Authors declare that the contents of this article are their own original unpublished findings.

**Title:** **Prurigo Pigmentosa: Diagnostic Challenges and Clinical Algorithm for Early Recognition**

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We, the authors, confirm that we have obtained written informed consent from the patient to use health information in the creation of this Material. Permission may be revoked in writing by the patient prior to the duration of online publication.

**KEY CLINICAL MESSAGE:**

Maintain a high index of suspicion for prurigo pigmentosa (PP) in patients with recurrent, symmetric, pruritic, erythematous papules that progress to reticulated hyperpigmented patches. Utilize a diagnostic algorithm to differentiate PP from similar dermatoses, considering triggers beyond ketogenic diets, such as stress-induced caloric restriction, hormonal changes, and infections

**INTRODUCTION:**

Prurigo pigmentosa (PP) is an uncommon inflammatory dermatosis characterized by recurrent eruptions of symmetric and highly pruritic erythematous papules and plaques that can coalesce to form reticulated, macular patches of hyperpigmentation upon resolution[[1–4](https://www.zotero.org/google-docs/?WMfmGM)].  Lesions are predominantly localized to the neck, trunk, and suprapubic regions but can also affect the face and scalp, with sparing of the mucous membranes[[5](https://www.zotero.org/google-docs/?vMobKr)]. Since Nagashima's first description of PP in 1971[[6](https://www.zotero.org/google-docs/?j9qFjM)], knowledge of the typical presentations, prognosis, and demographics of patients affected by this condition has evolved considerably. The etiology, however, remains unclear. Still, a growing body of evidence seems to implicate ketoacidosis, caloric/carbohydrate restriction, hormonal changes, infections, and pathologies such as Sjogren’s syndrome, adult-onset Still’s disease, and atopic diathesis as likely triggers[[1,3](https://www.zotero.org/google-docs/?uqTgXl)].  Oral tetracyclines are considered the first line of management, perhaps owing to their anti-inflammatory and neutrophil migration inhibition effects and dietary modifications, if a significant history of ketogenic eating habits is noted.  Although young women of East Asian descent are known to have a greater propensity towards developing PP, reports suggest that its geographic and ethnic distribution might not be as confined as previously thought, with few cases even being reported in the United States[[2,4,7,8](https://www.zotero.org/google-docs/?NHnTUj)]. Despite this increasing recognition, misdiagnosis and late diagnosis of PP are very common[[5,7](https://www.zotero.org/google-docs/?7tg7nF)], and patients bear the brunt of going through multiple recurrences and ineffective treatments. Multiple recurrences, in particular, not only tend to aggravate the intensity of the pruritus but also of the subsequent post-inflammatory hyperpigmentation, creating strong cosmetic and body image concerns among the affected patients, further warranting timely diagnosis. In addition to the lack of awareness among providers, the morphological diversity and evolution of PP lesions with disease progression and the overlapping characteristics of these lesions with other dermatoses render clinical diagnosis challenging. Here, we describe a classic case of prurigo pigmentosa in a young woman and outline a simple yet comprehensive algorithm enabling providers to clinically distinguish PP from other closely mimicking differentials at an early stage.

**CASE PRESENTATION:**

A young woman presented with a recurrent rash occurring twice over the course of two years, with subsequent hyperpigmentation resolving over nearly a year. The rash consisted of erythematous, pruritic vesicles and papules localized to the back, trunk, shoulders, and axillary region [figure 1(a), 1(b)]. The patient reported worsening symptoms during spring, lasting 2-4 weeks. Notably, hyperpigmentation occurred approximately one week after the onset of the rash. The itching was severe (8/10 intensity) enough to impair her sleep. The patient attributed triggers to friction, heat, dry, cold weather, and decreased food intake due to stress. There was no history of recent travel or associated systemic symptoms. Additionally, the patient had a history suggestive of dermatographism during adolescence.

Initial treatment with Benadryl (diphenhydramine) 25mg PO BID and topical hydrocortisone 1% cream for one week, as prescribed at urgent care, provided unsatisfactory relief. However, control of pruritus was achieved with continued use of topical triamcinolone 0.1% cream. Hyperpigmentation persisted, and the patient was not started on any particular treatment regimen for it. Although a diagnosis of PP was confirmed, the patient was not started on oral tetracyclines owing to the lack of active lesions at the time of presentation. The patient was unwilling to follow up for further testing as she did not find the symptoms bothersome.

**DIFFERENTIAL DIAGNOSIS AND DISCUSSION:**

When relying exclusively on clinical features, a relatively high index of suspicion must be maintained for PP since a careful analysis of the rash's frequency, distribution, and evolution can help narrow the diagnosis. Indeed, in our patient, the findings associated with these three variables were exemplary of PP but not confirmatory. Our patient was not practicing a ketogenic diet but only noted a slight reduction in caloric intake due to stress, leaving the exact trigger of PP speculative. Without histopathological evidence, ruling out other closely related differentials can prove challenging. This reinforces the importance of highlighting this otherwise straightforward case for two reasons: a) with significantly less exposure to PP in the United States, it is beneficial for providers to first gain a broad understanding of the condition by learning from such “textbook examples” and b) to incorporate an evidence-based deduction strategy that can signal accurate cases of PP among the noise of other, closely related differentials. The brief, parsimonious algorithm employed to confirm a clinical diagnosis of PP from other potential diagnoses is outlined below.

**Confluent and reticulated papillomatosis (CARP)**

CARP typically manifests due to aberrant keratinization and produces scaly, hyperpigmented lesions of almost ichthyosiform appearance with peripheral reticulation[[9](https://www.zotero.org/google-docs/?M54Cfl)]. Pruritus is often absent and may be very mild in intensity if present. In contrast, PP evolves from erythematous papules and plaques to mottled, hyperpigmented patches and is associated with significant pruritus, as in our patient. Therefore, eliciting a good history of the presentation of lesions at and after onset can help narrow the diagnosis to one of these conditions. Likewise, the resolution of hyperpigmentation with treatment adherence can support the initial diagnosis of CARP, whereas the persistence of dyspigmentation lends credence to PP[[9](https://www.zotero.org/google-docs/?VrzEfG)].

**Urticaria pigmentosa (Cutaneous mastocytosis)**

Urticarial plaques are defined by erythema, pruritus, and blistering at the site (producing wheals and hives) with or without concurrent angioedema[[10](https://www.zotero.org/google-docs/?HEKj7f)]. At the same time, PP lesions do not typically exhibit the last two characteristics. If lesions are markedly erupted and palpable, Darier’s sign may be elicited.  Our patient did not exhibit these defining features, but they were suspected of having a history of dermatographism in adolescence, although no signs of dermatographic urticaria were present on examination. We also recommended mast cell disorder lab workups and a dermatologist consultation to rule out any form of cutaneous mastocytosis.

**Dermatitis herpetiformis**

The patient's diet and allergy history did not raise concerns regarding gluten intolerance, nor was there a presence of subepidermal blisters, vesico-bullous lesions, or any other combination of polymorphic rashes specifically localized to the elbows, knees, lumbosacral, or gluteal regions[[11,12](https://www.zotero.org/google-docs/?MXtOhK)].

**Contact and atopic dermatitis (Eczema)**

Our patient did not report the onset of rashes after coming into contact with any particular physical or chemical irritant. Instead, she reported that her rash was exacerbated by heat and friction. She was previously treated with topical hydrocortisone and triamcinolone; the former did not provide any therapeutic benefits, while the latter provided some relief from pruritus. Indeed, the quickest way to filter through differentials of dermatoses might be to start by assessing responsiveness to steroids.

**CONCLUSION:**

Although PP is well characterized in young Asian women, our patient adds to the scarce body of literature on cases seen in the United States and can enhance provider knowledge about its characteristic clinical picture and promote careful utility of pathological correlation. Understanding the condition through such a classical presentation might attune allergists and dermatologists to recognize its existence. It may facilitate reducing the mean time to diagnosis and treatment of PP. This is of particular importance among young women who are more likely to be affected since they have to endure not only the physical but also the mental burden associated with hyperpigmentation.

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**Author Contributions:**

1. Dharaneswari Hari Narayanan: Concept and design, data acquisition and interpretation, drafting of the manuscript, critical review of the manuscript for important intellectual content.
2. Ivan Lee: Concept and design, data acquisition and interpretation, critical review of the manuscript for important intellectual content, Supervision

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**Figure legends:**

Figure 1(a): Hyperpigmented patches noted over the left axillary, left mammary, left inframammary, and left shoulder region.

Figure 1(b): Hyperpigmented patches noted over the left thoracic, left flank, and right scapular region