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CASE REPORT

Bipolaris spicifera: An unusual cause of non-healing cutaneous ulcers in a patient with diabetes and alcohol abuse

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ABSTRACT

This is a case report of *Bipolaris spicifera*, a dematiaceous fungus commonly found in soil and as a plant pathogen, isolated from culture of the lesions and from an excisional biopsy specimen in a patient with diabetes and alcohol abuse. This case highlights the importance of considering Bipolaris as a differential diagnosis in patients with cutaneous lesions and the need for vigorous management for complete cure. *J Microbiol Infect Dis 2014;4(1): 33-35*

Key words: Immunodepression, *Bipolaris spicifera*, cutaneous ulcer

Bipolaris spicifera: Diyabetik ve alkol düşkünü bir hastada iyileşmeyen cilt ülserlerinin nadir nedeni

ÖZET

Burada, koyu renkli, toprak ve bitkilerde hastalık yapan bir mantar olan, diyabetli ve alkol bağımlısı bir hastanın yara kültürlerinden ve eksizyonel biyopsi örneklerinden izole edilen *Bipolaris spicifera*'nın etken olduğu bir olgu sunuldu. Bu olgu, cilt lezyonu olan hastalarda Bipolaris türlerinin de ayırıcı tanıda olması ve tam kür sağlanması için sıkı bir olgu yönetiminin gerekliliğini vurgulamaktadır.

Anahtar kelimeler: İmmün depresyon, *Bipolaris spicifera*, cilt ülseri

INTRODUCTION

The dematiaceous fungi comprise a large and heterogeneous group of molds found in decaying vegetables, rotting wood, forest carpets, dust, and soil.[1,2] Infections are found most common in warm, humid, tropical and subtropical climates.[1] The dematiaceous fungi, or "black fungi", found to cause infections in humans include the Bipolaris species and other pathogens like the *Alternaria species*, *Cladophialophora bantiana*, *Curvularia species*, *Exophiala species*, *Exserohilum species*, *Fonsecaea pedrosoi*, *Madurella species*, *Phialophora species*, *Scedosporium prolificans*, *Scytalidium dimidiatum* and *Wangiella dermatitidis*.[1,3] We herein report a case of cutaneous ulcers due to *B. spicifera* in a patient with diabetes and alcohol abuse.

CASE REPORT

A 47-year-old male who is resident of rural area of Amritsar, Punjab, India presented with bluish discoloration of 4th toe of the left foot which gradually progressed upwards up to the middle of leg. He was a known case of diabetes mellitus type 2 (on oral antidiabetic agent treatment), coronary artery disease, and hypertension (on and off medication) since last seven years. He also noted that he had had consumption of alcohol over the course of 20 years. He had history of fever (38.9°C arm pit, remittent) for last 27 days for which he took medication from local medical practitioner but was not relieved. There was past history of amputation of right great toe one year ago. There was no history of bronchial asthma or tuberculosis. On examination, he was afebrile, slightly anemic, breathing comfortably in room air. Abdominal examination revealed hepatomegaly without splenomegaly. On local examination right great toe was amputated. Peripheral pulses were absent on left lower limb foot. There was an ulcer on the anterior aspect of left foot (size, 15x6 cm) and two ulcers on lateral and medial aspect of left leg (sizes, 6x3 cm and 6x4cm respectively). Other systems were normal.

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Complete blood count (CBC) revealed anemia and total leucocyte count (TLC) was raised to 25600/mm^3 (90% polymorph nuclear, 7% lymphocyte, 2% monocyte, and 1% eosinophil leucocyte respectively). Neutrophils showed toxic granulations and slight shift to left. He had hypoalbuminaemia and elevated serum alkaline phosphatase. Renal function tests were within normal limits. An ultrasonography scan of abdomen showed hepatomegaly, with fatty liver and mild ascites. An X-ray of left foot ruled out of bony involvement.

Tissue debridement of the food lesions was done after hospitalization. The biopsy sample was inoculated onto MacConkey agar (MA), Blood agar (BA), and Sabouraud's dextrose agar (SDA). Pus from various sites of ulcers was also inoculated onto SDA with gentamicin and incubated at 37°C and 25°C in ambient air. BA, MA, thioglycollate and Lowenstein-Jensen (LJ) medium were inoculated and incubated under standard conditions.

Gram stain of pus and debrided tissues from ulcers revealed Gram negative bacilli, pus cells and Gram variable hyphal elements. Ehrlich-Ziehl Neelsen stained smear of pus did not reveal acid-fast bacilli. Biopsy of ulcer of left leg revealed fibrous tissue heavily infiltrated with chronic inflammatory cells consisting of lymphocytes, plasma cells and macrophages with marked proliferation of blood vessels. Inguinal lymph node biopsy revealed reactive hyperplasia. Growth on BA and MA was identified as *Klebsiella oxytoca* sensitive to levofloxacin and imipenem. Both thioglycollate and LJ medium showed no growth.

Potassium hydroxide preparation (KOH mount) and Gram staining of biopsy specimen revealed thick, brown, branching septate hyphae. Pure growth of white mycelia colony was obtained on SDA after 3 days of incubation at 25°C and 37°C. Colony turned to grey-black with black pigmentation on reverse after further incubation. Lactophenol cotton blue preparation of the growth from SDA showed brown septate hyphae with sympoidal geniculate conidiophores, bearing multicellular conidia with thick transverse septa. The isolate was identified as *Bipolaris spp.* by demonstration of formation of germ tube from poles of macroconidia extending parallel to its long axis after incubation of spores in distilled water for 2-4 hours at room temperature (Figure 1). The species was identified as *Bipolaris spicefera*, on the basis of morphology of conidia, which showed predominantly three transverse distosepta and four cells.[4] A flattened hilum was seen on the basal cells (Fig 2). The patient was started on antibiotic and supportive treatment was continued. Resolution of infection started occurring following excisional biopsy of the ulcers and concomitant amphotericin B therapy. Outpatient treatment with oral itraconazole was continued after discharge. Near complete wound healing was seen after 10-week follow-up period. A written informed consent was obtained from the patient for publication.

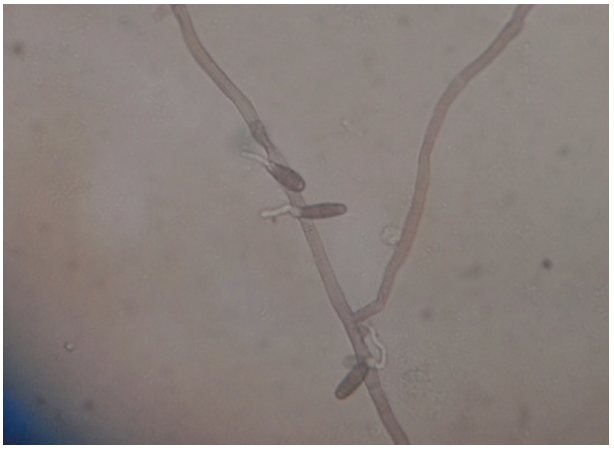

Figure 1. Demonstration of germ tube from the poles of macroconidia extending parallel to its long axis in *Bipolaris species* (Lactophenol cotton blue preparation at 40X magnification)

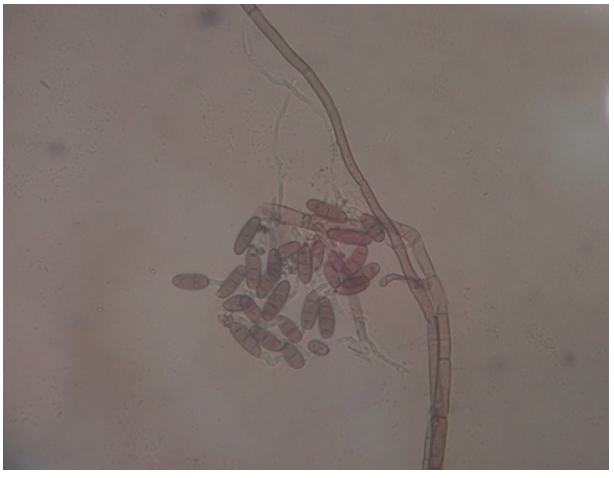

Figure 2. Conidia with predominantly three transverse distosepta and four cells (Lactophenol cotton blue preparation at 40X magnification)

DISCUSSION

Dematiaceous fungi are characterized by the presence of pale to dark brown melanin-like pigment in their cell walls.[3] Clinical infections caused by dematiaceous fungi are classified as chromomycoses, mycetomas, or phaeohyphomycoses.[1,3] First de-

scribed in 1922, chromomycoses are chronic, localized, subcutaneous or cutaneous infections characterized by sclerotic bodies in tissue called muriform cells.[1-3] First described by Ajello et al.[5] in 1974, phaeohyphomycosis are superficial, cutaneous, subcutaneous, corneal, or systemic infections characterized by dematiaceous mycelial elements, which include hyphae, pseudohyphae-like structures, and yeast-like cells in tissue with variable pigmentation of the fungus.

Inoculation of minor wounds with fungi from contaminated environmental sources appears to be closely associated with wound exacerbation and infection.[1,2] Straka et al.[2] reported a case of a non-healing cutaneous ulcer due to *Bipolaris species* in a pancytopenic patient presenting with acute leukemia following traumatic injury. Histopathologic examination and mycologic studies are essential to diagnose and demonstrate the combination of characteristics that are specific to Bipolaris. Microscopic examination helps to differentiate between the fungal species Bipolaris, Drechslera, and Exserohilum and identify characteristics of conidial shape, the presence or absence of a protruding hilum, the contour of the basal portion of the conidium and hilum, and the point where the germ tube originates from the basal cell.[6,7]

The most common reaction to Bipolaris is skin infections. It affects the skin through open wounds. The mold spores attack the wound, making it impossible to cure with antibiotics. Bipolaris is also linked to severe immune disorders. The toxins that are released from this mold put continual stress on the immune system making it difficult to fight off illness.[8] In the immunocompromised patient, surgical excision is reported as the treatment of choice for localized cutaneous Bipolaris infection with or without adjunctive systemic antifungal chemotherapy. Previous reports have demonstrated successful use of itraconazole and amphotericin B as systemic antifungal chemotherapeutic agents.[1] Itraconazole is considered as a drug of choice for the treatment of fungal infections caused by dematiaceous fungi. Posaconazole, with a similar structure as itraconazole, is another promising agent which of can be used against these dematiaceous fungi.[9] The decision for prompt aggressive surgical intervention is based on the prevention of local expansion, cosmetic deformity, and possible dissemination.[1] Disseminated disease should be treated with systemic antifungal chemotherapy.[1,6,7,10]

In conclusion, cutaneous Bipolaris infection can cause of chronic, non-healing ulcers, *Bipolaris spp.* are often misdiagnosed as non-pathogenic Drechslera or Helminthosorium and careful microscopic identification can differentiate the categories. Traumatic inoculation associated with contamination from environmental sources is a common etiologic factor. Appropriate treatment consists of amphotericin B or itraconazole with surgical excision if necessary.

Conflict of interests: No conflict of interests is declared.

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