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ORIGINAL ARTICLE

Evaluation of Dermoscopic Features in Cutaneous Leishmaniasis

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Abstract

Background: **Cutaneous leishmaniasis (CL) is an infectious protozoan disease. Dermoscopy is a noninvasive diagnostic tool used to diagnose a variety of skin disorders, such as infestations.**

Aim: **The aim was to determine dermoscopic features of CL and to relate it with clinical findings.**

Patients and methods: **This study was conducted on 40 males with age range from 21 to 28 years. This study was performed between March 2021 and October 2021. Clinical and dermoscopic examination of CL lesions was done to assess specific dermoscopic criteria.**

Results: **We noticed the following dermoscopic features: background erythema (100%), yellow tears (75%), yellowish hue (42.5%), hemorrhagic spots (30%), central crustation (65%), white starburst-like pattern (20%), white scar-like patch (15%), milia-like cyst (15%), and change in the vascular structures like comma-shaped vessels (5%), linear irregular vessels (62.5%), dotted vessels (75%), hairpin vessels (17.5%), and glomerular-like vessels (20%).**

Conclusions: **Dermoscopic examination can be helpful in the diagnosis of CL.**

Keywords: Clinical examination, Cutaneous leishmaniasis, Dermoscopy

1. Introduction

Leishmaniases are infectious diseases induced by at least 20 different species of protozoan *Leishmania*, which is spread through bite of many species of *Phlebotomus* sand fly.[1]

There are three types of leishmaniases: cutaneous, mucocutaneous, and visceral. Interactions among host, parasite, vector, and environment all play important roles in leishmaniasis epidemiology and clinical spectrum.[2]

Cutaneous leishmaniasis (CL) is the most common type of leishmaniasis and has estimated 1.5 million infections yearly worldwide.[3,4]

CL usually affects exposed sites of the body, for example, face, upper extremities, and lower extremities.[5]

CL causes chronic noduloulcerative lesions in the skin that recover with atrophic scars. CL can be diagnosed using a variety of techniques, including skin smears, biopsy, culture, screening, and polymerase chain reaction.[6]

Dermoscopy is a noninvasive method for observing skin *in vivo* that enables a magnified view of lesions and submacroscopic constructions in epidermis and upper dermis. Dermoscopy is a powerful tool for diagnosing and characterizing pigmented lesions. It has recently gained popularity as a complementary procedure in a variety of nonpigmented lesions.[7]

2. Patients and methods

This research was performed on 40 patients with CL. All subjects gave consent to participate in this

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work after an explanation of the steps of the research. The research was recognized by the Research Ethical Committee of Al-Azhar University and fulfilled all the ethical aspects required in human research.

The study included 40 patients with CL consecutively recruited from the Dermatology Outpatient Clinic of Kobry Al-Kobba Military Complex between the periods from March 2021 to October 2021.

Any prior CL treatment was the exclusion criterion.

For every case, complete demographic information and history of disorder were documented in a predesigned clinical record form, such as name, years old, sex, address, occupation, disease duration, localization, and clinical type of lesions.

Complete dermatological examination was performed for each case to determine the distribution and morphology of CL lesions.

Dermoscopic test and images of 40 CL lesions were collected using DermLite 4, LLC, and San Juan Capistrano, California, USA, to assess different dermoscopic criteria. Before taking dermoscopic images, we applied a drop of 70% alcohol to lesions. To visualize vascular structures, we used minimal downward pressure when taking images.

2.1. Statistical methods

Data were fed to the computer and analyzed using IBM SPSS software package version 20.0 (Armonk, NY: IBM Corp). Values were expressed as mean ± SD, frequency, and percentage. *P* values of less than 0.05 were deemed important.

3. Results

3.1. Demographic data

This research was carried out on 40 patients [40 males (100%) and 0 females (0%)]. The mean age of patients was 23.40 ± 1.75 years (range: 21–28 years; median: 23 years) and the duration of the disease was 3.13 ± 1.30 months (range: 1–8 months). All patients were Egyptian soldier in Sinai (Table 1).

The most common lesion localization was forearm (22%), followed by arm (12.5%), foot (12.5%), leg (10%), hands (7.5%), wrist (7.5%), elbow (7.5%), and face (5%). CL lesions were classified into four types: popular, nodular, noduloulcerative, and plaque. Most lesions (65%) were erythematous plaques with central crustation. Table 2 shows clinical and demographic features of studied cases and lesions in detail.

Table 1. Distribution of the studied cases according to demographic data (n = *40*).

	N (%)
Sex	
Male	40 (100)
Female	0
Years old	
Minimum–maximum	21–28.0
Mean ± SD	23.40 ± 1.75
Median (IQR)	23.0 (22.0–25.0)
Occupation	
Egyptian soldier in Sinai	40 (100)

IQR, interquartile range.

Table 2. Distribution of studied cases according to clinical data (n = *40*).

	N (%)
Location of the lesion	
Face below left eye	2 (5.0)
Forehead	1 (2.5)
Lip	1 (2.5)
Arm	5 (12.5)
Ear	1 (2.5)
Elbow	3 (7.5)
Foot	5 (12.5)
Forearm	9 (22.5)
Hand	3 (7.5)
Leg	4 (10.0)
Wrist	3 (7.5)
Neck below left ear	2 (5.0)
Right big toe	1 (2.5)
Duration of the lesion (months)	
Minimum–maximum	1.0–8.0
Mean ± SD	3.13 ± 1.30
Median (IQR)	3.0 (2.0–3.50)
Description of the lesion	
Papule	2 (5.0)
Nodule	6 (15.0)
Erythematous plaque with central erosion	6 (15.0)
Erythematous plaque with central crustation	26 (65.0)

IQR, interquartile range.

Table 3. Distribution of studied cases according to dermoscopic features (n = *40*).

	N (%)
General	
Background erythema	40 (100.0)
Yellow keratotic plugs (yellow tears)	30 (75.0)
Scales	19 (47.5)
Central crustation	26 (65.0)
Hemorrhagic spots	12 (30.0)
White starburst-like pattern	8 (20.0)
White scar-like patch	6 (15.0)
Milia-like cyst	14 (35.0)
Yellowish hue	17 (42.5)
Vascular	
Comma-shaped	2 (5.0)
Linear irregular	25 (62.5)
Dotted	30 (75.0)
Hairpin	7 (17.5)
Glomerular-like	8 (20.0)

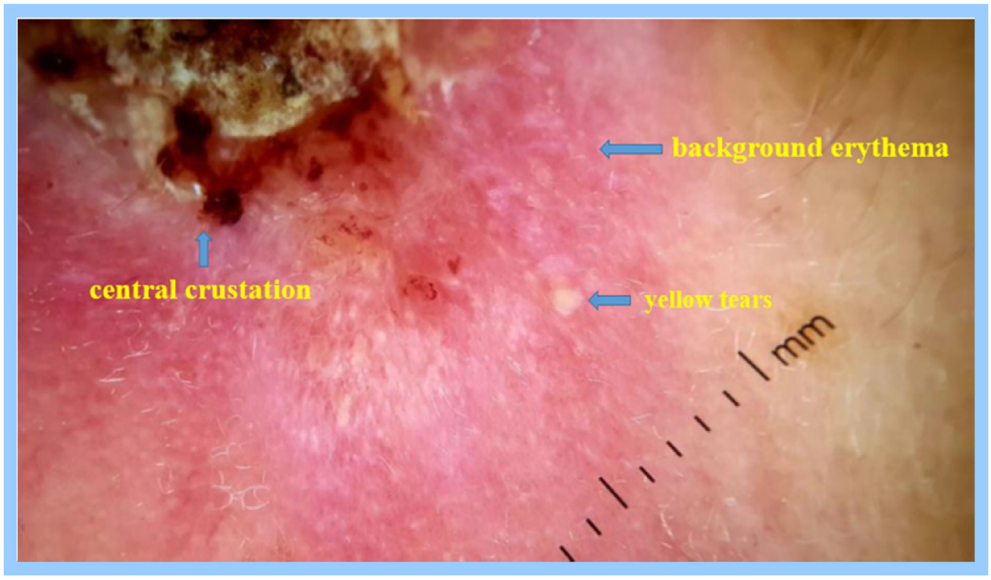

Fig. 1. Dermoscopic features of the lesion showed background erythema, yellow tears, and central crustation.

3.2. General feature

General dermoscopic features of lesions included background erythema, which presents in all CL lesions (100%), yellow keratotic plugs (yellow tears) (75%), scales (47.5%), central crustation (65%), hemorrhagic spots (30%), white starburst-like pattern (20%), white scar-like patch (15%), milia-like cyst (35%), and yellowish hue (42.5%) (Table 3, Figs. 1, 3 and 4).

3.3. Vascular morphology

The changes in the vascular structure were dotted vessels (75%), linear irregular vessels (62.5%), glomerular-like vessels (20%), hairpin vessels (17.5%), and comma-shaped vessels (5%) (Table 3, Figs. 2–5).

Dermoscopic features according to the types of CL lesions are found in Table 4. Most general and vascular dermoscopic features were more prominent in erythematous plaque with central crustation

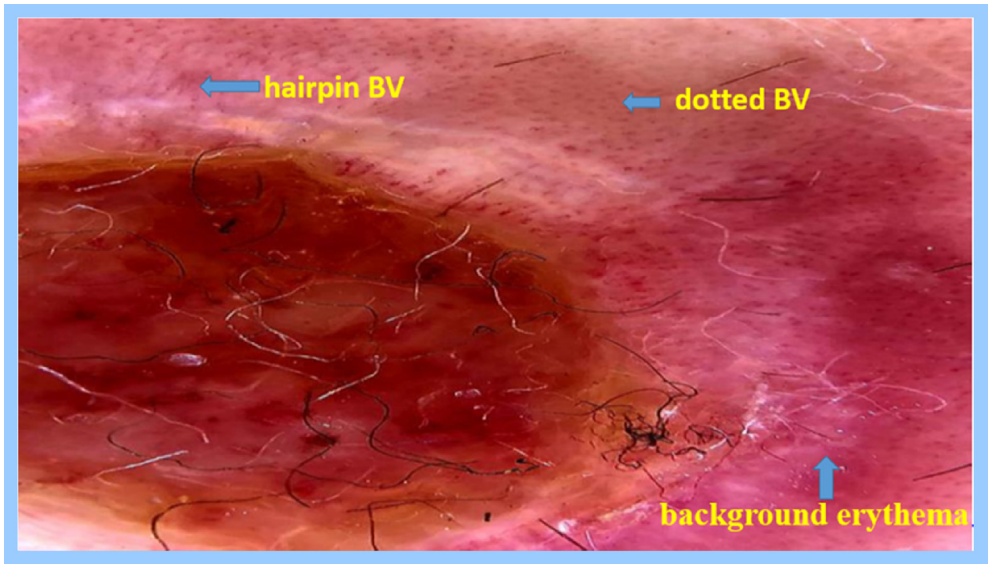

Fig. 2. Dermoscopic features of the lesion showed background erythema, yellow tears, central crustation, changes in vascular structures as dotted BV, linear irregular BV, and hairpin BV. BV, blood vessel.

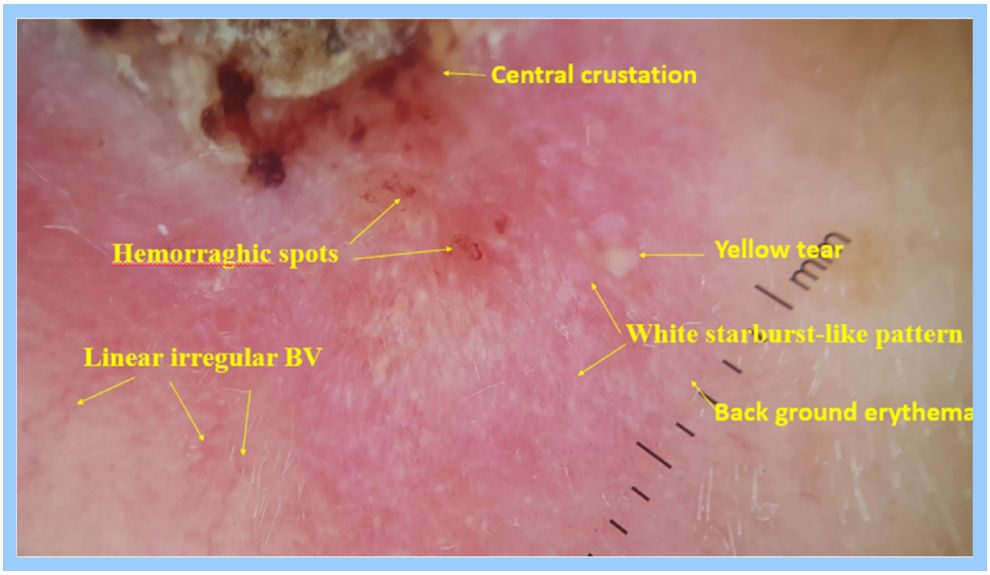

Fig. 3. Dermoscopic features of the lesion showed background erythema, yellow tears, hemorrhagic spots, white starburst-like pattern, and changes in vascular structures such as linear irregular BV. BV, blood vessel.

type and less prominent in papule type of CL (Figs. 3, 4, 6 and 7).

4. Discussion

Leishmaniases are infectious diseases induced by at least 20 different species of protozoan *Leishmania* that is spread through bite of many species of *Phlebotomus* sand fly.[1]

Dermoscopy is a noninvasive method for observing skin *in vivo* that allows for magnified view of lesions and submacroscopic structures in epidermis and upper dermis. Dermoscopy is a powerful tool for diagnosing and characterizing pigmented lesions. It has recently gained popularity as a complementary procedure in a variety of non-pigmented lesions.[7]

Our findings show that erythema is the most common dermoscopic discovery in CL. Background erythema and vascular constructions, which correlate with distended blood vessels, were found in 100% of cases.

Related to our findings, Llambrich et al.,[8] Ayhan et al.,[9] and Yücel et al.[10] found generalized erythema

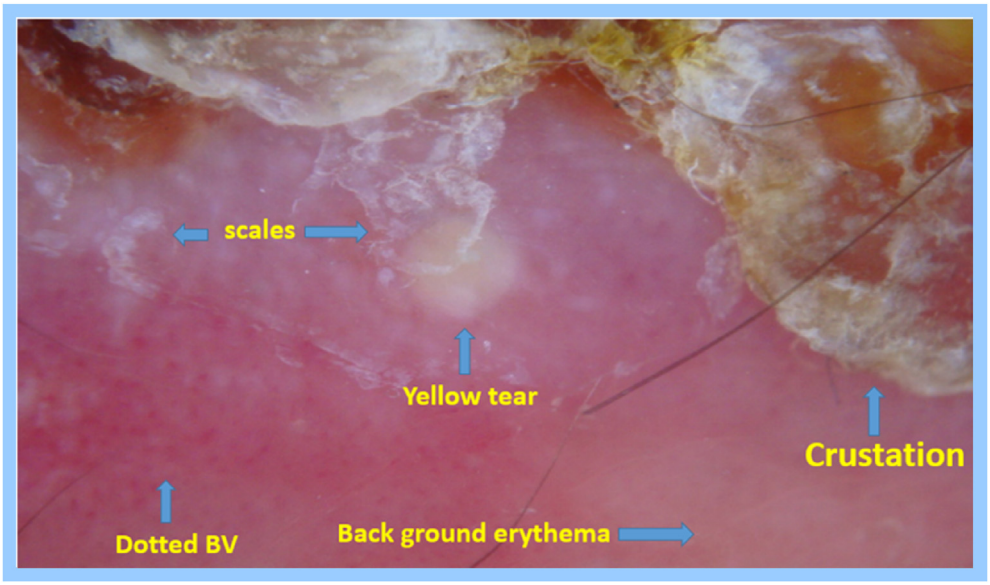

Fig. 4. Dermoscopic features of the lesion showed background erythema, yellow tears, scales, crustation, and changes in vascular structures as dotted BV. BV, blood vessel.

in all lesions. Taheri et al.,[11] on the contrary, found that generalized erythema was present in 81.9% of lesions and was more popular in developed and ulcerated lesions.

Presence of at least one vascular structure in all lesions was most significant finding in our research. In our research, dotted vessels were the most common vascular structures (75%). The second most common vascular structure in CL (62.5%) was linear irregular vessels. Other vascular structure variations observed included glomerular-like vessels (20%), hairpin vessels (17.5%), and comma-shaped vessels (5%).

Llambrich and colleagues, on the contrary, noted that comma-shaped vessels were the most common vascular structure in their research (73%). Linear irregular vessels (57%) were the second most common vascular structure in CL. Dotted vessels were found in 53% of CL cases.[8]

Moreover, Serarslan and colleagues noted that linear irregular vessels were the most common vascular structure (60%). Hairpin vessels (57%) were the second most common vascular structure in CL. Dotted vessels were found in 19% of CL cases.[12]

General dermoscopic features of the lesions in our study included background erythema, which

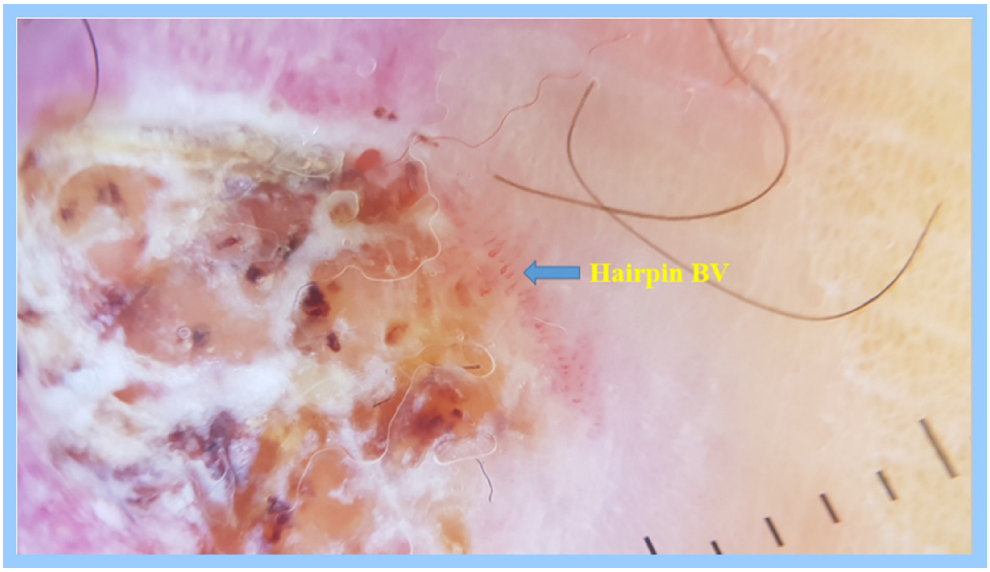

Fig. 5. Dermoscopic features of the lesion showed changes in vascular structures as hairpin BV. BV, blood vessel.

Table 4. Dermoscopic features according to description of the lesion (n = *40).*

	Description of the lesion			
	Papule ($n = 2$)	Nodule ($n = 6$)	Erythematous plaque with central erosion ($n = 6$)	Erythematous plaque with central crustation ($n = 26$)
General				
Background erythema	2	6	6	26
Yellow keratotic plugs (yellow tears)	1	3	6	20
Scales	0	3	2	14
Central crustation	1	1	0	24
Hemorrhagic spots	0	4	4	4
White starburst-like pattern	2	3	1	2
White scar-like patch	0	2	1	3
Milia-like cyst	2	0	2	10
Yellowish hue	0	2	3	12
Vascular				
Comma-shaped	0	1	0	1
Linear irregular	2	4	3	16
Dotted	2	4	6	18
Hairpin	0	2	0	5
Glomerular-like	0	1	3	4

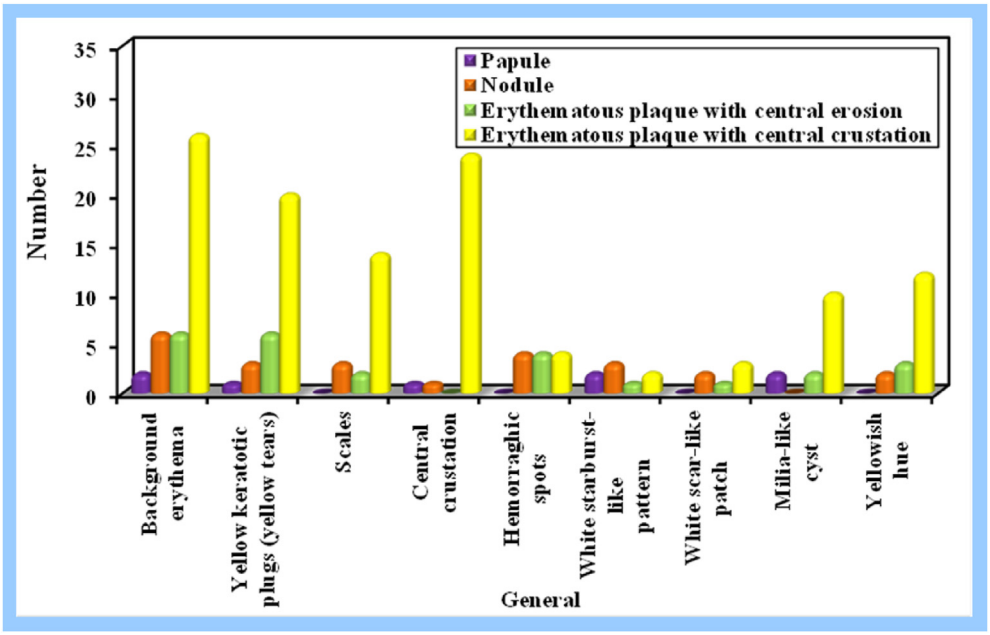

Fig. 6. General dermoscopic characteristics as said by description of lesion (n = 40).

presented in all CL lesions (100%), yellow keratotic plugs (yellow tears) (75%), scales (47.5%), central crustation (65%), hemorrhagic spots (30%), white starburst-like pattern (20%), white scar-like patch (15%), milia-like cyst (35%), and yellowish hue (42.5%).

'Yellow tears' are follicular plugs induced by lesion's lateral compaction of follicular ostium, whereas 'white starburst-like pattern' results through presence of parakeratotic hyperkeratosis around erosion.

Serarslan et al.[12] discovered that the most common dermoscopic characteristics were yellow tears (75.5%) and white starburst-like pattern (58.3%).

Lambrich and colleagues characterized two significant dermoscopic patterns associated with

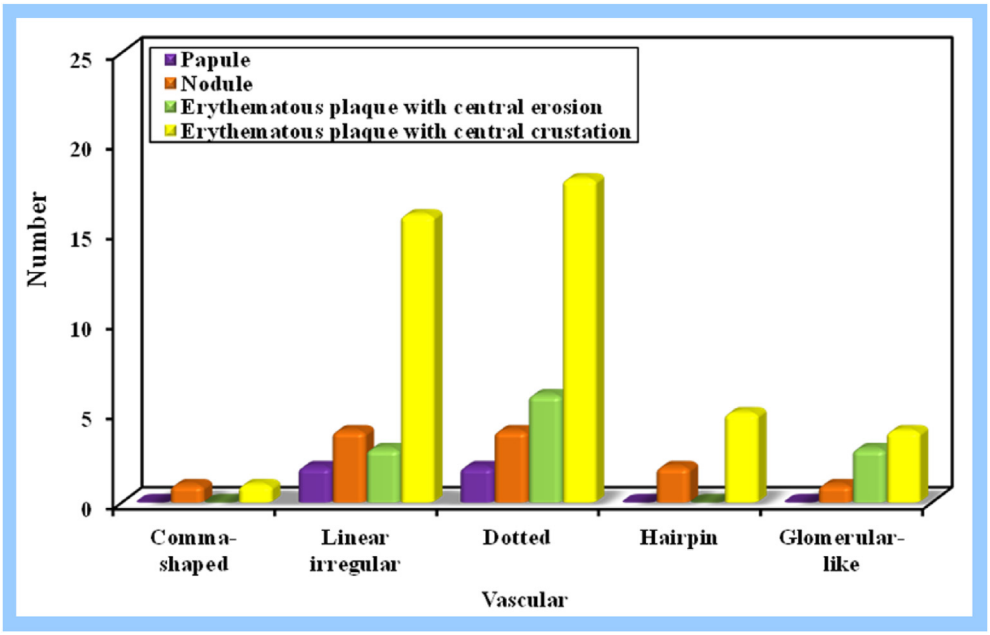

Fig. 7. General dermoscopic characteristics according to description of lesion (n = 40).

progression of lesions: pattern one is consistent with early lesions (<6 months) and is described by papular lesions with vascular structures and 'yellow tears', whereas pattern two is consistent with developed lesions (>6 months) and includes tumors with central erosion, ulceration, and hyperkeratosis, 'white starburst-like pattern', and peripheral vascular structures. There may also be some mixed and incomplete forms.[8]

Taheri et al.[11] noted that papular lesions with short evolution period were valued for their yellowish hue.

4.1. Conclusion

Leishmaniasis is an infection caused by the protozoan *Leishmania*. In almost all fields of dermatology, dermoscopy is critical for diagnosis and treatment monitoring. CL dermoscopy contains both general and vascular patterns. The most common dermoscopic discovery in CL is erythema. Background erythema and vascular structures were found in every case. Dermoscopy may be used as an adjunct noninvasive technique in diagnosis of CL.

Conflicts of interest

None declared.

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