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Original Research Article

Dermoscopy of pigmented purpuric dermatosis variants

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Abstract

Background: A group of chronic skin conditions with an unknown cause, pigmented purpuric dermatosis is characterized by symmetrical petechial and pigmented macules that are often present on the lower limbs as a result of hemosiderin deposition and erythrocyte extravasation. Clinically, there are five varieties.As a non-invasive method of detecting pigmented and vascular lesions, dermoscopy is useful for assessing PPD and diagnosing its clinical variations.
Materials and Methods: This prospective observational study was carried out from March 2024 to March 2025 in a tertiary care facility. Consenting patients with clinical suspicion of PPD had a thorough history and clinical examination followed by dermoscopy and a total of 30 HPE confirmed patients were included.
Results: Out of 30 cases, the most distinctive dermoscopic characteristics found were: Schamberg: brown to black reticular pigment network (87.5%), coppery red background (75%), red vascular areas (75%); Lichen aureus: linear vessels (100%), red dots and globules (100%), light brown reticular pigment network (100%), white structureless areas (100%); Itching purpura: Scaling (100%), brown structureless areas (66.6%), red dots (83.3%), globules (66.6%); Gougerot and Blum: Brown structureless pigmented areas (100%), red dots (60%), and globules (100%), brown dots (60%); Majocchi: fine brown reticular pigment network (100%), brown circles with red globules (100%), coppery red background (100%).
Conclusion: Dermoscopy aids in precise identification and demarcation of pigmented purpuric dermatosis. Since the clinical variants have similar histopathological findings, we focused on dermoscopic distinction in our investigation because there was little information available on this topic.

Keywords: Dermoscopy, Pigmented purpuric dermatosis, Majocchi.

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1. Introduction

Pigmented purpuric dermatosiss is a collection of chronic skin conditions with symmetrical petechial and pigmented macules that are typically limited to the lower limbs, has an etiology that is mostly unknown.Distinct purpuric lesions are characterized by patchy pigmentation brought on by erythrocyte extravasation and hemosiderin deposition in the skin.

A non-invasive diagnostic technique called dermoscopy allows for the observation of morphological traits that are not visible to the naked eye.

It combines a method that makes the corneal layer of skin translucent with an optical system that magnifies the images displayed onto the retina.[1] Thus, it aids in distinguishing PPD from its close differentials, such as purpura due to hematological diseases, contact dermatitis, stasis dermatitis, etc. Dermoscopy facilitates rapid and straightforward diagnosis, particularly in remote locations where histopathology, an invasive method, poses challenges.

Clinically, PPD is classified into five types, including Schamberg's progressive pigmentary dermatosis is typified by flat, orange-red patches with specks of cayenne pepper around the edges. Majocchi purpura, also known as Purpura annularis telangiectodes, is characterized by annular brown plaques that are 1-3 cm in size and gradually spread outward,

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with punctate telangiectases and petechiae inside the borders. A mixture of purpuric and Schamberg-like reddish-brown lichenoid thickened papules is a characteristic of pigmented purpuric lichenoid dermatosis of Gougerot and Blum. Doucas and Kapetanakis eczematid-like purpura presents as itchy, scaly petechial or purpuric macules, papules, and patches. Lichen aureus appears as persistent patches that range in color from purple-brown to golden or rust. All these variants typically exhibit a common histopathological profile characterized by superficial lymphocytic infiltration, with or without granuloma formation, extravasation of red blood cells, capillary thickening, and hemosiderin deposition.

Dermatologists typically utilize histological investigation to establish a clear diagnosis and distinguish it from other comparable clinical disorders, which may frequently be tough, despite being invasive and not always practical.

2. Materials and Methods

2.1. Study design

During the 12-month period from March 2024 to March 2025, this prospective observational study was carried out in the dermatology department of Great Eastern Medical School and Hospital in Srikakulam, Andhra Pradesh. The purpose of this study is to determine the dermoscopic characteristics of various forms of pigmented purpuric dermatosis. Approval 11/IEC/GEMS&H/2025 was granted by the Great Eastern Medical School and Hospital's institutional ethics committee.

2.2. Study population

This study includes 30 histopathology proven cases of different types of pigmented purpuric dermatosis that are consecutively selected of all ages and either sex who attended our outpatient department and done as a pilot study

2.3. Data collection

A complete history and clinical examination of patients with clinical suspicion of pigmented purpuric dermatosis, who are willing to give written informed consent were included and the details regarding the patients age, gender, duration of disease, site of involvement, associated symptoms, comorbidities were collected. Thorough cutaneous examination was done, dermoscopy of the lesions was done using DL4 (Dermlite) with 10x magnification in both polarized and non-polarized modes at multiple sites over the lesions in each patient and all the features were collected and noted by a single observer. Histopathology was done and a total of 30 HPE proven cases of PPD were included in the study and the results were compiled.

2.4. Statistical analysis

Data were analysed using Open epi to provide a detailed and thorough summary of patient demographics, clinical and dermoscopic features.

3. Results

3.1. Clinical findings

Of the 30 patients included in the study, 18 (60%) were males and 12 (40%) were females [**Figure 1**]. Peak incidence was seen in the age group of 45-55 years. All patients exhibited lesions on the lower legs; of these, 20 had lesions on the distal third extending to the ankle region, 6 presented with lesions on the middle third, 3 had lesions extending to the knee, and 1 patient had lesions reaching the hip level. Thirteen individuals had lesions mostly on the medial aspect of the lower legs, nine patients displayed lesions on the lateral aspect, and eight patients had lesions affecting the medial, lateral, and posterior portions of the lower legs.

Of the 30 cases, 22 were asymptomatic and 8 exhibited symptoms of itching.

Clinically, among the 30 cases, there were 16 of Schamberg type, 2 of Lichen aureus type, 5 of Gougerot and Blum type, 6 of Doucas and Kapetanakis type, and 1 of Majocchi type [**Figure 2**].

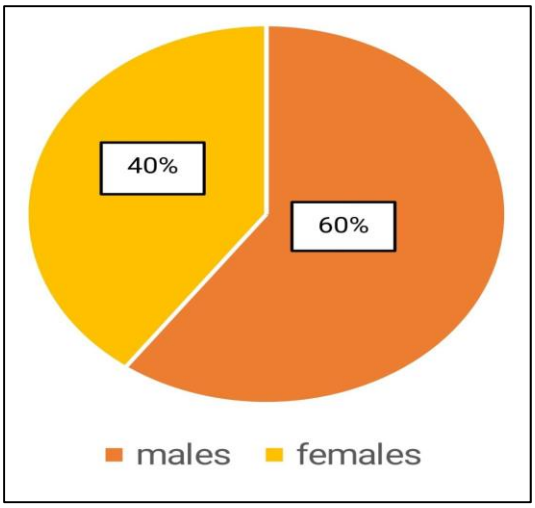

Figure 1: Gender distribution in a pie chart

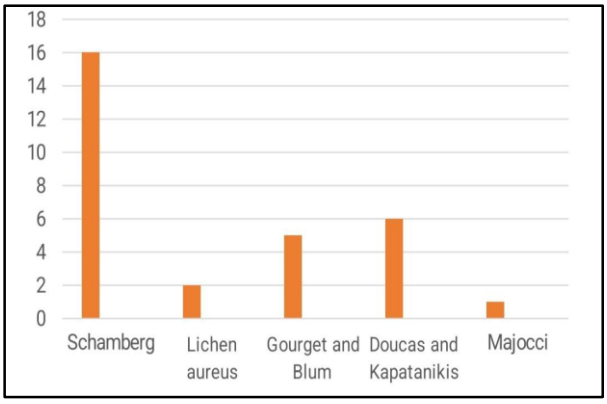

Figure 2: Bar chart demonstrating distribution of different forms of pigmented purpuric dermatosis

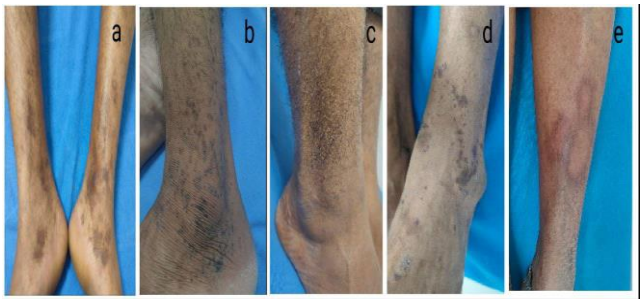

Figure 3: (**a**): Multiple, asymptomatic hyperpigmented macules with cayenne pepper like pigmentation- Schamberg type; (**b**): Multiple lichenoid papules - lichen aureus type; (**c**): Multiple itchy papules and plaques with scaling - Doucas and Kapetanakis type; (**d**): Multiple hyperpigmented macules with few lichenoid papules- Gougerot and Blum type; (**e**): Few erythematous to hyperpigmented annular plaques with central clearing - Majocchi type

3.2. Dermoscopic findings

This study identified the most prevalent dermoscopic features across all cases as a coppery red backdrop, a brown reticular pigment network, and round to oval red spots and globules. With little variations in each clinical category, additional characteristics such as scaling, brown spots and globules, linear arteries, and brown circles were observed in a small number of cases (**Table 1**). Although no particular defining traits are mentioned, we did observe a few features that are more prevalent in a certain clinical type, even though the majority of the features overlap across many clinical kinds.

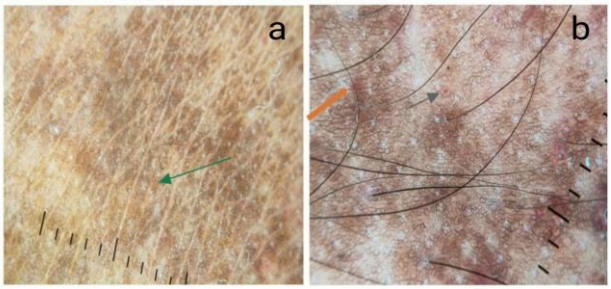

Figure 4: Dermoscopic features of Schamberg type**; a:** Network of brown reticular pigment (green arrow); **b:** Red vascular regions (orange patches) on a coppery red background (black arrow)

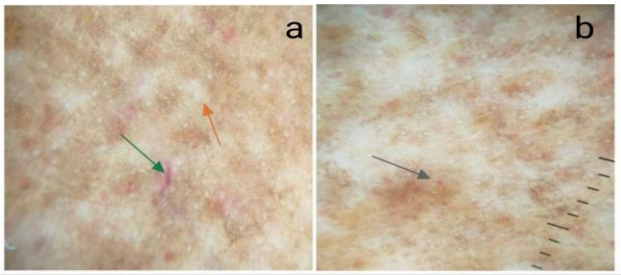

Figure 5: Dermoscopic features of Lichen aureus; **a:** Linear vessels (green arrow) red globules, light brown reticular pigment network, white structureless areas (orange arrow); **b:** Red dots (black arrow)

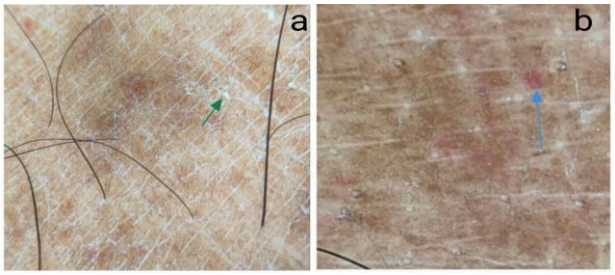

Figure 6: Dermoscopic characteristics of Doucas and Kapetanakis; **a:** Red spots and globules, brown structureless areas, and scaling (green arrow); **b:** Brown circles, follicular openings, and rosettes (blue arrow)

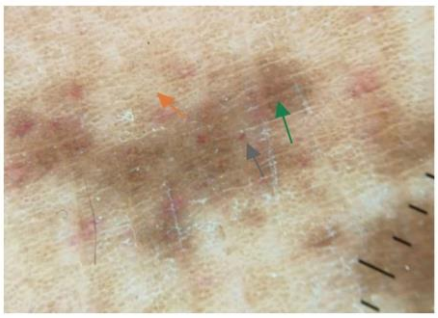

Figure 7: Dermoscopic features of Gougerot and Blum; Brown structureless pigmented areas (green arrow), red dots and globules (black arrow),brown dots (orange arrow), scaling

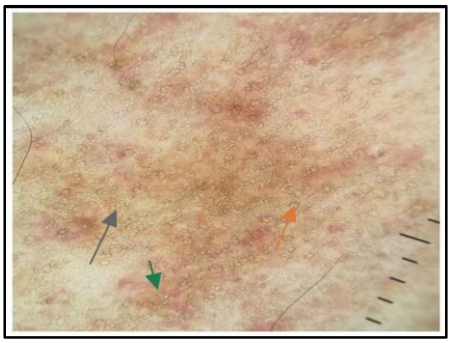

Figure 8: Dermoscopic features of Majocchi type; Fine brown reticular pigment network (black arrow), brown circles (orange arrow) with red globules, coppery red background (green arrow)

Out of 16 Schamberg type cases, 12 cases (75%) have a coppery red backdrop, 14 cases (87.5%) have brown to black reticular coloring, 5 cases (31.25%) have red structureless patches, 12 cases (75%) have round to oval red dots and globules, 12 cases (75%), have brown dots (75%), and 6 cases (37.5%) have rosettes. [**Figure 3**].

Of the two cases of lichen aureus, one (50%) had a coppery red backdrop, two (100%) had linear vessels, two (100%) had red dots and globules, two (100%) had brown reticular pigmentation, two (100%) had white structureless patches, and one (50%) had brown dots and clods [**Figure 5**].

Table 1: Table showing dermoscopic features of different types of pigmented purpuric dermatosis

	Schamberg	***Lichen aureus***	***Doucas and kapetanaki***	***Gougerot and blum***	***Majocchi***
Coppery red background	75%	50%	50%	60%	100%
Brown to black reticular pigmentation	87.5%	100%	33.3%	20%	100%
Red dots	75%	100%	83.3%	60%	100%
Red globules	75%	100%	66.6%	100%	100%
Scaling	12.5%	0%	100%	60%	0%
Brown structureless areas	18.75%	0%	66.6%	100%	0%
Linear vessels	0%	100%	0%	0%	0%
Brown circles	20%	0%	16.6%	0%	100%
White structureless areas	0%	100%	0%	0%	0%
Gray clouds and globules	0%	0%	0%	40%	0%
Brown dots and clods	75%	50%	0%	60%	0%
Rosette structures	37.5%	0%	33.3%	0%	0%
Follicular openings	0%	0%	50%	20%	0%

Of the 6 cases of Doucas and Kapetanakis, four cases (66.6%) had brown pigmented structureless areas, six cases (100%), five cases (83.3%) had red globules, two cases (33.3%) had reticular pigmentation, three cases (50%) had coppery red backgrounds, two cases (33.3%) had rosettes, and three cases (50%), had follicular openings [**Figure 6**].

Of the 5 cases of Gougerot and Blum, three cases (60%) had red dots, five cases (100%) had red globules, five cases (100%) had brown structureless pigmented areas, three cases (60%) had brown dots, three cases (60%) had coppey red pigmentation, three cases (60%) had scaling, two cases (40%) had gray clods and globules, and one case (20%) had follicular openings [**Figure 7**].

A single Majocchi-type displayed a coppery red background, brown circles with red globules, and a fine network of brown reticular pigment [**Figure 8**].

4. Discussion

Pigmented purpuric dermatosis is a chronic relapsing cutaneous disorder with petechiae, pigmented macules, papules and patches and is more frequently seen in male patients.[2] Though they can occasionally appear on the arms as well, the lesions are most frequently found on the lower extremities, typically seen around the fourth or fifth decade of life. Although there are few case reports of PPD in newborns and children, the disorder is rarely observed in preschoolers.[4]

Clinical presentations include many subtypes that have been described over the years although histology is usually superimposable.[5] Clinically, PPD is classified into five types: lichen aureus type, pigmented purpuric lichenoid dermatosis of Gougerot and Blum type, eczematid-like purpura of Doucas and Kapetanakis type, Purpura annularis telangiectodes (Majocchi purpuric type), and progressive pigmentary dermatosis (Schamberg type).[2] Granulomatous PPD is another very rare variant which is clinically and histopathologically similar to infectious, inflammatory dermatoses, T-cell lymphomas;[6] however in this study we haven't seen this variant.

Numerous illnesses, including autoimmune diseases, diabetes mellitus, and hypertension, have been linked to PPD.[7] HIV patients on retroviral therapy also had an association with PPD.Some drugs had been suspected to occur with PPD, such as acetaminophen, aspirin, glipizide and hydralazine.[2]

In this study, the average age of presentation was 46.5 years, with a male predominance of 60%. Lesions were observed in the lower one-third of the legs in 66.6% of cases. The majority are asymptomatic, while itching is reported as a symptom in 22.6% of cases.

4.1. Progressive pigmentary dermatosis (Schamberg)

It is the most prevalent clinical form of PPD and is characterized by cayenne pepper pigmentation, as also observed in the 2020 study by Martínez Pallás I et al.[8] In this study, the predominant dermoscopic findings are brown or black reticular pigment network, brown dots, few red dots and globules, coppery red background, rosette structures.

4.2. Lichen aureus

Clinically, it is characterized by brown to rust-colored macules, patches, papules, and plaques[9] or flat, pin-tip papules,[10] which are typically found above a varicose vein and occasionally accompanied by itching. Linear vessels with red dots and a brown reticular pigment network with white, structureless regions between the pigmented sections are the most prevalent dermoscopic features in this study.

4.3. Itching purpura type

On the lower extremities, eczematid-like purpura of Doucas and Kapetanakis[11] manifests as itchy, scaly papules, macules,

and plaques.[3] Dermoscopy scale in this study shows brown, structureless patches with red globules and dots that are circular to oval, along with a few rosettes and follicular apertures. A 2006 study by Ozkaya DB et al.[1] also found follicular holes on dermoscopy in PPD.

4.4. Pigmented purpuric lichenoid dermatosis of gougerot and blum

This typically manifests as confluent purpuric papules, plaques, and macules and included primarily brown, structureless, pigmented patches, round to oval red spots, and gray globules. One foot's dorsum had a localized pigmented purpuric eruption of plaques that resembled Kaposi's sarcoma, according to a case report by R C Wong et al. Nonetheless, a biopsy verified the Gougerot-Blum diagnosis of pigmented purpuric lichenoid dermatitis.[12] In certain situations, dermoscopy can be used as a primary diagnostic procedure before biopsy.

4.5. Purpura annularis telangiectodes of Majocchi

It is a rare subclass of PPD which present as annular or ring shaped brown macules[13] or as erythematous to violaceous papules and macules coalescing to form plaques with central clearing with multiple punctate macules[14] usually over lower legs.This study shows a network of brown reticular pigment with red spots and globules on a coppery red background. The increased number of blood vessels and extravasated red blood cells are reflected in the red globules and dots.[15]

In histological analyses, a coppery red background is commonly observed, signifying lymphohistiocytic infiltration together with extravasated red blood cells and hemosiderin deposits. This study identifies scaling as a prominent hallmark of eczematid type, while dilated capillaries manifest as linear vessels in the lichen aureus type, necessitating more investigation for proper definition.

According to a study by Zaballos P et al. (2006), the condition can be distinguished from statis eczema, which is characterized by red globules, glomerular-like capillaries, and scaling over the surface.[16] In addition to white and yellow structureless regions, cutaneous small vessel vasculitis also manifests as red spots and globules.[17]

A bigger sample size is required to precisely define the dermoscopic features of different types of pigmented purpuric dermatosis because we have included cases that visited our outpatient department, which is a restriction.

5. Conclusions

The more accurate identification and delineation of pigmented purpuric dermatosis is certainly made possible by dermoscopy. Non-invasive techniques can also help distinguish the condition from other similar clinical entities such as stasis dermatitis, contact dermatitis, and purpura secondary to hematological disorders.

This study examined the application of dermoscopy in distinguishing several clinical forms of PPD, as dermoscopy is a non-invasive, time-efficient, and feasible investigative method, with limited data regarding this and further studies with larger sample size and histopathological correlations are required. Timely and prompt diagnosis facilitates more effective and precise therapy, thereby enhancing patients quality of life.

6. Sources of Funding

None.

7. Conflicts of Interest

None.

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