen sclerosus was considered most likely. The patient was treated with ketoconazole 400 mg on days 1 and 8, as well as ciclopirox shampoo daily, and the lesions resolved.

### Light microscopic findings

A fairly uniform presentation was seen in all 6 cases characterized by areas of focal epidermal attenuation with an overlying hyperkeratotic stratum corneum at times accompanied by focal parakeratosis (Fig 2, *A*). The stratum corneum contained

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