

## Case report

# Chromoblastomycosis caused by *Cladophialophora carrionii* in a child from India

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### Abstract

Chromoblastomycosis is a chronic fungal infection of the skin and subcutaneous tissue. It usually occurs following trauma with vegetative matter and mainly affects middle-aged male agricultural workers. Only a few cases have been reported in children. The lesions commonly involve the lower limbs, while the upper limbs and face are only rarely affected. We report a case of cutaneous chromoblastomycosis of the left arm, caused by *Cladophialophora carrionii*, in a 9-year-old boy from India, who was earlier misdiagnosed as cutaneous tuberculosis. The patient showed a good response to treatment with itraconazole and terbinafine.

**Key words:** Chromoblastomycosis; *Cladophialophora carrionii*; granuloma with caseous necrosis

*J Infect Dev Ctries* 2011; 5(7):556-560.

(Received 13 July 2010 – Accepted 02 June 2011)

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### Introduction

Chromoblastomycosis, a localized chronic fungal infection of the skin and subcutaneous tissues, is characterized by verrucous, crusted, or ulcerated lesions, with a slow evolution often resulting in disfigurement of the affected body sites [1-3]. This mycosis is distributed worldwide but most cases have been reported from tropical and subtropical regions [2,4-6]. It is caused by various dematiaceous fungi present in soil, decaying vegetation, and rotting wood [3,5,6]. It usually occurs following trauma with vegetative matter and mainly affects middle-aged male agricultural workers [4,5]. Only a few cases have been reported in children [4,7]. The lesions commonly involve the lower limbs, while the upper limb and face are only rarely affected [4,6,8-10].

We report a case of cutaneous chromoblastomycosis of the left arm, caused by *Cladophialophora carrionii*, in a 9-year-old boy from India, who was earlier misdiagnosed as cutaneous tuberculosis. This report discusses the clinical presentation, diagnosis, and treatment of this condition.

### Case report

A 9-year-old boy from the Nellore district of Andhra Pradesh, India, presented with slowly

spreading, hyperpigmented skin lesions on his left arm. The lesions were associated with itching. He was apparently normal 18 months earlier when he developed a small gray brown nodule, which gradually increased in size. He was then diagnosed with cutaneous tuberculosis at a tertiary care hospital in Hyderabad, India, based on histopathological findings and was treated with anti-tubercular drugs for one and half years, without any response.

He did not have any similar lesions in the past. There was no past history of allergy or tuberculosis and he had received BCG vaccine at birth. He admitted that he often used to climb coconut trees and had got minor abrasions on his limbs.

He was moderately built and well nourished. On physical examination, his height and weight were 140 cm and 38 Kg respectively with a body mass index of 19.38. A large, necrotic, hyperkeratotic verrucous plaque was seen on the left arm of the patient (Figure 1). His haemoglobin was 12.4 g/dl, total leukocyte count was 14,500/mm<sup>3</sup> with 15% eosinophils, platelet count was 3,30,000/mm<sup>3</sup> and ESR was 28 mm/hr. His random blood sugar was 94 mg/dl. ELISA done for detection of HIV antibodies was negative. Blood culture was sterile after seven days of incubation. Multiple skin biopsy samples were taken and subjected to microbiological and histopathological

**Figure 1.** Large, necrotic, hyperkeratotic verrucous plaque on left arm of the patient

investigations. Aerobic and anaerobic bacterial cultures of the biopsy tissues showed no growth. The biopsy tissue was negative for acid fast bacilli by Ziehl Neelsen staining. A hematoxylin and eosin stained section of the biopsy material revealed chronic granulomatous lesions with areas of central necrosis suggestive of tubercular granuloma. Skin biopsy sections sent to a super-specialty hospital in Bangalore also confirmed the same findings.

However, histopathological examination of the skin biopsies taken a week later from a deeper plane revealed a few golden-brown round structures measuring 6 – 12  $\mu$ , suggestive of copper penny bodies (sclerotic bodies) of chromoblastomycosis (Figure 2). Ziehl Neelsen staining of the biopsy tissue did not reveal any acid fast bacilli. Culture of the biopsy tissue on Lowenstein-Jensen medium showed no growth after eight weeks of incubation. KOH examination did not reveal any fungal elements; however, culture on Sabouraud dextrose agar with chloramphenicol (50  $\mu$ g/ml) and gentamicin (20  $\mu$ g/ml) revealed a slow growing fungus, which was first observed on the ninth day and gradually matured over the next two weeks. The growth was initially gray-green with a velvety texture, which slowly turned olive-green with cottony texture and produced a jet black reverse after three weeks of incubation at 25°C. The lactophenol cotton blue preparation from the culture showed septate fungal hyphae with acropetal long chains of conidia suggestive of *Cladophialophora* spp. (Figure 3). For identification of the species additional tests were performed. The

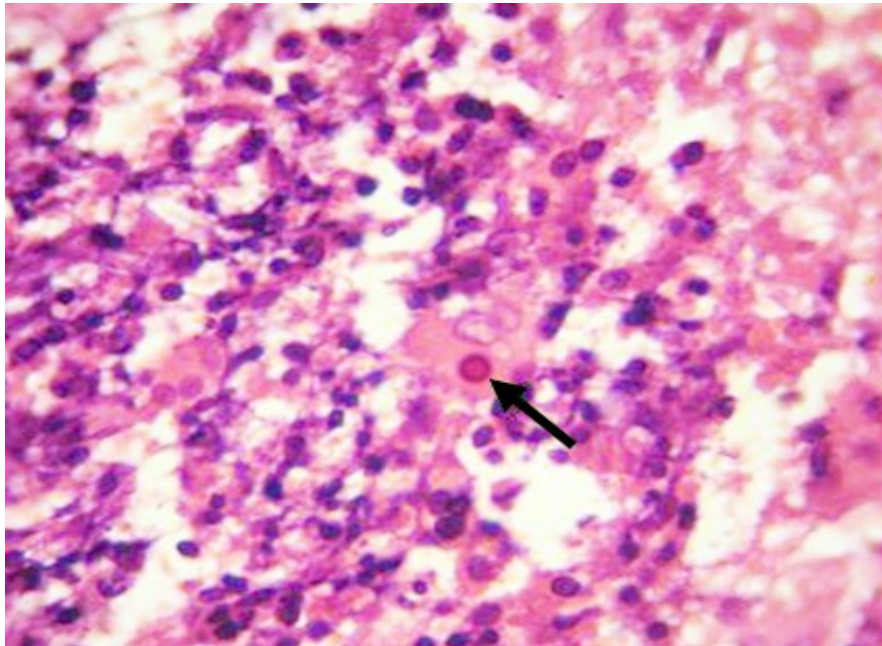
fungus grew at 37°C, but not at 42°C. It did not liquefy gelatin or Loeffler's serum medium. It was urease negative. Based on these findings the fungus was identified as *Cladophialophora carrionii*. The patient was diagnosed to have cutaneous chromoblastomycosis and as he had a chronic, long-standing lesion, we treated him with a combination of oral itraconazole (100 mg/day) and terbinafine (250 mg/day) for two months. Mycological examination performed two months later was negative. He showed good response to these antifungals and therefore was advised to continue treatment for one year and come for regular followup.

## Discussion

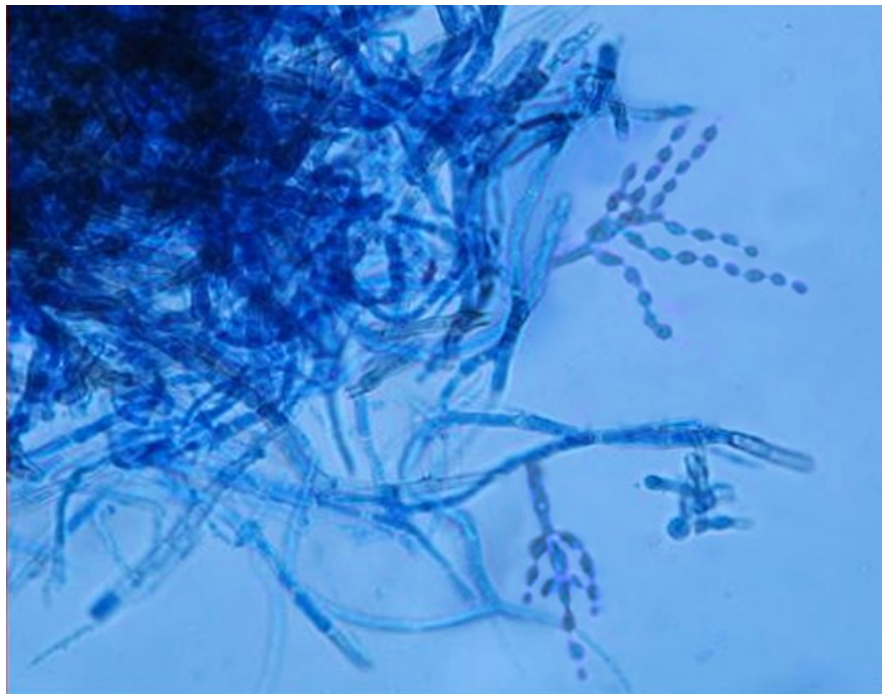
Chromoblastomycosis is caused by several dematiaceous fungi such as *Fonsecaea pedrosoi*, *Fonsecaea compactum*, *Phialophora verrucosa*, *Cladophialophora carrionii*, *Exophiala jeanselmei*, *E. castellanii* and *Rhinocladiella aquaspersa* [3;5]. *Fonsecaea pedrosoi* is the most common causative agent of this condition. However, in our patient we isolated *Cladophialophora carrionii*, a relatively rare cause of chromoblastomycosis [10]. In India this condition has been reported from Delhi, Orissa, and Guwahati in the lower extremities of middle-aged or older men, but to the best of our knowledge there are no reports of this condition in children [9;11-13].

Cutaneous chromoblastomycosis often occurs following a minor abrasion or penetrating trauma of the extremities as the agents causing this condition are found ubiquitously in the soil and vegetative

**Figure 2.** Golden-brown round copper penny body suggestive of chromoblastomycosis



**Figure 3.** Lactophenol cotton blue preparation showing septate fungal hyphae with acropetal long chains of conidia suggestive of *Cladophialophora* spp



matter. Likewise, in our report, the boy gave history of climbing coconut trees and thereby getting minor injuries of the arms, which could have predisposed him to this disease.

This condition is often misdiagnosed as it is clinically indistinguishable from tuberculosis verrucosa cutis, squamous cell carcinoma, palmo-plantar psoriasis, and sporotrichosis [4;9;12]. Even in our case the boy was initially misdiagnosed as cutaneous tuberculosis and was treated for one and half years with antitubercular drugs. Chromoblastomycosis can present as nodules, tumours, plaques, warty lesions, and scarring lesions [11]. Our patient presented with necrotic hyperkeratotic verrucous plaque, which is atypical for chromoblastomycosis.

The typical histopathological findings of cutaneous chromoblastomycosis are marked epitheliomatous hyperplasia, microabscesses, chronic granulomatous infiltrates with multinucleate giant cells, epithelioid cells, histiocytes and lymphocytes and presence of copper penny bodies. However, in our patient, though the histopathological examination finally revealed the presence of a few sclerotic bodies, it primarily showed only multiple granulomas with central caseous necrosis, which is considered characteristic of tubercular granuloma [14]. The presence of granulomatous infiltrates with central caseous necrosis in our patient with cutaneous chromoblastomycosis is a unique finding not reported elsewhere.

The microbiological confirmation of the diagnosis is very important. In our case the KOH examination was negative; however, the direct microscopic examination of 10% KOH preparation of the scrapings and crusts from the lesions can reveal small, round, thick-walled, brownish septate sclerotic bodies. This is an inexpensive and simple technique which does not require any sophisticated tools [15]. Proper identification of the fungus grown in culture is necessary for confirming the diagnosis as chromoblastomycosis. Certain non-pathogenic or contaminant fungi such as *Paecilomyces* spp and *Penicillium* spp. may be sometimes confused with *Cladophialophora carrionii*. Although both these fungi produce long chains of elliptical conidia, the conidia arise from structures such as metula and phialides, which are not seen in *C. carrionii*. Both these fungi are rapid growers, unlike *C. carrionii*, which grows very slowly. Moreover, these non-pathogenic fungi usually form greenish white or greenish brown colonies with no pigment on the

reverse, in contrast to the jet black reverse of *C. carrionii*, which helps in correct identification of this fungi [15]. However, *C. carrionii* should be differentiated from other similar dematiaceous fungi such as *Cladophialophora bantiana* and *Fonsecaea pedrosoi*. *C. bantiana* has the ability to grow at 42-43°C, which can be used to differentiate it from *C. carrionii*. Unlike *Cladophialophora* spp., *Fonsecaea* spp. produce short chains of five or less conidia. Moreover, in *Fonsecaea* spp. At least two of the three types of anamorphic conidiation (rhinocladiella, phialophora, cladosporium) will be seen [15]. Slide culture technique will be useful for proper identification of the above-mentioned features [15].

Surgery was considered the treatment of choice for chromoblastomycosis before the advent of triazole antifungal agents [11]. However, currently with the availability of potent antifungal agents, chemotherapy has become the first-line of treatment with itraconazole and terbinafine being the drugs of choice, while surgery is used only for limited or small lesions [16]. Usually *C. carrionii* responds better to these antifungal agents than *F. pedrosoi* [10,17]. Accordingly, our patient showed good response to these antifungals. Antifungal therapy should be continued until complete clinical resolution. A combination of fortnightly liquid nitrogen cryotherapy and pulsed monthly itraconazole was shown to shorten the duration of therapy and therefore could be a cost-effective approach for treatment of chromoblastomycosis [18].

In this report, though the patient showed a good response within two months, we failed to follow up the patient beyond this period, which is a major limitation of our report. Ideally, long-term follow-up is necessary to ensure complete cure and observe any relapse.

In conclusion, physicians should consider other diagnoses before long-term treatment with anti-tubercular drugs is initiated for long-standing skin infections. Chromoblastomycosis, although infrequent, must be considered in the differential diagnosis of long-standing skin lesions in patients from tropical and sub-tropical regions. Our report emphasises the need for awareness about this condition and proper communication between clinicians and pathologists.

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**Conflict of interests:** No conflict of interests is declared.