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Wound Infection Caused by *Pseudallescheria boydii* with Black Discharge: A Case Report

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Pseudallescheria boydii could cause lethal infections involving brain, lung, eyes and other deep tissue infections both in immune-compromised and immune-competent patients. Mycetoma and wound infection are also caused by this fungus. *Pseudallescheria boydii* usually reported as resistant to Amphotericin B *in vivo*. *Pseudallescheria boydii*, have been implicated as potentially emerging human and veterinary pathogen. Mycetoma and mycetomatous infections have been reported in both immuno-compromised and immuno-competent patient caused by *Pseudallescheria boydii* and by its asexual state *Scedosporium apiospermum*. Hence a timely diagnosis is essential as the organism is often resistant to many antifungal drugs. A nine year old, healthy girl who was presented with history of trauma, due to falling down on the tiled floor, incurring a 2 mm wound on her right forearm at school. Subsequently, the swelling was increasing dramatically in size with a large amount of black discharge over a short period of time without any foul smell. The black discharge was collected and sent to Microbiology Laboratory. Culture and microscopy for bacteria were negative while potassium hydroxide (KOH) microscopy reported positive for fungal element with septate mycelium. Fungal culture yielded *Pseudallescheria boydii*. It was treated successfully with surgical debridement under general anesthesia and systemic antifungal therapy. Patient was initially started with liposomal Amphotericin B and shifted to voriconazole after identification of fungus. Patient was discharged home on oral voriconazole and showed no complications on follow up. The report is a pointer to the fact that *P. boydii* can cause mycetoma, hence, an early diagnosis and treatment of infection could avert the dangerous outcome. A late diagnosis after formation of mycetoma could make clinical treatment a difficult task and resulted in failure and amputation. To the best of our knowledge this is the first reported case of *Pseudallescheria boydii* causing wound infection in Saudi Arabia.

Key words: Child, black discharge, *Pseudallescheria boydii*, wound infection

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INTRODUCTION

Pseudallescheria boydii has been reported as causes of mycetoma and nonmycetomatous infections in both immune-compromised and immune-competent people and animals. *Scedosporium apiospermum* and its teleomorphic state *Pseudallescheria boydii*, have been implicated as potentially emerging human and veterinary pathogens. Timely diagnosis is essential as the organism is often resistant to commonly used antifungal drugs (Berzina *et al*., 2011; Ong *et al*., 2011; Tammer *et al*., 2011; Kravitz *et al*., 2011).

METHODOLOGY

Clinical studies: A nine years old girl, not known to have any previous medical illness, who fell down accidentally on the tiled floor in their school incurring a 2 mm wound on her right forearm, cleaned with alcohol by the teacher and covered with band aid. Later, at home she developed mild swelling around the wound which progress quickly in the form of rapid swelling and increased in the blackish discharge around the band aid. Upon pressing around the wound opening, more black tar-like, non-foul smelling discharge came out (Fig. 1). There was no history of fever, chills, body malaise, pain, tenderness or joint pains.

She was brought to Pediatrics Department, Prince Sultan Military Medical City (PSMMC). The impression at that time was a hematoma which has not solidified yet. Wound was cleaned and closed with no further discharge and patient was sent back to home. After 12 h, swelling increased about 3-4 cm around the wound. She was brought back to Emergency Department (ER) and impression was hematoma vs. an abscess. She was given a dose of (700 mg kg^{-1} b.wt.) of amoxicillin-clavulanate (augmentin) and local sodium fusidate ointment (fucidin) and advised to follow up after 2 days and plan to do Incision and Drainage (I and D) when it become more fluctuation. Next morning, there was heavy black discharge from the wound (Fig. 2). She was brought back again to ER and was seen by Infectious Disease (ID) consultant. Patient still had no fever or other systemic signs or symptoms.

Black discharge was aspirated and sent for bacterial and fungal studies. Gram stain was negative for any type of bacteria and also there was no bacterial growth after 48 h on the routine media used for isolation of bacteria (Blood agar, Mackonky agar, Chocolate agar and Brain Heart Infusion broth). Patient had normal Complete Blood Count (CBC) and C-Reactive Protein (CRP), although Erythrocyte Sedimentation Rate (ESR) was slightly elevated. Blood microscopy and culture report was also negative.

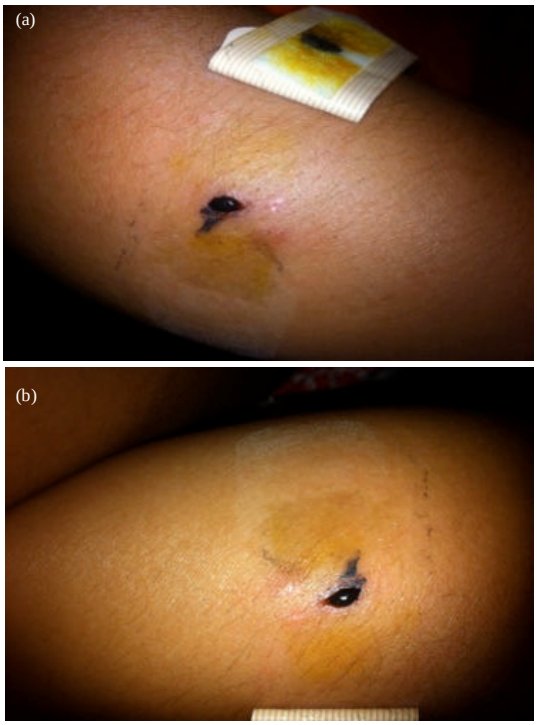

Fig. 1(a-b): A 2 mm wound on right forearm

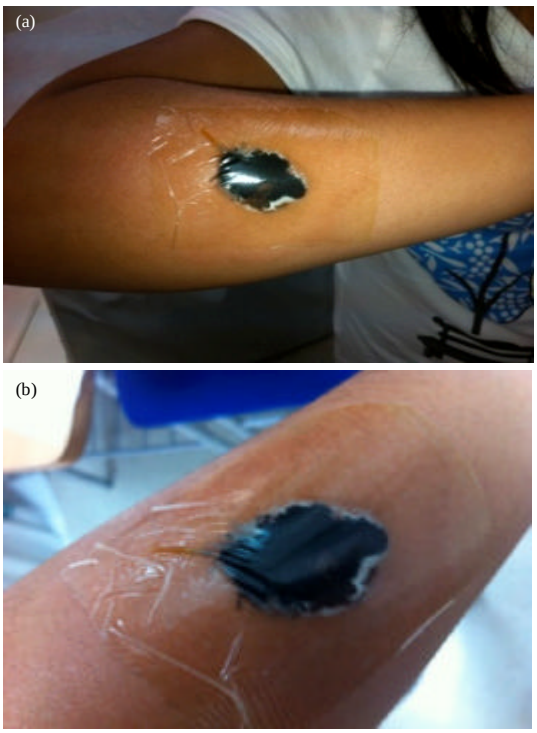

Fig. 2(a-b): Large amount of black discharge

X-ray of the affected forearm showed no bony involvement. Ultrasound showed a fluid collection measuring 1.0×0.6 cm on top of the bone with a tract connecting it to the surface.

Preliminary report from mycology (KOH microscopy) received in 4 h time, was suspicious of a "mold" with closely septate mycelium (Fig. 3). Patient was started with Liposomal amphotericin B (5 mg kg^{-1} day^{-1}) and Pipercillin-tazobactum (Tazocin IV).

Surgical wound debridement was done under general anesthesia and daily dressing was done. Tazocin IV was discontinued and later on Amphotericin B was replaced by voriconazole after fungal identification which took seven days. Patient was discharged on oral voriconazole and showed no complications on follow up.

Mycological studies

Potassium hydroxide (KOH) test: It was was done as soon as black aspirate was received. A drop of aspirate was put on glass microscopic slide, two drops of KOH-glycerol was poured over the aspirate and a cover slip of 22×50 mm then put for microscopic examination. After 15 min microscopy was done and closely septate branched mycelium seen under the microscope at 1000X magnification (Fig. 3).

Identification of fungus: Isolated fungus was identified on the basis of colonial (Fig. 4) and microscopic (Fig. 5) as described in the literature (Larone, 2011). Colony at first grows white with grayish color at the center with reverse brownish black which turn blackish

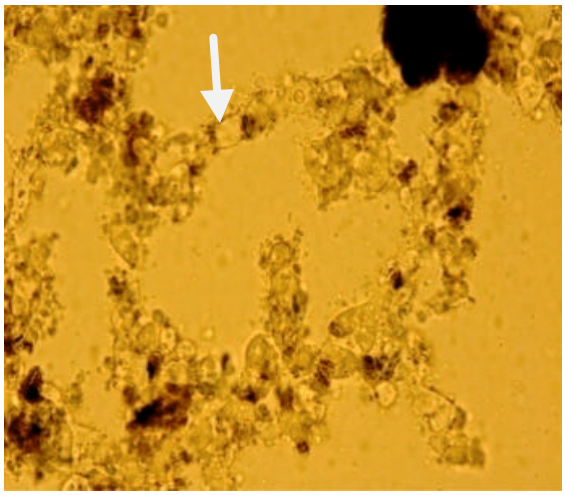

Fig. 3: KOH slide having closely septate and branched mycelium 1000X

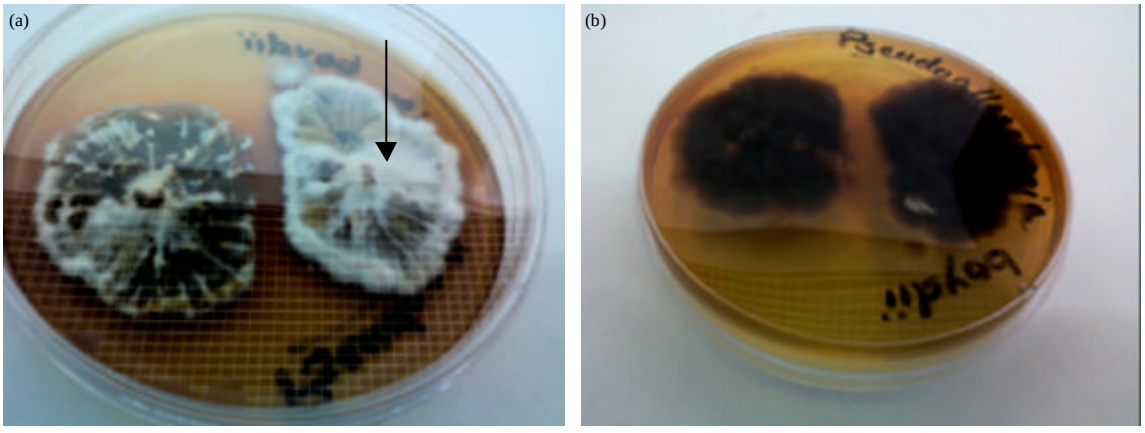

Fig. 4(a-b): Ten days old colonies having (a) Grayish black front with white aerial mycelium, while (b) Reverse of colony become black

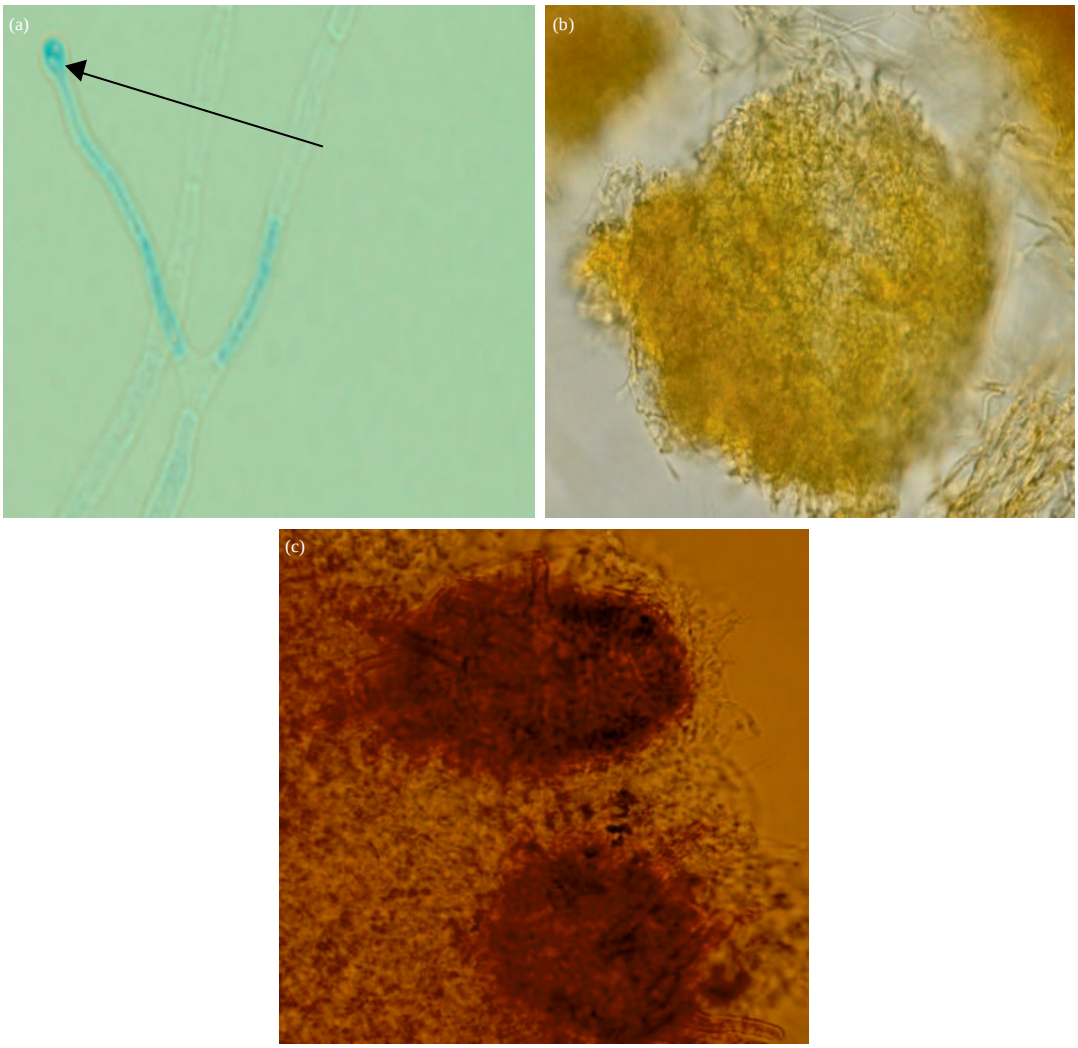

Fig. 5(a-c): Conidiophore with (a) Solitary non-septate conidia and (b-c) Young cleistothecia 1000X

grey along with aerial mycelium with age. Reverse of colony become black (Fig. 4). Conidiophore bear single non-septate hyaline conidia with abundance of cleistothecia which grows inside the agar medium (Fig. 5).

DISCUSSION AND CONCLUSION

Pseudallescheria boydii (*Scedosporium apiospermum*) is a ubiquitous filamentous and an emerging fungal pathogen, increasingly recognized as a cause of infection not only in immune-compromised but also in immuno-competent patients (Bibashi *et al*., 2009; Lindsley *et al*., 2008; Buzina *et al*., 2006; Leechawengwongs *et al*., 2007; Ouchi *et al*., 2008). This fungus can infect skin, sinusitis (Lindsley *et al*., 2008), many other infections involving bone, lung and brain (Lindsley *et al*., 2008; Buzina *et al*., 2006; Leechawengwongs *et al*., 2007; Ouchi *et al*., 2008). A timely detection and identification of fungal pathogen, as in this case, could avert the serious consequences of fungal infection. This fungus (*P. boydii*), could cause mycetoma and bone infection. Therefore, this case serves as an example that prevent, mycetoma formation, bone and deep wound infection which could be difficult to treat because of timely isolation and detection of fungus.

The field of medical mycology has become a challenging study of infections caused by a wide

and taxonomically diverse opportunistic fungi (about 450 fungal species so for been reported as a human pathogen (Larone, 2011). The spectrum of mycotic disease continues to expand well beyond the familiar entities of Candidiasis and Aspergillosis. Any fungus, capable of growing under low oxidation-reduction condition, could be a human pathogen. Although immune-deficient patients are at a higher risk of getting fungal infections but rate of deep fungal infection in an immuno-competent hosts are also increasing at alarming (Bibashi *et al*., 2009). Fungal infections although are much lower in number as compared to bacterial or viral infections but mortality rates are much higher than bacterial and viral infections and also much more difficult to control, if not detected (Larone, 2011).

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