Subcutaneous Phaeohyphomycosis caused by *Cladophialophora bantiana* after Abdominal Hernia Surgery

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**Abstract**

Phaeohyphomycosis is a term used to describe infections caused by dematiaceous fungi, i.e. fungi which contain melanin in their cell wall. *Cladophialophora bantiana* has been implicated to cause brain abscess in immunocompromised patients. Infection caused by *Cladophialophora bantiana* in an immunocompetent host is relatively rare. Surgical site infection at abdominal subcutaneous tissue caused by *Cladophialophora bantiana* was noted in this case, which was rarely reported.

**Introduction**

The genus, *Cladophialophora* represents the anamorph members of ascomycetes fungus in the order Chaetothyriales in the family Herpotrichiellaceae.¹ These members are encountered in human infections which range from mild cutaneous lesions to fatal CNS infections.² *Cladophialophora bantiana* is classified as dematiaceous fungi i.e. fungi which contain melanin in their cell wall. Very few cases were reported of subcutaneous tissue infection by this organism. We report a case of subcutaneous phaeohyphomycosis caused by *Cladophialophora bantiana*, after abdominal hernia surgery.

**Case Report**

A 50 years old married female, case of uncontrolled diabetes mellitus presented with a non healing wound with blackening of skin at local site after 20 days of the abdominal hernia repair surgery with a 15 mm defect (Figure 1). Patient was operated laparoscopically and mesh was inserted. Patient had past history of pyelonephritis 4 months back and treated with intravenous and oral antibiotics for one month.

Her reports were - Haemoglobin: 7.8 gm/dl, Total WBC count :12300/cmm, with 77 % polymorph. Platelet count was 5,40,000/cmm, serum creatinine 1.1 mg/dl, random blood sugar was 114 mg/dl, serum C-reactive protein – 86 mg/dl, total protein 6.8 gm/dl, serum albumin: 2.8 gm/dl, serum globulin: 3.97 gm/dl, A/G:0.72. ANA – Negative, C-ANCA – Negative, P-ANCA – Negative

Aspirated fluid and tissue from non healing wound was sent for bacterial & fungal culture and histopathological examination.

Emperic treatment was started with intravenous antibiotics: Tigecycline, Pazufloxacin.

Bacterial Culture identified polymicrobial infection with isolation of *Protease vulgaris* and *Escherichia coli*.

Tissue culture showed septate branching filaments with unicellular conidiospores in chains suggestive of *Cladosporium Spp*. Fungal growth sent for identification of species of Fungus to referral laboratory and it was identified as *Cladophialophora bantiana*.

The culture was originally isolated on Sabouraud dextrose agar. The growth was observed with in 6 days of incubation at 36°C. On this medium the fungus had formed dark gray, velvety, and flat colonies. These colonies also grew at 42°C. On slide cultures, pigmented, septate, branched hyphae were present, as were unbranched acropetal chains of blastoconidia. *C. bantiana* has few important microscopic features which help in its identification. The fungus showed hyaline-to-brown, septate hyphae. Smooth-walled, single-celled, pale olivaceous, ellipsoidal to spindle-shaped conidia of approximately 2.5-5 x 6-11 μm in size were seen. They were arranged in long, strongly coherent (non-fragile) chains and rarely show branching (Figure 2). The chains of the conidia arose directly from the hyphae.

The fungal isolate demonstrated positive results in the nitrate assimilation test and the urea test. These morphologic (acropetal chains of blastoconidia), growth, and nutritional characteristics of the isolate were consistent with *C. bantiana*.

Histopathology was suggestive of branching and nonbranching dematiaceous hyphae suggestive of *Cladosporium Spp*.

Patient was treated with voriconazole orally for 6 weeks, terbinafine for 14 days and conventional Amphotericin-B local dressing along with tigecycline and pazufloxacin as anti bacterial agent to treat *Protease vulgaris* and *Escherichia coli* infection.

After 6 weeks of treatment tremendous improvement at local site (Figure 3) was noted confirmed by ultrasound which revealed no fungal granuloma lesion. There after ultrasound was done every three months up to 9 months and no fungal granuloma lesion was noticed.

**Discussion**

Phaeohyphomycosis is a term used to describe infections caused by fungi that contain melanin in their cell walls.³ *Cladophialophora bantiana* is a soil-based neurotropic fungus, which has been implicated as a leading cause of cerebral phaeohyphomycosis.

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*Fig. 1: Blackier discoloration of operative wound over abdomen*
because of its affinity to glial tissue. Relatively little is known regarding the pathogenic mechanism by which this fungi cause diseases particularly in immunocompetant individuals. One of the likely virulence factors is the presence of melanin in the cell wall which can help to scavenge free radicals produced by phagocytic cells. Primary subcutaneous phaeohyphomycosis can rarely be caused by Cladophialophora bantiana. Only few cases have been reported and we present the histologic and culture findings of another.

The role of trauma and the retention of foreign materials have previously been emphasized. Our patient had history of umbilical hernia repair surgery. This suggested that the fungus survived within the subcutaneous tissue after traumatic implantation during surgery and subsequently resulted in symptomatic subcutaneous infection. Even the patients in previously published cases developed subcutaneous phaeohyphomycosis shortly after the time of traumatic implantation of the etiologic agents.

As per literature most cases were cured by surgical excision with antifungal treatment, with only rare cases of disseminated phaeohyphomycosis reported in immunocompromised individuals. In the absence of established guidelines for the duration of the therapy, ultrasound monitoring of the treatment response is advisable.

References