

Clinico- Dermoscopic Evaluation of Nail Disorders

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Abstract

Background: Nails constitute an important aspect of human aesthetics & a mirror of variety of systemic diseases. Nail disorders are abnormalities affecting any part of nail unit i.e., nail plate, nail matrix, nail bed, proximal and lateral nail folds, hyponychium & distal phalanx. Nails are affected in about 10% of skin conditions leading to functional impairment, sensory loss, decreasing finger grip.

Aims and objectives: To evaluate the clinical and Dermoscopic features of various nail disorders and role of dermoscopy in early diagnosis.

Materials and methods: Prospective observational study from January 2021 to June 2022 was conducted at the Department of DVL, Guntur Medical College, Guntur, Andhra Pradesh. 100 patients of both sexes and

aged above 18 years with nail disorders are included in the study. **Results:** Among 100 cases, 53 were females and 47 were males. Onychomycosis was the most common finding constituting 32 (32%) cases followed by nail psoriasis (pitting (13%), oil drop sign (9%), onycholysis (7%)), chronic paronychia (7%) and other nail disorders constituting small number of cases.

Conclusion: The features of nail disorders can be visualized by clinical examination but by that time significant damage to the nail plate has already occurred. So, Onychoscopy aids in early diagnosis and management of nail disorders.

Keywords: nail dermoscopy, Onychoscopy, nail disorders, onychomycosis, nail psoriasis

Introduction

Nail disorders are common dermatologic complaints and constitute about 10% of skin disorders^[1]. Majority of nail disorders are because of infections followed by inflammatory or metabolic cause and pigmentary causes. Nail unit is a complex structure with significant histopathological differences between different nail structures. Several nail disorders may mimic one another^[2].

Dermoscopy is proved to be efficient, easy, non-invasive supportive method in the diagnosis of various dermatologic diseases. Onychoscopy helps in visualization of various nail structures like nail plate, nail matrix, nail bed, hyponychium, proximal and lateral nail folds, distal end of nail plate. Nail dermoscopy aids in subtle nail changes that are missed clinically^[3].

Dermoscopy serves as a vital link between macroscopic dermatology (clinical features) and microscopic dermatology (i.e., histopathological features). Similarly, Onychoscopy acts as an intermediate between clinical examination and nail histopathology^[4].

This study aims in the evaluation of nails using dermoscope in various nail disorders and comparing with clinical examination of nails.

Materials and Methods

A prospective observational study was conducted for a period of 18 months from January 2021 to June 2022 at the Department of DVL, Guntur Medical College, Guntur, AP. After obtaining clearance and approval from the Institutional Ethics Committee, 100 patients with nail disorders were examined and enrolled for the study. All patients were explained about the purpose of study, procedure of clinical examination and necessary investigations like KOH mount and nail biopsy were done in cases of diagnostic difficulty. Informed and

written consent was taken and documented from all cases.

A total of 100 patients with nail disorders of both sexes and age above 18 years were taken from the outpatient of Department of DVL, Government General Hospital, Guntur. Detailed history (past, present) was taken from every patient with nail disorder. History of medical diseases, history of medications, family history of similar complaints was enquired. General examination was done. Patients were examined for any associated cutaneous diseases.

All 20 nails were examined both clinically and dermoscopically:

Clinical: All nails were examined by naked eye and photographs were taken using a smart phone camera.

Dermoscopy: All 20 nails were examined using dermoscope (nail plate, nail matrix, nail bed, proximal and lateral nail folds). Nail dermoscopy images were captured in 10X and 30X magnification.

Results

One hundred patients with various nail disorders were included in the study. Of which 53 were females and 47 are males with slight female preponderance (53%). The study population ranges in age from 19 to 74 years with average age of 42.4 years. Nail disorders lasted anywhere from 5 days to 20 years with average duration of 2.4 years. Majority of the female patients were housewives and male patients were labourers, farmers and other occupations like students, software and others were included in study.

Of all the 100 cases, Onychomycosis accounts for 32 cases (32%) which was the most common condition followed by Pitting of 13 cases (13%), Oil drop sign (9%), Onycholysis (7%), Chronic paronychia (7%), Sub ungual hyperkeratosis (6%), Longitudinal ridges (6%),

Transverse grooves (5%), Total nail dystrophy (4%). There were four cases of periungual erythema (4%), four cases of subungual warts (4%), three cases of ragged cuticle (3%), and three cases of Trachyonychia (3%). Dorsal pterygium, Longitudinal melanonychia, Ingrown toe nail, Clubbing - 2 cases (2% each), Acute paronychia, and Pincer nails - 1 case (1% each) as shown in Table 1.

In 26 (26% of 100 cases), nail changes were observed in conjunction with a pre-existing systemic disorder. Diabetes Mellitus was the most common systemic disorder associated with nail changes, accounting for 9 cases (34.6%), followed by HIV, Systemic Sclerosis - 3 cases each (11.5%), Lupus erythematosus, Acute pneumonia, COPD - 2 cases each (7.7%), Typhoid fever, Atopy, Bronchial asthma, CRF, MCTD - 1 case each (3.8%)

Table: Spectrum of nail changes

Sn.	Disease	No: of Cases	Percentage (%)
1	Onychomycosis	32	32
2	Pitting	13	13
3	Onycholysis	7	7
4	Total nail dystrophy	4	4
5	Oil drop sign	9	9
6	Sub ungual hyperkeratosis	6	6
7	Chronic Paronychia	7	7
8	Peri ungual erythema	4	4
9	Ragged cuticle	3	3
10	Longitudinal ridges	6	6
11	Transverse grooves	5	5
12	Subungual warts	4	4
13	Trachyonychia	3	3
14	Dorsal pterygium	2	2
15	Longitudinal Melanonychia	2	2
16	Ingrown toe nail	2	2
17	Clubbing	2	2
18	Acute Paronychia	1	1
19	Pincer nails	1	1

Table 2: Dermoscopic features of nail disorders

Sn.	Dermoscopy features in nail disorders				
1.	Onychomycosis	DLSO	Percentage (%)	TDO	Percentage (%)
	Spike pattern	9	56.2	3	50
	Longitudinal striae pattern	13	81.2	1	16.6
	Ruins pattern	6	37.5	5	83.3
	Aurora borealis pattern	4	25	3	50
	Chromonychia	3	18.7	1	16.6
	Spike pattern	9	56.2	3	50
2.	Nail Psoriasis	No. of cases	Percentage (%)		
	Pitting	13	50		
	Oil drop sign	9	34.6		
	Longitudinal ridges	8	30.7		
	Subungual hyperkeratosis	6	23.1		
	Nail dystrophy	4	15.3		
	Splinter haemorrhages	3	11.5		
Leukonychia	1	3.8			

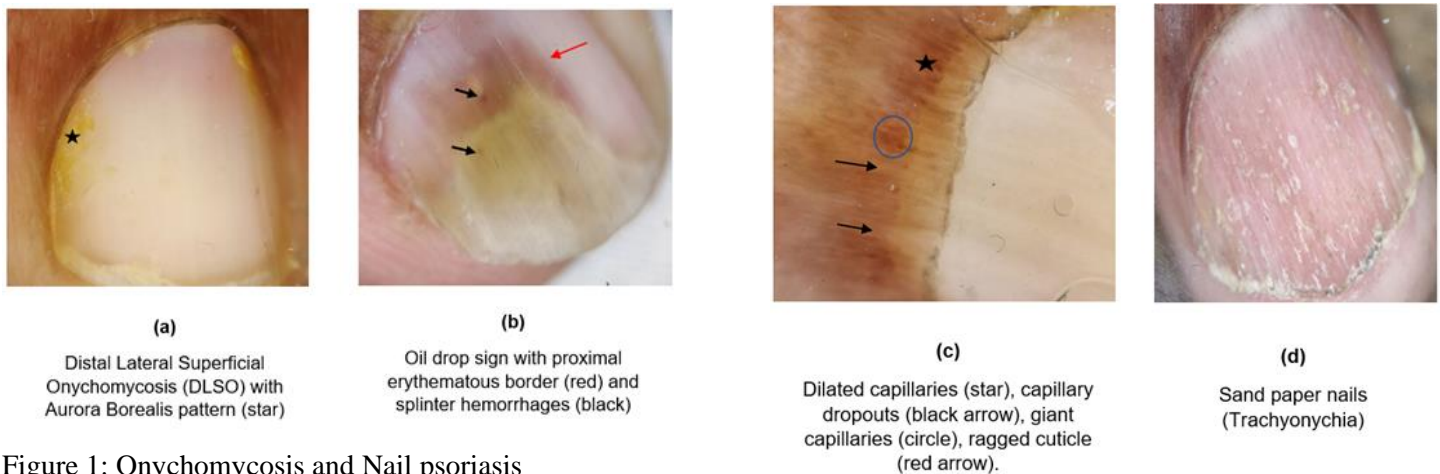


Figure 1: Onychomycosis and Nail psoriasis

Figure 2: Connective tissue disorder and Trachyonychia

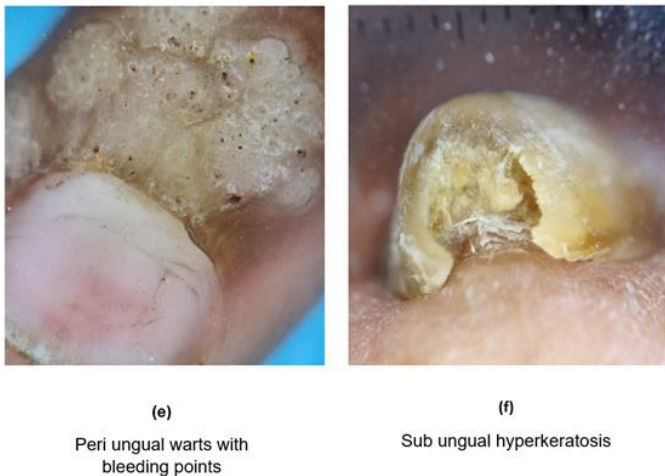


Figure 3: Periungual warts and Subungual hyperkeratosis

Discussion

Females constitute 53% of the total cases of nail disorders, while males constitute 47%. The gender ratio is 1.12:1. There is no significant difference in nail disorders between sexes, according to Scher RK, Daniel CR, et al [5].

Onychomycosis was found in 32 of the 100 cases, accounting for 32% of the total. It was the most common nail disorder in the current study. Onychomycosis was the most common finding, [Figure 1(a)] accounting for 32% of all nail disorders, according to Yasmeen J Bhat et al [6].

The prevalence of morphological pattern Distal Lateral Subungual Onychomycosis (DLSO) ranged from 65 to 90%, according to Grover S [7], Sujatha V, Grover S et al [8], and Garg A, Vimala V et al [9]. They also discovered that the most severe Onychomycosis (TDO) pattern ranged from 6 to 11%. The observed percentage of DLSO & TDO cases in the current study was 50% and 18%, respectively.

Sujatha V, Grover S et al [8], Grover S [7], Garg A, Vimala V et al [9] discovered that superficial white onychomycosis was uncommon, accounting for 2.86%,

2%, and 1.11% of cases, respectively. In comparison to the previous study, the current study shows a higher rate of SWO (15%). This could be due to an increase in the prevalence of HIV positive cases in the general population as stated by C. Ralph Daniel III et al [10].

Among the Dermoscopic patterns identified in nail onychomycosis in the current study, the longitudinal striae pattern was most common (81%), followed by the spike pattern (56%), and the ruins pattern (83%). Dipali Rathod et al [11] conducted a study in which longitudinal striae pattern (73%) was seen most commonly in DLSO and Ruins pattern and rough scaly surface (100%) was seen in TDO subtypes of onychomycosis. The current study also found other patterns of onychomycosis, such as the Aurora Borealis pattern and chromonychia.

Psoriasis accounted for 26 cases (26% of the total) in the current study. The most common age group observed was between the ages of 31 and 40, with a male to female ratio of 1.6:1. Pitting was the most common finding (50%) in psoriasis patients. In studies conducted by Yadav et al [12], Armesto et al [13], and Yorulmaz et al [14], similar male preponderance was observed, in contrast to female preponderance in Schons et al [15]. Onycholysis, pitting, oil drop sign [Figure 1(b)], subungual hyperkeratosis, splinter haemorrhage, leukonychia, red spot, and crumbling have all been described in studies on nail changes in psoriasis. Almost identical findings were observed in the current study.

Pitting (39.1%) and onycholysis (21.7%) were the most common Dermoscopic findings in psoriasis patients in a study conducted by Yadav et al. Pitting (50%), oil drop sign (34.6%), longitudinal ridges (31%), subungual hyperkeratosis, nail dystrophy, splinter haemorrhages, and leukonychia were all found in the dermoscopic evaluation of psoriasis patients' nails in this

study. However, splinter haemorrhages (73.1%) were the most common Dermoscopic finding observed in a study conducted by Yorulmaz et al ^[16], followed by pitting (58.2%).

Chronic paronychia was found in 7 cases. The average age was 48.4 years. Esteves J ^[17] reported in his study that the majority of cases of Chronic Paronychia occurred between the ages of 30 and 60 years; Wilson WJ ^[18] stated that the fungus most frequently recovered from chronic paronychia was *Candida albicans* and *Pseudomonas aeruginosa* was considered pathogenic bacteria. Only three of the seven cases of chronic paronychia studied in this study were culture positive, with two caused by candida species and one by pseudomonas.

Clinical nail features of connective tissue disorders such as periungual erythema (4%), ragged cuticle (3%), [Figure 2(c)] and others such as splinter haemorrhages and leukonychia are also noted in this study. Nail fold capillary dilatation is seen in 100% of cases of systemic sclerosis, 56% of cases of MCTD, and 0% of cases of lupus erythematosus, according to Blockmans D et al ^[19]. In the current study, nail fold capillaroscopy reveals non-specific findings such as periungual telangiectasias, splinter haemorrhages, and leukonychia, as well as specific findings such as nail fold capillary dilatation (mega capillaries) in 100% of cases of systemic sclerosis and MCTD and 0% of cases of Lupus erythematosus associated with capillary dropouts.

Nail Lichen planus accounted for approximately 7 cases in the current study. The average age is 42.3 years. Trachyonychia (3%), [Figure 2(d)] dorsal pterygium (2%), longitudinal ridges (6%), and chromonychia are clinical nail findings of lichen planus. Nakamura et al ^[20] performed nail dermoscopy on patients with nail LP in

their study. This study found the most common Dermoscopic nail findings to be longitudinal streaks (82.28%), followed by chromonychia (55.70%), trachyonychia (50.63%), and splinter haemorrhage (35.44%), which is almost identical to the current study's longitudinal ridges (85.7%), trachyonychia (42.8%), and dorsal pterygium (28.5%).

Verruca Vulgaris was found in all four cases (4%) of Subungual and periungual Warts [Figure 3(e)]. Subungual warts were the most common tumours in the study, according to de Berker DAR et al ^[21], who discovered that Subungual warts were the most common nail tumour. Periungual and subungual warts are mildly contagious and are most likely caused by HPV DNA inoculation into skin after biting or pricking.

In the current study, there were two cases of longitudinal melanonychia (2%), one of which was idiopathic and the other was HIV positive on HAART. There is no family history of melanoma. According to Cribier B et al ^[22] and Gupta AK et al ^[23], Longitudinal Melanonychia is the most common finding in HIV positive patients. It could be because of HAART or the disease itself. Nail symptoms are much more common in HIV cases than in healthy controls, and some of them may be related to the level of immunosuppression.

Collins RJ ^[24] found that racial variation is the most common cause of Longitudinal Melanonychia; 77% of Afro-Caribbeans over the age of 20 have it, and this prevalence rises to nearly 100% by the age of 50. However, in this context, Afro-Caribbeans have a higher percentage of malignant melanomas presenting to the nail unit (15-20%) than any other group (3% in white populations).

Two cases (2%) had ingrown toenails, with a mean age of 36 years. According to the Cambiaghi S et al ^[25]

study, the main cause of deformity is compression of the toes from the side due to ill-fitting footwear, and the main contributory cause is cutting the toenail in a half circle rather than straight across.

COPD was the cause of clubbing in two (2%) cases. According to Baran R and Dawber RPR [26], the most common causes of clubbing are thoracic organ disorders (80%), alimentary tract disorders (5%), and other causes such as endocrine and idiopathic forms. In the current study, COPD was the primary cause of clubbing, as opposed to other studies in which the primary cause of clubbing was idiopathic.

Transverse grooves (Beau's lines) in the nail were observed in five cases (5%) due to nail psoriasis and trauma. According to DeBecker DAR [27], transverse grooves can occur as an isolated disease, trauma, inflammation, and neurological events.

Conclusion

Our study concluded that nail involvement was more frequent in females than males. Onychomycosis (32%) was the most common finding in the present study followed by pitting (13%), oil drop sign (9%), chronic paronychia (7%), onycholysis (7%), subungual hyperkeratosis (6%), longitudinal ridges (6%), transverse grooves (5%). On dermoscopy, the most common finding observed in onychomycosis was Longitudinal striae pattern (81.2%) in DLSO and Ruins pattern (83.3%) in TDO. Other patterns like Spike pattern, Aurora borealis pattern, Chromonychia were also seen. Patients with long standing disease are more likely to develop nail changes. Diabetes mellitus was the co-morbidity most commonly associated with nail changes. Onychoscopy can be used as an important supportive and diagnostic tool for evaluating nail disorders and can avoid unnecessary, time-consuming

and invasive procedures. In spite of that, the present study had a limitation of relatively small sample size and it is only observational study which did not compare with the culture and biopsy which are diagnostic.

Ethical Approval: Approval for the study was obtained from Institutional Ethics Committee, Guntur Medical College, Guntur, AP, India.

Consent: Written and informed consent was obtained from all participants of the study.

List of Abbreviations

DVL – Dermatology, Venerology, Leprosy

DLSO – Distal Lateral Superficial Onychomycosis

TDO – Total Dystrophic Onychomycosis

Data Availability: Data related to the study is available upon request from the corresponding author.

Authors' Contributions: BS collected, analysed and interpreted the data. MR supervised and guided at all stages.

All authors read and approved the final manuscript.

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