

Primary cutaneous cryptococcosis caused by *Cryptococcus gattii* VGII in a tsunami survivor from Thailand



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ABSTRACT

Skin and soft tissue fungal infections with *Apophysomyces elegans*, *Fusarium solani*, *Cladophialophora bantiana* have been reported in survivors from 2004 Indian ocean Tsunami. We report the first case of primary cutaneous cryptococcosis caused by *Cryptococcus gattii* VGII in a Tsunami survivor from Thailand.

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1. Introduction

Skin and soft tissue fungal infections were rare in survivors from 2004 Indian ocean Tsunami. Only *Apophysomyces elegans* [1], [2], *Fusarium solani* [3] and *Cladophialophora bantiana* [4] associated wound infections have been reported in Tsunami survivors. *Cryptococcus gattii* may be found worldwide, not only restricted to tropical and subtropical regions. *C. gattii* has been isolated from the environment e.g. decayed wood, soil around the trees. *C. gattii* can be divided into four molecular types VGI, VGII, VGIII and VGIV [5],[6]. *C. gattii* associated infections usually manifest as pneumonia and meningitis [7]. Primary skin and soft tissue cryptococcosis is rare. We report the first case of primary cutaneous cryptococcosis caused by *Cryptococcus gattii* VGII in a Tsunami survivor from Thailand.

2. Case

A previously healthy 48-year-old Thai woman was admitted to Vichaiyut hospital in Bangkok on December 27, 2004 (day 0 being the day of hospital admission) for treatment of sustained injuries in the Tsunami. One day earlier while walking on the beach in front of the hotel in Lanta island, Krabi province, Thailand, she was

hit and carried by the Tsunami wave towards the hotel. Fortunately she was able to grab the wooden fence of the veranda. Although she was submerged under the sea water for some time, she did not pass out or aspirate the sea water. Despite sustaining injury to her chin, right chest, back, right elbow, right index finger, left wrist and both lower legs, she was able to stand and walk to the high ground and later returned to her hotel. She flew to Bangkok on the next day.

On examination her vital signs were normal. She was afebrile and not in respiratory distress. Her ear canals were packed with sand. Sand was also found in the conjunctiva of both eyes. Heart and lungs were normal. Abdomen was soft and not tender. Her mandible, right index finger and left wrist were swollen. There were multiple skin abrasions of her back and anterior surface of both lower legs. A very small puncture wound was found over the left shin. Rib cage x-ray revealed fracture of right 7th, 8th, 9th and 10th ribs. Chest x-ray showed no pulmonary infiltration. No other fracture was found on the x-ray of the affected parts. Blood test was normal. Cryptococcal antigen was not sent.

Initially she was treated with broad spectrum antibiotics ciprofloxacin and clindamycin for 2 weeks. However, the wound of both lower legs gradually got worse. The skin of anterior surface of both lower legs appeared inflamed, red and tender. Culture of pus from the left lower leg was sent on day 18 and on day 21 *Cryptococcus* spp. grew.

Ultrasound of the wound of left shin revealed thickening of skin and subcutaneous layer with irregular hypoechoic area about 0.9 × 3 cm². Debridement of wounds of both lower legs was done

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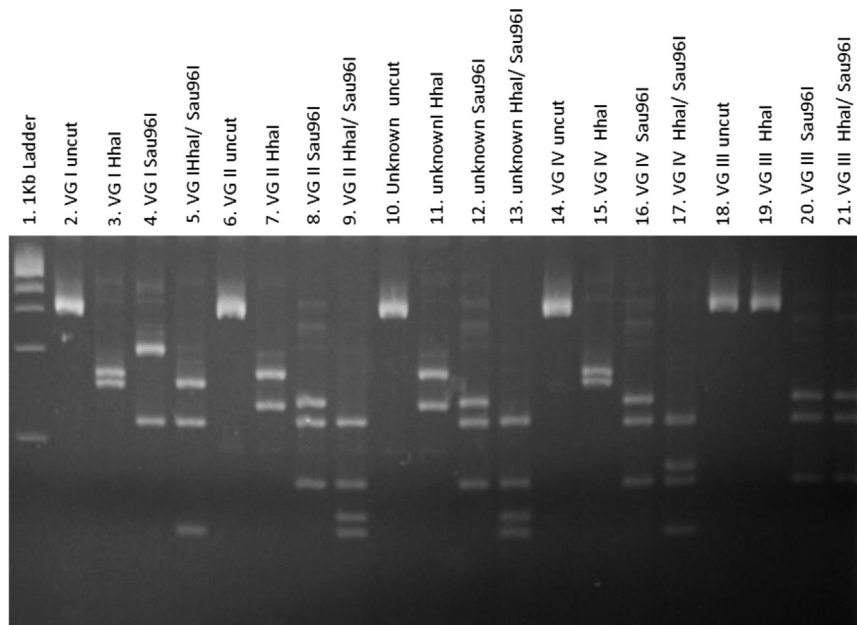


Fig. 1. PCR-RFLP of *URA5* gene of *C. gattii*. The strains of *C. gattii* molecular type VG I, VG II, VG III and VG IV were used for comparison. The isolate from our patient was labelled as “Unknown”. The pattern of *URA5*-RFLP of our isolate matched with the VGII as shown. From left: Lane 1; 1 kb Ladder, Lanes 2–5; VG I uncut/HhaI/Sau96I/Double digest with HhaI and Sau96I, Lanes 6–9; VG II uncut/HhaI/Sau96I/Double digest with HhaI and Sau96I, Lanes 10–13; Test strain uncut/HhaI/Sau96I/Double digest with HhaI and Sau96I, Lanes 14–17; VG IV uncut/HhaI/Sau96I/Double digest with HhaI and Sau96I, Lanes 18–21; VG III uncut/HhaI/Sau96I/Double digest with HhaI and Sau96I.

under general anaesthesia on day 23. Foreign bodies including sand and small pieces of woods were found and removed. Wounds were irrigated and removal of dead tissue was done. Moderate encapsulated yeast cells were found on the India ink stain of discharge of the left leg but not of the right leg. Bacterial cultures of discharge from both legs were negative. Culture of pus from the left leg grew *Cryptococcus* spp. which was identified as *C. gattii* serotypes B and C by using the canavanine-glycine-bromothymol blue agar and later it was determined to be *C. gattii* molecular type VGII by the *URA5*-RFLP typing method (Fig. 1).

She was started on anti-fungal treatment on day 21 with IV amphotericin B 0.5 mg/kg/day and oral itraconazole 100 mg twice a day. On day 42 IV amphotericin B was discontinued and itraconazole was switched to oral fluconazole 200 mg daily. Repeated India ink stain of pus on day 43 and day 56 still showed encapsulated yeast cells. On day 64 India ink smear was negative and fungal culture showed no growth. She was discharged from the hospital on day 65. Oral fluconazole was stopped on day 111. The wound finally closed and no relapse was seen during follow-up for the last nine years (Fig. 2).

3. Discussion

The lungs and central nervous system are the most common organs affected by *C. gattii* acquired through the inhalation. Primary skin and soft tissue cryptococcosis can occur after the traumatic inoculation. To our knowledge skin and soft tissue infection caused by *C. gattii* has not been reported in Indian ocean Tsunami survivors. Our previously healthy patient most likely acquired infection during the 2004 Tsunami as we found the small piece of woods inside her wound. Culture of pus from the left leg grew *C. gattii* which belonged to VGII molecular type. Molecular subtyping was not done. In Thailand cryptococcosis caused by *C. gattii* is uncommon and the most prevalent molecular type of *C. gattii* is VGII as in our case. VGIIb is found to be the most common molecular subtype of VGII in Thailand [8]. VGII can be found in Vancouver Island, Canada, northwestern United States, Brazil,



Fig. 2. Scar of the skin lesion measured 4 cm in length on the left lower leg caused by *C. gattii*.

Columbia and Puerto Rico [9]. Our patient was successfully treated by a combination of surgical drainage and antifungal treatment including three weeks of IV amphotericin B and three months of oral azoles. No relapse occurred on follow up for nine years.

In summary, clinicians should be aware of possibility of *C. gattii* skin and soft tissue infection in Tsunami survivors. Early diagnosis and early treatment of *C. gattii* can lead to complete wound healing.

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There are none.

Conflict of interest statement

There are none.

Consent

Written consent has been obtained from the patient.

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