

Histopathological Examination of Seborrheic Keratosis in the Saudi Population

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Abstract

Background: One of the most prevalent skin epidermal tumors is seborrheic keratosis (SK). But only a few extensive histopathological studies have been conducted on people with SK. This study's objective was to examine different histological cases of SK.

Methods and Results: The subjects of this retrospective study were 39 patients (28 male and 11 female), aged 50-90 and older, with clinically confirmed SK who presented to the outpatient dermatology departments of Prince Sattam bin Abdulaziz University Hospital and the Military Industries Hospital between January 2024 and June 2025. Pathology sections stained with hematoxylin and eosin were categorized as acanthotic (classic), mixed, melanoacanthoma (pigmented), or irritated based on their histological characteristics.

The highest number of SK cases (13/33.3%) in this study was identified in the age group of 60 to 69 years. The trunk (21/53.8%) was the most common biopsy site for biopsy-proven seborrheic keratosis, followed by the neck (9/23.1%), the face (4/10.2%), and the extremities (5/12.8%). The acanthotic (classic) subtype was the most common histopathological subtype (23/59.0%), followed by the mixed (9/23.1%), irritated (5/12.8%), and melanoacanthoma (pigmented) (2/5.1%) subtypes.

Conclusion: The acanthotic type of seborrheic keratosis was the most common histologic type identified, predominantly observed in patients aged 60–69 years. The trunk is a primary location for seborrheic keratosis. (*International Journal of Biomedicine*. 2026;16(2):227-231.)

Keywords: seborrheic keratosis • histopathology • subtype • Saudi population

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Introduction

The most prevalent benign, pigmented epidermal lesion in the older population is seborrheic keratosis (SK).¹ It appears as distinct, slightly elevated, brownish patches or plaques, typically on sun-exposed skin.² Research conducted by the US

National Health and Nutrition Examination Survey estimates that 23 million Americans suffer from SK. It was initially described in 1869 as a well-defined, black, spherical, raised, adherent skin lesion that enlarges with age.³ Clinically, these tumors appear as pigmented growths resembling papules or skin warts, with a greasy crust. Microscopically, these lesions

show hyperproliferation of basal-layer immature keratinocytes, most of which exhibit melanocytic pigmentation.⁴ These benign tumors are more common in older people. Seborrheic keratosis is frequently discovered by accident. Treatment is not required because this tumor is benign. Nonetheless, the lesions are frequently removed, particularly for aesthetic reasons.⁵ Sometimes it is important to differentiate SK from other skin tumors that could be benign or malignant. For example, deeply pigmented SK may be mistaken for malignant melanoma by non-dermatologist doctors or laypeople.⁶ Even though SK can show in a variety of ways, the diagnosis is typically clinically simple. However, the tumor may mimic other conditions, such as lentiginos, melanocytic nevi, actinic keratosis, Bowen's disease, common warts, and more serious conditions, including squamous cell and basal cell carcinomas, and even cutaneous melanomas.⁷ Acanthosis, papillomatosis, hyperkeratosis, and horn pseudocysts are the histological features of SK. Seborrheic keratosis may be classified into several histological subgroups based on the relative dominance of these characteristics. The acanthotic, hyperkeratotic, and adenoid are the most significant of them.⁸ The disorder's pathophysiology remains largely unknown. Although tumors can occur in relatively young patients, it is known that the occurrence of SK rises noticeably with age. It is believed that there is a genetic susceptibility to numerous SKs. It is also being discussed how UV light contributes to lesion formation.⁸ Even though SK is a benign condition, there are several reasons lesions should be removed, including irritation and inflammation, exclusion of cancer (if the clinical presentation is ambiguous), and cosmetic concerns in patients with many lesions.⁵ Surgical therapy, laser therapy, electrocautery, cryotherapy, and topical medication therapy, which is still under development, are among the available treatment options. Individualized treatment should be based on the patient's preferences and the clinical picture.⁽⁹⁾ This study intended to identify the histological pattern of seborrheic keratosis in Saudi individuals.

Materials and Methods

The subjects of this retrospective study were patients with clinically confirmed SK who presented to the outpatient dermatology departments of Prince Sattam bin Abdulaziz University Hospital and the Military Industries Hospital between January 2024 and June 2025. A retrospective analysis of medical records was conducted to identify variations in age, sex, and lesion location. Pathology sections stained with hematoxylin and eosin were categorized as acanthotic (classic), mixed, melanoacanthoma (pigmented), or irritated based on their histological characteristics. However, only cases with adequate tissue samples and thorough clinical information were examined. All materials and important clinical information, such as age, sex, and clinical examination results, were sent to the histopathology section of the pathology department in 10% formalin. All tissue sections were processed according to the standard biopsy procedure for paraffin-embedded sections. After creating slices that were three to five microns thick, eosin and hematoxylin stains were

applied. Two qualified pathologists examined each slide under a light microscope to ensure diagnostic consistency.

The biopsy-proven sites were divided into the following categories for convenience: face, neck, trunk, and extremities.

Statistical analysis was performed using the statistical software package SPSS version 22.0 (SPSS Inc, Armonk, NY: IBM Corp). Baseline characteristics were summarized as frequencies and percentages.

Results

All 39 of the cases (28 male and 11 female) of SK that were clinically diagnosed were later confirmed by histological examination of biopsy samples. The patients were aged 50-90 and older. The highest number of cases (13/33.3%) in this study was identified in the age group of 60 to 69 years. The next most frequent age group affected was 70 to 79 years old (Table 1). The trunk (21/53.8%) was the most common biopsy site for biopsy-proven SK, followed by the neck (9/23.1%), the face (4/10.2%), and the extremities (5/12.8%). (Table 2).

Table 1.

Lesion distribution according to histology, age, and gender (n=39)

Parameter	Category	n	Percentage
Gender	Male	28	71.8 %
	Female	11	28.2 %
Age	50-59	5	12.8 %
	60-69	13	33.3 %
	70-79	12	30.8 %
	80-89	7	17.9 %
	90 and above	2	5.1 %
Type of lesion	Acanthotic (Classic)	23	59.0 %
	Mixed (Irritated and Pigmented)	9	23.1 %
	Irritated	5	12.8 %
	Melanoacanthoma (Pigmented)	2	5.1 %

Table 2.

Location of seborrheic keratosis.

Location	n	Percentage
Face	4	10.2 %
Neck	9	23.1 %
Trunk	21	53.8 %
Limbs	5	12.8 %

A comprehensive analysis showed that the acanthotic (classic) subtype was the most common histopathological subtype (23/59.0%), followed by the mixed (9/23.1%), irritated (5/12.8%), and melanoacanthoma (pigmented) (2/5.1%).subtypes.

The acanthotic variety has numerous basaloid cells and pronounced acanthosis. The vertical diameter of the acanthosis can be at least 3 mm (Figure 1). Wide keratinocyte bands enlarged the epidermis. Hyperkeratosis and papillomatosis are typically mild. Horn cysts, also known as pseudocysts, are a

defining characteristic, and in certain situations, there may be several cysts (Figure 2).

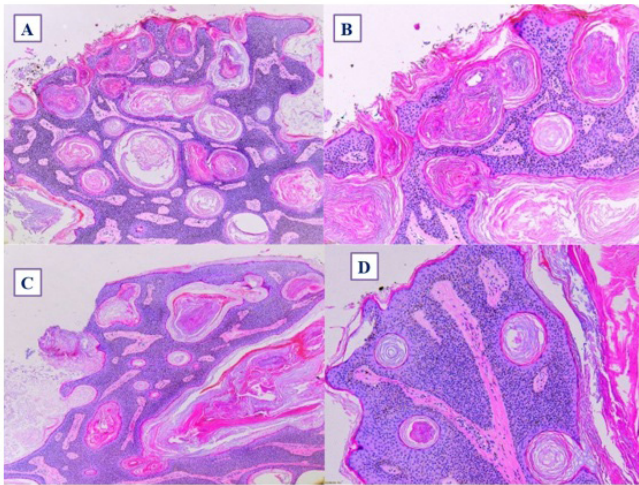


Fig. 1. Images of the acanthotic (classic) type of seborrheic keratosis stained with H&E. There is significant thickening of the epidermis. The appearance of horny invaginations is similar to pseudohorn cysts. (A X200), (B, C, and D X400)

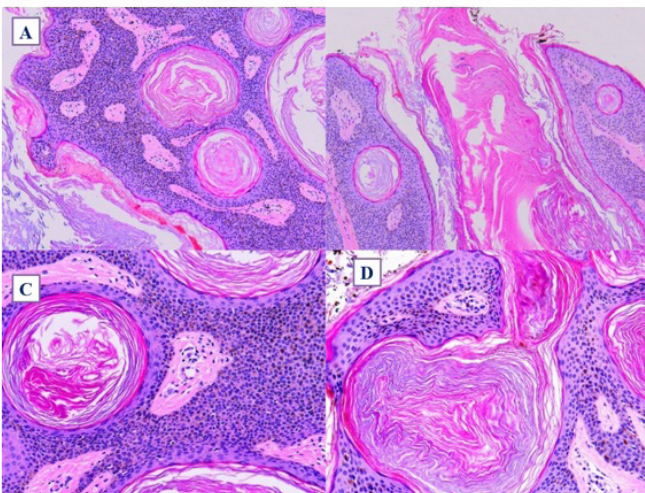


Fig. 2. Images of the acanthotic (classic) type of seborrheic keratosis stained with H&E. There are horn pseudocysts and horn cysts. In contrast to pseudohorn cysts, which are created by keratin downgrowths from the underlying stratum corneum and are thus attached to it, horn cysts develop intraepidermally and are discharged transepidermally. A thin granular cell layer surrounds the surrounding keratinocytes in the spherical, keratin-filled center of both cysts. (A, B, C, and D X 400).

In the mixed (irritated and pigmented) subtype, we found acantholysis, dyskeratosis, spongiosis, an inflammatory cell infiltrate with partially lichenoid appearances in the dermis (which may not be present), eosinophilic squamous epithelial cell aggregations (squamous eddies) resembling onion skin, and apoptotic basal cells. The mixed form was highly pigmented, with melanocytes proliferating (Figure 3 A,B).

Aggregated eosinophilic squamous cells were observed in the irritated type, along with acantholysis, dyskeratosis, spongiosis, and degeneration of the basal cell layer. (Figure 3 CD).

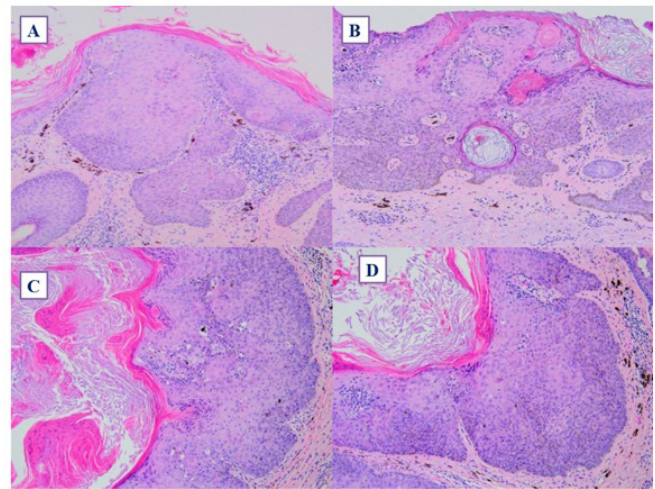


Fig. 3. (A, B) Two images of mixed (irritated and pigmented) type of seborrheic keratosis stained with H&E. (C, D) Two images of irritated type of seborrheic keratosis stained with H&E. (A, B, C, and D X 400).

Melanoacanthoma (pigmented), characterized by rapid, dark pigmentation and proliferation of dendritic melanocytes across an acanthotic epidermis, was detected in only two cases (Figure 4).

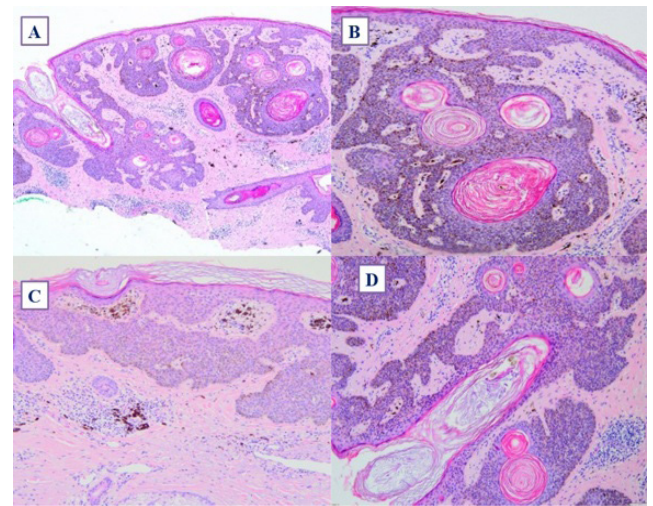


Fig. 4. Images of melanoacanthoma (pigmented) stained with H&E. (A, B, C, and D X 400)

Discussion

Dermatologists see seborrheic keratoses every day since they are among the most prevalent skin tumors. These distinct, round or oval growths might be flesh-colored, light brown, or black, and they seem to be adhered to the skin. Based on clinical presentation, most seborrheic keratoses are easily diagnosed. Sometimes, distinguishing certain lesions from others, including malignant melanoma, can be challenging.⁵ Acanthosis, papillomatosis, hyperkeratosis, and horn pseudocysts are the histological features of seborrheic keratosis. Seborrheic keratosis is thought to be caused by several factors, including age, genetic susceptibility, and potentially UV radiation exposure.² It has been documented

in younger age groups, such as teens and young adults, despite being more common in the elderly.¹⁰

Studies and geographical areas differ greatly in how seborrheic keratosis is classified pathologically.¹¹ We divided seborrheic keratosis into five histological categories based on *Andrews' Diseases of the Skin: Clinical Dermatology*: acanthotic, mixed, hyperkeratotic, clonal, irritable, and melanoacanthoma.¹² The acanthotic form was the most common, accounting for 23 cases (58.9%), in line with earlier studies and confirming the general understanding of its predominance in SK. In our study, we did not find hyperkeratotic or clonal types. The correct etiopathogenesis of this lesion remains unclear despite its high incidence. Therefore, it has been proposed that human papillomavirus (HPV), sun exposure, genetics, and chronic irritation are risk factors. Recent genetic research suggests that somatic mutations in the Fibroblast Growth Factor Receptor 3 (*FGFR3*) gene may play a significant role in the onset of SK. Multiple seborrheic keratoses appearing suddenly could be an indication of Leser-Trélat, which can be linked to an underlying cancer.¹³ According to current clinical viewpoints, SK shows age-dependent trends, with incidence rates increasing progressively with age. According to Hainan Province's empirical data, the old-age population is growing faster than the working-age population, supporting the region's shift toward an aging population. One etiological factor contributing to the secular trend of rising SK incidence may be demographic aging.¹⁴

Aside from cosmetic correction, asymptomatic SK typically does not require treatment; it may also resolve on its own in a short time.¹⁴ According to our research, the trunk is the anatomical area most affected by seborrheic keratosis. However, according to a prior study, the face, neck, and upper extremities were more commonly impacted than the trunk.¹⁵ In conclusion, the acanthotic type of SK was the most common histologic type identified in this research. It usually affects older people. To rule out other premalignant or malignant conditions, a biopsy should be performed on lesions.

Ethics Approval

All steps in this study complied with the Ethics Committee of the Institutional Review Board of Prince Sattam bin Abdulaziz University (SCBR-639/2026).

Author Contributions

Mohammed Saud Alsaidan: Study design, Writing – original draft.

Salman Bin Dayel: Study design, Writing – original draft.

Wafaey Badawy: Study design, Writing – original draft.

Mariyyah Abdulrahman Alnathir: Data curation, Investigation, Writing – original draft.

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Ghada Lazzam Allazzam: Data curation, Investigation, Writing – original draft.

Faris Majed Almusayfir: Study design, Formal analysis, Writing – original draft.

Raghad Shudayyid R. Almutairi: Study design, Formal analysis, Writing – original draft.

Ali Hassan A. Ali: Conceptualization, Methodology, Writing – review and editing.

All authors have approved the final article.

Conflict of Interest

The authors have declared no conflict of interest.

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Availability of Data and Materials

The data are available upon request from the authors.

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