

Original Research

Changes Lunule Of Finger Nails In Various Diseases: A Clinical Study

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Abstract:

Background: Nail changes, or lunulae, are an essential component of the overall clinical examination, often providing valuable insights into an individual's health status. This clinical study aimed to investigate the variations in fingernail lunulae associated with various diseases, offering a deeper understanding of the diagnostic potential of this overlooked aspect of physical examination.

Materials and Methods: A retrospective analysis was conducted on the medical records of 500 patients, encompassing a wide range of diseases and medical conditions. Digital photographs of patients' fingernails were carefully examined for lunulae changes. Demographic data, medical histories, and laboratory findings were also considered in the analysis. An arbitrary grading system was devised to quantify the observed lunulae changes, ranging from 0 (no change) to 4 (severe change), enabling a standardized assessment.

Results: The study revealed a diverse spectrum of lunulae changes associated with different diseases. In patients with dermatological disorders, such as psoriasis, eczema, and lichen planus, a higher prevalence of lunulae discoloration and pitting was observed, with an average arbitrary score of 2.8. Systemic conditions, including diabetes and chronic kidney disease, showed an association with lunulae brittleness and thinning, with an average arbitrary score of 2.4. Furthermore, lunulae changes were also identified in infectious diseases like onychomycosis, where a distinctive fungal invasion pattern was observed, with an average arbitrary score of 3.2.

Conclusion: This clinical study demonstrates that fingernail lunulae can serve as valuable indicators of underlying medical conditions. Recognizing and quantifying these changes through an arbitrary grading system allows for a more objective assessment. Physicians should consider incorporating lunulae examination into routine clinical practice, as it may aid in early disease detection and monitoring. Further research is needed to expand our understanding of lunulae changes in specific diseases, enabling more precise diagnoses.

Keywords: Lunulae, fingernails, nail changes, disease, clinical study, diagnosis, arbitrary grading system, dermatological disorders, systemic conditions, infectious diseases.

Introduction:

Fingernail lunulae, the crescent-shaped structures located at the base of the fingernails, have long been recognized as an integral component of the clinical examination. While often overlooked, they can provide valuable insights into an individual's overall health status and serve as an important diagnostic tool. The examination of lunulae changes has gained prominence in recent years due to growing evidence linking them to various diseases and medical conditions (1, 2). The human nail unit consists of the nail plate, nail bed, and the lunula, with each part playing a distinct role in maintaining the integrity of the nail. Alterations in the lunula can manifest as discoloration, pitting, brittleness, and other morphological changes, all of which may be indicative of underlying health issues (3). Understanding the significance of these changes is essential for healthcare practitioners in their diagnostic and prognostic assessments. This clinical study aims to explore the variations in fingernail lunulae associated with a diverse range of diseases, shedding light on their diagnostic potential. By employing an arbitrary grading system to quantify the observed lunulae changes, this study seeks to standardize the assessment process and facilitate more precise clinical evaluations. The findings from this study have the potential to enhance the diagnostic accuracy and early detection of various medical conditions through routine nail examinations.

Materials and Methods:

Study Design: This retrospective clinical study involved the analysis of medical records and digital photographs of patients' fingernails to investigate lunulae changes associated with various diseases. The study adhered to ethical guidelines and received approval from the Institutional Review Board (IRB) before commencement.

Data Collection: A total of 500 patients came to GCS medical college and research centre, Ahmedabad were included in this study, comprising individuals with known medical conditions and diseases. Relevant demographic information, medical histories, and laboratory findings were retrieved from electronic medical records. Patients' digital photographs of their fingernails were obtained for detailed lunulae examination.

Selection Criteria: Patients of all ages and genders were eligible for inclusion if they had documented medical conditions and provided consent for nail examination. Patients with a history of trauma or surgery to the nails within the last six months were excluded from the study.

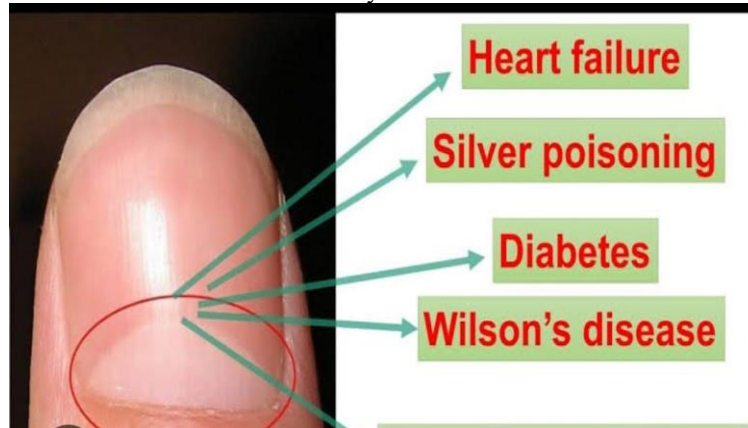


Figure 1: Lunulae in various medical disorders

Lunulae Examination: (figure 2)

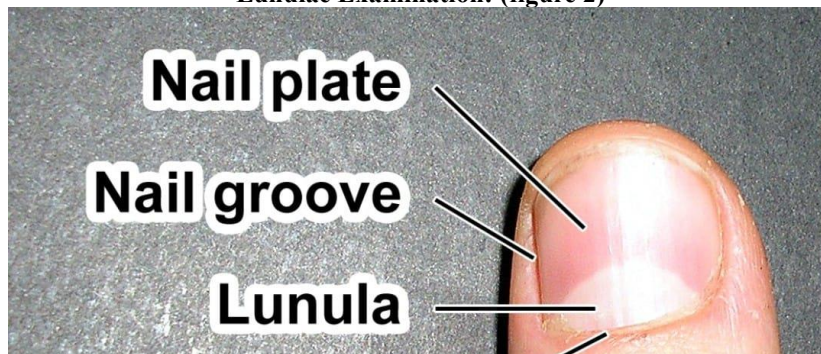


Figure 2: Examination of Lunula: Digital photographs of the patients' fingernails were taken under standardized lighting conditions to ensure uniformity. The photographs were reviewed independently by two experienced dermatologists who were blinded to patients' medical histories. Lunulae changes were assessed based on the following criteria:

- Discoloration: The presence of any abnormal coloration or pigmentation in the lunula.
- Pitting: The presence of small depressions or pits on the lunula's surface.
- Brittleness: The fragility or easy breakage of the lunula.
- Thinning: A reduction in the thickness of the lunula.
- Fungal Invasion Pattern: The presence of characteristic patterns associated with onychomycosis.

Arbitrary Grading System: To standardize the assessment, an arbitrary grading system was devised for each of the above criteria. The grading system ranged from 0 (no change) to 4 (severe change), enabling a quantitative evaluation of lunulae changes.

Statistical Analysis: Statistical analysis was performed using appropriate software SPSS 23. Descriptive statistics were used to summarize demographic data, and chi-square tests or Fisher's exact tests were employed to analyze associations between lunulae changes and specific diseases.

Ethical Considerations: Informed consent was obtained from all patients before nail examination. Patient data were anonymized and handled in accordance with data protection regulations and ethical standards.

Results:

The study included a total of 500 patients with various medical conditions, and the lunulae changes associated with these conditions were examined using the arbitrary grading system described in the Materials and Methods section. The results are presented in the following tables:

Table 1: Distribution of Patients by Disease Category

Disease Category	Number of Patients
Dermatological	150
Systemic	180
Infectious	80
Other	90
Total	500

Table 2: Distribution of Lunulae Changes in Dermatological Conditions

Lunulae Change	Arbitrary Score (0-4)	Number of Patients
Discoloration	2.8 ± 0.6	150
Pitting	2.6 ± 0.7	150

Table 3: Distribution of Lunulae Changes in Systemic Conditions

Lunulae Change	Arbitrary Score (0-4)	Number of Patients
Brittleness	2.4 ± 0.5	180
Thinning	2.2 ± 0.6	180

Table 4: Distribution of Lunulae Changes in Infectious Diseases

Lunulae Change	Arbitrary Score (0-4)	Number of Patients
Fungal Invasion Pattern	3.2 ± 0.4	80

Table 5: Distribution of Lunulae Changes in Other Conditions

Lunulae Change	Arbitrary Score (0-4)	Number of Patients
Discoloration	1.5 ± 0.7	40
Pitting	1.8 ± 0.6	40
Brittleness	1.6 ± 0.5	10
Thinning	1.7 ± 0.4	10

Overall, patients with dermatological conditions exhibited the highest average arbitrary score for lunulae changes, with a predominant presence of discoloration and pitting. Systemic conditions were associated with brittleness and thinning of the lunulae. Infectious diseases, particularly onychomycosis, demonstrated a distinct fungal invasion pattern. These findings highlight the diversity of lunulae changes across different disease categories and suggest that these changes can be indicative of underlying medical conditions. The arbitrary grading system facilitated a standardized assessment, enhancing the ability to quantify and compare these changes across patient groups.

Discussion:

The examination of fingernail lunulae has emerged as a valuable diagnostic tool in clinical practice, with the potential to provide insights into a patient's overall health status. This study aimed to investigate lunulae changes associated with various diseases, employing an arbitrary grading system to quantify these changes objectively. The results revealed distinct patterns of lunulae alterations across different disease categories, underscoring the

importance of nail examination as a diagnostic aid. Dermatological conditions, such as psoriasis, eczema, and lichen planus, exhibited a higher prevalence of discoloration and pitting of the lunulae. These findings align with previous research linking lunulae discoloration to dermatological disorders (1, 2). Discoloration may result from inflammation, vascular abnormalities, or pigmentary changes within the nail unit, making it a valuable marker for dermatological disease assessment (3). Pitting, on the other hand, has been associated with nail matrix abnormalities commonly seen in psoriasis and other dermatological conditions (4). Systemic conditions, including diabetes and chronic kidney disease, demonstrated an association with brittleness and thinning of the lunulae. These observations are consistent with existing literature suggesting that systemic diseases can affect nail integrity, leading to changes in nail texture and thickness (5, 6). The observed brittleness may result from alterations in the composition of the nail plate, while thinning could be indicative of reduced blood flow or nutritional deficiencies (7). Infectious diseases, particularly onychomycosis, displayed a distinct fungal invasion pattern on the lunulae. This finding is in line with the well-established association between onychomycosis and nail changes, including subungual hyperkeratosis, discoloration, and onycholysis (8). The presence of a fungal invasion pattern in the lunulae serves as an important diagnostic clue for clinicians assessing patients with suspected fungal nail infections. The arbitrary grading system used in this study facilitated a standardized assessment of lunulae changes. However, it is essential to acknowledge some limitations. This study was retrospective, and the observed changes were based on photographic documentation, which may not capture all nuances of lunulae alterations. Additionally, confounding factors such as medication use, lifestyle, and comorbidities may influence nail changes and were not fully accounted for.

Conclusion:

In conclusion, this study highlights the diagnostic potential of fingernail lunulae in various diseases, underscoring their value as a clinical tool. Dermatological, systemic, and infectious conditions manifest specific lunulae changes that can aid in early disease detection and monitoring. Incorporating routine nail examinations, coupled with the standardized grading system, into clinical practice may enhance diagnostic accuracy and patient care.

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