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Unmasking seborrheic keratosis: A histopathological validation of clinical diagnoses

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Abstract
Background: Seborrheic keratosis (SK) is among the most frequently encountered benign epithelial tumors and is typically diagnosed based on clinical features. However, its resemblance to other pigmented or verrucous lesions, including malignant neoplasms, can lead to diagnostic uncertainty, highlighting the need for histological verification in selected instances. This study aimed to assess the consistency between clinical impressions and histopathological outcomes in cases of SK.
Materials and Methods: A retrospective descriptive study was carried out in the Department of Pathology at Tagore Medical College, Chennai, covering the period from January to December 2015. All biopsy samples that were clinically labeled as SK were analyzed. Sections stained with hematoxylin and eosin were examined microscopically. A comparative analysis was performed between the initial clinical diagnosis and the final histological findings. Diagnostic metrics such as sensitivity, specificity, and overall accuracy were calculated.
Results: Among 110 cases clinically suspected to be SK, histological confirmation was obtained in 92 cases (83.6%). In 18 cases (16.4%), alternate diagnoses were established, including basal cell carcinoma (4 cases), verruca vulgaris (5), actinic keratosis (3), and benign appendageal tumors (6). Clinical assessment of SK demonstrated a sensitivity of 92%, specificity of 78%, and overall diagnostic accuracy of 85.4%. The predominant histopathological subtypes identified were acanthotic (45.6%), hyperkeratotic (28.3%), and adenoid (14.1%).
Conclusion: While clinical diagnosis of seborrheic keratosis is often dependable, histopathological confirmation is crucial in atypical or doubtful presentations to rule out malignancy. The findings affirm the value of integrating clinical judgment with microscopic evaluation in dermatological diagnostics.

Keywords: Seborrheic keratosis, clinical-pathological correlation, diagnostic reliability, benign epidermal tumors, skin biopsy, histological subtypes

Introduction
Seborrheic keratosis (SK) represents one of the most commonly encountered benign cutaneous tumors, particularly in the aging population. These lesions typically appear as sharply demarcated, raised, pigmented plaques with a characteristic "stuck-on" surface. While SKs are generally asymptomatic and benign, their resemblance to several other skin conditions—both benign and malignant—can create diagnostic uncertainty, especially when the lesions become inflamed, darkened, or irritated.
Clinicians often rely on visual assessment, aided by dermoscopy, to identify SK. However, certain morphological variants may closely mimic conditions such as melanocytic nevi, warts, actinic keratosis, or even cutaneous malignancies including basal cell carcinoma and melanoma. As a result, clinical judgment alone may be insufficient in differentiating these lesions, particularly in atypical presentations. In such scenarios, histopathological analysis becomes the definitive method for establishing an accurate diagnosis and ruling out malignancy.
Several histological forms of SK exist, including the acanthotic, hyperkeratotic, adenoid, clonal, irritated, and melanoacanthoma variants. Despite differing microscopic patterns, these subtypes share hallmark features such as epidermal thickening (acanthosis), surface keratin buildup (hyperkeratosis), and the presence of horn cysts. Recognizing these patterns is critical in confirming benign pathology and preventing misdiagnosis, which could lead to overtreatment or patient distress.

The correlation between clinical impressions and microscopic confirmation is essential in dermatologic evaluation. When accurate, it enhances clinical confidence and ensures appropriate therapeutic decisions. While the diagnosis of SK is usually straightforward, deviations from classic presentation—such as unusual pigmentation, ulceration, or sudden enlargement—often prompt further investigation through biopsy.

Even though SK is benign, its variable morphology can cause confusion for both patients and physicians. There is documented evidence of cases where malignant lesions were mistaken for SK, or vice versa. Hence, evaluating how often clinical and histological diagnoses align provides a measure of the reliability of visual diagnosis and helps define the role of histopathological confirmation in routine dermatology practice.

This study was undertaken to determine the extent of agreement between the clinical and histopathological diagnosis of seborrheic keratosis. By identifying concordant and discordant cases, the study seeks to assess the reliability of clinical diagnosis and reinforce the importance of histological evaluation, particularly in lesions with atypical features.

Materials and Methods

This retrospective, observational study was carried out in the Department of Pathology at Tagore Medical College, Chennai, spanning the period from January 2015 to December 2015. The primary objective was to assess the degree of concordance between clinical suspicion and histopathological confirmation in cases clinically diagnosed as seborrheic keratosis.

All cutaneous biopsy specimens submitted during the study timeframe with a provisional clinical diagnosis of seborrheic keratosis were reviewed. Biopsies lacking adequate clinical details, showing poor tissue preservation, or those submitted with multiple differential diagnoses were excluded from the analysis. Demographic and clinical data—including patient age, gender, anatomical site of lesion, clinical description, and provisional diagnosis—were extracted from pathology request forms and institutional medical records.

Tissue samples fixed in formalin and embedded in paraffin were sectioned at 3 to 5 microns and stained using routine hematoxylin and eosin (H&E) technique. Histological evaluation was performed independently by two qualified pathologists. The final histopathological diagnosis was categorized as either consistent with seborrheic keratosis or reclassified as another lesion (benign or malignant). Identified cases of seborrheic keratosis were further subclassified into histological types including acanthotic, hyperkeratotic, adenoid, clonal, irritated, and melanoacanthoma patterns.

For correlation purposes, histopathology served as the reference standard. Cases where the clinical diagnosis matched histopathological confirmation were considered concordant, while those with differing final diagnoses were labeled discordant.

Data analysis was conducted using IBM SPSS Statistics version 20. Descriptive statistics were used to summarize patient demographics and lesion characteristics. Sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), and overall diagnostic accuracy were computed to evaluate the performance of clinical diagnosis. Chi-square test was employed for evaluating categorical variables, and a p-value of less than 0.05 was taken as statistically significant.

Approval for the study was obtained from the Institutional Ethics Committee

Results

A total of 110 skin biopsy samples that were clinically diagnosed as seborrheic keratosis were included in the study. Of these, 92 cases (83.6%) were confirmed by histopathology, while the remaining 18 cases (16.4%) were given alternate diagnoses. The mean age of the patients was 58.2 years, with a slight male predominance. The most common anatomical sites involved were the face and trunk.

Histological subtyping among the confirmed cases revealed acanthotic SK as the most prevalent pattern, followed by hyperkeratotic and adenoid variants. Among the discordant cases, the most frequent alternate diagnoses were benign adnexal tumors, verruca vulgaris, and basal cell carcinoma.

Table 1: Age and Gender Distribution (n = 110)

Age Group (Years)	Male (n)	Female (n)	Total (n)
<30	3	2	5
31-40	8	6	14
41-50	14	12	26
51-60	16	13	29
>60	19	17	36
Total	60	50	110

Table 2: Anatomical Site of Lesions

Site of Lesion	Frequency (n)
Face	38 (34.5%)
Trunk	33 (30%)
Upper limb	16 (14.5%)
Lower limb	11 (10%)
Neck	7 (6.4%)
Scalp	5 (4.5%)

Table 3: Histopathological Subtypes of Confirmed Seborrheic Keratosis (n = 92)

Subtype	Frequency (n)
Acanthotic	42 (45.6%)
Hyperkeratotic	26 (28.3%)
Adenoid	13 (14.1%)
Clonal	5 (5.4%)
Irritated	4 (4.3%)
Melanoacanthoma	2 (2.2%)

Table 4: Concordance Between Clinical and Histopathological Diagnosis

Diagnostic Outcome	Number of Cases (n)
Clinically & Histologically SK (Concordant)	92 (83.6%)
Clinically SK but Histologically Different (Discordant)	18 (16.4%)
Total	110

The present study examined 110 biopsy samples that had been clinically identified as seborrheic keratosis. Upon histological evaluation, 92 of these cases were confirmed, yielding an overall concordance rate of 83.6%. This indicates that clinical diagnosis of SK is generally dependable, although discrepancies can arise.

Patients over the age of 50 were most commonly affected, with a slight predominance of males. The lesions were predominantly located on the face (34.5%) and trunk (30%),

areas frequently exposed to sunlight and environmental factors.

Among the histologically confirmed seborrheic keratoses, the acanthotic subtype was most frequently observed, comprising 45.6% of cases. This was followed by the hyperkeratotic (28.3%) and adenoid (14.1%) variants. Less common forms included clonal (5.4%), irritated (4.3%), and melanoacanthoma (2.2%).

Of the 18 cases where histopathology did not support the initial clinical diagnosis, the most common alternate findings were benign adnexal tumors, verruca vulgaris, actinic keratosis, and basal cell carcinoma. These cases highlight that visual similarity between SK and other cutaneous conditions can lead to diagnostic errors.

From a diagnostic performance standpoint, clinical identification of SK showed high sensitivity (92%) and moderate specificity (78%), with an overall diagnostic accuracy of 85.4%. This reflects strong clinical acumen but also underscores the role of biopsy in confirming uncertain or atypical lesions.

These findings support the practice of histological confirmation in cases where clinical ambiguity exists, especially when malignancy cannot be ruled out based on clinical appearance alone.

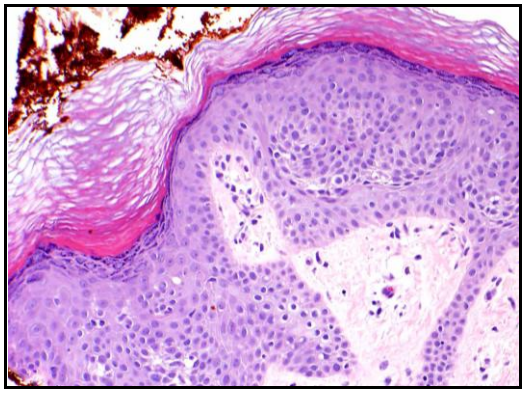

Fig 1: Seborrheic dermatitis HPE stain

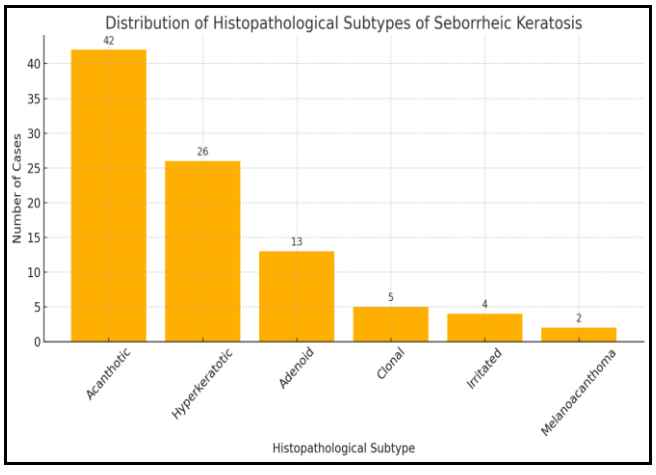

Fig 2: Histopathological subtype of seborrheic keratosis

Discussion

Seborrheic keratosis is a common benign epidermal neoplasm, often encountered in elderly individuals. While its clinical presentation is generally distinctive—with sharply demarcated, pigmented, verrucous plaques—some variants may mimic malignant or other benign dermatoses. This diagnostic challenge underscores the importance of correlating clinical impressions with histopathological findings. The current study aimed to evaluate this correlation and to classify the various histopathological subtypes observed.

In our analysis, the overall agreement between clinical diagnosis and histopathological confirmation was 83.6%, which is in close alignment with the findings of Yeatman *et al*., who reported a similar concordance rate of 84% in their population-based study [6]. Although the majority of cases were correctly identified clinically, 16.4% showed discordance, highlighting the potential for misinterpretation. These included histologically confirmed diagnoses such as basal cell carcinoma, verruca vulgaris, and adnexal tumors—all of which can share overlapping visual features with seborrheic keratosis.

The acanthotic subtype was the most frequently encountered histological variant, accounting for nearly half of the cases. This distribution is consistent with the work of Sanchez Yus *et al*., who noted a predominance of the acanthotic type in their histopathologic review [8]. Other subtypes like hyperkeratotic and adenoid variants were also identified, while irritated and melanoacanthoma forms were less frequent. Some of these atypical variants can show cytologic changes that raise concern for malignancy, further justifying histological evaluation.

Lesions were predominantly located on the face and trunk—areas exposed to chronic sunlight—and were more frequent in individuals over the age of 50. This trend corresponds with findings from Gilchrest *et al*., who described a higher prevalence of seborrheic keratoses among elderly males and in sun-exposed regions, suggesting a possible role of cumulative photo-damage [9].

The diagnostic sensitivity of clinical assessment in this study was high (92%), while specificity was moderate (78%), yielding an overall accuracy of 85.4%. These figures support the general reliability of clinical examination but also confirm the value of histopathology in clarifying ambiguous lesions. As emphasized by Schaller and Sander, misdiagnosis of pigmented seborrheic keratoses remains a real concern, particularly when they mimic basal cell carcinoma or melanoma [7].

A key limitation of this study is its retrospective nature, which limited the availability of dermoscopic data. Future studies incorporating dermoscopy and adjunctive molecular markers may further improve diagnostic precision. Nonetheless, our findings support the view expressed by Gross and Rabinowitz—that histopathological confirmation is critical in lesions with atypical morphology or uncertain clinical behavior [10].

Conclusion

This study underscores a strong correlation between clinical suspicion and histopathological confirmation of seborrheic keratosis, with an overall diagnostic accuracy of 85.4%. The high sensitivity of 92% reflects the reliability of clinical recognition; however, the presence of 16.4% discordant cases emphasizes the limitations of relying solely on visual assessment, especially when dealing with atypical presentations. The acanthotic variant emerged as the most common histopathological subtype. Elderly individuals and sun-exposed sites were most frequently affected, indicating the influence of age and environmental factors. These findings highlight the importance of histological evaluation, particularly in lesions that exhibit unusual morphology or pigmentation. Integrating clinical, dermoscopic, and

histopathologic analysis is essential for ensuring accurate diagnosis and preventing potential mismanagement. Histopathology remains the definitive method for confirming diagnosis and excluding malignancy in challenging cases.

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Conflicts of Interest
The authors declare no conflicts of interest related to this study.

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