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Evaluation of dermoscopic findings of longitudinal melanonychia in referred patients to dermatology clinics in Guilan, Iran

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Abstract

Introduction: Longitudinal melanonychia (LM) is a common clinical condition that is mostly identified by the presence of longitudinal, demarcated, and pigmented bands on the nail. Different benign or malignant pathologies can present with longitudinal melanonychia. Therefore, we aimed to investigate the frequency of dermoscopic features of LM in patients with LM referred to dermatology clinics in Guilan, Iran.

Materials and Methods: This case-series study was conducted on 30 patients with LM who were referred to Besat clinic and Razi hospital, Rasht, Iran, from March 2022 to August 2022 with a complaint of LM. Demographical data and dermoscopic findings of patients were collected and analyzed using SPSS version 21. The LM and dermoscopic features were investigated using a dermatoscope (HEINE IC1, HEINE Optotechnik, Germany).

Results: Out of 30 patients, 24 patients were female and 6 patients were male with a mean age of 30.08 ± 14.31 years old. Among these patients, five patients had a family history of LM, one patient with melanoma had Hutchinson's sign, and three patients had pseudo-Hutchinson's sign. The mean width of lesions of the nail was 2.42±2.12 mm with a mean time of onset of 7.42 ± 7.12 months. Also, the majority of the involved site of LM was hand (26.6%).

Conclusion: According to our study, LM was more frequent in females and the trauma-related lesions of the nail were the most common dermatological findings among the patients.

Keywords: Dermoscopic findings, Linear melanonychia, Melanoma

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Introduction

Longitudinal melanonychia (LM) is identified by the presence of longitudinal, demarcated, and pigmented bands on the nail (1)**.** The frequency of LM has been reported variously according to age groups, ethnicity, and gender (2–5). Melanonychia is characterized by brownish-black discoloration of the nail plate. In fewer cases, this color change can also be seen transversely from light brown to blue-black and it is called transverse melanonychia. Melanonychia may also involve the entire nail plate, which is referred to as total melanonychia (6). The width of these lines can vary from a few millimeters (mm)s to those that cover the entire nail plate (7,8).

LM is a product of melanin deposition in the nail plate, which is created by the melanocytes of the nail matrix (9). The etiology of LM is categorized as melanocytic activation or melanocytic hyperplasia (benign nail matrix nevi and malignant subungual melanoma) (10). Subungual melanoma can initially appear as LM. Subungual melanoma is a malignant neoplasm that requires early diagnosis and complete surgical excision and it has an increasing trend in Guilan, Iran (11). Malignant melanoma accounts for *7*5% of all skin cancer deaths and is potentially curable in the case of early diagnosis (12). Hutchinson's sign, which indicates the radial growth phase of the tumor, is highly suggestive of nail melanoma but may be absent in primary or *in situ* lesions (13). Different etiologies of LM can be differentiated by biopsy and histopathological examination but nail biopsy is an aggressive and costly procedure that can cause irreversible dystrophy of the nail plate, therefore, the physician should be cautious about performing this procedure.

Dermoscopy is a non-invasive and inexpensive method in which, by attaching a camera to a magnifying set of lenses, enables the practitioner to better evaluate the epidermis, upper dermis, superficial vascular structures and pigmentations with 10-50 × magnification. Although used primarily for pigmentary lesions (e.g. melanocytic nevi), dermoscopy can be helpful in assessing non-pigmented lesions and inflammatory processes like lichen planus of scalp (14,15). While the gold standard diagnosis method is nail biopsy, dermoscopy is a useful noninvasive method to investigate various dermatological disorders and provides important information for the management of melanonychia, which can help to avoid unnecessary nail biopsies (16–18). Although dermoscopy has limitations in providing direct analysis of the nail matrix and pigment band origins, still it is an integral part of the clinical evaluation of LM (19–21).

Since LM is always one of the most challenging complaints in dermatology clinics, and acral lentiginous melanoma (ALM) is one of the sub-branches of melanoma that can represent a melanotic pattern, which is hardly diagnosed, the early and accurate diagnosis of these complications is vital. In this regard, we aimed to investigate the dermoscopic features of LM in patients via dermatoscope to prevent unnecessary nail biopsy in these patients.

Materials and Methods

Study design and variables

In this case-series study, demographical data and clinical characteristics of 30 patients with complaints of LM or diagnosed by LM at the time of entrance who were referred to the dermatology unit of Besat clinic and Razi hospital, Rasht, Iran, from December 2020 to August 2020, were collected. The data included age, gender, the time of the onset, family history of melanoma, family history of melanonychia, drug history (with a focus on the drug which may cause LM), history of trauma of the nail, the irregular margin of the LM, frequency of multicolor (polychromasia) in LM, presence of Hutchinson’s sign (when melanin pigment extends into the skin and soft tissue surrounding the nail plate, such as hyponychium, eponychium, or lateral grooves) (22) and pseudo-Hutchinson’s sign, subungual hyperkeratosis, dystrophy of the nail surface, onycholysis, number of fingers involved, and width of the pigmented band. LM was evaluated using a hand-held dermatoscope (HEINE IC1, HEINE Optotechnik, Germany) with ×10 magnification. In the case of suspicious manifestations in favor of malignancy, the biopsy of the nail was taken for further investigations. The exclusion criteria included patients with incomplete data**.**

Statistical analyses

Mean and standard deviations are used to describe quantitative variables with normal distribution. Qualitative variables are described using numbers and percentages. Statistical calculations were performed using the IBM SPSS Statistics version 21.

Results

Clinical data of 30 patients with LM were analyzed. The majority of the study population consisted of females (80%), the mean age of patients was 30.08±14.31 years old with no family history of melanoma, while 16.6% of patients had a family history of LM. Polychromatic lesions and lesions with irregular margins were detected in four patients. Hutchinson's sign was only present in one patient and three patients had pseudo-Hutchinson's sign. Subungual hyperkeratosis, drug-induced melanonychia, and dystrophy were rare among patients. Nevertheless, trauma-related melanonychia was reported in 40% of patients with LM. The mean width of the pigmented lesion was 2.42±2.12 mm (4.45-0.30 mm) with a mean duration of 7.42±7.12 months (0.3-14.5 months). The frequency of clinical manifestation of LM is illustrated in table 1.

Table 1. The frequency of demographical data and dermatological manifestation of patients with Longitudinal melanonychia.

Variables		Number (%)
Age (year)	<15	4 (13.33)
	15-30	9 (30)
	30-45	15 (50.66)
	45<	2 (6.66)
Gender	Male	6 (20.00)
	Female	24 (80.00)
Family history of melanoma	Yes	0 (0.00)
	No	30 (100.00)
Family history of melanonychia	Yes	5 (16.66)
	No	25 (83.33)
Polychromatic lesion of nail	Yes	4 (13.33)
	No	26 (86.66)
Nail's lesion with irregular margin	Yes	4 (13.33)
	No	26 (86.66)
Hutchinson's sign	Yes	1 (3.33)
	No	29 (96.66)
Pseudo- Hutchinson's sign	Yes	3 (10.00)
	No	27 (90.00)
History of trauma	Yes	12 (40.00)
	No	18 (60.00)
Subungual hyperkeratosis	Yes	1 (3.33)
	No	29 (96.66)
Onycholysis	Yes	5 (16.66)
	No	25 (83.33)
Dystrophy	Yes	2 (6.66)
	No	28 (93.33)
Drug*-induced *melanonychia	Yes	2 (6.66)
	No	28 (93.33)
Fingernails and toenails involvement	Thumb	11 (36.66)
	Index	5 (16.66)
	Multiple fingernails	8 (26.66)
	Multiple toenails	2 (6.66)
	Multiple fingernails & toenails	4 (13.33)

Discussion

Melanonychia could be an important sign for a variety of benign or malignant nail diseases, and the differential diagnosis of LM from melanoma is important for dermatologists (7,9,23,24). Subungual melanoma can mimic onychomycosis or paronychia, leading to a delay in diagnosis since pigmented longitudinal bands within the nail plate can be seen in some benign lesions of the nail (25,26).

Our results showed a higher frequency of LM among patients of the female gender, aged 30-45 years old. The frequency of LM varies according to the different geographical regions. In a recent study conducted by Signal and Bisherwal, the prevalence of LM was estimated to be about 4.1% in the age group of 56-65 years (7); while Sobjanek et al. reported that the frequency of LM was 19.4% with the majority in the age group of 49 years (4). Leung et al. reported that the prevalence of LM was 0.8% with equal frequency among males and females (3), which was in contrast to our results, which have been demonstrated to be more frequent in females.

In this present study, a family history of LM was reported in 16.6% of patients but no history of melanoma has been identified. The frequency of

polychromatic, lesions with irregular margins, Hutchinson and pseudo-Hutchinson's sign, sublingual hyperkeratosis, onycholysis, dystrophy, and drug-induced lesions of the nail was less than 15% among patients. Only one patient had melanoma based on the dermoscopy findings that represented an irregular and polychromatic lesion along with Hutchinson's sign with the biopsy confirmation of melanoma.

A study by Ko BS et al. illustrated that none of the patients with subungual melanoma had a personal history of melanoma and one of the eight patients with subungual melanoma had a family history of melanoma (27). Moulonguet et al. reported that Hutchinson's sign and nail dystrophy were identified in 40% of patients with melanoma, while it was reported in only 3.5% of patients with benign lesions (28). Moreover, in the present study, the frequency of pseudo-Hutchinson's sign was reported to be 10% in patients with LM, therefore, follow-up of patients every six months was recommended.

It has been reported that the most common causes of LM with melanocyte hyperplasia are subungual melanoma, melanocytic nevus, and lentigo simplex (29). Alessandrini et al. reported in their study on dermoscopy findings on 100 patients with LM that six patients had melanocytic activation, 22 patients had nail matrix nevi, eight patients had melanocytic hyperplasia, and five patients had melanoma. Also, drug-induced lesions were reported in 8% of patients with LM. Furthermore, they reported that the most common fingers of involvement were the thumb, index finger, fingernails, multiple fingernails & toenails, and toenails, respectively (30), which was similar to our results.

Due to the present study, the mean width of the pigmented lesion was reported 2.42 mm in diameter with the most frequency in the thumb, multiple fingernails, index finger, multiple fingernails and toenails, and multiple toenails, respectively. Rodger et al. reported that the mean width of lesions in patients with LM was 6.2 mm, which was different from our results. The number of involved nails and the width diameter of the lesions vary due to different factors, in which drug exposure, co-existence of other dermatological diseases, and racial pigmentation commonly result in multiple nails, while lentiginous and nail matrix nevus results in single nail involvement (17,19,31,32).

Limitation

The limitations of our study were the failure to perform long-term follow-up of the pigmented lesion to ensure whether the lesion is benign or not by considering the history of underlying disease. Also, it should be considered that a dermatoscope, like any other diagnostic tool, may miss the diagnosis of some samples.

Conclusions

Melanonychia is a challenging dermatological symptom for specialists, in this regard, nail dermoscopy is an important method in the diagnosis of melanosis and allows to avoidance of unnecessary biopsies for LM.

Author contribution

KGH and **HE** participated in the research design and writing the first draft; **RGH**, **AD**, and **RR** participated in the performance of the research and analytic tools; **NA**, **ME**, and **NP** participated in data analysis. All author reviewed and confirmed the final manuscript.

Ethical approval

This study design was approved by the ethical committee of Guilan University of Medical Sciences (IR.GUMS.REC.1400.503).

Conflict of interest

No potential conflict of interest was reported by the authors.

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