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CASE REPORT

Rare Dermoscopic Vascular Manifestations of Clonal Seborrheic Keratosis: A Case Report

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Abstract: Clonal seborrheic keratosis (SK) represents a rare histological subtype of seborrheic keratosis that is challenging to distinguish from conventional SK and other skin neoplasms based solely on clinical presentation and dermoscopic features. Current clinical observations indicate that vascular-related manifestations in this subtype are exceedingly rare. Our report herein reports the uncommon globular vascular findings identified on dermoscopic examination of clonal SK, which not only holds great significance for the diagnosis and differential diagnosis between clonal SK, ordinary SK and other cutaneous tumors, but also provides strong support for the development of standardized dermoscopic diagnostic criteria and treatment advice for clonal SK.

Keywords: clonal, seborrheic keratosis, Borst-Jadassohn phenomenon, vessel, dermoscopy

Introduction

Seborrheic keratosis (SK) is one of the most common benign epidermal tumors encountered in dermatological practice. While typically diagnosed based on characteristic clinical and dermoscopic features-such as comedo-like openings, milia-like cysts, and fissures-certain variants may pose diagnostic challenges.[1,2] The presence of vessels, notably hairpin vessels, can also be observed in SK, especially when inflamed.[3] Among these, clonal SK represents a distinct histopathological subtype characterized by intraepidermal nests of monomorphic keratinocytes. Dermoscopically, it often presents with a pattern of sharply demarcated, round to oval, whitish or bluish-gray globules and structureless areas.[4] Notably, vascular features have rarely been described in association with this variant,[4–6] and their presence may lead to diagnostic uncertainty, potentially mimicking ordinary SK and other benign or malignant neoplasms such as melanocytic lesion and basal cell carcinoma (BCC).[7] Under such circumstances, the early identification and diagnosis, along with the selection of a suitable individualized treatment regimen, are of significant importance. Herein, we report a case of clonal SK presenting with uncommon globular vascular findings on dermoscopic examination, aims to provide a reference and therapeutic basis for the future dermoscopic diagnosis of clonal SK.

Case Presentation

A 70-year-old woman presented with a 10 years history of a growing-gradually, asymptomatic, pigmented lesion on her left lower leg. No treatment had been received during this period. The physical examination showed an irregular, reddish-brown flat plaque with 2cm×1.5cm of dimension, medium hardness, and non-tender (Figure 1A). Dermoscopy revealed a demarcated border lesion with diffuse yellowish-pink background with moth-eaten edges, globular blood vessels distributed in a circular pattern, multiple blue-brown globules, comedo-like and fingerprint-like pigment structures (Figure 1C and D).

Based on the atypical dermoscopic appearance, an excisional biopsy was performed to rule out malignancy. Histopathological examination disclosed hyperkeratosis of the epidermis, the epithelial cells are arranged in

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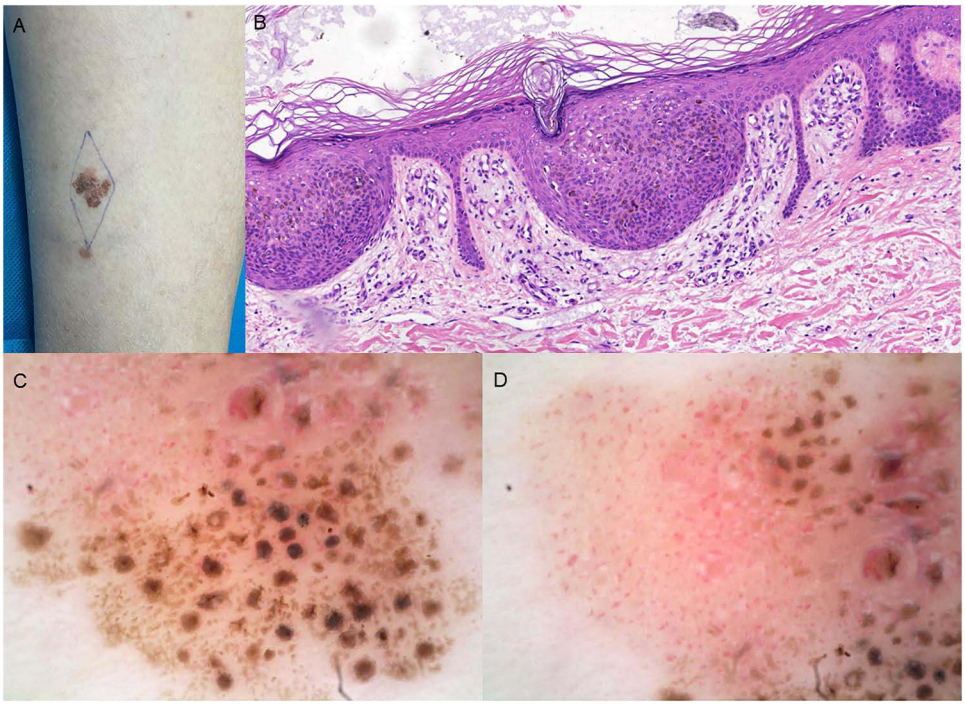

Figure 1 (**A**) Physical examination showed an irregular, reddish-brown flat plaque with 2cm×1.5cm with a rough surface on the left lower leg. (**B**) The histopathology disclosed classical Borst-Jadassohn phenomenon include intraepidermal nests, horn cysts and melanin within the basaloid cells (hematoxylin-eosin staining; original magnification, ×40). (**C**) Dermoscopic imagines revealed multiple blue-brown globules, comedo-like and fingerprint-like pigment structures within a demarcated border lesion with diffuse yellowish-pink background with moth-eaten edges. (**D**) Globular blood vessels distributed in a circular pattern.

a concentric whorled configuration, aggregating to form nests containing brownish pigment granules, along with lymphocytic infiltration and dilated capillaries within the dermis, corresponding to the Borst-Jadassohn phenomenon (BJP). No cytologic atypia, which diagnosis is consistent with clonal SK (Figure 1B).

Discussion

The dermoscopic identification of unequivocal vascular structures in clonal SK is exceptionally uncommon.[4–6,8] While the classic dermoscopic criteria for clonal SK primarily focus on keratin-related and pigmentary patterns, our case illustrates that a distinct globular vascular pattern. This finding confirms and expands the known dermoscopic characterize of this histologic variant.

The presence of vessels in SK is generally considered uncommon and is more frequently reported in irritated or inflamed lesions.[3] However, in our case, there was no histological evidence of irritation or significant inflammation. The observed dermoscopic circular-pattern globular blood vessels likely correspond to dilated capillaries trapped between the intraepidermal nests of tumor cells, representing an intrinsic architectural feature rather than a secondary change. This unique anatomical configuration explains why they manifest dermoscopically as well-defined, globular structures, as opposed to the more superficial, linear, hairpin or dotted vessels seen in conventional SK.[5] Furthermore, in contrast to the classic dermoscopic pattern of SK (comedo-like and fingerprint-like pigment structures), our case exhibited a predominance of blue-brown globules, corresponding histopathologically to pigmented intraepidermal, tightly aggregated keratinocyte nests, which offers a compelling illustration of the direct correlation between its underlying histopathology and dermoscopic features.

Clinically, it is difficult to distinguish clonal SK from typical SK or other cutaneous neoplasms based on lesion morphology, as they often present as similar light brown or black papules or plaques with either a smooth or rough surface.[5,9,10] As the most widely utilized non-invasive diagnostic modality in dermatology, dermoscopy holds clinical precedence over cutaneous biopsy. The presence of characteristic dermoscopic features permits a preliminary diagnosis for certain diseases.[11] However, the combination of dermoscopic blue-brown globules and circular-pattern globular blood

vessels in clonal SK could potentially be mistaken for the vascular patterns seen in melanocytic lesions, BCC, or Spitz nevus, creating a potential for misdiagnosis.[1,7,12–15] Thus, the identification of dermoscopic hallmarks specific to clonal SK for the differentiation between clonal SK and other skin tumors would substantially contribute to refine the preoperative differential diagnosis and therapeutic decision-making.

The BJP as histopathological hallmark of clonal SK is not pathognomonic for a single entity but represents a shared architectural pattern seen in a spectrum of benign and malignant skin tumors mainly include Hidroacanthoma simplex (HS) and Bowen's disease.[16–18] Therefore, accurate diagnosis requires a thorough clinicopathological correlation, integrating key clinical features with detailed histopathological analysis. HS is a benign cutaneous tumor that poses a significant challenge for clinical differentiation from clonal SK. The key distinction lies in their differing cellular lineages on histopathology-HS comprise nests of poroid cells within an acanthotic epidermis and contain cystic or ductal structures in the nests which are absent in the basaloid keratinocyte nests of clonal SK.[18] Bowen's Disease is a in situ lesion of squamous cell carcinoma (SCC), classically presents as a solitary, slowly enlarging, well-demarcated erythematous plaque with fine scale and a crusted surface, also pose a significant diagnostic challenge by mimicking clonal SK.[19] Histopathologically, Bowen's disease can exhibit intraepidermal nesting, but the nests are composed of severely atypical keratinocytes with pleomorphic, hyperchromatic nuclei and abundant mitotic figures, characteristics that are not present in clonal SK.[19] For the purpose of distinguishing clonal SK from typical SK, HS, melanocytic nevus, BCC, Bowen's disease and Spitz nevus, a detailed summary of key diagnostic points is provided in Table 1.

Currently, clonal SK is classified as benign cutaneous neoplasm. The polymorphic vascular patterns include linear-irregular, dotted, corkscrew, arborizing, glomerular and hairpin vessels observed under dermoscopy are generally indicative of malignant lesions due to the dysregulation of the intracellular environment.[3] In contrast, the monomorphic, uniform circular-pattern globular vessels observed in our case of clonal SK are unlikely a result of active, tumor-driven angiogenesis. Instead, they are best explained by mechanically compresses and distorts of the progressive expansion intraepidermal "clonal" nests of keratinocytes, indicate not a marker of malignant potential. However, we propose that clonal SK requires a more radical therapeutic strategy as it exhibits a significantly elevated recurrence rate and a higher likelihood of progressing to SCC in comparison with typical SK, especially in incomplete excision and cytologic

Table 1 Comprehensive Differential Diagnosis of Clonal Seborrheic Keratosis

Disease	Clinical Presentation	Dermoscopic Features	Histopathological Hallmarks
Clonal Seborrheic Keratosis	Well-demarcated, verrucous or stuck-on papule/plaque; often light brown to grayish	Sharply demarcated whitish/bluish-gray globules and structureless areas. Rare globular vessels	Intraepidermal nests ("clones") of monomorphic basaloid keratinocytes
Classic Seborrheic Keratosis	Stuck-on, waxy, verrucous plaque; light tan to dark brown	Milia-like cysts, comedo-like openings, fissures, light brown structureless areas	Proliferation of basaloid cells; horn cysts; papillomatosis; no "clonal" nests
Malignant Melanoma	ABCDE rules: Asymmetry, irregular Border, Color variation, Diameter >6mm, Evolution	Atypical pigment network; multiple colors; irregular dots/globules; polymorphous vessels	Atypical melanocytes with pagetoid spread and dermal invasion; mitotic figures
Basal Cell Carcinoma (Pigmented)	Pearly papule/plaque with telangiectasia; rolled border; may ulcerate	Leaf-like areas, arborizing vessels, large blue-gray ovoid nests, ulceration	Nests of basaloid cells with peripheral palisading; retraction clefts
Spitz Nevus	Dome-shaped, pink, red, or pigmented papule; in children/young adults	Starburst pattern, regular symmetric globules, dotted vessels	Symmetrical; large epithelioid/spindled melanocytes; epidermal hyperplasia; Kamino bodies
Hidroacanthoma Simplex	Solitary, flat or slightly elevated, brownish-red patch; often on lower limbs	Fine, brownish-red or structureless areas; often non-specific	Intraepidermal nests of poroid cells (small, cuboidal); ductal differentiation
Bowen's Disease (presence of BJP)	Solitary, slowly enlarging, scaly, erythematous plaque; crusted surface	Fine scale, glomerular (coiled) or dotted vessels, often multifocal	Full-thickness epidermal atypia of keratinocytes; disordered maturation; mitoses

atypia.[13,20,21] The immunohistochemical investigation of BJP reveals a core hyperproliferative phenotype with strong epidermal growth factor-receptors (EGF-R), Ki-67, p63 and p53 expression within intraepidermal nests, indicate enhanced invasive potential.[22] The lesion was excised with a 1-cm margin of surrounding tissue in our case due to regarding the underlying risk of malignancy and no recurrence was observed after one-year follow-up.

Conclusions

In conclusion, our case does more than simply document a rare dermoscopic finding, it elucidates how the microscopic anatomy of clonal SK directly dictates its macroscopic dermoscopic pattern. Bridging specific dermoscopic features with their underlying pathological substrates is a crucial step towards achieving more precise, non-invasive diagnosis in clinical dermatology. In addition, the presence of the BJP in SK or other skin tumors mandates a nuanced diagnostic evaluation and therapeutic approach to rule out potential malignancy. However, evidence from reported cases remains exceedingly limited currently. Consequently, more robust data from larger cohorts with extended follow-up are necessary to confirm this finding.

Data Sharing Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Ethics Approval

Institutional approval for the publication of anonymized case details was granted by the Ethics Committee of Zhuji People's Hospital of Zhejiang Province. This study was performed in accordance with the Declaration of Helsinki.

Consent Statement

A written informed consent form has been obtained from the patient, consenting to the publication of anonymous patient information in this article.

Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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Disclosure

The authors declare no conflicts of interest in this work.

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