Cutaneous infection caused by *Fusarium lichenicola* in a patient with verrucous hyperplasia vermiculatum manifestation

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Case report

General information

A 4-year-old girl presented with a 2 years history of verrucous hyperplasia vermiculatum in the right cheek (Fig.1A). The patient complained of itching in the lesion of cheek. She gave no history of trauma and denied contact with soil, sewage, or plants but had a history of pneumonia 3-year ago. She had used some topical steroid or anti-fungal cream months ago without any improvement. No systemic involvement was observed.

Fungal and Histopathological examination

KOH mount of the skin scrapings was positive for fungal elements of septate, branches and hyaline hyphae. Culture from the biopsy material grew white velvety to floccose colonies, with a red-brown diffusing pigment reverse (Fig.2A, B). Macroconidia with 3 to 5 septate were borne singly and in clusters at the apices of phialides (Fig.2C, D).

Fig.1 Clinical features

A, Before treatment; B, After treatment with 5 doses of intralesional AmB; C, After treatment with 7 doses of intralesional AmB; D, After treatment with 8 doses of intralesional AmB ; E, After treatment with 9 doses of intralesional AmB; F, After treatment with 2-week of oral voriconazole

Fig.2 Subculture features

A, B, colony on SDA after 6 days of incubation at 25°C, showing velvety to floccose mycelium, reverse exhibited red-brown diffusing pigment C, D, microscopically features were septate and hyaline hyphae. Macroconidia borne singly and in clusters at the apices of phialides

Fig. 3 Histopathological features

A, B,C, H&E stain. Ulcers and serous scab were seen in the epidermal. Lymphocytes infiltrated in the superficial dermis and subcutaneous adipose tissue. There were epithelioid cells and multinucleated giant cells displayed in the dermis. D,E,F, GMS stain. A large number of fungal hyphae were detected. The scattered hyphae was seen throughout the dermis

phylogenetic analysis

Phylogenetic tree was created based on the analysis for *TEF-1a* gene of 43 *Fusarium* species, including 42 nucleotide sequences (among which six marked with peach solid dot were taken as reference strains according to reference (usam Salah, The Journal of infection, 2015)) from GenBank and one from the clinical isolate (marked with the red diamond)(Fig. 4). The isolate was identified as *Fusarium lichenicola*.

Fig. 4 Phylogenetic tree

Antifungal susceptibility test

The drug susceptibility test showed the MICs to be 0.25ug/ml for AmB, 2ug/ml for voriconazole and posaconazole, >64ug/ml for 5-Fc, and >16ug/ml for Itr.

Treatment

We started treatment with intravenous amphotericin B (AmB) with initiated dose of 0.1 mg per kg of body weight per day and increased to 0.8mg/kg on day 7 and maintained for a total of 750 mg for 65 days (Fig. 1B). Then the girl was treated with injections of intralesional amphotericin B (2.5mg/L) in the outpatient department every one or two weeks for 10 times with little improvement (Fig. 1C-E). Followed treatment with oral voriconazole (50mg bid), the lesion is getting improved with reducing infected area till now (Fig. 1F).

Literature review

Fusarium lichenicola, in previous cases of infection caused by this species, has been characterized as causes of keratitis (5 cases), mycetoma (1 case), athlete's foot (1 case), scaly lesions in the webspaces (1 case), localized invasive lesion in a case of acute myelogenous leukemia (AML) (1 case) and disseminated infection in two cases with Leukemia (2 cases). The clinical manifestation were characterized by localized involvement, slow pace of progression, lesion of scaly verrucous formation and laceration. Rarely, the infection lead to invasive disease in immunocompromised patients. Mostly, terbinafine, itraconazole and/or amphotericin B were used and showed effective for the treatment. (Table 1)

	Case 1	Case 2	Case 3	Case 4
Clinical presentation	abrasive laceration between the fourth and fifth metacarpophalangeal joints and on the dorsum of the right hand	a small and painless verrucous formation at second right toe with swollen	Dry scaly lesions in webspaces and skin over the proximal interphalangeal joints	Maceration at the inter-toes area Onychomycosis
Immune status	AML	Immunocompetent	Immunocompetent	Immunocompetent
Therapy	AMB→ITR	wide surgical debridement with removal of all involved tissues →>3 mg/kg/d(lioosomal AMB)*5 d→ITR maintenance for 5 m	ITR 200 mg/d *1m	TRB 250 mg/d *3m
Prognosis	Unknown	Healed	Healed	Healed Renewal of the nail plate
Reference	Peter C. IWEN, et al. Journal of Clinical Microbiology. 2000; 3375-3378	Bibiana Chazan, et al. J Travel Med. 2004; 11:331-332	Hemachandra Champa, et al. Medical Mycology Case reports. 2013; 55-58	Khadim Diongue, et al. Case reports. 2016; 13-15

Conclusion

Herein, we report the first case of localized cutaneous infection presented as verrucous hyperplasia vermiculatum caused by *Fusarium lichenicola* in an immunocompetent 4-year-old girl in Mainland China.