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CASE REPORT
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Dermoscopy-Histopathology of *Liken Amiloidosis*: A Case Report

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ABSTRACT

Introduction: The deposition of amyloid in the dermis or epidermis characterizes cutaneous amyloidosis. Dermoscopy and histopathology can help establish the diagnosis of lichen amyloidosis, so it is important to understand the correlation between the results of these two tests.
Case Presentation: A 52-year-old female patient with lichen amyloidosis presented to the dermatology and venereology department of RSUP, Dr. M. Djamil Padang. For the past year, she has been experiencing itchy, dark brown spots on both legs. Dermoscopy revealed a scar-like center surrounded by brown pigmentation on the ridge's periphery. The surface was composed of stratified squamous epithelium with hyperkeratosis, parakeratosis, and acanthosis, as ascertained by histopathology. On examination with Congo Red staining, skin tissue revealed a partially atrophic epidermis and dermis with inflammatory cells, particularly perivascular. Positive Congo Red staining is observed between the connective tissue stroma and the basement membrane in the dermis. Positive Congo Red staining is also observed beneath the basement membrane. Lichen amyloidosis can be diagnosed with dermoscopy, histopathological examination, and Congo Red staining.
Discussion: Dermoscopy and histopathological examination confirmed with Congo Red staining can help confirm the diagnosis of Lichen amyloidosis. This case report looks at the correlation of dermoscopy and histopathology results in a patient with lichen amyloidosis and found positive Congo Red staining.
Conclusion: This case study examined the relationship between dermoscopy and histopathology results in patients with lichen amyloidosis and discovered positive Congo Red staining.

INTRODUCTION

There are limited reports on the use of dermoscopy in diagnosing primary cutaneous amyloidosis. Primary cutaneous amyloidosis is characterized by the deposition of amyloid in the dermis or epidermis. In the case of local cutaneous amyloidosis, amyloid deposition is typically restricted to the papillary dermis, while in the case of systemic amyloidosis, it can involve the sub-papillary dermis, skin sub-organs, and blood vessels. Vascular involvement may result in petechiae, purpura, or ecchymoses, which are typically observed in the upper chest and periorbital regions.

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Dermis involvement can cause skin thickening and manifest as papules, plaques, or nodules with a waxy or waxy-like surface (Gunawan & Rakhmawati, 2021).

There are 16 different fibril proteins described as the origin of amyloid. Amyloidosis is categorized as local or organ-limited when the amyloid deposition is restricted to a single tissue site. Primary localized cutaneous *amyloidosis* (PLCA) is characterized by limited amyloid deposition in the skin that appeared normal previously, without systemic organ involvement. Macular and lichen subtypes are the most common forms of localized amyloidosis, while nodular subtypes are less common (Krati et al., 2017).

Among PLCA, lichen amyloidosis is reported as the most prevalent form. It has never been associated with systemic *amyloidosis*, typically manifests later in life, especially in the fifth and sixth decades, and is more prevalent in men and patients with a Fitzpatrick skin type IV. Intense pruritus is the initial symptom, which may improve with sun exposure and worsen by stress. It is believed that scratching results in hyperpigmented lesions. Clinically, the lesion frequently occurs on the shins and forearms as well-pigmented, grouped hyperkeratotic papules that can develop into large plaques. However, the upper back may also be affected (Gunawan & Rakhmawati, 2021; Krati et al., 2017).

The diagnosis PLCA can confirm the histopathology of lichen amyloidosis lesions obtained from a tissue biopsy. Histopathology is considered the gold standard for diagnosing PLCA. However, this examination is invasive and requires special experts. Histologically, the most prominent epidermal findings for *lichen amyloidosis* are hyperkeratosis and acanthosis. Lymphohistiocytic infiltrates common skin changes in both amyloidosis subtypes. Under the light microscope, hematoxylin and eosin staining reveal *amyloid* deposits as eosinophilic, fissile masses (Krati et al., 2017).

Dermoscopic examination of *lichen amyloidosis* reveals two gray-white to white-brown unstructured areas and margin areas with margin grooves and brown pigmentation. The histological image reveals a white keratotic area in the center and increased basal pigmentation. Ridge and fissure areas correspond to hyperkeratosis, acanthotic, papillomatous and epidermal invaginations.

CASE PRESENTATION

A 52-year-old female patient referred to Dr. M. Djamil Padang's dermatology and venereology department complained of itchy dark brown spots on both lower extremities that have persisted for one year. The patient frequently scratches at these spots until they develop into excoriations. The patient acknowledges that his itching is worsened by stress. There was no history of sore throat, purpleness around the eyes, fatigue, weight loss, shortness of breath, numbness, or hoarseness. No history of diabetes mellitus and hypertension, and there was no family history of similar complaints either. From the history of the present disease, it was determined that the symptoms first appeared approximately five years ago. Despite frequent visits to general practitioners and skin specialists, there was no improvement.

The patient did not appear ill on physical examination, as he or she presented cooperative composure and stable hemodynamics. A dermatological examination of both lower extremities revealed hyperpigmented papules, macules, and plaques. The efflorescence was scattered locally

and was arranged atypically. The lesions were lenticular-nummular in size, with firm-not-firm borders (Figure 1).

In this case, dermoscopy helps visualize the epidermis, dermo-epidermal junction and papillary dermis, with a variety of morphological structures and patterns aiding to identify the dermoscopic features of PLCA. The dermoscopy examination revealed a scar-like center surrounded by brown pigmentation on the periphery of the ridge (Figure 2). Histopathological analysis revealed that the surface of the tissue was composed of stratified squamous epithelium with hyperkeratosis, parakeratosis, and acanthosis. Basement membrane thickening and basal cell ballooning were observed. Amyloid derived from keratin was observed in the papillary dermis. Skin adnexa and a thin layer of lymphocytes were located in the dermis. A probable amyloid lichen was depicted on the microscopic image (Figure 3).

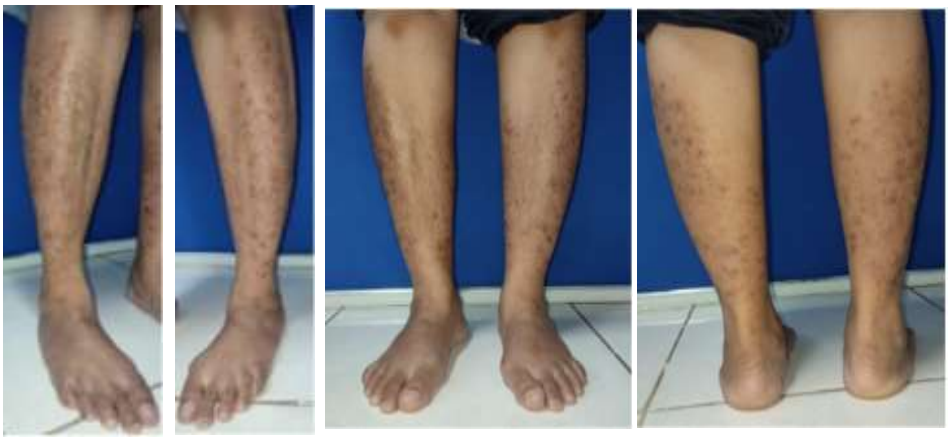

Figure 1. Clinical picture of PLCA showed hyperpigmented papules, hyperpigmented macules, hyperpigmented plaques scattered locally and is arranged atypically with the sizes are lenticular-nummular with firm-not-firm borders et regio cruris anterior posterior sinistra and dextra.

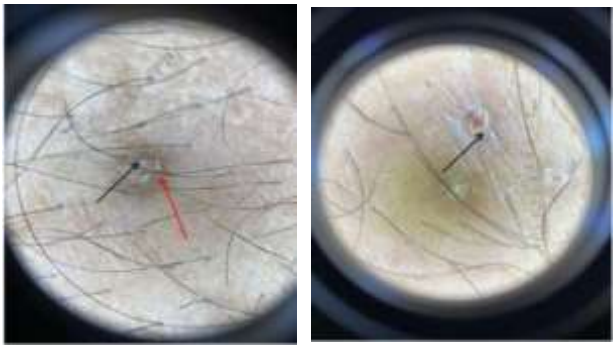

Figure 2. A dermoscopy reveals a scar-like center (black arrow) surrounded by a brown pigmentation on the periphery of the ridge (red arrow).

The Congo Red examination revealed positive dermis and skin tissue results with partially atrophic epidermis and inflammatory cells, particularly perivascular, in the dermis. The matrix areas were positively stained with *Congo Red* in the dermis between the connective tissue stroma (arrows) and the area beneath the basement membrane.

The patient's condition was identified as *lichen amyloidosis.* The medical treatment for brown spots on both legs consisted of systemic therapy with cetirizine tablets 1x10 mg and topical therapy with desoximetasone 0.25% ointment 2x daily.

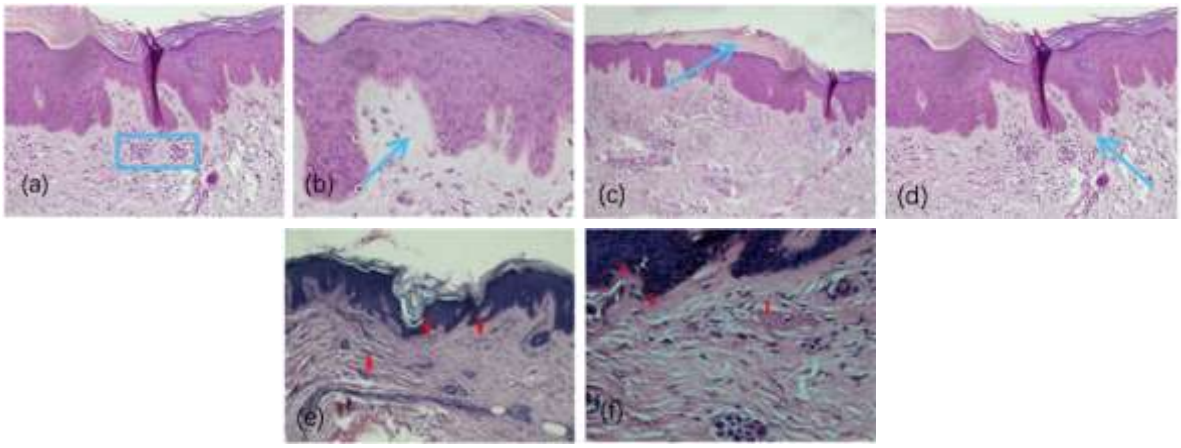

Figure 3. Histopathological analysis revealed (a) Lymphocytes in the perivascular, (b) Amyloid derivatives (blue arrow) and pigmentary incontinence (black arrow), (c) On the exposed epidermis, orthokeratosis is visible, (d) Increased basement membrane thickness, (e) zoomed in (10x), (f) zoomed in (40x).

DISCUSSION

A 52-year-old female presented to the Dermatology and Venereology Polyclinic at RSUP Dr. M. Djamil Padang with a one-year history of itchy dark brown spots on both lower extremities and was diagnosed with primary cutaneous amyloidosis.

Amyloidosis refers to the extracellular deposition of protein, which alters the affected tissue's structure and function. German botanist Schleiden coined the term in 1838 to describe a plant cellulose-like substance. By light microscopy, amyloid appears as an eosinophilic amorphous substance that exhibits apple-green birefringence when stained with *Congo Red* and viewed under polarized light. Primary localized cutaneous amyloidosis (PLCA) is the deposition of amyloid in the skin that appears normal and does not affect internal organs. Amyloid in PLCA is believed to be caused by keratinocyte apoptosis and filament degeneration. Primary cutaneous *amyloidosis* is classified based on the pattern of amyloid deposition and epidermal changes such as *lichen amyloidosis*, macular amyloidosis, nodular amyloidosis, and biphasic amyloidosis (Kang et al., 2019; Schreml et al., 2010).

There are some methods to diagnose *amyloidosis* of the skin. In this case report from the disease's past, the patient complained of persistent, itchy, dark brown spots on both lower extremities. In addition, there was a history of chronic pruritus and intense scratching of the lesions. This patient had no prior history of secondary cutaneous *amyloidosis* symptoms. From physical examination, dark brown papules and hyperpigmented plaques were found above the macula. Another method to diagnose *lichen amyloidosis* involves blood tests and histopathological analysis.

Amyloid deposits have been shown to contain disulfide bonds, which are present in keratin. Cutaneous amyloid deposits are thought to be derived from degenerated keratin peptides of

apoptotic keratinocytes transformed into amyloid fibrils by dermal macrophages and fibroblasts. The deposition of filamentous material secondary to intense scratching induced by pruritogenic processes leads to amyloid formation in the skin. Chronic scratching, as for example seen in atopic dermatitis, may promote damage to keratinocytes resulting in localized amyloid formation. However, dermoscopy of primary cutaneous *amyloidosis* is rarely reported. In a study of 35 cases, (Chuang et al., 2012) observed a white or brown central hub surrounded by various configurations of hyperpigmentation. A scar-like white area replaced the white central hub in cases with prominent hyperkeratosis, such as *lichen amyloidosis*. Nodular amyloidosis is characterized by atypical patterns such as yellow teardrop-shaped areas and orange-yellow homogeneous backgrounds with serpentine vessels. Dermoscopic characteristics of PLCA include epidermal hyperplasia, increased epidermal melanin, and pigment incontinence. Numerous dermoscopic structures are caused by melanin and epidermal hyperplasia (shaded in white). The white, amorphous area is caused by hyperkeratosis and acanthosis, whereas the black, brown, brown-gray, gray, and blue-gray hues are caused by melanin. Acanthosis with increased epidermal melanin and dermal pigment incontinence causes a brownish-white, gray-white, or blue-gray-white hue. Based on their concentration and aggregation, black dots, globules, and peppering are associated with melanin in the stratum corneum (Chuang et al., 2012). In this reported case, dermoscopic showed a scar-like center surrounded by brown pigmentation on the ridge's periphery. This findings is supported with previous studies by Madarkar et al. that shows orthohyperkeratosis with acanthosis surrounding rete ridges and basal hyperpigmentation in patients in PLCA.

As a result of intense pruritus, the epidermis of lichen amyloidosis is typically acanthotic and papillomatous with compact horns; hyperkeratosis, basal keratinocyte hyperpigmentation, and elongated rete ridges are also typical. With intraepidermal cytoid bodies, basal cell vacuolar changes may occur. The papillary dermis is dilated, where melanophages frequently surround small collections of amphophilic material (macrophages with ingested melanin). On H&E-stained sections, amyloid appears as a homogeneous, hyaline, eosinophilic precipitate. Under an electron microscope, it exhibits positive Congo red staining and apple green birefringence under polarized light. Upon direct immunofluorescence, all lichen amyloidosis specimens fluoresce positively for immunoglobulins or complement, specifically IgM and C3. In his study, (Kulkarni et al., 2019) discovered that of 85 cases of primary local skin amyloidosis, 43 cases (50.6%) were lichen amyloidosis involving the pretibial region, with hyperkeratosis and irregular acanthosis in the epidermis. This characteristic is more noticeable in lichen amyloidosis.

In 43 cases of lichen amyloidosis, the larger amyloid deposits frequently displace the rete ridges elongated laterally and are accompanied by markedly irregular acanthosis (86.04%), hyperkeratosis (83.72%), papillomatosis (55.81%), hypergranulosis (23.25%), and pigmentation of the epidermis' basal cells. In this reported case, histopathological examination revealed a tissue with hyperkeratosis, parakeratosis, and acanthosis on the surface of stratified squamous epithelium. There was basement membrane thickening and basal cell ballooning as well. In the papillary dermis, keratin-derived amyloid was observed. There were skin adnexa and a thin layer of lymphocytes in the dermis. Congo red staining revealed partially atrophic epidermis and dermis with inflammatory cells, particularly perivascular, in this patient's skin tissue. In the dermis, areas with positively stained matrix and Congo red positive staining were also visible

beneath the basement membrane between the connective tissue stroma. The microscopic appearance supported lichen amyloidosis.

In this reported case, the results of dermoscopy and histopathological examination were congruent. On histopathological examination, orthokeratosis and pigmentary incontinence were observed in the form of orthokeratosis and pigment incontinence. A scar-like center surrounded by brown pigmentation on the periphery was observed on the dermoscopy.

CONCLUSION

The diagnosis of lichen *amyloidosis* is usually established clinically; however, dermoscopy and histology may be useful if in the cases with unclear clinical presentation. Dermoscopy is an easy to use and non-invasive method to diagnose *lichen amyloidosis*, as it allows us to see the structures beneath the skin. In this particular case, the results of dermoscopy and histopathological examination were congruent. The histopathological examination revealed A scar-like center surrounded by brown pigmentation at the periphery, which is observed in the form of orthokeratosis and pigment incontinence. Additionally, A positive *Congo Red* result further confirmed this patient's diagnosis.

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