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CLINICAL RESEARCH

Dermoscopy Findings of Herpes Simplex Virus and Varicella Zoster Virus

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ABSTRACT

Herpes simplex (HSV) and varicella zoster (VZV) are common dermatologic infections often diagnosed on physical findings. Herpes simplex viruses are ubiquitous, and the incidence of infection varies from 50% to 100% of the population [1]. Approximately 1 out of 3 people in the United States will develop herpes zoster during their lifetime [2]. Natural infection with wild-type varicella virus or varicella vaccination can result in herpes zoster [2]. Approximately 99.5% of people born before 1980 have been infected with wild-type varicella virus [2]. When presentation of these conditions is delayed, PCR viral testing may be negative, making validation of the diagnosis difficult. In addition, clinicians may not have access to Tzank smears. Dermoscopy may serve as a valuable and readily available tool for diagnosis with characteristic findings of multinucleated giant cells and ballooned keratinocytes. These features help clinicians to confirm the diagnosis and guide clinical treatment and medication choice.

KEYWORDS

Herpes simplex; Varicella zoster; Dermoscopy; DNA

1. INTRODUCTION

Human herpes viruses are part of the large family of DNA viruses known as Herpesviridae. There are currently 107 species within the Herpesviridae family. Of the numerous species, eight specific viruses are known to cause human disease ranging from genital herpes to shingles to Kaposi's sarcoma. Herpes simplex virus 1 and 2 (HSV-1 and HSV-2) along with varicella zoster virus (HHV-3) are ubiquitous cutaneous infections resulting in significant medical morbidity in the United States population. Clinical lesions are prone to recurrence with a viral prodrome of burning, itching, or other forms of pain. Early clinical presentation is distinctive, while later

presentation is more challenging and can easily be misdiagnosed as bacterial or other inflammatory conditions by the inexperienced clinician. In addition, with the increased prevalence of varicella zoster vaccination, patients can present with “atypical” presentation of re-activation zoster, also known as shingles [3].

The classic histopathological findings of herpetic infection are well established and include acantholysis, ballooning degeneration, intranuclear inclusions, multinucleation, necrosis, and formation of vesicles or ulcers [4]. Characteristic cytopathic changes include enlarged and pale keratinocytes with steel-gray nuclei, marginated chromatin, multinucleated cells, nuclear molding and eosinophilic intranuclear inclusions [5]. Babar K. Rao et al. described and photographed both the dermoscopy and reflective confocal microscopy features of HSV and VZV as multinucleated giant cells and ballooned keratinocytes [6,7].

Scarce evidence exists on the dermoscopic findings of HSV and VZV. Polylobular white structures have been proposed to correspond to ballooned keratinocytes, and central brown dots corresponding to multinucleated giant cells [8]. These findings appear to correlate with the histopathologic viral cytopathic changes. HSV-1 spreads from keratinocyte to keratinocyte. These infected cells undergo cell-to-cell fusion with one another resulting in multinucleated giant cell formation. Differentiated keratinocytes promote multinucleated giant cell formation by cell-to-cell fusion with resolution of the cell membrane and transmission of HSV-1 from infected keratinocytes to neighboring uninfected keratinocytes [8].

2. MATERIAL AND METHODS

We examined 10 patients with clinical features of HSV and VZV between June 2018 and March 2021. Patients were interviewed with clinical symptoms, and a hand-held dermatoscope was used to obtain images with a digital camera. The patient age range was 35 years to 79 years old. The time from presentation to evaluation ranged from 4 days to 12 days following onset of prodromal symptoms including burning, itching, and vesicular eruption. The clinical appearance ranged from crusted papules to intact vesculopustules on an erythematous base.

Of the 10 cases, five were confirmed by viral PCR testing. The remaining five cases presented later in the clinical course with no intact vesicles for culture, or the treating provider did not obtain a culture. Dermatoscopic examination of all cases showed ballooned keratinocytes and multinucleated giant cells. VZV cases also demonstrated brown dots. All cases cleared with antiviral therapy (e.g. Valacyclovir).

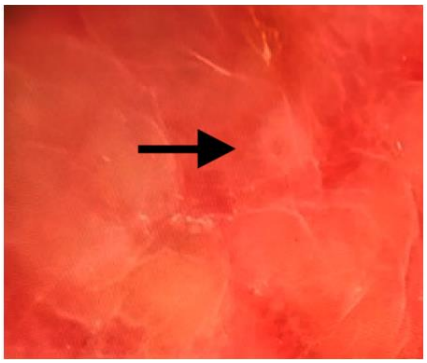

Figure 1: Herpes simplex.

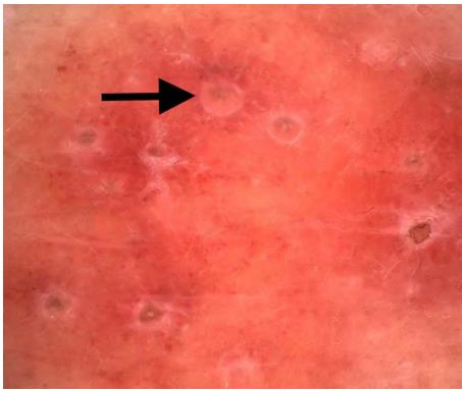

Figure 2: Varicella zoster.

3. CLINICAL CASE OF VIRAL FOLLICULITIS OF THE FACE AND DERMATOSCOPIC FEATURES

One case presented with a history of recurrent peri-oral HSV-1. Clinical inspection showed follicularly based grouped pustulovesicles on an erythematous base on both cheeks and forehead. Dermatoscopic examination showed white aggregated globules. Viral PCR testing was not obtained by the treating physician. A bacterial culture was obtained and found to be negative. The patient was not treated with antiviral agents. The patient returned with a similar eruption several months later having failed several courses of antibiotics for presumptive bacterial folliculitis. Repeat dermoscopy demonstrated the previous findings of white aggregated globules. The patient was successfully treated with valacyclovir 1 gram three times per day for one week (no steroids) and had sustained long-term remission on a suppressive dose of valacyclovir 1 gram daily.

Viral folliculitis on the face has been well described as presenting with multiple clustered erythematous papules involving the bilateral cheeks and forehead and demonstrating ballooning degeneration and intranuclear viral inclusions in the follicular epithelium [1]. The clinical features seen in HSV and VZV have a broad spectrum ranging from macules, papules, and plaques to vesicles and pustules [9]. Clinical diagnosis of HSV folliculitis is often difficult because signs of typical herpes infection (i.e. vesicles or pustules), may be entirely lacking. The typical presentation of HSV folliculitis is reminiscent of lesions of acne [10]. HSV should be considered in cases presenting with folliculitis-like eruptions refractory to antibiotic treatment and demonstrating the dermatoscopic feature of white aggregated globules.

4. RESULTS AND DISCUSSION

Diagnosis and management of infections due to human herpes viruses can be a complex issue for health care providers. Herpes Simplex Virus 1 and 2 coupled with varicella zoster virus infections may masquerade as one of many inflammatory skin conditions.

We present a series of 10 cases of HSV and VZV characterized by consistent dermatoscopic features, namely white aggregated globules in HSV and white globules centered by brown dots in VZV. Our findings indicate that dermoscopy may serve as a reliable and supporting confirmatory tool for HSV and VZV when viral testing is delayed or absent, the clinical progression is advanced, or Tzank smear exam is not readily available. Furthermore, these dermatoscopic findings are useful in delayed or ambiguous clinical presentations.

5. CONCLUSION

Combined with a high index of suspicion, these specific dermatoscopic findings may provide a distinction between viral, bacterial, and inflammatory etiologies in the differential diagnosis and will be clarified with further investigation. The increased speed to appropriate diagnosis of infections due to human herpes viruses can be critical to initiating appropriate treatment and to preventing long-term sequelae.

6. DATA AVAILABILITY

The data cited in this report is not directly available to the public for review by way of the patient consent process. Questions on case data may be sent to the contact author for review and consideration.

7. CONFLICT OF INTEREST

The authors have no known conflicts or perceived conflicts of interest or financial interest in the publication this article.

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