Case Report

Herpetic Infection Overlying Pigmented Bowen's Disease Resulting in Diagnostic Pitfall: A Case Report

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Abstract

Background: At a glance: Bowen's disease (BD; squamous cell carcinoma in situ) is an in-situ malignant intra-epidermal lesion, which can exhibit diverse clinical and histopathological manifestations. The pigmented Bowen's disease is a rare subset (less than 2%) and can be confused with several benign and malignant dermatological diseases. Superimposed infections may further confuse the picture and cause some very difficult diagnostic problems. **Case Presentation:** A case of a 63 year old man with a pigmented lesion over the right, low abdomen, which had been present for 3 years. The lower half of the lesion has recently developed presenting with burning pain and erosions there necessitating medical consultation. The initial punch biopsy specimen showed features consistent with viral dermatitis with herpetic cytopathic changes with multinucleated keratinocytes, ballooning degeneration and intra-nuclear inclusions. There was no definite sign of malignancy. But due to the continuing clinical suspicion, given the longstanding pigmented plaque, a repeat biopsy was performed from a representative site. Biopsies revealed full thickness epidermal dysplasia with irregular acanthosis and atypical keratinocytes typical of Bowen's disease with secondary inflammatory changes. The finding of superadded herpetic infection to the underlying neoplastic process was suggested with the previous biopsy. **Conclusion:** This case illustrates the rare occurrence of herpetic infection and pigmented Bowen's disease that occurred simultaneously, and the need for a clinic-pathological correlation when the clinic-pathologic presentation does not otherwise fully explain the clinic-pathological diagnosis, as well as a recommendation to repeat biopsy in such persistent and suspicious lesions.

Keywords: Bowen's disease, Pigmented Bowen's disease, Herpetic infection, Viral dermatitis, Squamous cell carcinoma in situ, Diagnostic pitfall.

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Introduction

Bowen's disease (BD) represents squamous cell carcinoma in situ characterized by full-thickness epidermal atypia without invasion through the basement membrane. First described by Bowen in 1912, it is considered a precursor lesion of invasive squamous cell carcinoma and possesses malignant potential if left untreated. The risk of progression to invasive squamous cell carcinoma is estimated at 3–5%, making timely diagnosis essential for optimal patient management.[1,2]

Clinically, Bowen's disease usually presents as a slowly enlarging erythematous scaly plaque occurring on sun-exposed or non-sun-exposed skin. Several etiological factors have been implicated, including chronic ultraviolet radiation exposure, arsenic exposure, immunosuppression, human papillomavirus infection, chronic trauma, and aging.[3,4] Histologically, the lesion demonstrates complete disorganization of epidermal architecture with full-thickness keratinocytic atypia, mitotic activity, dyskeratosis, and preservation of the basement membrane.[5]

Pigmented Bowen's disease is a rare clinicopathological variant accounting for approximately 1–2% of all cases of Bowen's disease.[6] Clinically, it appears as a brown-to-black plaque and may mimic melanoma, seborrheic keratosis, pigmented basal cell carcinoma, melanocytic nevus, and other pigmented dermatoses. Histopathological confirmation is therefore mandatory for accurate diagnosis.[7]

Herpes simplex virus (HSV) infection typically manifests histologically by ballooning degeneration of keratinocytes, multinucleation, nuclear molding, chromatin margination, and eosinophilic intranuclear inclusions.[8] These characteristic changes can dominate the microscopic picture, particularly in biopsies obtained from eroded or inflamed areas. In such situations, underlying neoplastic processes may be overlooked, especially when sampling is limited.

The coexistence of herpes infection with cutaneous neoplasms has been rarely documented. Secondary infection may alter both the clinical appearance and histopathological architecture of lesions, leading to delayed diagnosis and inappropriate management.[9,10] We report an unusual case of pigmented Bowen's disease with superadded herpetic infection in which

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the initial biopsy revealed only viral cytopathic changes, while repeat biopsy established the diagnosis of Bowen's disease.

Case Report

A 63-year-old male presented to the dermatology outpatient department with a pigmented lesion over the right side of the lower abdomen. The lesion had been gradually increasing in size over the preceding three years.

The patient remained asymptomatic for most of the disease course. However, during the previous few weeks, he developed burning sensation, pain, and superficial erosions involving the lower half of the lesion. There was no history of trauma, bleeding, systemic symptoms, immunosuppression, or prior treatment.

Clinical examination revealed a well-defined pigmented plaque over the right lower abdomen with irregular borders. The inferior aspect showed erythema, crusting, and superficial erosions associated with tenderness. Based on the chronicity and morphology of the lesion, Bowen's disease was considered among the differential diagnoses.

Initial Histopathological Examination

A punch biopsy was obtained from the eroded area of the lesion. Microscopic examination demonstrated hyperparakeratotic epidermis with irregular acanthosis. Most keratinocytes exhibited viral cytopathic changes characterized by:

- Multinucleation
- Intranuclear viral inclusions
- Ballooning degeneration
- Eosinophilic nuclear bodies
- Acantholysis
- Lymphocytic exocytosis

The dermis showed edema, melanin incontinence, and perivascular lymphocytic infiltrate.

Based on these findings, a diagnosis of viral dermatitis, likely herpetic in etiology, was rendered. No definite evidence of malignancy was identified in the sampled tissue.

Repeat Biopsy

Despite the histopathological diagnosis, the longstanding nature of the lesion and persistent clinical suspicion prompted a repeat biopsy from a different representative area.

Microscopic examination of the second biopsy revealed:

- Compact orthokeratosis and focal parakeratosis
- Irregular acanthosis
- Full-thickness epithelial dysplasia
- Loss of normal epidermal maturation
- Atypical keratinocytes involving the entire epidermis
- Marked dermal edema
- Mixed inflammatory infiltrate
- Melanin incontinence

These findings were diagnostic of Bowen's disease (squamous cell carcinoma in situ) with associated secondary inflammatory changes.

Review of the previous biopsy in conjunction with the repeat specimen suggested that prominent herpetic cytopathic changes had obscured the underlying neoplastic process, resulting in an initial false-negative diagnosis for Bowen's disease.

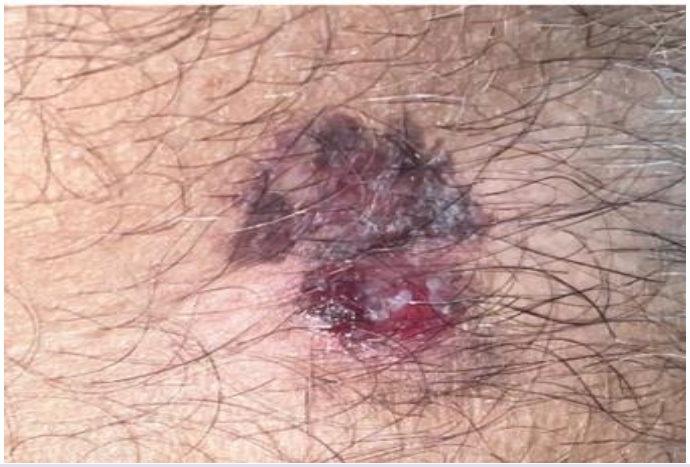

Figure 1: Clinical photograph of the pigmented plaque on the right lower abdomen showing irregular borders, with erythema, crusting, and superficial erosions

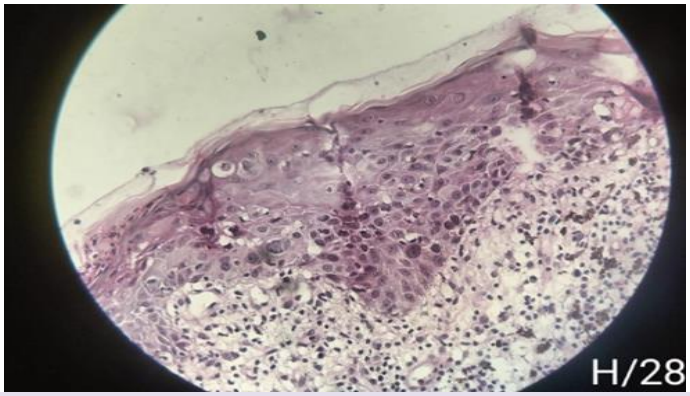

Figure 2: Histopathology of repeat biopsy showing full-thickness epithelial dysplasia, loss of normal epidermal maturation, mixed inflammatory infiltrate, and dermal edema

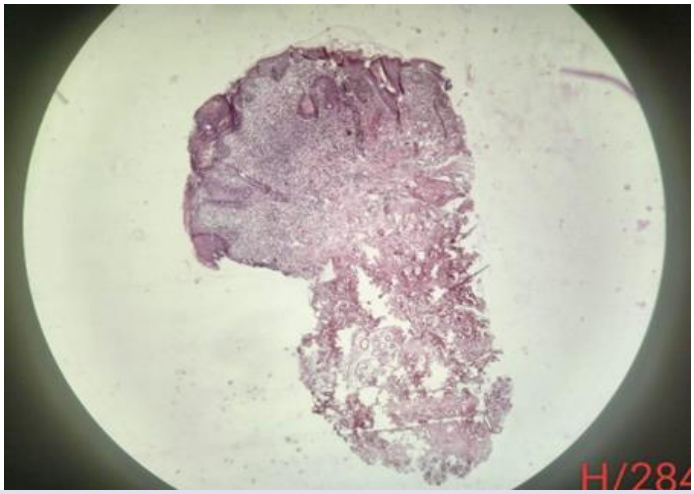

Figure 3: Irregular acanthosis with atypical keratinocytes involving the entire epidermis, consistent with Bowen's disease

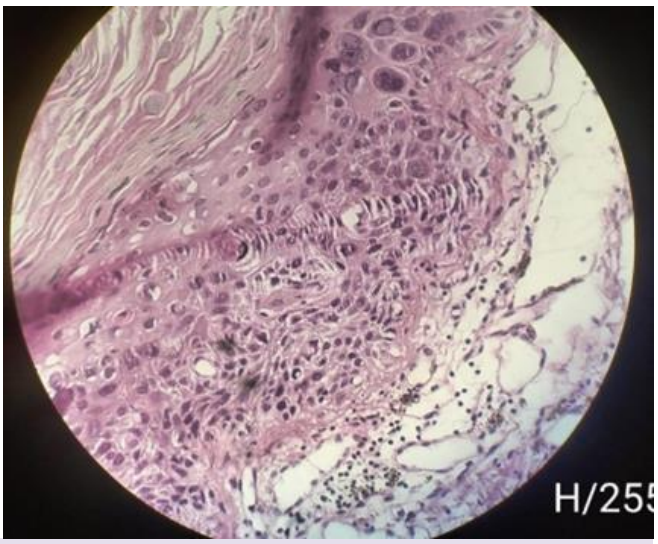

Figure 4: High-power view demonstrating multinucleated keratinocytes with intranuclear eosinophilic inclusions, ballooning degeneration, and acantholysis, characteristic of herpetic infection.

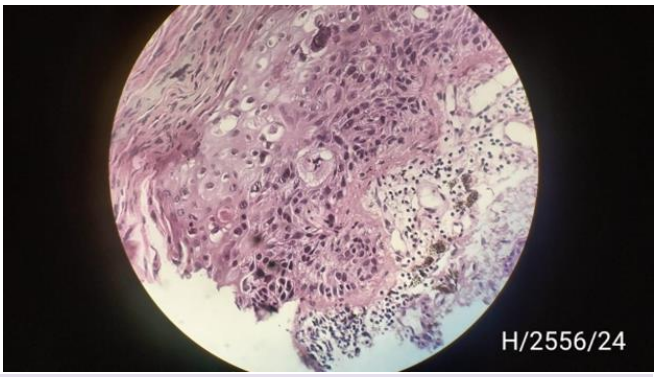

Figure 5: Full-thickness epidermal atypia and dyskeratotic keratinocytes in pigmented Bowen's disease.

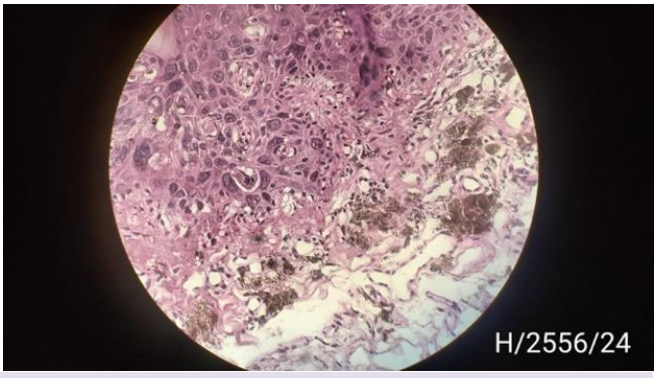

Figure 6: Superadded herpetic cytopathic changes (multinucleation, nuclear molding, and ground-glass inclusions) obscuring the underlying neoplastic process in the initial biopsy specimen.

Discussion

Bowen's disease is known to be a histological mimic of multiple inflammatory and infectious dermatoses. However, many times the disease may be mistaken for the underlying neoplasia due to inflammation and infection.[2,5]

Pigmented Bowen's disease occurs rarely and may have a variable clinical presentation making diagnosis difficult. The lesion often resembles pigmented basal cell carcinoma, seborrheic keratosis and lichenoid keratosis.[6,7] Reading the biopsy tissue (histopathology) is still considered to be the most reliable diagnostic tool.

The present case is remarkable in that the first biopsy showed a large amount of viral cytopathic effects typical of herpes infections. Multinucleation, ballooning degeneration, nuclear molding and eosinophilic inclusions are regarded as features of HSV infection which are very characteristic.[8] The changes involved a significant area of epidermis and covered the dysplastic characteristics of the Bowen's disease.

The difficulty of diagnosis may have been attributed to several factors. First, they did the biopsy from the "problems place" where there is likely maximum viral replication as it is an eroded area. Secondly, the size of the biopsy specimen was relatively small and it could be subject to sampling error. Thirdly, inflammation and viral damage to the epithelium could have confounded minor dysplastic processes.

Representative cases of clinic-pathological discordance are important indications for repeat biopsy. Repeat sampling from a different site should be strongly recommended if clinical findings indicate that a sample is malignant and a benign or non-specific diagnosis was obtained in the histopathological examination.[9] In this case, the lesion appeared for 3 years and showed progressive enlargement, which is not characteristic of an isolated case of herpetic infection. This was finally recognized, resulting in the correct diagnosis.

The connection between herpesvirus infection and the development of skin tumors is not completely understood. HSV infection can be a secondary opportunistic infection in regions of compromised epithelial barrier. Neoplastic tissue can create an environment that is conducive to the multiplication of viruses. The same events are reported with different kinds of epithelial malignancies and dysplastic lesions.[10]

This case highlights some salient points. First, superadded infection may change the clinical-pathological features of cutaneous neoplasms. Second, biopsies from ulcerated or inflammatory areas might not be representative of the entire ulcer. Last but not least, repeat biopsy should always be undertaken when there is discordance between the histopathological diagnosis and clinical suspicion.

Conclusion

Pigmented Bowen's disease has been associated with superadded superinfection with herpes and is an extremely rare manifestation which can be a great diagnostic challenge. In our patient, the obvious cytopathic changes were deemed to be viral, delaying the diagnosis. Repeat biopsy from representative areas should be done carefully clinicopathologically whenever there is a clinical doubt despite seemingly benign histopathological findings.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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