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Dermoscopic (Onychoscopic) findings of various nail disorders among patients attending dermatology-teaching center in Sulaymaniyah city

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Abstract

Background and objectives: The term onychoscopy have recently been introduced to define the use of dermoscopy in nail disorders, which is the dermoscopic examination of nail unit and its components. With onychoscopy, many nail signs can be magnified and combined with clinical examination to reach a diagnosis, it aids in avoiding the need of nail biopsy. Aim of this study is to describe the onychoscopic features of the most important nail disorders. **Methods:** A cross-sectional, descriptive study of 99 patients with various nail lesions conducted over a period of 9 months. All participants subjected to complete medical history, general and skin examination. Dermoscopic examination of the affected nails performed by a handheld Dermlite DL4 device of (10-20) power of magnification and the findings recorded. **Results:** The most frequent onychoscopic findings were longitudinal striation in 93 % of onychomycosis cases, splinter hemorrhage and onycholysis with erythematous border in 94% of psoriasis cases, round homogenous pigment pattern, streaked distal end in 100% of subungual hematoma patients and multiple brown-black small dots in 100% of periungual wart cases. **Conclusions:** This study showed that onychoscopy could be considered as a non- invasive and easily accessible tool for reinforcing clinical diagnosis of certain nail disorders. Onychoscopy can aid in decreasing the number of unnecessary investigations, including nail culture and biopsy.

Key words: Dermoscopy, Nail, Onychomycosis, Onychoscopy, Psoriasis.

Introduction

Diseases of nail comprise approximately 10% of all the dermatological conditions[1]. There is a relative lack of diagnostic modalities, which can be used to diagnose nail disorders[2]. Nail biopsies are not commonly done by dermatologists, owing to the need of surgical expertise and a trained pathologist, thus, onychoscopy offers a distinct advantage by helping to avoid some nail biopsies[3]. Nail structures can be affected by infections, trauma, primary skin dermatosis, systemic diseases, neoplasm and congenital syndromes[4]. Among the important nail disorders are infectious diseases of nail, such as onychomycosis, which is a fungal infection of nail, forms the most common nail disorder and accounts for nearly 50% of all onychopathies[5]. Dermoscopic features of onychomycosis are jagged edge of the proximal margin of the onycholytic area with sharp structures directed to the proximal fold and white-yellow longitudinal striae in the onycholytic nail plate[6].

Traumatic nail abnormalities include Traumatic onycholysis, Subungual Hematoma, Ingrown Toenails, and Onychotillomania[4]. Dermoscopic finding of traumatic onycholysis is the presence of a linear edge in the proximal margin of the onycholysis without spikes[7].

The dermatoses that affect nails are psoriasis, lichen planus, alopecia areata, Darier disease and eczema[8]. Nail psoriasis accounts for up to 50% of patients with psoriasis, may be the only manifestation of the disease, and is often associated with psoriatic arthritis[4].

Nail lichen planus is seen in approximately 10% of patients with skin lichen planus, and the most severe clinical manifestation is dorsal pterygium[8]. Other important nail disorders are benign and malignant tumors, including periungual pyogenic granuloma, glomus tumor, nail matrix nevi, myxoid cyst, onychomatricoma[8]. Malignant nail tumors include Nail melanoma, Bowen disease, keratoacanthoma, and squamous cell carcinoma[4].

The dermoscope is a non-invasive and practical magnification device that visualizes subtle clinical patterns of

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skin lesions, hair disor¬ders, and nail changes that are not normally visible to the naked eye[5,9]. Onychoscopy is the dermoscopic examination of nail unit and its components, namely, nail plate surface, nail bed, hyponychium and periungual nail folds[3]. The use of dermoscopy in nail disorders is quite recent[6]. With onychoscopy, many nail signs can be magnified and combined with clinical examination to reach a diagnosis[10]. Nail examination can be performed with hand-held dermoscope at 10-40x magnification[9]. The unique anatomy of the nail apparatus makes nail dermoscopy technically difficult to be performed and not easy to be interpreted. The main technical problem of nail dermoscopy is the convexity and hardness of the nail plate[6]. The dermoscope may be used dry in evaluation of the nail plate surface or with ultrasound gel in cases of nail pigmentation, onycholysis, and the distal nail margin[11].

Aim of this study is to describe the onychoscopic features of the most important nail disorders.

Patients and methods

This study was a cross-sectional, descriptive study, carried out over a period of 9 months from August 2018 to May 2019, in Sulaymaniyah dermatology teaching center in Sulaymaniyah city, Kurdistan Regional Government-Iraq. After approval of our research protocol by ethical and scientific committees of Kurdistan Board for Medical Specialties, a total of 99 patients with various nail lesions presented to Sulaymaniyah dermatology teaching center were enrolled in this study. The purpose of our study was explained to each participant with both verbal and written informed consent obtained. This study included all patients with onychopathies of both sexes and any age groups. Patients who underwent topical or systemic treatment for the past 4 weeks and those who applied henna on their affected nails were excluded from our study. All participants were subjected to complete medical history, general and skin examination. All affected fingers and toenails of each participant were examined both clinically and by means of a handheld dermoscopy device.

The diagnosis of different nail disorders were achieved clinically based on experience of two board certified dermatologists. After that, they underwent dermoscopic examination by means of a handheld Dermlite DL4 (3Gen, Inc., | San-Juan Capistrano, CA 92675 | USA) device of 10-20 power of magnification. Initially, dry dermoscopy of affected nails were performed followed by application of an immersion fluid as ultrasound gel for enhancing transparency of nail plate and better visualization of nail bed changes.

Many digital images were obtained through attachment of the dermoscopic device to a smart phone. The data was recorded on a specially designed questionnaire, and analyzed by using statistical package for social science (SPSS), version 22.

Results

A total of 99 patients with various onychopathies were included in this descriptive study. There was female predominance with 58 (58.6%) of cases and 41(41.4%) were male. Patient's age ranged from 4 years to 70 years. The mean age of patients was 36.3 ± 17.4. Forty-one patients (41.4%) were in the age group of 31 to 50 years, with 22 (22.2%) of them were in the age group of 51 to 70 years, 19 (19.2%) of them were in the age group of 18 to 30 years and the lowest number of patients 17 (17.2%) belonged to the age group of 4 to 17 years. Fingernails were involved in 91 patients (91.9%) while toenails involved in 7 patients (7.1%) and in only 1 patient (1.0%) both finger and toenails were involved. Among 99 patients, only 13 (13.1%) of them had systemic diseases in form of diabetes mellitus and 7 (7.1%) of them had hypertension. Regarding associated skin dermatosis, of the total 99 patients, 68 (68.7%) presented with onychopathies alone, while associated skin dermatosis observed were as follows in order of frequency: psoriasis 15(15.2%) and chronic hand dermatitis 7 (7.1%), lichen planus 4 (4.0%), dermatomyositis 2 (2.0%), Systemic sclerosis (1), Pemphigus foliaceous (1), and Darier disease (1).

Sixteen different nail diseases were observed in our study, as shown in decreasing order of frequency in Table (1).

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Table (1): Nail disorders found in the study group

Clinical diagnosis	No.	%
Onychomycosis	27	27.3
Nail psoriasis	16	16.2
Peri ungual wart	9	9.1
Subungual hematoma	6	6.1
Traumatic onycholysis	5	5.1
Longitudinal melanonychia	4	4.0
Green nail syndrome	4	4.0
Nail lichen planus	4	4.0
Onychomadesis	4	4.0
Chronic paronychia	4	4.0
Punctate leukonychia	4	4.0
Glomus tumor	3	4.0
Onychoschizia (brittle nail)	3	3.0
Nail changes in connective tissue disease	3	3.0
Nail biting	2	2.0
Nail changes in Darier disease	1	1.0
Total	99	100.0

The onychoscopic findings of various nail disorders observed in this study were as follows: clinically suspected onychomycosis was found in 27 cases (27.3%), it was of distal and lateral subungual type. The most common dermoscopic nail findings observed is shown in Table (2) and Figure (1).

Table (2): Onychoscopic findings in patients with onychomycosis

Onychoscopic findings	No.	%
White – yellow longitudinal striation	25	93
Spike pattern	24	89
Jagged proximal edge of oncholytic area	17	63
Aurora borealis pattern	17	63
Splinter hemorrhage	13	48
Ruin – appearance	12	44
Multicolored pattern	9	33
Fungal melanonychia	9	33
Total	27	100.0

Nail psoriasis was clinically suspected in 16 cases (16.2%) of psoriasis with skin lesions elsewhere and the onychoscopic findings observed is shown in Table (3) and Figure (2).

Table (3): Onychoscopic findings in patients with nail psoriasis

Onychoscopic findings	No.	%
Splinter hemorrhage	15	94
Onycholysis with erythematous border	15	94
Pitting	14	88
Longitudinal ridges	10	63
Nail plate crumbling	10	63
Subungual hyperkeratosis	8	50
Salmon patch	4	25
Total	16	100.0

Periungual wart was found in 9 cases (9.1%) and the onychoscopic findings that was observed in all of them were well-demarcated hyperkeratotic structure 9 cases (100%), multiple brown-black small dots 9 cases (100%) and white scale 9 cases (100%).

Subungual hematoma was found in 6 cases (6.1%) and the onychoscopic findings that was recognized in all six cases were round homogenous pigment pattern 6 cases (100%), peripheral fading 6 cases (100%), streaked distal end 6 cases (100%) and globules 6 cases (100%) Figure 3.

Traumatic onycholysis was found in 5 cases (5.1%) and the onychoscopic findings were onycholysis with linear and regular proximal border of oncholytic area without spikes or indentation 5 cases (100%), splinter hemorrhage 2 cases (40%).

Longitudinal melanonychia was found in 4 cases (4.0%) and the onychoscopic findings were longitudinal bands with regular thickness, spacing and parallelism in all 4 cases (100%), brown background 3 cases (75%), brown longitudinal bands 3 cases (75%), pseudo- Hutchinson patients sign 3 cases (75%), gray background 1 cases (25%), gray longitudinal bands 1 case (25%) and distal nail plate destruction 1 case (25%), Figure (4).

Nail lichen planus was found in 4 cases (4.0%), which was diagnosed on the basis of clinical suspicion and associated with cutaneous lesions. The onychoscopic findings were nail plate fragmentation 4 cases (100%), paronychia 4 cases (100%), splinter hemorrhage 4 cases (100%), longitudinal fissures 3 cases (75%), Chromonychia 3 cases (75%), pterygium 3 cases (75%) Subungual keratosis 3 cases (75%), trachyonychia 2 cases (50%), onycholysis 2 (cases 50%), and nail plate crumbling 1 case (25%).

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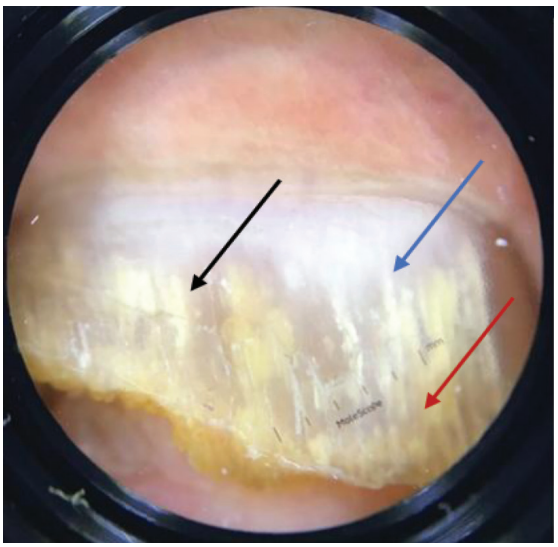

Figure (1): Onychoscopy of onychomycosis: Longitudinal striae (red arrow), spikes (blue arrow) and jagged proximal margin (Black arrow).

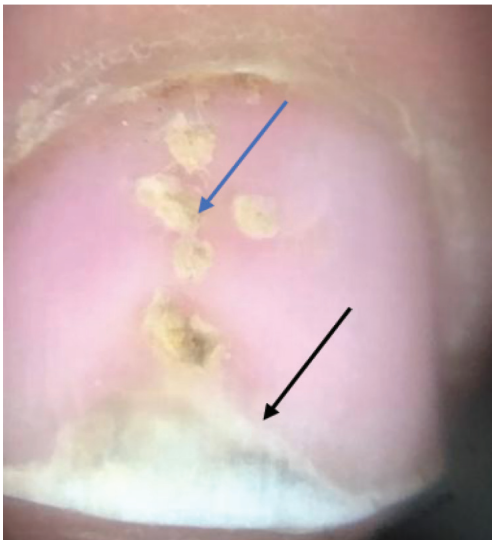

Figure (2): Onychoscopy of nail psoriasis: Large and irregularly shaped pits with yellowish surface scales (blue arrow) and distal onycholysis with linear erythematous border (Black arrow).

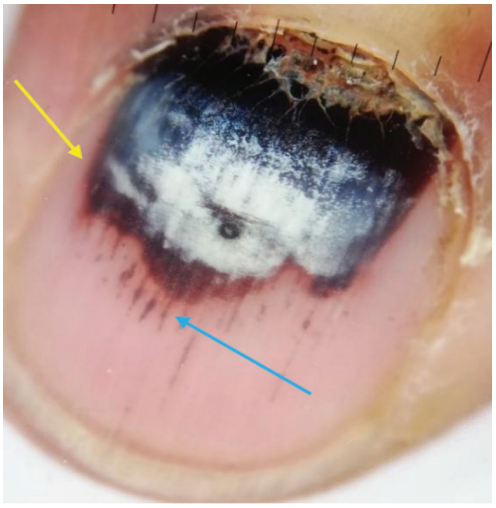

Figure (3): Onychoscopy of subungual hematoma: homogenous pigment pattern, peripheral fading (yellow arrow), streaked distal end (blue arrow).

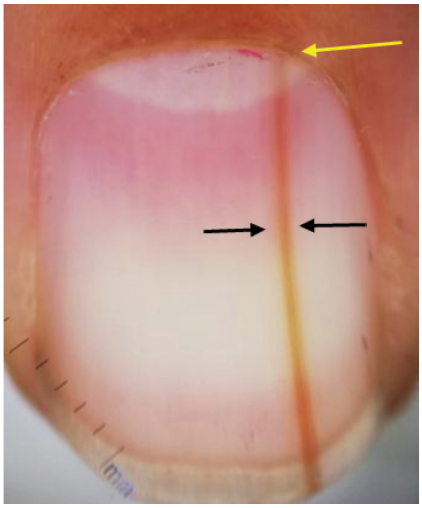

Figure (4): Onychoscopy of nail melanocytic nevus: brown longitudinal bands with regular thickness and spacing (black arrow), pseudo- Hutchinson sign (yellow arrow).

Green nail syndrome was found in 4 cases (4.0%) and the onychoscopic findings were onycholysis with longitudinal green bands 4 cases (100%), and peripheral fading of green color to yellow 4 cases (100%).

Punctate leukonychia was found in 4 cases (4.0%) and the onychoscopic findings were punctate milky white spots 4 cases (100%), smooth nail plate surface 4 cases (100%) and splinter hemorrhage 1 case (25%).

Onychomadesis was found in 4 cases (4.0%) and the onychoscopic findings were periungual folds erythema 4 cases (100%), proximal loss of nail plate 4 cases (100%) and splinter hemorrhage 2 cases (50%).

Glomus tumor was found in 3 cases (3.0%) and the onychoscopic findings were deep bluish – pink subungual area 3 cases (100%), distal onycholysis 3 cases (100%), splinter hemorrhage 2 cases (67%), and distal nail plate fissuring 1 case (33%), Figure (5).

Onychoschizia (brittle nail) was found in 3 cases (3.0%) and the dermoscopic nail findings were distal horizontal splitting of nail plate 3 cases (100%), longitudinal ridges 3 cases (100%) and distal onycholysis 1 case (33%).

Nail fold changes was found in 3 patients with connective tissue disease (3.0%) and the onychoscopic findings were

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enlarged capillary loops 3 cases (100%), loss of capillaries 3 cases (100%), tortuous capillary 3 cases (100%), cuticular hemorrhage 3 cases (100%) and avascular area 1 case (33%), Figure (6).

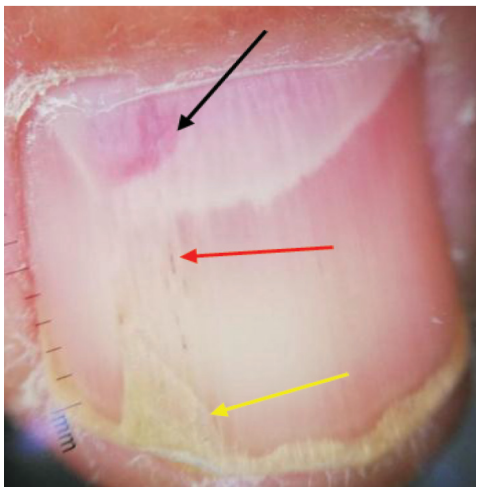

Figure (5): Glomus tumor: deep bluish – pink subungual lesion (black arrow), and splinter hemorrhage (red arrow)

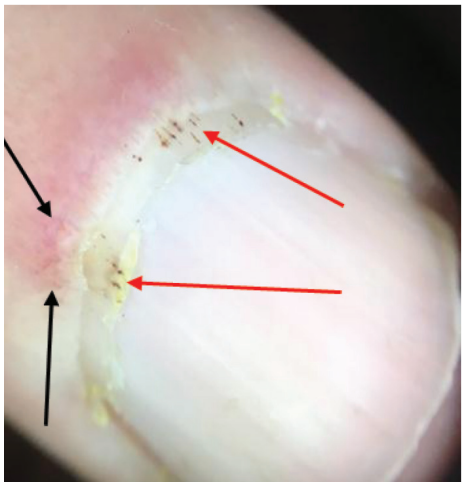

Figure (6): Dermatomyositis: cuticular hemorrhage (red arrows), enlarged and tortuous capillary loops (black arrows)

Discussion

The use of dermoscopy for nail diseases was recently introduced. Although the naked eye can appreciate the majority of macroscopic details of the nail components, onychoscopy furnishes details, which may be easily missed[1].

According to the results of our study, the most common nail disorder was onychomycosis and the clinical pattern that was observed in all cases was distal and lateral subungual onychomycosis. The predominant onychoscopic findings of onychomycosis were white – yellow longitudinal striation followed by spikes pattern and jagged proximal edge of onycholytic area. This was in agreement with the study performed by Chetana K et al[12], who found the longitudinal striae as predominant pattern and stated that the longitudinal striae, spikes, and jagged patterns are statistically significant findings of onychomycosis. The contrast of our study is the study performed by Yorulmaz A et al[13], who revealed that the most common dermoscopic finding was jagged proximal edge with spikes of the onycholytic area. These findings together resemble aurora borealis which is described as aurora pattern, and we observed this pattern in 17(63%) of onychomycotic cases.

The second common onychopathy in our study was nail psoriasis and the frequent dermoscopic findings that we found were splinter hemorrhage, pitting, onycholysis with erythematous border and nail plate crumbling. Our findings were consistent with those observed in studies done by Bhat YJ et al5 and Yorulmaz A et al[14].

The third common onychopathy in this study was peri-ungual wart and three onychoscopic findings were observed in all of them, which were well-demarcated hyperkeratotic structure, multiple brown- black small dots, and white scale. Similar findings were observed by Rathod D et al[1] and Piraccini BM et al[6], they reported that the small black dots correspond to the dilated capillaries of the papillary dermis. Although diagnosis of warts is essentially clinical, onychoscopy can be used to magnify small periungual warts not evident to the naked eye and helpful in its differentiation from periungual Bowen disease, which clinically appears as periungual verrucous plaque[10].

Longitudinal melanonychia is another nail lesion that can be of concern, it was observed in 4 cases in our study. All the 4 cases in our study where benign, three of them were diagnosed as benign melanocytic nevus and the other one as ethnic melanonychia. Dermoscopy of nail appears to be helpful to distinguish benign causes of longitudinal melanonychia from malignant causes[5]. On onychoscopy, the prominent findings that were observed were longitudinal homogenous bands with regular spacing, thickness and parallelism (4/4; 100%). We observed brown background, brown longitudinal bands, and pseudo- Hutchinson

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sign in 3/4(75%), while in only one patient we found gray background, gray longitudinal bands, and distal nail plate destruction observed in only one case. Our findings were similar to a study conducted by Ronger et. al[15].

Subungual hematoma was another nail disease in our study observed in six patients. Onychoscopic findings that we recognized in all six cases were round homogenous pigment pattern, peripheral fading, streaked distal end and globules. Similar findings were described by Piraccini MB et al[11], who stated that in subungual hematoma, onychoscopy is diagnostic and aid its differentiation from subungual melanoma.

Although most nail fold changes in connective tissue diseases are not specific, they may give an important clue to the diagnosis[5]. In this study, we found proximal nail fold changes in two patients with dermatomyositis and one case of scleroderma. On onychoscopy, we observed enlarged capillary loops, loss of capillaries, tortuous capillary and cuticular hemorrhage in all three cases, while only in patient with scleroderma, we found avascular area. Our findings were similar to those observed in Lencastre A et al[7] and studies performed by Bhat YJ et al[5] and Rathod D et al[1].

Three patients with glomus tumor were included in this study, which is painful benign nail tumor. By onychoscopy, we found deep bluish – pink subungual area and distal onycholysis in all three cases. In only one patient, we observed distal nail plate fissuring. Similar findings were described by Alessandrini A et al[10] and Bhat YJ et al[5].

Our study was only descriptive and the limitations were small sample size and lack of correlation with culture and histopathology, because our patients were hesitant to perform nail matrix biopsy as it is a painful surgical procedure and may lead to permanent destruction of nail.

Conclusions

This study showed that onychoscopy could be considered as a quick, non- invasive and easily accessible tool for reinforcing clinical diagnosis of certain nail disorders. Especially in onychomycosis, differentiation of benign from malignant melanonychia and distinguishing different causes of onycholysis can be done. Onychoscopy can aid in decreasing the number of unnecessary investigations, including nail culture and nail matrix biopsy.

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