Dermoscopy could be useful in differentiating sarcoidosis from necrobiotic granulomas even after treatment with systemic steroids

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ABSTRACT

Background: Diagnosing cutaneous sarcoidosis and necrobiotic granulomas is challenging.

Objective: Assessing the value of dermoscopy in differentiating cutaneous sarcoidosis from necrobiotic granulomas and evaluating whether their dermoscopic features will be altered after treatment.

Methods: Nineteen cutaneous sarcoidosis and 11 necrobiotic granuloma patients (2 necrobiosis lipoidica, 4 granuloma annulare and 5 rheumatoid nodule) were included in this study. The diagnosis was confirmed by skin biopsy. The lesions were examined using non-contact polarized dermoscope (Dermlite 2 HR-Pro; 3Gen, San Juan Capistrano, CA).

Results: Ten out of 19 cutaneous sarcoidosis patients and 7/11 necrobiotic cases group were receiving treatments (topical, intralesional or systemic steroids ± chloroquine) but still have cutaneous lesions. Treatment duration in the sarcoidosis group ranged from 2 months to 10 years (median 3 years) and in the necrobiotic cases group ranged from 3 months to 16 years (median 2 years). Pink homogenous background, translucent orange areas, white scar-like depigmentation and fine white scales were significantly associated with the cutaneous sarcoidosis compared to necrobiotic cases group. On the other hand mixed pink, white and yellowish background was significantly associated with the necrobiotic cases group. No significant difference in the dermoscopic findings was detected between treated and non-treated patients.

Conclusion: Some dermoscopic findings are shared between the cutaneous sarcoidosis group and the necrobiotic cases group, yet dermoscopy could be a useful aid in differentiating them even after treatment.

Introduction

Dermoscopy is gaining popularity in the diagnosis of inflammatory dermatoses. Polarized dermoscopes are widely used due to their better visualization of the deeper epidermis and papillary dermis [1].

A granulomatous disorder is a pathological description of a variety of conditions that have different etiologies but...
was represented using the terms sensitivity, specificity, +ve predictive value, -ve predictive value, and overall accuracy. P values less than 0.05 was considered statistically significant. All statistical calculations were done using computer program SPSS (Statistical Package for the Social Science; SPSS Inc., Chicago, IL, USA) release 15 for Microsoft Windows (2006).

### 2.2 Accuracy calculations

\[
\text{Sensitivity} = \frac{T(+)ve}{T(+)ve + F(-)ve} \\
\text{Specificity} = \frac{T(-)ve}{T(-)ve + F(+)ve} \\
\text{Positive predictive value} = \frac{T(+)ve}{T(+)ve + F(+)ve} \\
\text{Negative predictive value} = \frac{T(-)ve}{T(-)ve + F(-)ve} \\
\text{Overall accuracy} = \frac{T(+)ve + T(-)ve}{\text{All sample}}
\]

### Results

The demographic data of the patients are summarized in Table 1. Nineteen cutaneous sarcoidosis cases and 11 necrobiotic cases groups (2 necrobiosis lipoidica, 4 granuloma annulare and 5 rheumatoid nodule) were included in this study. The number of examined lesions in the cutaneous sarcoidosis group ranged from 1 to 16 lesions (median=3). The number of examined lesions in the necrobiotic cases group (necrobiosis lipoidica, granuloma annulare and rheumatoid nodules) ranged from 1 to 14 lesions (median=2).

Ten out of 19 cutaneous sarcoidosis cases and 7/11 of the necrobiotic cases group were receiving treatments but still had cutaneous lesions. The cutaneous sarcoidosis patients received systemic steroids and chloroquine. One patient received adjuvant intralesional steroids. Three patients from the necrobiotic cases group received topical steroids, 1 patient received systemic steroids, 2 patients received systemic steroids and methotrexate and 1 patient received systemic steroids, methotrexate and chloroquine.

The dermoscopic findings are summarized in Table 2. The results showed that pink homogenous background, translucent orange areas, white scar-like depigmentation and fine white scales (Figure 1) were significantly associated with cutaneous sarcoidosis compared to the necrobiotic
TABLE 2. Summary of the dermoscopic findings [Copyright: ©2016 Ramadan et al.]

|                      | Cutaneous sarcoidosis (n=19) | Necrobiotic cases group | P value |
|----------------------|------------------------------|-------------------------|---------|
| Background color     |                              |                         |         |
| Pink homogenous      | 14                           | 0                       | 0       | *0.018  |
| background           |                              | 0                       | 0       |         |
| Mixed pink           | 0                            | 1                       | 0       | 0.298   |
| and white homogenous |                              | background              |         |         |
| Mixed pink           | 0                            | 2                       | 2       | *0.012  |
| white and yellowish  |                              | background              |         |         |
| background           | 5                            | 0                       | 0       | 0.082   |
| Mixed pink and       |                              |                          |         |         |
| orange background    | 5                            | 0                       | 0       |         |
|                      |                              |                          |         |         |
| Translucent orange   | 4                            | 0                       | 0       | 0.141   |
| globules and areas   |                              |                          |         |         |
| Translucent orange   | 12                           | 0                       | 0       | *0.001  |
| globules             |                              |                          |         |         |
| Translucent orange   | 5                            | 0                       | 2       | 1       | 0.637   |
| areas                |                              |                          |         |         |
| Blood vessels        |                              |                          |         |         |
| Arborizing vessels   | 9                            | 0                       | 2       | 1       | 0.245   |
| Short linear         | 9                            | 0                       | 2       | 1       | 0.637   |
| blood vessels        |                              |                          |         |         |
| Pigmentation         |                              |                          |         |         |
| Hypopigmented areas  | 0                            | 2                       | 0       | 0       | 0.367   |
| Scar like depigmentation | 7                        | 0                       | 0       | 0       | *0.025  |
| Reticulate pigmentation | 1                        | 1                       | 2       | 1       | *0.047  |
| Scales               |                              |                          |         |         |
| Fine white scales    | 9                            | 0                       | 0       | 0       | *0.006  |

*P value <0.05 is significant

Figure 1. Dermoscopic picture of cutaneous sarcoidosis cases showing (a) arborizing blood vessels (black arrow) (no treatment); (b) translucent orange areas (black arrow) (treatment for 3 years); (c) scar-like depigmentation (black arrow) (no treatment); (d) white scales (black arrow) (no treatment). [Copyright: ©2016 Ramadan et al.]
Discussion

The spectrum of inflammatory diseases that can be diagnosed using a dermoscope has markedly increased. Granulomatous skin diseases are a group of inflammatory dermatoses that are characterized pathologically by granuloma formation. Few studies evaluated the use of dermoscopy in diagnosing cutaneous sarcoidosis; the largest of which was using 7 cases [7]. In this work we aimed to assess the value of the dermoscope in diagnosing cutaneous sarcoidosis using a larger number of patients. Moreover, we tried to evaluate whether receiving treatment affected the dermoscopic findings. We compared the dermoscopic findings of the patients who were receiving treatment with those who had not started any treatment. However, the results were not significant in all the dermoscopic findings (Table 3) (Figure 3).

| TABLE 3. Comparison between dermoscopic findings in treated and untreated cases |
|---|
| Cutaneous sarcoidosis (n=19) | Necrobiotic cases group (n=11) |
| | Untreated cases (9) | Treated cases (10) | P value | Untreated cases (4) | Treated cases (7) | P value |
| Background color | | | | | | |
| Pink homogenous background | 5 | 9 | 0.119 | 0 | 3 | 0.212 |
| Mixed pink and white homogenous background | 0 | 0 | | 0 | 2 | 0.382 |
| Mixed pink, white and yellowish background | 0 | 0 | | 3 | 1 | 0.088 |
| Mixed pink and orange background | 4 | 1 | 0.119 | 0 | 0 | |
| Translucent orange globules and areas | | | | | | |
| Translucent orange globules | 1 | 3 | 0.333 | 0 | 0 | |
| Translucent orange areas | 7 | 5 | 0.22 | 0 | 0 | |
| Blood vessels | | | | | | |
| Arborizing vessels | 4 | 1 | 0.119 | 1 | 2 | 0.721 |
| Short linear blood vessels | 4 | 5 | 0.586 | 1 | 2 | 0.721 |
| Pigmentation | | | | | | |
| Hypopigmented areas | 0 | 0 | | 2 | 0 | 1 |
| Scar like depigmentation | 2 | 5 | 0.22 | 0 | 0 | |
| Reticulate pigmentation | 0 | 1 | 0.526 | 2 | 2 | 0.47 |
| Scales | | | | | | |
| Fine white scales | 5 | 4 | 0.414 | 0 | 0 | |

Figure 2. Dermoscopic picture of necrobiotic cases group (a) necrobiotic granuloma showing mixed pink, white and yellowish background and arborizing blood vessels (black arrow) (no treatment); (b) granuloma annulare showing hypopigmented areas (black arrow) (no treatment); (c) rheumatoid nodule showing mixed pink and white background and short linear vessels (black arrow) (treatment for 2 years). [Copyright: ©2016 Ramadan et al.]
authors stated that arborizing blood vessels were detected in necrobiosis lipoidica while linear vessels were detected in sarcoidosis. Nonetheless, we detected arborizing blood vessels in 5 (26.3%) cases of cutaneous sarcoidosis. Those arborizing blood vessels might be shorter with fewer branches in sarcoidosis than necrobiosis lipoidica.

Necrobiosis lipoidica is a rare disease. Bakos et al. [12], Pellicano et al. [11] and Lallas et al. [13] all reported the presence of arborizing vessels on yellowish background in necrobiosis lipoidica, and our results confirm their findings. Hairpin like structures were detected by Bakos et al. in necrobiosis lipoidica; although we did not detect any hair pin like structures, we noticed that short linear blood vessels can be seen in necrobiosis lipoidica patients.

Lallas et al [13] reported the dermoscopic findings of granuloma annulare in 47 lesions of 24 patients. They found that the dermoscopic findings in granuloma annulare are heterogeneous. The background color is a combination of red and white in 42.6%, dotted vessels in 40.4%, short linear vessels in 21% and arborizing vessels in 14.9% of the lesions. In this work we found mixed pink and white background in 1 patient. Interestingly we found hypopigmented areas in 2/4 granuloma annulare patients and mixed pink white and yellow background in 1 patient.

Some dermoscopic features of inflammatory lesions are lost after treatment with steroids, which makes their diagnosis difficult [14]. Regarding lichen planus, Wickham’s striae and peripheral homogenous vascular pattern disappeared after 4 weeks of treatment with topical steroids [14]. Interestingly, our results showed that the dermoscopic findings of cutaneous sarcoidosis and necrobiotic cases group remained even after several years of treatment. Some possible explanations are that topical and systemic steroids may not be effective in treating all patients [15] or that more time may be needed for these lesions to disappear. In addition to that, different drugs with different mechanisms of action may be responsible for different dermoscopic modifications after treatment.
Some limitations of this work should be highlighted: dermoscopic features before and after treatment have not been compared; the limited number of patients, especially in the necrobiotic cases group; and most of the patients were Fitzpatrick’s skin type IV skin phototype.

In conclusion, some dermoscopic findings are shared between the cutaneous sarcoidosis and necrobiotic cases group. However, translucent orange areas, white scar-like depigmentation and white scales may be more suggestive of cutaneous sarcoidosis, while mixed pink, white and yellowish background may be more suggestive of necrobiotic granuloma. The dermoscopic features of cutaneous sarcoidosis might remain even after receiving treatment.

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