Dermoscopy in cutaneous sarcoidosis

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Abstract

Cutaneous sarcoidosis has a wide variety of manifestations and can be challenging to diagnose clinically. Dermoscopy is a useful tool to support the clinical diagnosis. Herein, we report an elderly woman with pruritic facial plaques. Dermoscopy showed translucent orange globules with shiny white lines, and microscopic examination showed non-necrotizing granulomas with perigranulomatous fibrosis. Shiny white structures on dermoscopy are conventionally associated with basal cell carcinoma, melanoma, and dermatofibroma, and have not yet been reported in sarcoidosis. Current descriptions of dermoscopy findings of sarcoidosis in the literature are summarized. Further differential diagnostic entities for this presentation are described and treatment options for cutaneous sarcoidosis are discussed.

Keywords: dermoscopy, granulomatous disease, sarcoidosis

Introduction

Sarcoidosis is an inflammatory disorder characterized by non-caseating granulomas in one or more organ systems [1]. Diagnosis of cutaneous sarcoidosis requires characteristic histopathological findings and exclusion of other causes of granulomatous inflammation [1]. Cutaneous sarcoidosis has protean manifestations, including patches, papules, plaques, ichthyosis, and subcutaneous nodules [1]; it, can thus be challenging to diagnose clinically. Dermoscopy is therefore a useful clinical adjunct to support clinical diagnosis. Herein, we report the novel dermoscopic finding of shiny white lines in sarcoidosis. We also describe the differential diagnosis for this presentation and discuss treatment options.

Case Synopsis

A woman in her 70s with a history of diabetes mellitus and hypertension presented with a 2-year history of pruritic erythematous plaques over her

Figure 1. *Clinical image of erythematous facial plaques.*

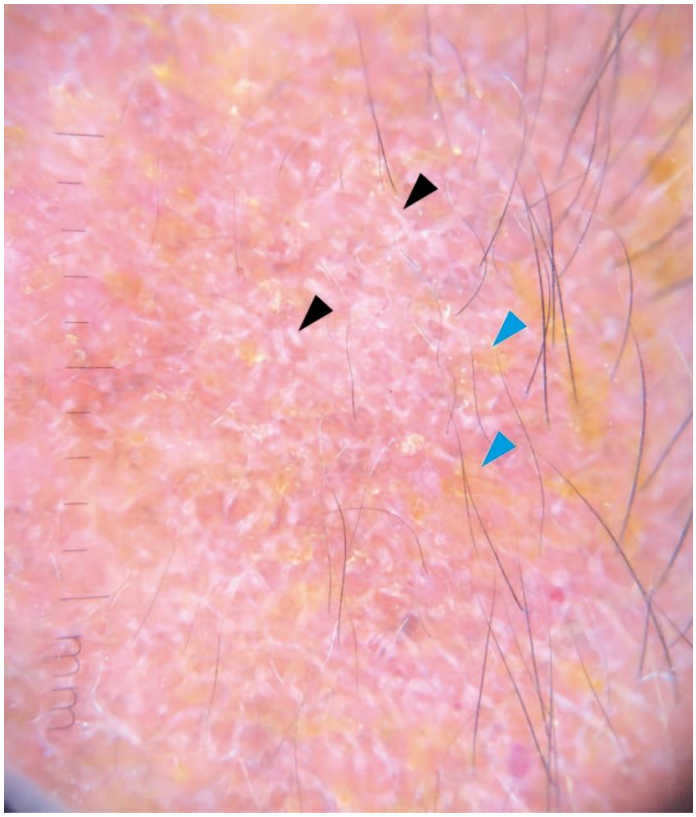

Figure 2. *Polarized dermoscopic image showing translucent orange globules (blue arrowheads) with shiny white lines (black arrowheads), (DermLite 4, 3Gen).*

face, which gradually spread to her scalp. The plaques started off as small papules and gradually enlarged. She travelled to India frequently and the papules started on one of these trips. She eventually developed hair loss over the plaque sites. She did not complain of photosensitivity, oral ulcers, joint pain, weight loss, or night sweats. She did not have skin lesions elsewhere. On examination, she had discoid erythematous plaques over her face and scalp (**Figure 1**). Dermoscopy showed translucent orange globules with shiny white lines (**Figure 2**).

Microscopic examination of a skin biopsy from the left eyebrow (**Figure 3**) showed discrete non-necrotizing granulomas within the superficial-to-deep dermis, with an accompanying mild-to-moderate lymphocytic infiltrate. The overlying epidermis showed irregular acanthosis with occasional elongated rete ridges. No polarizable foreign material was seen and no fungal organisms or acid-fast bacilli were identified with the periodic acid-Schiff, Grocott's methenamine silver, Ziehl-Neelsen, and Fite stains, respectively. Serum investigations showed hypercalcemia (levels

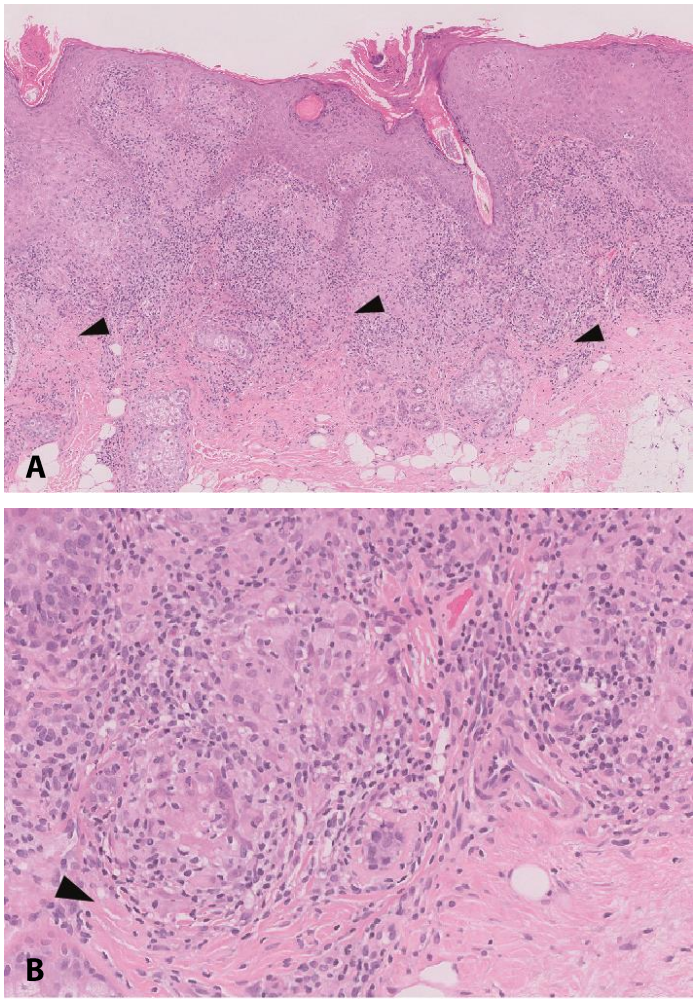

Figure 3. *Hematoxylin and eosin-stained skin biopsy specimens taken from a plaque showed discrete non-necrotizing granulomas within the dermis, with perigranulomatous fibrosis (black arrowheads).* ***A)*** *4×;* ***B)*** *20×.*

2.56mmol/L), but 25-hydroxyvitamin D levels were normal. Electrocardiography and urinalysis were unremarkable. A chest radiograph showed prominence of the hilar structures, but the patient declined further workup. Ocular examination showed no evidence of uveitis or optic neuritis. A diagnosis of sarcoidosis was made and she was given topical 0.1% mometasone furorate cream once a day with partial response (**Figure 4**). Her subsequent appointments were postponed owing to the COVID-19 pandemic.

Case Discussion

We discuss a patient with sarcoidosis presenting as erythematous facial plaques. In recent years, there has been increased interest in the use of dermoscopy

Figure 4. *Clinical image of facial plaques after two weeks of topical corticosteroid use.*

for diagnosis of non-malignant skin conditions [2]. In addition to sarcoidosis, the differential diagnosis for multiple erythematous facial plaques includes discoid lupus erythematosus, borderline tuberculoid leprosy, and granuloma annulare, which all have different findings on dermoscopy (**Table 1**).

Discoid lupus erythematosus is an autoimmune condition, more commonly seen in females and skin of color patients [3]. Characteristic dermoscopic findings in early lesions are perifollicular whitish halos, follicular keratotic plugs, and white scaling; late lesions show whitish structureless areas, hyperpigmentation, and radial pigment streaks [4]. Histological findings include interface dermatitis with basal layer vacuolization [5].

Given our patient's travel history to an endemic region, borderline tuberculoid leprosy was considered. Leprosy is a chronic granulomatous infection caused by *Mycobacterium leprae*, which primarily affects the skin and peripheral nerves. The most commonly seen dermoscopic findings are white areas and decreased hair density [6]. White areas correspond to a decreased number of melanocytes [6]. Yellow-orange globules may sometimes be seen, corresponding to regions of high granuloma number [6]. Histological findings include foamy macrophages and tuberculoid granulomas [7].

Granuloma annulare is a condition of uncertain etiology with characteristic necrobiotic histology [8,9]. The main dermoscopic findings are unfocussed vessels with variable morphology over a pinkish-reddish background [6]. Yellow-orange areas are sometimes seen in palisading granuloma histologic variants and are absent in interstitial histologic variants [6].

A review of published case reports and case series describing dermoscopy of sarcoidosis yielded a total of 50 cases (**Table 2**), [10-17]. The cases were mainly females in their forties and fifties. The lesions included papules, plaques, and nodules, and these were located on the face, trunk, and limbs. The predominant dermoscopy finding was orange-yellow areas [10,11,14-17], which correspond to dermal granulomas, and linear or branched blood vessels [11,15-17]. Although whitish structureless areas [11,16], crystalline structures [10], and white scales [12,17] were described, shiny white lines have not yet been reported.

Dermoscopy is a useful tool to aid the diagnosis of granulomatous inflammatory skin conditions, although it alone is not diagnostic. The correlation between dermoscopic orange globular areas, which correspond to dermal granulomatous infiltrates, and granulomatous dermatoses such as sarcoidosis, granuloma annulare, and necrobiosis lipoidica, is well established [4]. However, orange areas are also found in non-granulomatous conditions. These include conditions characterized by dense cellular infiltrate, such as pseudolymphomas or histiocytosis, and conditions characterized by dermal deposits, such as nodular amyloidosis, pityriasis lichenoides chronica, and small-plaque parapsoriasis [18]. In addition, the lack of orange areas on dermoscopy does not rule out the diagnosis of granulomatous disease, as orange areas may be absent if granulomas are deeply located or if there are marked

Table 1. *Dermoscopy features of selected granulomatous disorders.*

Disease	Clinical features	Pathophysiology	Histology	Dermoscopy	Ref
Cutaneous sarcoidosis	Patches, papules, plaques, icthyosis and subcutaneous nodules	Extrinsic antigens potentially trigger a dysregulated type one helper T cell immune response that generates the formation of noncaseating granulomas.	Non-caseating granuloma consisting of centrally organized collections of macrophages and epithelioid cells encircled by lymphocytes.	Diffuse or localized structureless yellowish-orange areas with focused linear or branching vessels	[4,23]
Discoid lupus erythematosus	Erythematous infiltrated discoid plaques with central hyperkeratosis	Autoimmune condition resulting from loss of tolerance towards self by the innate and adaptive immune system	Interface dermatitis with basal layer vacuolization	Perifollicular whitish halos, follicular keratotic plugs and white scaling; late lesions show whitish structureless areas, hyperpigmentation and radial pigment streaks	[4,5]
Borderline tuberculoid leprosy	Hairless papules or plaques with well-defined borders and depressed center	Chronic granulomatous infection caused by *Mycobacterium leprae*	Foamy macrophages and tuberculoid granulomas	Yellow-orange globules, white areas and decreased hair density	[6,7]
Granuloma annulare	Begins as a ring of skin-colored or red papules that may coalesce into plaques with central involution and increase in size	Unknown	Epithelioid histiocytes palisading around an anuclear dermis with mucin deposition	Unfocused vessels with variable morphology over a pinkish-reddish background. Yellow-orange areas are sometimes seen in palisading granuloma histologic variants, and are absent in interstitial histologic variants	[6,9]

overlying changes [18]. As such, it is helpful to have other features to aid dermoscopic evaluation.

In this case, we noted the presence of shiny white lines under polarized dermoscopy. Shiny white lines are defined as thick, short, bright white linear structures, often oriented in an orthogonal or stellate fashion [19]. They are distinct from shiny white areas, which are larger structureless areas of shiny white color often seen in basal cell carcinoma, or rosettes, which are four shiny white points arranged in a clover-leaf pattern that can be seen in actinic keratoses [20]. Shiny white lines on dermoscopy are conventionally associated with melanoma, Spitz nevi, and dermatofibroma and are reported to correlate with fibrosis or altered collagen in the dermis [19,21]. Shiny white lines have not yet been reported in sarcoidosis. In the context of sarcoidosis, shiny white lines likely correspond to perigranulomatous fibrosis, a histological feature of cutaneous sarcoidosis [22].

In terms of treatment of cutaneous sarcoidosis, potent topical corticosteroids or intralesional triamcinolone (3-10mg/ml every 3-4 weeks) can be utilized for localized lesions [23]. If these therapies are ineffective or involvement is more diffuse, corticosteroid-sparing agents such as oral

Table 2. *Dermoscopy findings of patients with cutaneous sarcoidosis.*

No. of cases	Profile	Morphology	Lesion location	Dermoscopy finding	Ref
1	38/F	Coalescing hard yellowish red papules	Eyebrows	Structureless orange color intermingled with crystalline structures	[10]
1	43/F	Reddish, slightly scaly plaque	Right temple	Whitish structureless areas on a yellow-orange background, with diffuse linear irregular vessels	[11]
1	70s/F	Multiple firm asymptomatic papules and nodules	Back	Light white scales on the surface and sparse, dotted vessels, overlying a homogenous pinkish background	[12]
1	62/F	Red-orange papule	Knee	"Apple jelly" appearance	[13]
2	Mean age 53, 50% female	Lichenoid rash	Forearm, trunk	Round to oval, yellow-brown, homogenous patches (100%)	[14]
6	Mean age 51.7, 83% female	Red to yellow-brown grouped papules, plaques and nodules	Face, trunk, arms, back, leg	Grouped translucent orange ovoid structures (100%), linear vessels (100%), central scar-like areas (66.7%)	[15]
19	Mean age 39.7, 63% female	Not specified	Face	Orange-yellowish areas (84.2%), linear branching vessels (73.7%), whitish structureless areas (15.8%)	[16]

chloroquine (up to 2.3mg/kg/day), hydroxychloroquine (up to 5mg/kg/day), or methotrexate (7.5-25mg/week orally) may be utilized [23-27]. Minocycline, which is utilized for its immunomodulatory effect rather than antimicrobial effect in this setting, can be used as monotherapy or in combination with hydroxychloroquine or topical corticosteroids [28]. Alternatively, systemic corticosteroids such as oral prednisolone can be used at a dose of 1mg/kg/day (up to 60mg), and gradually tapered to the lowest effective dose if improvement is seen [23]. For patients who have lesions recalcitrant to systemic corticosteroids or corticosteroid-sparing agents, agents that inhibit tumor necrosis factor (TNF), such as thalidomide [29], can be considered. In terms of biologic TNF inhibitors, both adalimumab [30] and infliximab [31] have been shown to be effective for cutaneous sarcoidosis and superior to etanercept for treatment of recalcitrant cases [32,33]. Both systemic and topical Janus kinase inhibitors have been shown in case studies to be effective for cutaneous sarcoidosis [34-37].

Conclusion

This case highlights the utility of polarized dermoscopy for the evaluation of non-malignant skin conditions, especially in conditions such as sarcoidosis in which clinical diagnosis can be challenging. This case is the first description of shiny white lines in combination with orange globules on polarized dermoscopy of cutaneous sarcoidosis and further dermoscopic descriptions of sarcoidosis would be beneficial.

Potential conflicts of interest

The authors declare no conflicts of interest.

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