An Unusual Presentation of Cutaneous Alternariosis with Bullous Lesions in A Patient with Diabetes Mellitus

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Abstract

Diabetes mellitus considered to represent an immunodeficient state significantly predisposes patients to all types of opportunistic invasive fungal infection. However, very few cases of cutaneous alternariosis associated with diabetes have been reported previously. Herein, we describe a rare case of cutaneous alternariosis in an elderly diabetic patient with antecedent local trauma.

Main Text

An 82-year-old man presented with erythematous and blistering rashes on his upper extremities for 1 month. He was treated with antibacterial agents and incision and drainage of blisters with little improvement in local hospital. The lesions extended with development of scattered pustules over time. He recalled a history of prior abrasion on the forearms by accident tumble. His medical history was remarkable for diabetes mellitus controlled with diet and exercise. On examination, widespread erythematous, slightly infiltrated plaques and tense blisters, intermingled with pustules, sometimes eroded and crusting were noted over the dorsum of both hands, forearms, and part of the upper arms (Fig. 1 A, B, C, D). Laboratory findings disclosed an elevated white blood cell count of $18.87 \times 10^9/L$ with 81.87% neutrophils and C-reactive protein of 17.0 mg/dL. Chest X-ray and other hematological investigations including HIV serology were normal or negative. Direct microscopy of exudate staining with calcofluor white showed spores and septate hyphae (Fig. 1 E). A skin biopsy demonstrated dermal edema and granulomatous infiltrate with multiple rounded to oval, thick-walled spores highlighted by the periodic acid-Schiff and methenamine silver staining (Fig. 1 F, G, H). Fungal culture of both exudate and tissue yielded *Alternaria* species characterized by colonies with gray-white and cottony surface after 4 days of incubation (Fig. 1 I). Slide culture revealed brown septate hyphae and multiple darkly pigmented ovoidal conidia muriformes in groups and branched chains (Fig. 1 J). The pathogen was identified as *Alternaria alternata* by internal transcribed spacer region nucleotide sequencing. A diagnosis of cutaneous alternariosis was made. He was treated with itraconazole 200 mg twice daily and the lesions resolved completely after 2 months.

Cutaneous alternariosis is a phaeohyphomycosis caused by *Alternaria* species and occurs predominantly in immunocompromised hosts. Local trauma facilitates the penetration of the pathogen. Diabetes mellitus considered to represent an immunodeficient state significantly predisposes patients to all types of opportunistic invasive fungal infection. However, very few cases of cutaneous alternariosis associated with diabetes have been reported previously. Herein, we describe a rare case of cutaneous alternariosis in an elderly diabetic patient with antecedent local trauma.

The spectrum of clinical presentations is broad. Lesions can appear as either single or multiple, reddish-brown papulonodular, pustular, ulcerated or crusted plaques. To our knowledge, there are no prior reports of cutaneous alternariosis presenting with bullous lesions. *Alternaria* can be isolated from normal human skin or as a laboratory contaminant, therefore, histological confirmation is important to establish the clinical significance of a positive culture. In our patient, fungal elements were detected in both exudate

and the biopsy specimens. Subsequently *Alternaria alternata* was identified by mycological culture and molecular identification.

Management of cutaneous *Alternaria* infection includes antifungal therapy, surgery, and control of underlying conditions. Itraconazole has become the most common therapy and generally has favorable outcomes.

In conclusion, diagnosis of bullous lesions in diabetic patient must include an appropriate search for infection, especially fungi. Histopathological and mycological examination is necessary for correct diagnosis and identification of the fungal species.

Declarations

Patient consent statement: The authors obtained patient's informed consent to use the clinical information and photographs in publication.

Ethical approval: This study was approved by the ethical committee of Institute of Dermatology, Chinese Academy of Medical Sciences and Peking Union Medical College

Conflicts of interest: None declared

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Figures

Figure 1

(A, B, C, D) Widespread erythematous, slightly infiltrated plaques and tense blisters, intermingled with pustules, sometimes eroded and crusting over the dorsum of both hands, forearms, and part of the upper arms; (E) Direct microscopy of exudate staining with calcofluor white showing spores and septate hyphae ($\times 400$); (F) Histology showing dermal edema and granulomatous infiltrate (HE, $\times 40$); (G, H) Numerous fungal spores were revealed by Periodic acid-Schiff and Methenamine silver staining in the dermis

(×400); (I) Fungal culture showing a gray-white and cottony surface after 4 days of incubation; (J) Microscopic examination in a slide culture demonstrating brown septate hyphae and multiple darkly pigmented ovoidal conidia muriformes in groups and branched chains (×400).